



# Delichon Ecology

**Cutaway Bog Decommissioning and Rehabilitation Plan**

**Natura Impact Statement**

**Clooniff Bog, Co. Roscommon**

**Prepared For**

**BORD<sup>NA</sup>MÓNA**  
**Naturally Driven**

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## 1 INTRODUCTION

Bord na Móna have in recent years permanently ceased industrial peat production on a significant area of bog. In line with Bord na Móna's accelerated decarbonization strategy, the company has also committed to ambitious enhanced peatland decommissioning and rehabilitation improvements.

This strategy has been developed to optimise benefits of peatland rehabilitation and restoration for climate action. In addition, it will also have benefits for biodiversity, water (catchment management) and other ecosystem services. These improvements are in line with the Government Climate Action agenda, and will bring with it significant natural capital benefits. It will also create a stable natural landscape for the benefit of neighbours and local communities in former peat production areas.

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Blackwater bog group (Ref. P0502-01). As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The bog is part of the Blackwater bog group. Clooniff Bog is located in Co. Roscommon.

It is proposed by Government that Bord na Móna carry out a Peatlands Enhanced Decommissioning, Rehabilitation and Restoration Scheme (PCAS) on peatlands previously used for energy production. Note this proposal is also known colloquially as the 'Peatlands Climate Action Scheme'. The additional costs of the proposed Scheme will be supported by Government through the Climate Action Fund. Bord na Móna have identified a footprint of 33,000 ha (a subset of the BnM estate that has been used for energy production) as peatlands suitable for enhanced rehabilitation. This proposed Scheme will significantly go beyond what is required to meet rehabilitation and decommissioning obligations (Appendix VII) under existing EPA IPC licence conditions. Improvements supported by the Scheme will ensure that environmental stabilisation is achieved (meaning IPC obligations are met), and importantly, significant additional benefits, particularly relating to climate action and other ecosystem services, will also be delivered.

It is expected that the PCAS will have benefits accruing from biodiversity provision, water quality and storage attenuation as well as increased carbon storage, reduced carbon emissions and acceleration towards carbon sequestration. The Scheme will also facilitate monitoring of carbon fluxes (Greenhouse Gases and fluvial carbon) in selected areas (in addition to other established Research programmes), to monitor changes in where the improvements will accelerate the trajectory towards a naturally functioning peatland ecosystem.

It is envisaged that the PCAS will support activities, interventions, or measures across the Bord na Móna cutaway peatlands which accelerate the original timelines. Selected rehabilitation measures will take account of site environmental conditions, which can vary significantly. These measures potentially include:

- more intensive management of water levels through drain-blocking, outfall blocking and use of overflow pipes;
- drain blocking on extant remnant bog;
- re-profiling that will deliver suitable conditions for development of wetlands, fens and bog habitats;
- targeted fertiliser applications,
- seeding of targeted vegetation; and
- proactive inoculation of suitable peatland areas with *Sphagnum*.

These are collectively designed to optimise hydrological conditions (ideally and where possible water-levels <10 cm) for climate action benefits and to accelerate the trajectory of the site towards a naturally functioning ecosystem, and eventually a reduced carbon source/carbon sink again. In some areas of dry cutaway this trajectory will be significantly longer, and it is not feasible in the short-term to re-wet some areas, which will

develop other habitats. Other areas will naturally have deeper water). The key to optimising climate action benefits is the restoration of suitable hydrological conditions and more intensive intervention means that the extent of suitable hydrological conditions can be optimised. These measures are designed to encourage the development of peat-forming habitats, where possible. They are also designed to further slow the movement of water across the site (with the site acting similarly to a constructed wetland), slowing the release of water (improving local water attenuation) and water quality is also expected to improve as the site returns to a naturally functioning peatland ecosystem.

This Screening for Appropriate Assessment Report / Natura Impact Statement Report has been prepared by Delichon Ecology on behalf of Bord na Móna, and contains sufficient objective scientific information to facilitate Bord na Móna to determine whether the decommissioning and rehabilitation outlined in the plan referenced above requires Appropriate Assessment, or whether the potential for significant effects on any designated European Site can be excluded.

The preparation of this Screening for Appropriate Assessment Report has had regard to;

- EU Habitats Directive (92/43/EEC),
- EU Birds Directive (Council Directive (2009/147/EC)
- European Communities (Birds and Natural Habitats) Regulations 2011,
- Assessment of Plans and Projects significantly affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, European Commission 2001,
- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government (2010).
- Managing Natura 2000 Sites: The Provisions of Article 6 of the 'Habitats Directive' 92/43/EEC, European Commission, 2018.
- *Clooniff Bog Cutaway Bog Decommissioning and Rehabilitation Plan 2021* (2021) as prepared by BnM – see Appendix B of this document.

For the avoidance of doubt, within this appraisal, no reliance is made on existing mitigation measures which form part of current or previous industrial peat production. The scope of this appraisal refers to the proposed decommissioning and rehabilitation only, as described in the Plan included as Appendix B.

## **1.1 Appropriate Assessment Process**

Under Article 6(3) of the Habitats Directive, an Appropriate Assessment of the implications of any plan or project on a European Site is required before a project is approved/adopted. This must include all the aspects of the plan or project which can, either individually or in combination with other plans or projects, affect the conservation objectives of that European Site, in the light of the best scientific knowledge in the field. The competent national authorities are to authorise a plan, project or activity only if they have made certain that it will not adversely affect the integrity of any European Site.

This current document comprises a Screening for Appropriate Assessment to determine whether Appropriate Assessment is required, in addition to a Stage 2 Appropriate Assessment Report. The Screening must identify whether the project, alone or in combination with other plans and projects, is likely to have significant effects on any European Site in view of the qualifying interests and conservation objectives of these sites; or whether the potential for such significant effects can be excluded. This test is completed with cognisance of emerging case law.

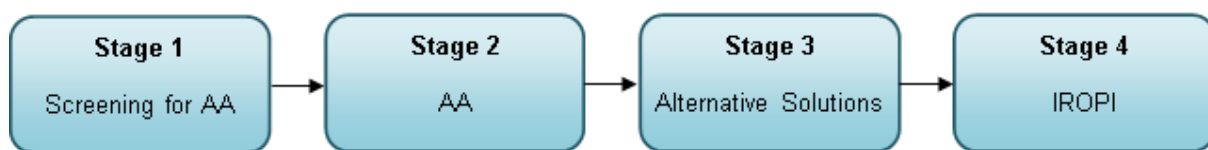
In the current context, where significant effects are considered likely, in view of the qualifying interests or special conservation interests and the respective conservation objectives of any European site, the Screening identifies that Appropriate Assessment is required. Therefore, this NIS report provides mitigation to avoid

adverse effects on European site integrity. This report is conducted in line with the requirements of Article 6(3) of the EU Habitats Directive (92/43/EEC) and the National Parks and Wildlife Service (NPWS) Guidance for Planning Authorities (2010), and it is intended that the information contained within this document will form the basis for the Article 6(3) Appropriate Assessment process completed by the Competent Authority.

### 1.1.1 Stages of the Appropriate Assessment Process

Appropriate Assessment involves a number of steps and tests that are applied using a stage-by-stage approach. Each step or stage in the assessment process precedes and provides a basis for other steps. The four stages in an Appropriate Assessment (AA), are further described below.

Guidance on the Appropriate Assessment (AA) process was produced by the European Commission in 2002, which was subsequently developed into guidance specifically for Ireland by the Department of Environment, Heritage and Local Government (DEHLG) (2009). These guidance documents identify a staged approach to conducting an AA, as shown in **Image 1**.



**Image 1: The Appropriate Assessment Process (from: Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities, DEHLG, 2009).**

#### **Stage 1 - Screening for AA**

This stage examines the likely effects of a project either alone or in combination with other projects upon a European site and considers whether it can be objectively concluded that these effects will not be significant.

#### **Stage 2 – Appropriate Assessment**

In this stage, the impact of the project on the integrity of the European site is considered with respect to the conservation objectives of the site and to its structure and function. Mitigation measures should be applied to the point where no adverse impacts on the site(s) remain.

#### **Stage 3 - Alternative Solutions**

Should the Appropriate Assessment determine that adverse impacts are likely upon a European site, this stage examines alternative ways of implementing the project that, where possible, avoid these adverse impacts. For the avoidance of doubt, no reliance is placed on Stage 3.

#### **Stage 4 - IROPI**

Assessment where no alternative solutions exist and where adverse impacts remain: Where imperative reasons of overriding public interest (IROPI) exist, an assessment to consider whether compensatory measures will or will not effectively offset the damage to the European site will be necessary. European case law highlights that consideration must be given to alternatives outside the project area in carrying out the IROPI test. It is a rigorous test which projects are generally considered unlikely to pass. In any event, the proponent does not purport to place any reliance on Stage 4.

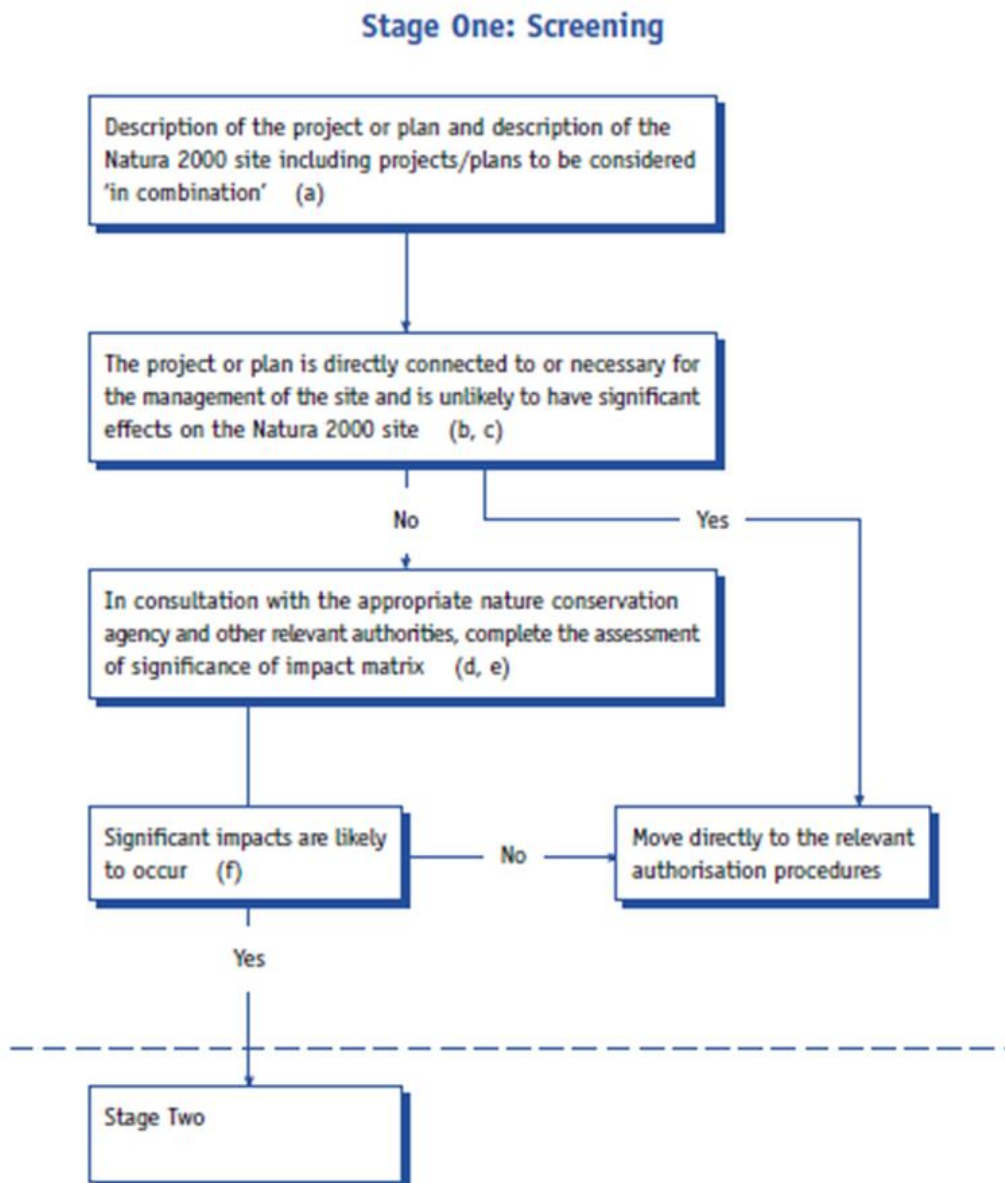
### 1.1.2 Statement of Authority

Eamonn Delaney BSc, MSc, MCIEEM, CECOL prepared this Natura Impact Statement. Eamonn has fourteen years consultancy experience and has prepared Screening for Appropriate Assessment and Natura Impact Statements for various projects, including residential, amenity, renewable energy and transport developments in addition to strategic policy and planning proposals. Eamonn conducted field visits to the Clooniff site in December 2020 and April 2021.

## 2 Stage 1: Screening

### 2.1 Screening Evaluation Process

The Screening process examines the likely effects of the described Clooniff Bog decommissioning and rehabilitation, as described in the appended ‘plan’ (Appendix B), either alone or in combination with other projects or plans, upon any European Site and considers whether it can be objectively concluded that these effects will not be significant. The Screening evaluation comprises four steps, as outlined in the diagram below:



## 2.2 Overview of Clooniff Bog Decommissioning and Rehabilitation

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Clooniff bog group (Ref. PO502-01). As part of Conditions 10.1 and 10.2 of this license, respectively, decommissioning and rehabilitation must be undertaken to ensure the permanent rehabilitation of the cutaway bog lands within the licensed area. Clooniff bog is part of the Blackwater bog group. Clooniff Bog is located in Co. Galway.

A document titled ‘*Clooniff Bog Cutaway Bog Decommissioning and Rehabilitation 2021*’ has been prepared specifically to describe the proposed decommissioning and rehabilitation measures at Clooniff Bog and is appended to this document as Appendix B.

It is proposed by Government that Bord na Móna carry out a Peatlands Enhanced Decommissioning, Rehabilitation and Restoration Scheme (PCAS) on peatlands previously used for energy production. The additional costs of the proposed Scheme will be supported by Government through the Climate Action Fund. Bord na Móna have identified a footprint of 33,000 ha (a subset of the BnM estate that has been used for energy production) as peatlands suitable for enhanced rehabilitation – including Clooniff Bog. This proposed Scheme will significantly go beyond what is required to meet rehabilitation obligations under existing EPA IPC licence conditions.

**Decommissioning** seeks to address condition 10.1 of license Ref. PO502-01, which requires the following:

*10.1 Following termination of use or involvement of all or part of the site in the licensed activity, the licensee shall:*

*10.1.1 Decommission, render safe or remove for disposal/recovery, any soil, subsoils, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.*

Decommissioning must take place at each bog prior to or concurrent with rehabilitation – the scale of decommissioning per bog varies dependant on the items/ infrastructure previously in place to facilitate prior peat extraction.

Enhanced decommissioning as part of the PCAS will enhance the future after use of the bog for amenity value, security against access for illegal and unsocial activities and general State and community benefit.

**Rehabilitation** seeks to address the requirements of Condition 10.2 of IPC License Ref. PO502-01, and is based on a reference document prepared by BNM per Bog for which the IPC license is applicable. See the following extract from IPC License Ref. PO502-01:

*“The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for permanent rehabilitation of the cutaway boglands within the licensed area.”*

Clooniff Bog was drained and developed for industrial peat production in the 1970s and has been in active peat production since 1975. Industrial peat production ceased in 2019. The primary rehabilitation goal and outcome for Clooniff Bog is **environmental stabilisation** of the bog.

Enhanced Rehabilitation interventions supported by the above referenced Scheme will ensure that environmental stabilisation is achieved (meaning IPC obligations are met), and importantly, significant additional benefits, particularly relating to climate action and other ecosystem services, will also be delivered.

### **2.3 Screening Evaluation: Is the Project Directly Connected to or Necessary for Management of a European Site?**

For a project or plan to be 'directly connected with or necessary to the management of the site', the 'management' component must refer to management measures that are for conservation purposes, and the 'directly' element refers to measures that are solely conceived for the conservation management of a site and not direct or indirect consequences of other activities.

**Finding:** No, the proposed Clooniff Bog Decommissioning and Rehabilitation is not directly connected to or necessary for the management of a European Site.

## 2.4 Description of the proposed Decommissioning and Rehabilitation

### 2.4.1 Location, Size, Scale, Landcover

#### 2.4.1.1 Location

Clooniff Bog is located approximately 4 km to the north of Shannonbridge in Co. Roscommon, on the western banks of the River Shannon (see **Figure 1**). The surrounding landscape is a mosaic primarily consisting of low-lying agricultural land (pasture) interspersed with other raised bogs, many of which have also been managed by Bord na Móna for peat production with some areas utilised for domestic turf-cutting. The River Shannon is immediately adjacent to the east and south corner of the site and parts of Clooniff form part of the flood plain of the River Shannon, regularly flooding during winter and at other times when the water levels on the river are high.

A rail line connects Clooniff bog with Cornafulla Bog to the north and to Cornaveagh Bog to the south. There is also road access to the site, with the several small public roads adjacent to the south, west and north of Clooniff Bog. The only infrastructure on-site, apart from the rail links and associated machinery access roads and tracks, is a small tea centre.

The bog comprises four distinct areas: southern, central, north-western and north eastern (See **Figure 2**). The north-western area is also called Cloonbeggane Bog (sub-site) and north-eastern area is also known as Coolumber Bog (sub-site).

See **Figure 1: Site Location of Clooniff Bog** (over).

**Figure 2: Aerial Imagery of Clooniff Bog** (over).

**Figure 4: Current habitats at Clooniff Bog** (over).

**Figure 5: Clooniff Bog – Habitats within SPA** (over).

#### 2.4.1.2 Size, Scale, Landcover

**Size and Scale:** Clooniff Bog comprises 531.1Ha in total.

Clooniff Bog (production area) is mainly composed of bare peat as the entire bog was in active peat production until 2019 (See **Appendix B**). There are some remnant sections of raised bog still present, but these are generally small.

The River Shannon flows within close proximity to the eastern boundary of the site and two narrow strips of land (under BnM ownership) extend from the site to the River Shannon. The River Shannon and its associated riparian habitats are important wildlife corridors and are key links for connectivity of habitats and species. There is a natural transition of habitats from the river to the edge of the former production bog in places. The wet grassland riparian zone floods in winter and is an example of 'callows' type grassland

The majority of the underlying geology at Clooniff Bog is massive unbedded lime-mudstone, with a small area on the eastern site of dark muddy limestone and shale<sup>1</sup>. The underlying soils and sub-soils are classed as 'Raised Bog Cutover Peat'. The peat is underlain by glacial deposits interbedded with glacio-fluvial deposits over limestone bedrock. The glacial deposits generally consist of grey gravelly clay/silt. Some lacustrine deposits (lake-deposits) are also present under peat (lacustrine shell marl).

Industrial peat production at Clooniff Bog ceased in 2019. The peat harvested from this site was used for fuel peat for West Offaly Power (WOP) in Shannonbridge.

<sup>1</sup> <https://www.gsi.ie/en-ie/data-and-maps/Pages/Bedrock.aspx>



In terms of size and scale, **decommissioning** at Clooniff includes, the cleaning of existing silt ponds (6 no.), the decommissioning and Removal of a Porto-cabin tea centre and a further materials store, decommissioning and de-gassing mobile fuel tanks, and peat stockpile management via levelling. Enhanced measures may include the lifting of the existing rail line, decommissioning of existing level crossings and measures to restrict access to the bog.

The total area of Clooniff Bog is 528.14Ha of which 431.8ha or 81.75% of the present Landcover (2021) has been allocated enhanced rehabilitation measures.

## Landcover

### Existing:

The proposed rehabilitation extent is dominated by cutover bare peat (PB4). Cutover areas support little plant species cover. The cutover bog areas support a network of field drains support that wetland plants such as Common Reed (*Phragmites australis*). Marginal habitats include Birch woodland (WN7)<sup>2</sup>, remnant sections of raised bog (PB1), scrub (WS1) and cutaway bog (PB4). The remnant sections are generally small and are dry with a dominance of Ling Heather (*Calluna vulgaris*). Coolumber Bog (the north-easternmost bog parcel) has been out of peat production for a longer period and has already developed pioneer cutaway vegetation dominated by Bog Cotton (*Eriophorum* sp.) and Sedges (*Carex* sp.), with Reeds.

The streams that flow through the site have been canalised and supports a small number of aquatic plant species. Riparian vegetation was mainly composed of Willow (*Salix* sp.), Common Reed and Reed Canary Grass (*Phalaris arundinacea*). A number of silt ponds, some of which were recently constructed, are located adjacent to the streams. A map showing existing habitats at Clooniff Bog is presented in **Figure 4**.

Extent of Landcover requiring Decommissioning: Decommissioning will be applicable across all of Clooniff Bog, where relevant.

Extent of Landcover requiring Rehabilitation: The total area of Clooniff Bog is 528.14Ha of which 431.8ha or 81.75% of the present Landcover (2021) has been allocated enhanced rehabilitation measures.

Future Landcover: Following decommissioning and rehab, future landcover of habitats currently evaluated as not requiring Rehab (i.e. Access Tracks and rights of way, marginal lands such as agricultural land, and marginal areas (e.g. high bog) around the edges of Clooniff Bog) will remain in line with existing baseline trends for these habitats, albeit without any waste or materials which would have been left in situ in the absence of decommissioning.

For habitats where rehabilitation is undertaken, landcover is expected to eventually comprise wetlands, reed swamp and fen on shallow cutaway peat and eventually naturally functioning wetland and peatland habitats. The margins of these habitats will comprise additional habitats such as marginal raised bog, broadleaved woodland and riparian areas. The development of these habitats will reflect the varying underlying environmental conditions and in part will develop as a mosaic of habitats. Rehabilitation will also modify the local environmental conditions (e.g. hydrology and topography).

The proposed rehabilitation will mean that environmental stabilisation is achieved (meaning IPC obligations are met) and, in addition, significant other positive quality effects particularly for climate action will be accrued.

In general, the key rehabilitation objective is to optimise the area of suitable hydrological conditions for climate action benefits This is defined as:

- Carrying out intensive rehabilitation with the application of enhanced rehabilitation measures (including drain-blocking, re-profiling, cell-bunding, fertiliser application, seeding of vegetation & inoculation of *Sphagnum*).

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<sup>2</sup> Alphanumeric codes follow the classification presented in 'A Guide to Habitats in Ireland' Fossitt (2000)

- Optimising hydrological conditions for the development of wetlands, Reed swamp and fen on shallow cutaway peat, and eventually naturally functioning wetland and peatland habitats. Clooniff has a pumped drainage regime and a significant area is likely to develop as wetland habitats.
- Optimising hydrological conditions for the development of embryonic *Sphagnum*-rich vegetation communities in suitable conditions.
- Stabilisation or reduction in water quality parameters (e.g. suspended solids).
- Environmental stabilisation.
- Setting the site on an appropriate trajectory to develop naturally functioning peatland habitats over time. It is not expected that the site has the potential to develop active raised bog (ARB) analogous to the priority EU Habitats Directive Annex I habitat within the foreseeable future (c.50 years). Nevertheless, re-wetting across the entire bog, as part of the proposed Scheme, will improve habitat conditions of the whole bog, making the overall bog wetter. Other peatland habitats such as embryonic *Sphagnum*-rich vegetation, fen and associated Reed swamp will develop in a wider mosaic that reflects underlying conditions. It will take some time for stable naturally functioning habitats to fully develop at Clooniff Bog.

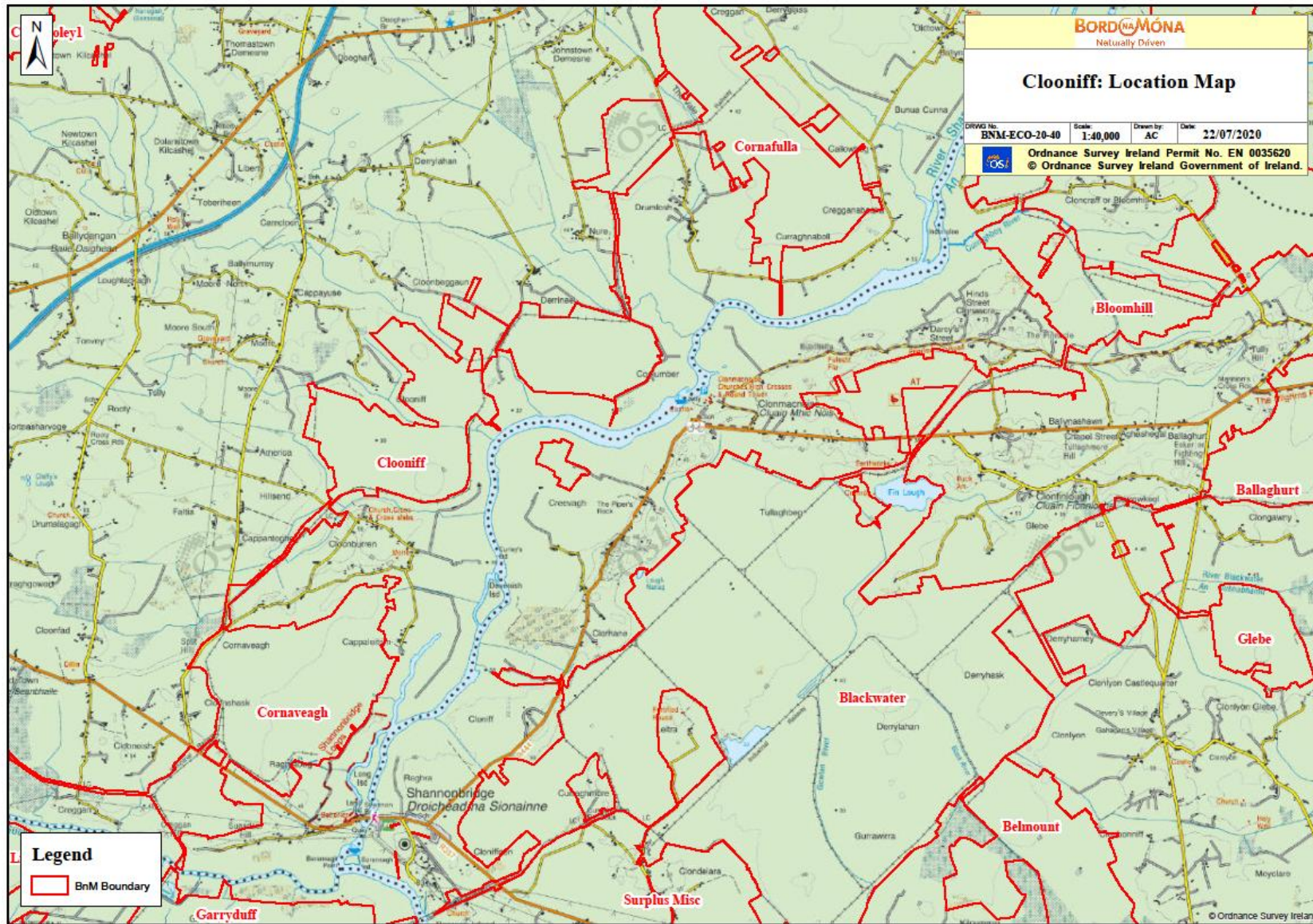


Figure 1: Site Location of Clooniff Bog





Figure 2: Aerial photo of Clooniff Bog

## 2.5 Description of the Receiving Environment

The majority of Clooniff Bog within the Bord na Móna boundary is bare peat as this site was in production until 2019 (see Image 1). The site is drained by tributaries of the Shannon Upper\_120 and Shannon Upper\_130 watercourses (Ballydangan, Derrineel, and Moore North), all of which provide connectivity to the River Shannon which is designated as part of the Middle Shannon Callows SPA and River Shannon Callows SAC.

### 2.5.1 Desk Based Assessments

#### 2.5.1.1 National Biodiversity Data Centre

A search was undertaken on the National Biodiversity Data Centre<sup>3</sup> for Protected and Invasive Species presence in the vicinity of the proposed development. Clooniff Bog is located within hectads M92 and M93<sup>4</sup>. The protected and invasive species records available for these hectads are shown in **Table 1**.

**Table 1: NBDC records of protected and invasive species in M92 and M93 10km grid squares**

Common Name (Species Name)	Date of Record	Designation	Hectad
Common Frog ( <i>Rana temporaria</i> )	26/08/2019 & 15/09/2020	Protected Species: EU Habitats Directive    Protected Species: EU Habitats Directive >> Annex V    Protected Species: Wildlife Acts	M92 & M93
Barn Owl ( <i>Tyto alba</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List	M92 & M93
Barn Swallow ( <i>Hirundo rustica</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Black-headed Gull ( <i>Larus ridibundus</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List	M92 & M93
Common Coot ( <i>Fulica atra</i> )	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Protected Species: EU Birds Directive >> Annex III, Section II Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93

<sup>3</sup> Available at <https://www.biodiversityireland.ie/>. Accessed in April 2021

<sup>4</sup> 10x10km Irish Grid Square



Common Name (Species Name)	Date of Record	Designation	Hectad
Common Grasshopper Warbler ( <i>Locustella naevia</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Common Kestrel ( <i>Falco tinnunculus</i> )	24/08/2016 & 31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Common Kingfisher ( <i>Alcedo atthis</i> )	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex I Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Common Linnet ( <i>Carduelis cannabina</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M93
Common Pheasant ( <i>Phasianus colchicus</i> )	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Protected Species: EU Birds Directive >> Annex III, Section I Bird Species	M92 & M93
Common Pochard ( <i>Aythya ferina</i> )	29/02/1984	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Protected Species: EU Birds Directive >> Annex III, Section II Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92
Common Quail ( <i>Coturnix coturnix</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List	M92
Common Redshank ( <i>Tringa totanus</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List	M92 & M93
Common Sandpiper	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92

Common Name (Species Name)	Date of Record	Designation	Hectad
Common Snipe ( <i>Gallinago gallinago</i> )	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Protected Species: EU Birds Directive >> Annex III, Section III Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Common Starling ( <i>Sturnus vulgaris</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Common Swift ( <i>Apus apus</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Common Tern ( <i>Sterna hirundo</i> )	31/07/1991	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex I Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M93
Common Wood Pigeon ( <i>Columba palumbus</i> )	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Protected Species: EU Birds Directive >> Annex III, Section I Bird Species	M92 & M93
Corn Crane ( <i>Crex crex</i> )	31/12/2011 & 31/07/1991	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex I Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List	M92 & M93
Dunlin	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex I Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92
Eurasian Curlew ( <i>Numenius arquata</i> )	31/12/2011 & 06/07/2010	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section II Bird Species    Threatened Species: Birds of Conservation Concern	M92 & M93

Common Name (Species Name)	Date of Record	Designation	Hectad
		Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List	
Eurasian Teal ( <i>Anas crecca</i> )	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Protected Species: EU Birds Directive >> Annex III, Section II Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Eurasian Wigeon ( <i>Anas penelope</i> )	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Protected Species: EU Birds Directive >> Annex III, Section II Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Eurasian Woodcock ( <i>Scolopax rusticola</i> )	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Protected Species: EU Birds Directive >> Annex III, Section III Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
European Golden Plover ( <i>Pluvialis apricaria</i> )	31/12/2011 & 18/10/2009	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex I Bird Species    Protected Species: EU Birds Directive >> Annex II, Section II Bird Species    Protected Species: EU Birds Directive >> Annex III, Section III Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List	M92 & M93
Gadwall ( <i>Anas strepera</i> )	29/02/1984	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92
Great Black-backed Gull ( <i>Larus marinus</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M93



Common Name (Species Name)	Date of Record	Designation	Hectad
Great Cormorant ( <i>Phalacrocorax carbo</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Great Crested Grebe ( <i>Podiceps cristatus</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Grey Partridge ( <i>Perdix perdix</i> )	31/07/1972	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Protected Species: EU Birds Directive >> Annex III, Section I Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List	M92
Greylag Goose ( <i>Anser anser</i> )	31/12/2011	Invasive Species: Invasive Species    Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)    Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Protected Species: EU Birds Directive >> Annex III, Section II Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern	M92
Greater White-fronted Goose ( <i>Anser albifrons</i> )	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex I Bird Species    Protected Species: EU Birds Directive >> Annex II, Section II Bird Species    Protected Species: EU Birds Directive >> Annex III, Section III Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M93
Hen Harrier ( <i>Circus cyaneus</i> )	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex I Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Herring Gull ( <i>Larus argentatus</i> )	29/02/1984	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List	M92 & M93

Common Name (Species Name)	Date of Record	Designation	Hectad
House Martin ( <i>Delichon urbicum</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
House Sparrow ( <i>Passer domesticus</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M93
Jack Snipe ( <i>Lymnocyptes minimus</i> )	18/10/2009	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Protected Species: EU Birds Directive >> Annex III, Section III Bird Species	M93
Lesser Black-backed Gull ( <i>Larus fuscus</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Little Egret ( <i>Egretta garzetta</i> )	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex I Bird Species	M92
Little Grebe ( <i>Tachybaptus ruficollis</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Mallard ( <i>Anas platyrhynchos</i> )	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Protected Species: EU Birds Directive >> Annex III, Section I Bird Species	M92 & M93
Merlin ( <i>Falco columbarius</i> )	31/07/1972 & 31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex I Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Mew Gull ( <i>Larus canus</i> )	29/02/1984 & 31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Mute Swan ( <i>Cygnus olor</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern	M92 & M93

Common Name (Species Name)	Date of Record	Designation	Hectad
		Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	
Northern Lapwing ( <i>Vanellus vanellus</i> )	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section II Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List	M92 & M93
Northern Pintail	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Protected Species: EU Birds Directive >> Annex III, Section II Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List	M92
Northern Shoveler ( <i>Anas clypeata</i> )	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Protected Species: EU Birds Directive >> Annex III, Section III Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List	M92
Northern Wheatear ( <i>Oenanthe oenanthe</i> )	31/07/1991 & 31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Peregrine Falcon ( <i>Falco peregrinus</i> )	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex I Bird Species	M92
Red Grouse ( <i>Lagopus lagopus</i> )	31/07/1972 & 09/09/2012	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Protected Species: EU Birds Directive >> Annex III, Section I Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List	M92 & M93
Ringed Plover	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92

Common Name (Species Name)	Date of Record	Designation	Hectad
Rock Pigeon ( <i>Columba livia</i> )	31/12/2011 & 31/07/1991	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species	M92 & M93
Sand Martin ( <i>Riparia riparia</i> )	01/07/2017 & 31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Sky Lark ( <i>Alauda arvensis</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Spotted Crake	22/06/2001	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92
Spotted Flycatcher ( <i>Muscicapa striata</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Stock Pigeon ( <i>Columba oenas</i> )	31/07/1991 & 31/07/1972	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Tufted Duck ( <i>Aythya fuligula</i> )	31/12/2011 & 29/02/1984	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU Birds Directive >> Annex II, Section I Bird Species    Protected Species: EU Birds Directive >> Annex III, Section II Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Water Rail ( <i>Rallus aquaticus</i> )	31/12/2011	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
Whinchat ( <i>Saxicola rubetra</i> )	13/06/2012 & 31/07/1991	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	M92 & M93
White-tailed Sea Eagle	31/12/2011	Protected Species: Wildlife Acts	M92
Whooper Swan ( <i>Cygnus cygnus</i> )	31/12/2011	Protected Species: Wildlife Acts    Protected Species: EU Birds Directive    Protected Species: EU	M92 & M93

Common Name (Species Name)	Date of Record	Designation	Hectad
		Birds Directive >> Annex I Bird Species    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List	
Yellowhammer ( <i>Emberiza citrinella</i> )	31/07/1991	Protected Species: Wildlife Acts    Threatened Species: Birds of Conservation Concern    Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List	M92 & M93
Blue Fleabane ( <i>Erigeron acer</i> )	05/08/2019	Threatened Species: Endangered	M92
Pitcherplant ( <i>Sarracenia purpurea</i> )	15/07/2017	Invasive Species: Invasive Species    Invasive Species: Invasive Species >> Medium Impact Invasive Species	M92
Nuttall's Waterweed ( <i>Elodea nuttallii</i> )	02/07/2018	Invasive Species: Invasive Species    Invasive Species: Invasive Species >> High Impact Invasive Species    Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)	M92
Japanese knotweed ( <i>Fallopia japonica</i> )	19/08/2015	Invasive Species: Invasive Species    Invasive Species: Invasive Species >> High Impact Invasive Species    Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)	M92
Rhododendron ( <i>Rhododendron ponticum</i> )	26/02/2010	Invasive Species: Invasive Species    Invasive Species: Invasive Species >> High Impact Invasive Species    Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)	M93
Sycamore ( <i>Acer pseudoplatanus</i> )	12/05/2005	Invasive Species: Invasive Species    Invasive Species: Invasive Species >> Medium Impact Invasive Species	M92 & M93
Ochthebius ( <i>Asiobates</i> ) bicolon	08/08/1996	Threatened Species: Vulnerable	M92
Dingy Skipper ( <i>Erynnis tages</i> )	28/05/2020	Threatened Species: Near threatened	M92 & M93
Grayling	12/08/1986	Threatened Species: Near threatened	M92
Large Heath ( <i>Coenonympha tullia</i> )	06/06/2018	Threatened Species: Vulnerable	M93
Marsh Fritillary ( <i>Euphydryas aurinia</i> )	10/09/2020	Protected Species: EU Habitats Directive    Protected Species: EU Habitats Directive >> Annex II    Threatened Species: Vulnerable	M93
Small Blue	03/07/2019	Threatened Species: Endangered	M92

Common Name (Species Name)	Date of Record	Designation	Hectad
Small Heath ( <i>Coenonympha pamphilus</i> )	28/05/2020	Threatened Species: Near threatened	M92 & M93
Wall ( <i>Lasiommata megera</i> )	06/08/2006	Threatened Species: Endangered	M92 & M93
Irish Damselfly ( <i>Coenagrion lunulatum</i> )	18/06/2002	Threatened Species: Vulnerable	M93
Large Red Tailed Bumble Bee (Bombus (Melanobombus) lapidarius)	08/06/2018	Threatened Species: Near threatened	M92
Moss Carder-bee (Bombus ( <i>Thoracomus muscorum</i> ))	18/05/2018 & 14/07/2016	Threatened Species: Near threatened	M92 & M93
Common Garden Snail ( <i>Cornu aspersum</i> )	18/09/1977	Invasive Species: Invasive Species    Invasive Species: Invasive Species >> Medium Impact Invasive Species	M92 & M93
Globular Pea Mussel ( <i>Pisidium hibernicum</i> )	18/09/1977	Threatened Species: Near threatened	M92
Common Whorl Snail ( <i>Vertigo (Vertigo) pygmaea</i> )	18/09/1977	Threatened Species: Near threatened	M93
Heath Snail ( <i>Helicella itala</i> )	18/09/1977	Threatened Species: Vulnerable	M92 & M93
Jenkins' Spire Snail ( <i>Potamopyrgus antipodarum</i> )	18/09/1977	Invasive Species: Invasive Species    Invasive Species: Invasive Species >> Medium Impact Invasive Species	M92 & M93
Marsh Whorl Snail (Vertigo (Vertigo) antivertigo)	18/09/1977	Threatened Species: Vulnerable	M92
Smooth Grass Snail ( <i>Vallonia pulchella</i> )	18/09/1977	Threatened Species: Vulnerable	M92
Tree Snail ( <i>Balea (Balea) perversa</i> )	11/09/1986	Threatened Species: Vulnerable	M92 M93
Wall Whorl Snail (Vertigo (Vertigo) pusilla)	11/09/1986	Threatened Species: Endangered	M92

Common Name (Species Name)	Date of Record	Designation	Hectad
Whirlpool Ramshorn ( <i>Anisus (Disculifer) vortex</i> )	18/09/1977	Threatened Species: Vulnerable	M92
Zebra Mussel ( <i>Dreissena (Dreissena) polymorpha</i> )	31/08/2006	Invasive Species: Invasive Species    Invasive Species: Invasive Species >> High Impact Invasive Species    Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)	M92
Atlantic Pocket-moss ( <i>Fissidens monguillonii</i> )	06/09/2007	Threatened Species: Near threatened	M92
Common Lizard ( <i>Zootoca vivipara</i> )	07/06/2018	Protected Species: Wildlife Acts	M92
American Mink ( <i>Mustela vison</i> )	22/03/2012 & 16/03/2012	Invasive Species: Invasive Species    Invasive Species: Invasive Species >> High Impact Invasive Species    Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)	M92 & M93
Bank Vole ( <i>Myodes glareolus</i> )	14/01/2011	Invasive Species: Invasive Species    Invasive Species: Invasive Species >> Medium Impact Invasive Species	M93
Brown Long-eared Bat ( <i>Plecotus auritus</i> )	26/08/2014 & 11/05/2012	Protected Species: EU Habitats Directive    Protected Species: EU Habitats Directive >> Annex IV    Protected Species: Wildlife Acts	M92 & M93
Eurasian Badger ( <i>Meles meles</i> )	31/12/2015 & 31/12/2014	Protected Species: Wildlife Acts	M92 & M93
European Otter ( <i>Lutra lutra</i> )	22/02/2010 & 16/03/2012	Protected Species: EU Habitats Directive    Protected Species: EU Habitats Directive >> Annex II    Protected Species: EU Habitats Directive >> Annex IV    Protected Species: Wildlife Acts	M92 & M93
European Rabbit ( <i>Oryctolagus cuniculus</i> )	07/02/1992 & 16/06/2015	Invasive Species: Invasive Species    Invasive Species: Invasive Species >> Medium Impact Invasive Species	M92 & M93
Eurasian Red Squirrel ( <i>Sciurus vulgaris</i> )	22/02/2010	Protected Species: Wildlife Acts	M92
Fallow Deer ( <i>Dama dama</i> )	02/02/2010	Invasive Species: Invasive Species    Invasive Species: Invasive Species >> High Impact Invasive Species    Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)    Protected Species: Wildlife Acts	M92 & M93



Common Name (Species Name)	Date of Record	Designation	Hectad
Pine Marten ( <i>Martes martes</i> )	31/12/2012	Protected Species: EU Habitats Directive    Protected Species: EU Habitats Directive >> Annex V    Protected Species: Wildlife Acts	M92 & M93
Pipistrelle ( <i>Pipistrellus pipistrellus sensu lato</i> )	11/05/2012	Protected Species: EU Habitats Directive    Protected Species: EU Habitats Directive >> Annex IV    Protected Species: Wildlife Acts	M93
Soprano Pipistrelle ( <i>Pipistrellus pygmaeus</i> )	11/05/2012	Protected Species: EU Habitats Directive    Protected Species: EU Habitats Directive >> Annex IV    Protected Species: Wildlife Acts	M93
West European Hedgehog ( <i>Erinaceus europaeus</i> )	01/05/2012 & 14/09/2018	Protected Species: Wildlife Acts	M92 & M93

### 2.5.1.2 National Parks and Wildlife Service Data Request

**Table 2** presents protected species records held for hectad M92 and M93 by the National Parks and Wildlife Service.

**Table 2: NPWS records of protected and invasive species in M92 and M93 10km grid squares**

Common Name	Species	Record Date	Location(s)
Alder Buckthorn	<i>Frangula alnus</i>	2003, 2005 & 2007	Correen, Northern shores of River Suck, Co. Roscommon Clorhane Garryduff
Atlantic Pocket Moss	<i>Fissidens monguillonii</i>	2007	Near Devenish Island, Co. Roscommon
Badger	<i>Meles meles</i>	1982 & 1992	Clonfert, Co. Galway
Barn Owl	<i>Tyto alba</i>	2009	Bishops palace, Co. Galway
Blue Fleabane	<i>Erigeron acer</i>	2005	Culliaghbeg, Co. Roscommon
Common Frog	<i>Rana temporaria</i>	1977, 1979, 1999 and 2011	Gorry, near Cornafulla, Co. Roscommon
Ephemerum hibernicum	<i>Ephemerum hibernicum</i>	2007	Devenish Island, Co. Roscommon



Common Name	Species	Record Date	Location(s)
Green-winged Orchid	<i>Orchis morio</i>	Various dates	Clonburren, Shannonbridge Clorhane, near Clonmacnoise, Co. Offaly Clonburren, Shannonbridge, Co. Roscommon Raghra Raghrabeg Leitra Callow, Shannonbridge, Shannon Callows, Co. Offaly Cloghane, Clonmacnoise, Co. Offaly
Irish Hare	<i>Lepus timidus hibernicus</i>	1982, 2007 and 2010	Kylemore, Co. Galway Kilmacshane, Co. Galway Lismanny, Co. Galway Clonboley, Co. Roscommon Shannonbridge, Co. Offaly
Otter	<i>Lutra lutra</i>	2005 & 2010	Ballydangan / Bridge u/s Shannon River, Co. Roscommon Garryduff, Co. Galway Suck / Correen Ford, Co. Galway Clonboley, Co. Roscommon
Pine Marten	<i>Martes martes</i>	2000, 2005 and 2010	Kilmacshane, Garryduff, Lismanny – Co. Galway Clonboley, Co Roscommon Blackwater, Co. Offaly
Serrated Wintergreen	<i>Orthilia secunda</i>	2015	Ballydangan, Co. Galway
Stoat	<i>Mustela erminea</i>	1982	Shannonbridge, Co. Offaly

**2.5.1.3 Baseline Water Quality Data for Clooniff Bog**

**Table 3** below provides baseline water quality data captured by Bord na Mona following sampling and monitoring efforts between August 2020 and April 2021. The results of these sampling events displays that suspended solids levels are in compliance with IPC licence targets. Water quality parameters are not provided in the Generic Conservation Objectives (SSCO) supporting document<sup>5</sup> for the water dependent or nutrient sensitive habitats and species of River Shannon Callows SAC.

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<sup>5</sup> [https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO000216.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000216.pdf)

**Table 3: Baseline water quality information for Clooniff Bog**

Emission Point	IPC Licence SS ELV	River Shannon Callows SAC Target CO parameters	01/11/2020	01/12/2020	01/01/2021	01/02/2021	01/03/2021
<b>Suspended Solids (mg/l)</b>							
SW51	35	n/a		6	2	2	4
SW52	35	n/a	6	2	2	2	3
SW53	35	n/a			2	4	2
<b>Ammonia (mg/l)</b>							
SW51	4.27	n/a		0.589	0.037	0.224	2.330
SW52	4.27	n/a	0.172	2.190	0.032	0.027	1.950
SW53	4.27	n/a			0.020	0.029	0.035
<b>Total Phosphorus (mg/l)</b>							
SW51	N/A	n/a		0.05	0.05	0.05	0.05
SW52	N/A	n/a	0.05	0.05	0.05	0.05	0.05
SW53	N/A	n/a			0.05	0.05	0.05
<b>pH (pH units)</b>							
SW51	N/A	n/a		7.7	7.5	8	7.7
SW52	N/A	n/a	7.9	7.5	7.6	8.1	7.9
SW53	N/A	n/a			7.8	7.9	7.8

### Clooniff Bog Water Quality Management

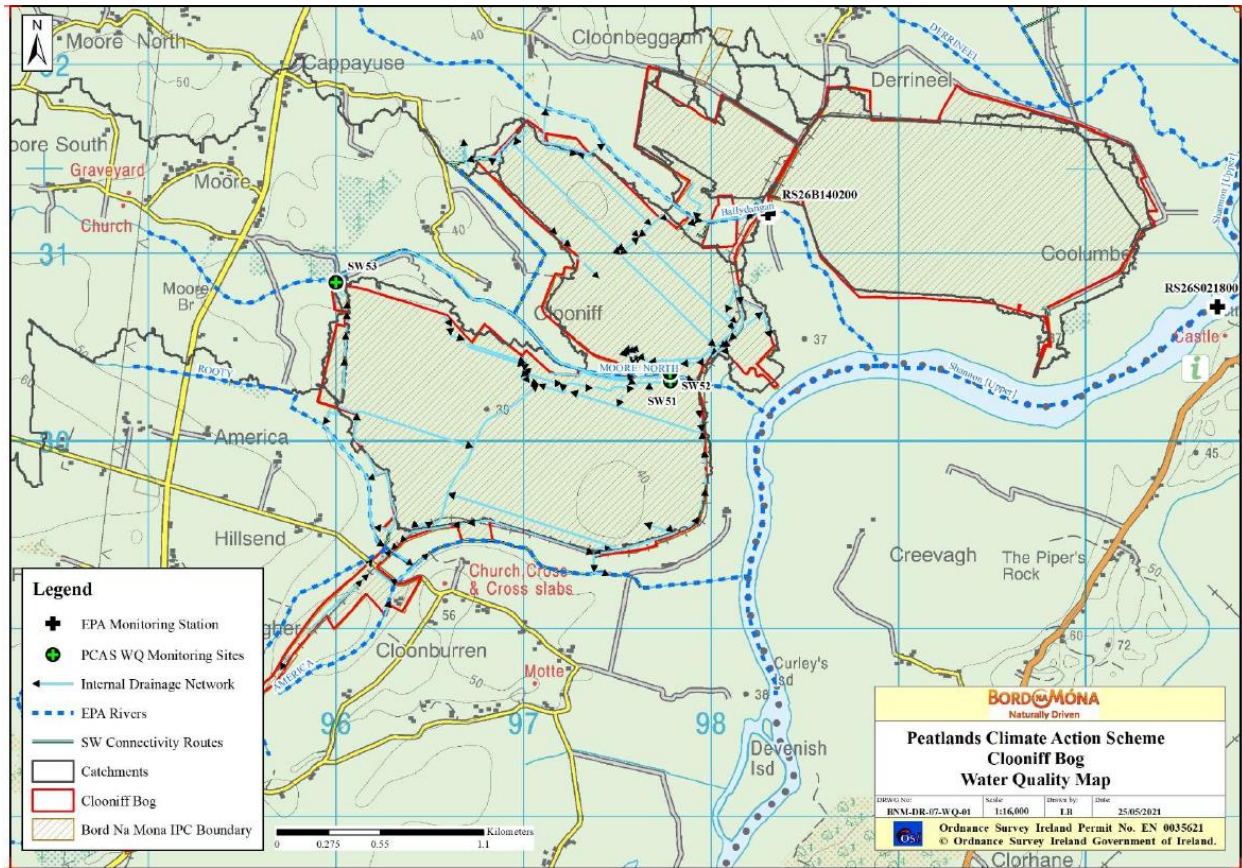
Clooniff bog surface water outlets discharge to the Upper Shannon water body IE\_SH\_26 S021800, via a number of feeder streams, including the Hillsend, Ballydangan and Moore streams, and also direct to the Shannon.

Peat extraction was identified as pressure in the second cycle of the river basin management plan in some of these feeder stream, but are not indicated as remaining so in the third cycle, currently under preparation, however the main receiving water body, the Shannon upper 120, is highlighted as remaining under pressure from peat extraction.

Details of the internal drainage network and surface water emission points and those being monitored and sampled as part of the PCAS scheme are detailed on the attached Water Quality Map (See **Figure 3**).

There is a robust monitoring program to track and verify any changes in baseline water quality conditions pre and post decommissioning and rehabilitation so that the success or otherwise can be tracked and verified for the National Parks & Wildlife Service, Environmental Protection Agency and Local Authority Water Program, amongst a range of stakeholders.

A water quality map for Clooniff Bog is presented in **Figure 3** below.



**Figure 3 – Water Quality Map**

The main emission limit value associated with this bog is 35mg/l suspended solids, with trigger levels for ammonia of 4.27mg/l and COD 100mg/l.

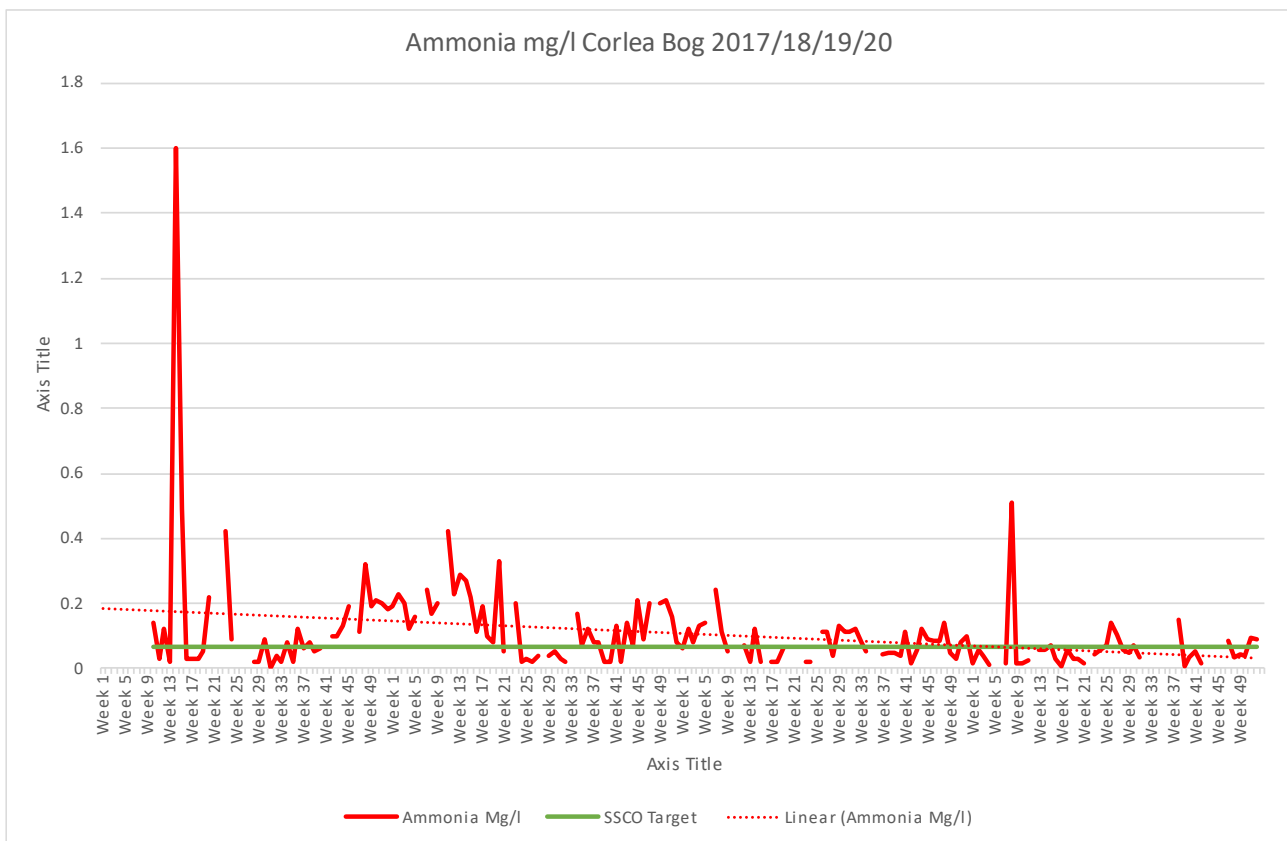
From an analysis of any monitoring over the past 3 yrs. of the IPC licence environmental monitoring of some of the discharges from this bog, indicate that results were under the ELV for SS and trigger level for ammonia. In some incidents, there have been COD results of above 100 mg/l, more related to natural sub-soil/surface water interactions.

Bog	SW	Monitoring	pH	SS mg/l	TS mg/l	Ammonia mg/l	TP mg/l	COD mg/l	Colour
Clooniff	SW-58	Q1 19	6.5	12	222	<0.02	0.11	138	264
Clooniff	SW-54	Q2 19	6.2	<5	150	<0.02	0.06	57	353
Clooniff	SW-54	Q1 18	6.2	5	136	0.56	0.05	79	253
Clooniff	SW-54	Q1 17	6.5	5	106	0.43	0.05	89	279
Clooniff	SW-58	Q1 17	6.7	5	70	0.07	0.05	65	285
Clooniff	SW-51	Q2 17	7.4	17	174	2.5	0.05	110	252
Clooniff	SW-52	Q2 17	7.4	10	230	1.2	0.05	106	191
Clooniff	SW-53	Q2 17	7.1	5	130	0.02	0.05	97	359
Clooniff	SW-57	Q2 17	8.5	35	196	0.04	0.05	93	96
Clooniff	SW-61	Q2 17	7.9	5	336	0.06	0.05	33	64

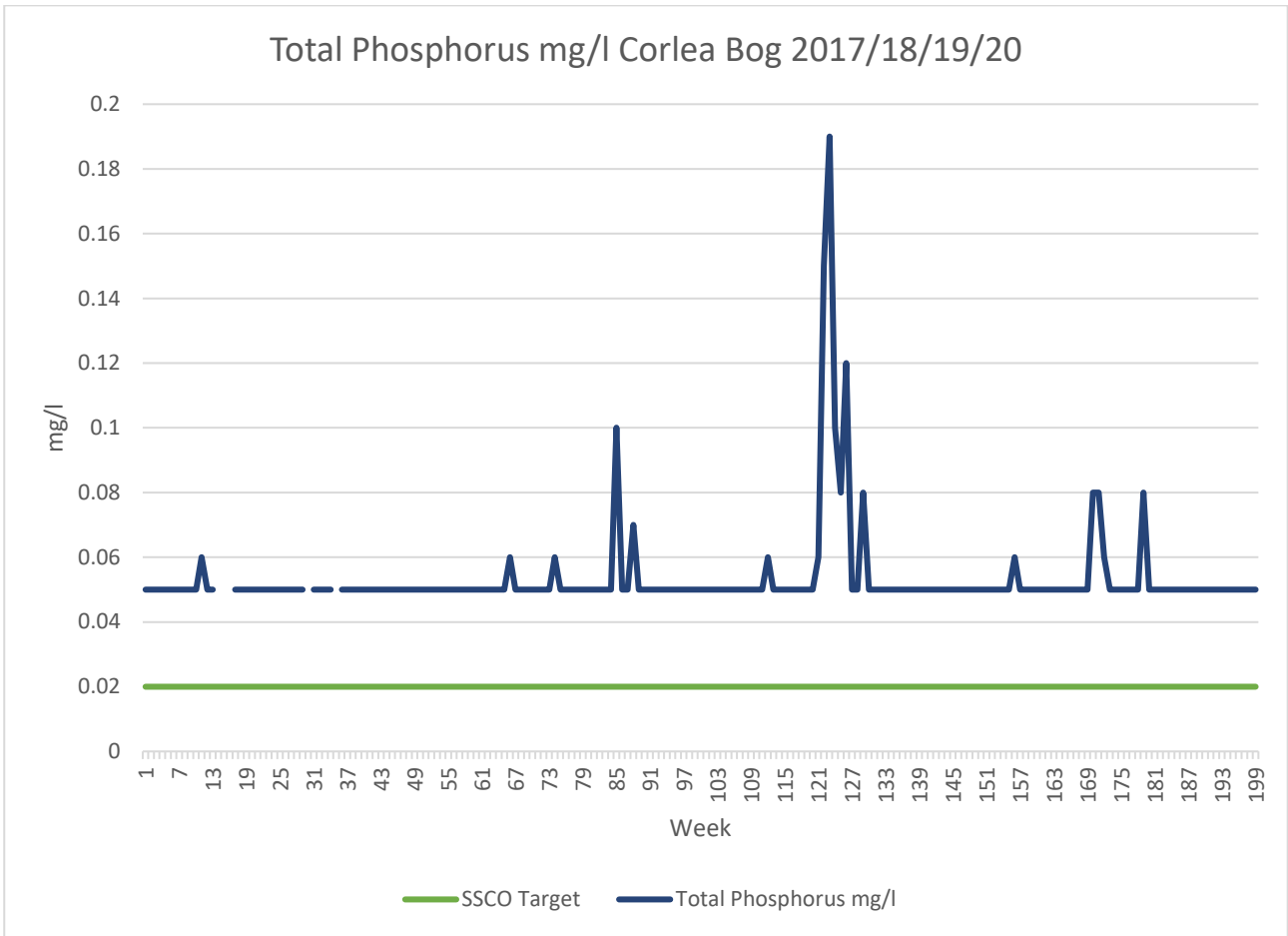
It is expected that following the implementation of the PCAS at Clooniff Bog the concentration of TP, ammonia, as well as Suspended Solids (SS) will follow a downward trend and will within the short-term (i.e. within a 3-year period) reduce concentrations of these parameters to below the NPWS limits.

This projection is supported by water quality monitoring of 2 other similar raised bogs (Longfordpass Bog, Co Tipperary and Corlea Bog, Co Longford) that were previously subject to industrial peat extraction and that have since been subject to peatland rehabilitation.

Graph 1 below shows the downward trend for ammonia at Corlea Bog, which is also located within Bilberry \_SC\_010 sub-catchment. Corlea Bog is located 32km north of Clooniff Bog. Graph 2 shows a consistent low level of TP recorded for Corlea Bog. The laboratory detection limit for TP is 0.05mg/l and Graph 2 shows that concentrations for TP are below the laboratory limits of detection, indicating very low levels. Similarly, the laboratory detection limits for SS was 5ml/l up until July 2019. The laboratory was changed in July 2019 and a new detection limit for SS of 2mg/l was applied. The SS concentrations were consistently below the 5mg/l and the 2mg/l at both laboratories, indicating very low SS concentrations in silt pond outfalls. Rehabilitation measures continue to establish at Corlea Bog and it has yet to stabilise, but the downward trend for ammonia found during the stabilisation of rehabilitation measures shows that once stabilised, the re-wetted bog will reduce ammonia emissions to meet the SSCO parameters / limits. It is also reasonable to predict a downward trend for SS and TP as the rehabilitation measures become established.



**Graph 1: Ammonia Concentrations and Trend at Corlea Bog**



Graph 2: TP Concentrations at Corlea Bog, showing the limit of detection at 0.05mg/l

## 2.5.2 Field Assessments

### 2.5.2.1 Current Habitats

Clooniff Bog is located approximately 6km to the north of Shannonbridge in Co Roscommon. The bog is divided into four individual units with a long rail link that connects it with Cornaveagh Bog located ca. 1km to the south.

Access to Clooniff Bog can be gained from public roads located to the north and to the south of the site respectively. The majority of Clooniff contains in excess of 2m of peat remaining on the site. The north western corner of the site contains an area of high bog that has recently been re-developed for milled peat production. This area was previously in milled peat production for a short period and it had re-vegetated with Heather.

Clooniff is mainly composed of bare peat as the entire bog was in active peat production until recently. Marginal habitats include Birch woodland (WN7), remnant sections of raised bog (PB1), scrub (WS1) and cutaway bog (PB4). The remnant sections are generally small and are dry with a dominance of Ling Heather.

The River Shannon flows within close proximity to the eastern boundary of the site and two narrow strips of land (under BnM ownership) extend from the site to the River Shannon. A number of long peat berms have been constructed on the site between 2010 and 2012. These berms have an average height of 0.6 m and are designed to prevent flooding from the Shannon and other smaller streams that flow through the site. A water pump is operational close to the centre of the site.

Two small streams flow through the site with a third stream flowing along the southern boundary of the site. These streams have been canalised and supports a small number of aquatic plant species. Riparian vegetation was mainly composed of Willow (*Salix* sp.), Common Reed (*Phragmites australis*) and Reed Canary Grass (*Phalaris arundinacea*). A number of silt ponds, some of which were newly constructed, are located adjacent to the streams.

Otter activity is high along these streams and there is frequent evidence of Otter tracks, spraint and fish remains. It is likely that an Otter "couch" is situated on the site. Coarse fish including Bream and Roach were also observed in these streams.

There are records of Rhododendron (*Rhododendron ponticum*) present in amongst the marginal habitats of the site. This invasive species has the potential to colonise portions of the site once production ceases and outcompete native plant species.

Although the majority of the site is classified as bare peat, many of the field drains support wetland plants such as Common Reed (as the dominant vegetation type). The presence of a drainage ditch that runs along most northerly section of the site supports Black Bog Rush (*Schoenus nigricans*), a species found on cutaway when the peat layer (acid base) meets the marl layer (base rich).

A rehabilitation trial was carried out in November 2016 on a small section of the cutaway (ca. 1.5 ha) concentrated in the northern part of the site at the location of the main outfall. The trial involved re-profiling and landscaping of berms, drain blocking and sourcing donor plant material from a donor site to enhance the establishment of wetland vegetation. Following reconfiguration of the constructed wetland, Common Reed (*Phragmites australis*) was sourced locally from within Clooniff and stands were translocated and planted within the rehab area. Drainage from the production bog was directed towards the main outfall location at the constructed wetland rehabilitation area. In addition to the silt ponds present at the main outfall location, the constructed wetland will serve to alleviate and attenuate suspended solids and ammonia concentrations from industrial peat production areas and provide a wetland refuge for species of wild flora and fauna.



Habitat complexes occurring along the southern boundary of Clooniff Bog, interesting with the Middle Shannon Callows SPA are presented in **Figure 5**. This displays an overlap comprising bare peat, broadleaved woodland, scrub and pioneer peatland habitat.

### 2.5.2.2 Bird Surveys

The Clooniff Bog site was visited on December 01<sup>st</sup> 2020 and April 08<sup>th</sup> 2021.

Large areas of the Clooniff Bog site support ephemeral standing water, particularly at Coolumber and cutover bog areas of Cloonbeggau and Clooniff. Site walkover surveys completed in December 2020 and April 2021 identified avifaunal usage of these areas, particularly the large seasonal wetland areas at Coolumber.

Bird species identified during the October and December 2020 and April 2021 walkover surveys are presented in **Table 4** below.

**Table 4: Bird Species identified during the site walkover surveys in winter 2020/2021**

Common Name	Species Name	Activity within the site	Survey Date
Blackbird	<i>Turdus merula</i>	Foraging within treeline, scrub and woodland habitats fringing the larger areas of expansive cutover bogs.	Identified during the December and April survey dates
Blue Tit	<i>Cyanistes caeruleus</i>	Foraging within treeline, scrub and woodland habitats fringing the larger areas of expansive cutover bogs.	Identified during the December and April survey dates
Golden Plover	<i>Pluvialis apricaria</i>	Foraging on ephemeral wetland on expansive cutover bog areas at Coolumber  Heard calling from expansive bog habitat near Clooniff townland during the April 2021 walkover survey.	Identified during the December and April survey dates
Goldcrest	<i>Regulus regulus</i>	Foraging within woodland habitats fringing the larger areas of expansive cutover bogs.	Identified during the December and April survey dates
Snipe	<i>Gallinago gallinago</i>	Flushed from the marginal wetland areas and silt pond margins.	April site visit
Pied Wagtail	<i>Motacilla alba</i>	Foraging along bog access tracks.	Identified during the December and April survey dates
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	Heard calling from marginal wetland habitats and drainage channels.	April site visit
Pheasant	<i>Phasianus colchicus</i>	Calling from adjacent scrub cover.	April site visit



Common Name	Species Name	Activity within the site	Survey Date
Sand Martin	<i>Riparia riparia</i>	Flying and foraging over ephemeral wetland habitat at Clooniff Bog.	April site visit
Willow Warbler	<i>Phylloscopus trochilus</i>	Foraging within treeline, scrub and woodland habitats fringing the larger areas of expansive cutover bogs.	April Site visit
Reed Bunting	<i>Emberiza schoeniclus</i>	Foraging along marginal wetland areas and drainage channels.	April site visit
Meadow Pipit	<i>Anthus pratensis</i>	Foraging over marginal bog habitats.	April site visit
Linnet	<i>Linaria cannabina</i>	Foraging along marginal wetland areas and drainage channels.	April site visit
Wren	<i>Troglodytes troglodytes</i>	Foraging within treeline, scrub and woodland habitats fringing the larger areas of expansive cutover bogs.	Identified during the December and April survey dates
Blackcap	<i>Sylvia atricapilla</i>	Foraging within treeline, scrub and woodland habitats fringing the larger areas of expansive cutover bogs.	April site visit
Ringed Plover	<i>Charadrius hiaticula</i>	Putative breeding pairs (3 no.) using ephemeral wetland area at Coolumber bog.	April site visit
Mallard	<i>Anas platyrhynchos</i>	Foraging on ephemeral wetland on expansive cutover bog areas at Coolumber  Putative breeding pairs using ephemeral wetland area at Coolumber bog during the April 2021 walkover survey.	Identified during the December and April survey dates
Little Grebe	<i>Tachybaptus ruficollis</i>	Putative breeding pairs (3 no.) using ephemeral wetland area at Coolumber bog.	Identified during the December and April survey dates
Mute Swan	<i>Cygnus olor</i>	Using ephemeral wetland area at Coolumber Bog.	Identified during the December and April survey dates
Lapwing	<i>Vanellus vanellus</i>	Foraging on ephemeral wetland on expansive cutover bog areas at Coolumber during December 2021 site visit.	Identified during the December and April survey dates

Common Name	Species Name	Activity within the site	Survey Date
		Putative breeding pair using ephemeral wetland area at Coolumber bog during April site visit.	
Kestrel	<i>Falco tinnunculus</i>	Flushed and flying over the expansive bog habitat at the Clooniff townland.	December site visit
Mistle Thrush	<i>Turdus viscivorus</i>	Foraging within treeline and woodland habitats fringing the larger areas of expansive cutover bogs.	December site visit
Whooper Swan	<i>Cygnus cygnus</i>	Foraging on ephemeral wetland on expansive cutover bog areas at Coolumber and Clooniff.	December site visit
Wigeon	<i>Anas penelope</i>	Foraging on ephemeral wetland on expansive cutover bog areas at Coolumber.	December site visit
Peregrine Falcon	<i>Falco peregrinus</i>	Foraging and perching on ephemeral wetland on expansive cutover bog areas at Coolumber.	December site visit
Woodcock	<i>Scolopax rusticola</i>	Flushed from scrub adjoining expansive cutover bogs during the December 2021 walkover survey.	December site visit
Black-headed Gull	<i>Chroicocephalus ridibundus</i>	Foraging over ephemeral wetland on expansive cutover bog areas at Coolumber.	December site visit
Water Rail	<i>Rallus aquaticus</i>	Using drainage channels near the southern margins Coolumber Bog.	December site visit
Grey Heron	<i>Ardea cinerea</i>	Using the wetland habitats such as drainage channels and silt ponds near the southern margins Coolumber Bog.	December and April site visits
Hen Harrier	<i>Circus cyaneus</i>	Foraging along the south-eastern margins of Coolumber Bog.	December site visits

### 2.5.2.3 Mammal Surveys

A mammal survey of the Clooniff site was undertaken on April 08<sup>th</sup> 2021. This provided further information to the baseline walkover surveys (which included a baseline appraisal and assessment for mammal activity) completed in late 2020. An otter survey was completed along silt ponds and drainage channels within and adjoining the Clooniff site. As well as the silt ponds and drainage channels used for past peat harvesting

works, the watercourses adjoining and being fed by the silt ponds were also surveyed for the presence of otter and other semi-aquatic mammals. It should be noted that pathways for otter injury and mortality as a result of the proposed rehabilitation works primarily exist only at silt ponds. Therefore, survey emphasis was concentrated, but not confined, to these features.

In addition, the Clooniff site and its environs were also surveyed for the presence and usage of non-volant mammal species including badger, fox, Irish Hare, mink etc.

The otter survey methodology followed those methods employed in the 'Otter Survey of Ireland 2004/2005' (Bailey & Rochford, 2006) comprising a modification of the Standard Otter Survey Method developed by Jefferies (1980).

In addition, the mammal survey incorporated badger surveys that were completed in accordance with the *Guidelines for the treatment of badgers prior to the construction of National Road Schemes* (TII, 2006) and *The Badger and Habitat Survey of Ireland* (Smal, 1995).

The mammal survey undertaken on April 08<sup>th</sup> 2021 at the Clooniff Bog site identified the signs of American Mink and Fox. Irish Hare was identified on expansive cutover bog habitat. The findings of the survey are presented in **Table 5** below and illustrated in **Figure 6**.

**Table 5: Findings of the April 2021 mammal survey**

Common Name	Species Name	Grid Co-ordinates (in ITM)		Description
		X	Y	
American Mink	<i>Mustela erminea</i>	599621	730742	Mink scat and access track / route to drainage channel and callow habitat to the south.
Fox	<i>Neovison vison</i>	597660	730397	Fox scat identified on the margins of silt ponds.
Irish Hare	<i>Lepus timidus hibernicus</i>	598556	731058	Foraging along the southern margins of Coolumber Bog

Silt ponds near the south-eastern corner of the Coolumber Bog section support signs of American Mink usage as evidenced by scat and trails / access routes to and from the silt ponds to the drainage channels and wetland habitats located to the south.

All silt ponds within the Clooniff Bog site were surveyed for signs of otter usage. There were no signs of ongoing or recent usage of these silt pond features during the December 2020 and April 2021 walkover surveys.

No evidence of other mammals such as badger or pine marten were identified during the site walkover surveys. These mammals are highly unlikely to utilise the expansive cutover bog areas. However, there is suitable habitat for these mammals outside of the proposed works footprint on the marginal bog areas, woodland and scrub areas located along the site bounds and outside of the proposed works footprint.

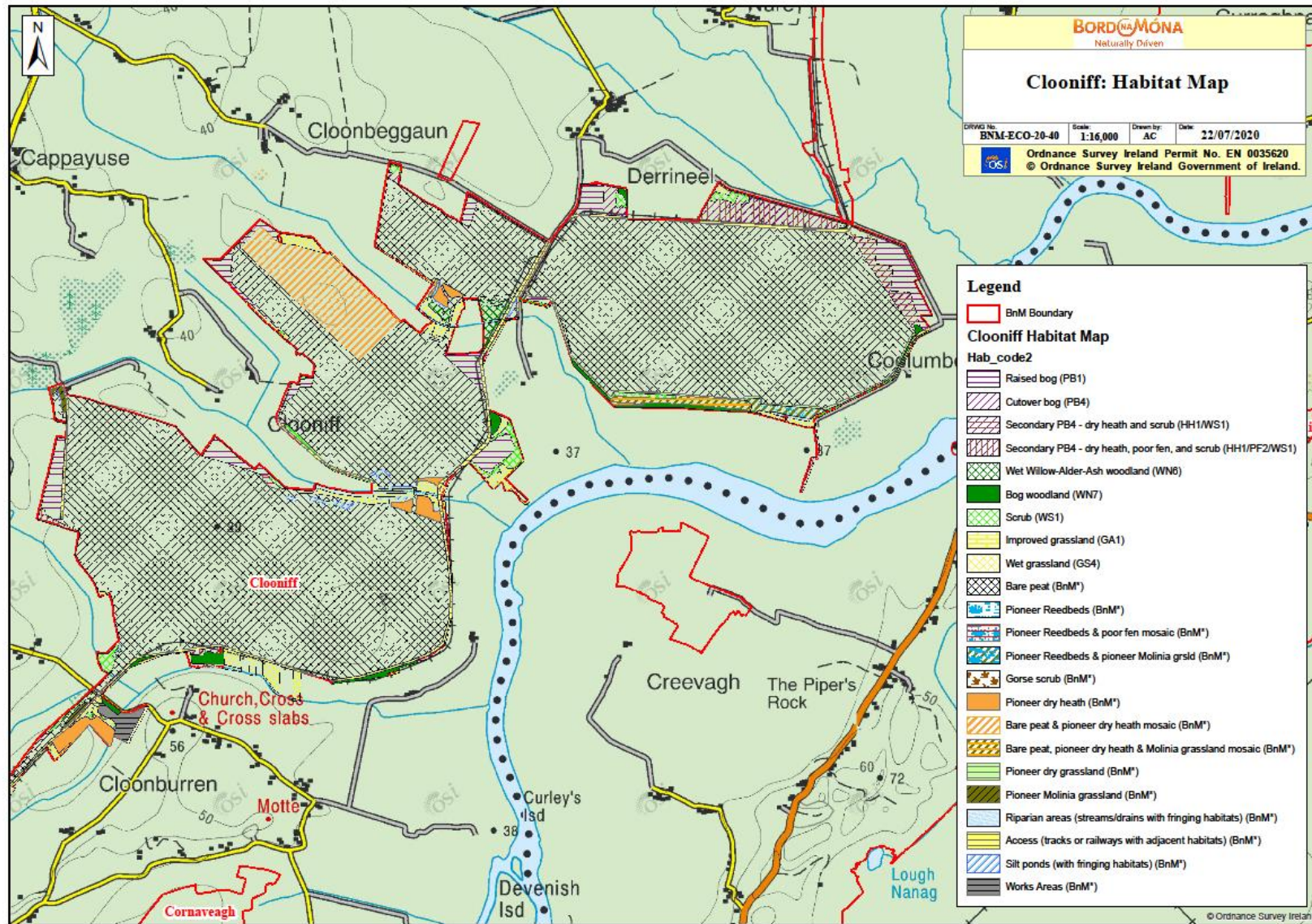


Figure 4: Current Habitats at Clooniff Bog



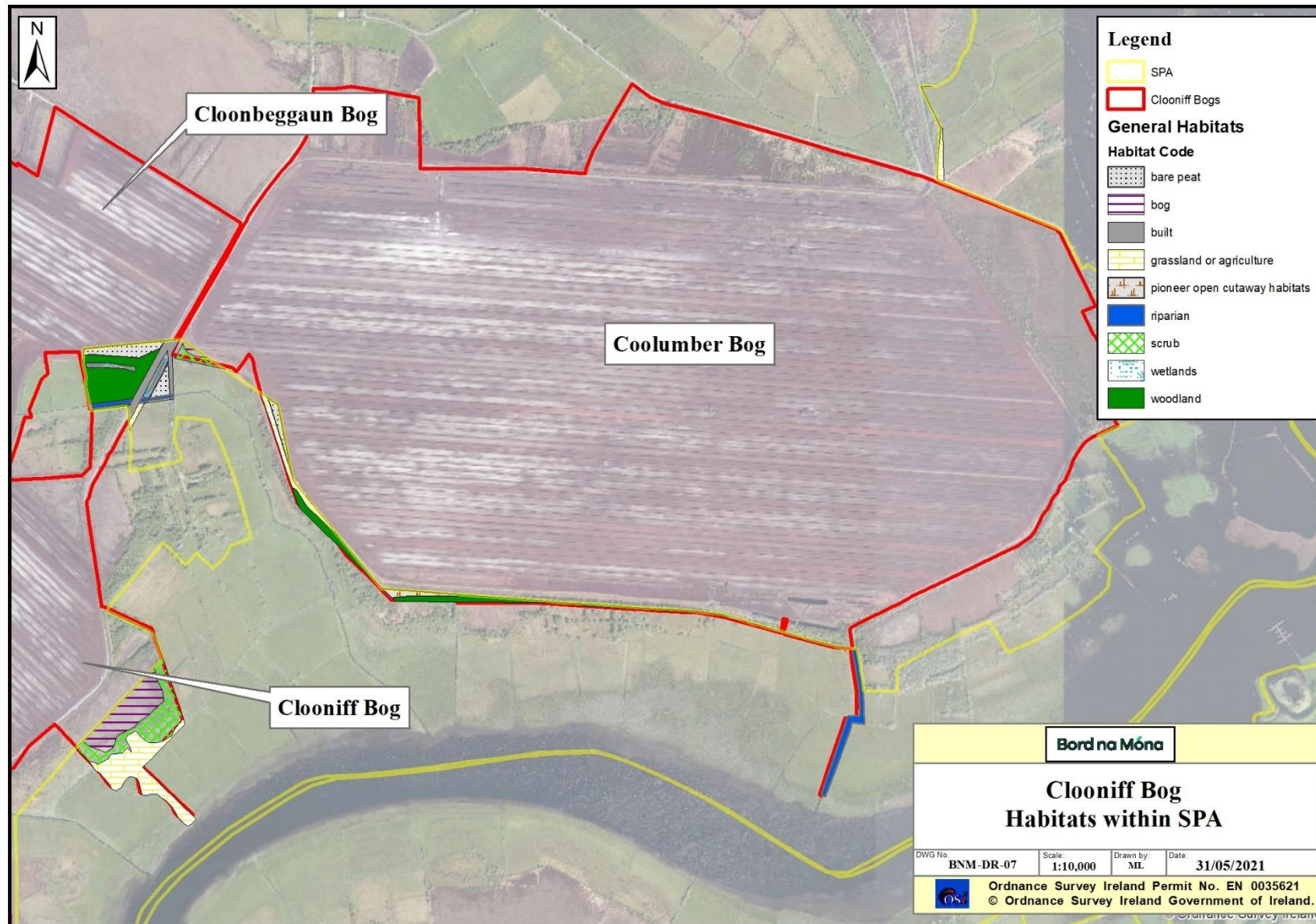


Figure 5: Clooniff Bog – Habitats within SPA



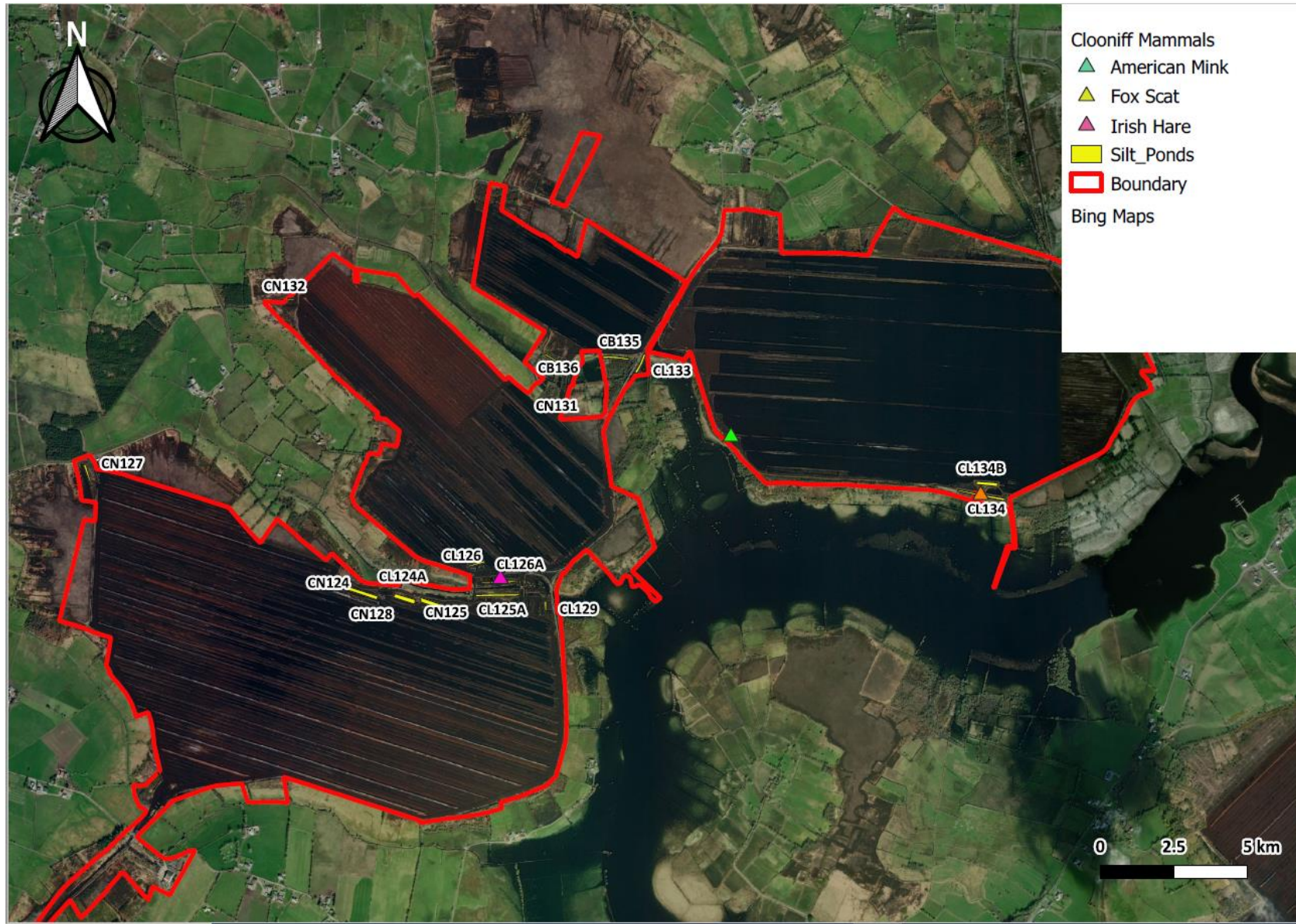


Figure 6: Mammal Signs and Features within the Clooniff Site





**Image 1:** Seasonally flooded section of Coolumber Bog



**Image 2:** Site Pond CL134



**Image 3:** Cutover Bog at Clooniff



**Image 4:** Silt Pond CN125



**Image 5:** Existing railway track linking Coolumber Bog and Clooniff Bog



**Image 6:** Cutover Bog at Clooniff





**Image 7: Ballydangan\_020 stream at Clooniff / Cloonbeggaun**



**Image 8: Drainage channel located near the south-western boundary at Cloonburren**

### 2.5.3 Species of Conservation Interest<sup>6</sup>

Otter activity is high along the streams on-site and there is frequent evidence of Otter tracks, spraint and fish remains. It is likely that an Otter “couch” is situated within the site environs. Evidence of Badger and Pine Marten using the site have also been noted, and coarse fish including Bream and Roach have been observed in the streams.

Curlew, Lapwing, Redshank, Common Sandpiper, Ringed Plover and Snipe have all been recorded on Coolumber Bog during the summer. During the April 2021 site walkover survey, Little Grebe, Lapwing and Ringed Plover were identified using the ephemeral wetland area at Coolumber Bog. Given the habitat availability, it is likely that Lapwing, Ringed Plover and Snipe all breed on this site, and possible that both Redshank and Common Sandpiper also breed at Coolumber Bog. The Curlew (and possibly Redshank) records are more likely to relate to breeding birds from the adjacent Shannon Callows using this site for roosting, foraging or loafing if disturbed off the callows grassland where they more typically nest. Black-headed Gull have also been recorded on Coolumber Bog, but do not currently appear to be nesting on this site.

In winter, large numbers of wildfowl, particularly Mallard and Teal have been recorded on-site. Coolumber Bog is inundated during the winter from the River Shannon, and it is possible that wintering waterfowl associated with this site will use Clooniff Bog, and particularly Coolumber Bog, during the winter if the site is inundated. During a site walkover survey completed in December 2020, the following over-wintering species were identified using the large waterfilled area of Coolumber Bog; Whooper Swan<sup>7</sup>, Wigeon, Lapwing, Golden Plover, Peregrine Falcon, Mallard, Snipe, Woodcock, Black-headed Gull, Water Rail, Grey Heron and Hen Harrier. Smaller numbers of Whooper Swan were also recorded using cutover bog areas, west of Coolumber Bog, within the Clooniff Bog complex.

### 2.5.4 Invasive species

Invasive alien species known to occur at the subject bog (or desktop review suggests presence is likely), and for which reasonably foreseeable source impact pathways for dispersal may result from the proposed PCAS are described here. There are records of Rhododendron (*Rhododendron ponticum*) present in amongst the

<sup>6</sup> Otter is a Conservation Interest Species for River Shannon Callows SAC. Whooper Swan, Wigeon, Golden Plover, Lapwing and Black-headed Gull are SCI species for the Middle Shannon Callows SPA and have been recorded at Clooniff Bog and environs.

<sup>7</sup> 58 Whooper Swan were identified using Coolumber and adjacent sections of Clooniff Bog during the site walkover survey completed in December 2020.



marginal habitats of the site, such as those located to the south-west of the Coolumber Bog. This species is listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011). Rhododendron has the potential to colonise portions of the site following the cessation of peat harvesting activities.

A broad range of common garden escapes are occasionally present around the margins of Bord na Móna bogs, and although spatial overlap with the PCAS is expected to be limited, these are, where necessary, to be treated in line with Best Practice during PCAS activities.

### **2.5.5 Certainty and Sufficiency of Data**

The Biodiversity baseline information presented in this Appropriate Assessment reporting was collated from site investigations and field surveys, along with publicly available online resources including from the National Biodiversity Data Centre (NBDC) and the National Parks and Wildlife Service (NPWS) online webpage, which are regularly updated.

All field survey work was carried out by qualified and experienced ecologists.

In addition, where required, or possible, specific data requests have been made to NPWS via the online data request facility<sup>8</sup>, specifically with regards to records of sensitive species; and, to BirdWatch Ireland in respect of the results of IWeBS surveys, which are available upon request.

Further sources of data used to supplement the current appraisal, included current, up to date, Bord na Móna held habitat mapping datasets, as well as previously commissioned baseline reporting of Bord na Móna Bog Groups, reporting to inform Bord na Móna wind farm proposals, and any available Bord na Móna wind farm monitoring reports where it was deemed there was overlap with the current scope of PCAS activities. Citations are provided at the end of this report for any reports which have been referenced.

For the avoidance of doubt although some of this supplementary baseline data was 3+ years old, due regard has been given to the passage of time & any changes to the baseline environment at Clooniff in the interim period were considered by a suitably qualified ecologist; visits to inform the current appraisal were used as ground-truthing exercises to confirm the relevance or not of any previously defined baseline information.

In the most part, due the continuation of industrial Peat Extraction by Bord na Móna up to and including the year 2019 at Clooniff, it was considered that habitats at the bog remained relatively unchanged from the point at which many prior baseline surveys were undertaken, and therefore, it is considered that data presented in prior baseline reporting was of relevance, with exceptions noted. Nonetheless reliance is focussed primarily on the most recently available or collected data.

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<sup>8</sup> <https://www.npws.ie/maps-and-data/sensitive-data-access>

## 2.6 Decommissioning and Rehabilitation Stage

The proposed **decommissioning** at Clooniff Bog includes the following

- Clean-up of remaining or unconsolidated waste or materials located in Bogs, Yards, Buildings and Offices
- Cleaning of existing silt ponds,
- Decommissioning and Removal of a Porto-cabin tea centre and a further materials store,
- Decommissioning and de-gassing mobile fuel tanks, and peat stockpile management via levelling.

Further measures include the lifting of the existing rail line, decommissioning of existing level crossings and measures to restrict access to the bog.

Rail line lifting may occur concurrently or after rehabilitation activities. In some instances, outer spurs are to be left in place to facilitate rehabilitation access, meaning these lines won't be lifted until rehabilitation is complete.

The proposed Clooniff Bog **rehabilitation** comprises a series of bespoke (to Clooniff Bog) interventions designed to stabilise the existing baseline and meet compliance with the requirements of the existing EPA, IPC License and the proposed PCAS. Prescriptive measures are unique to the existing baseline habitats and comprise 4 no. broad categories,

- 1) those associated with (exposed) Deep Peat; drain blocking (different intensities), berms and field reprofiling and cut and fill cell bunding;
- 2) those associated with Dry cutaway; i.e. drain blocking, managing water levels and overflows; and
- 3) measures associated with Wetland Cutaway, including restricting and reducing pumping regimes and associated drain blocking.
- 4) those associated with remnant high bog namely drain blocking

The aim of Rehabilitation is as much as possible to place existing peatlands on a **trajectory** towards a naturally functioning peatland system (Renou-Wilson 2012).

### 2.6.1.1 Decommissioning and Rehabilitation Access

Access will be through the existing entrance at the Cloonbeggaun townland, where existing infrastructure is already in place via access tracks to facilitate the previous peat extraction. Alternative access to the bog is available via local access roads and tracks at the Derrineel and Nure townlands, located east / north-east of Cloonbeggaun. No change to baseline conditions to facilitate access for either decommissioning or rehabilitation is required.

### 2.6.1.2 Standard Methodology for Decommissioning

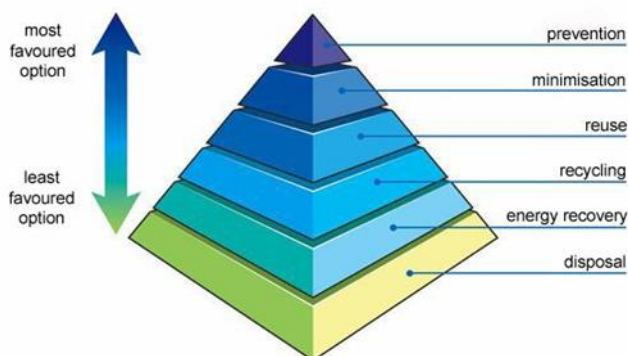
**Decommissioning** at Clooniff Bog will involve the deployment of a work crew to collect and oversee the removal of any remaining plant or potentially contaminating waste left *in situ* in line with Condition 7 of License Ref. P0-502-01. This condition specifically requires that BnM's procedures for the Disposal or recovery of waste shall take place only as specified in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* of the IPC license and in accordance with the appropriate National and European legislation and protocols. No other waste shall be disposed of/recovered either on-site or off-site without prior notice to, and prior written agreement of, the EPA. Waste sent off-site

for recovery or disposal shall only be conveyed to a waste contractor, as agreed by the EPA, and only transported from the site of the activity to the site of recovery/disposal in a manner which will not adversely affect the environment.

A full record, which shall be open to inspection by authorized persons of the EPA at all times, shall be kept by the licensee (BnM) on matters relating to the waste management operations and practices at Clooniff Bog. This record shall as a minimum contain details of the following:

- The names of the agent and transporter of the waste;
- The name of the persons responsible for the ultimate disposal/recovery of the Waste;
- The ultimate destination of the waste;
- Written confirmation of the acceptance and disposal/recovery of any hazardous waste consignments sent off-site;
- The tonnages and EWC Code for the waste materials listed in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* sent off-site for disposal/recovery;
- Details of any rejected consignments.

A copy of this Waste Management record shall be submitted to the Agency as part of the AER for Clooniff Bog. As required by the license, these waste items will be removed for recycling or disposal, using external contractors with the required waste collection permits, with waste records maintained as required. Where possible, Bord na Móna will utilize the appropriate waste hierarchy to identify waste that can reused or recycled ahead of disposal.



The validation of the success of condition 10.1 is carried out through an Independent Closure Audit (ICA), followed by an EPA Exit Audit (EA) and the eventual partial or full surrender of the license.

Decommissioning may also include measures to restrict access to the bog or silt ponds.

Regarding the lifting of rail lines this will be facilitated by a manual work crew either a) loading rail line components onto a trailer and removing a) direct to contractor, b) to a consolidation area via tractor, prior to disposal, or c) utilizing the rail line itself to remove the components in reverse order onto a locomotive trailer, with again, the parts being delivered up the rail line to be stored and/or disposed of, in line with IPC license conditions.

Decommission and Removal of Porto-cabin and materials store: Tea-centres were used to provide canteen and welfare facilities for bog operations and are either a concrete building, a portacabin or older prefabricated older bee hive units and typically contain tables and chairs, a fridge, lockers, cabinets, sinks and other fixtures and fittings. All basic fixtures and fittings will be retained with all other general waste or unused items removed and disposed to skips for removal off-site.

Bog area clean up: These bog areas include the parking spaces for production plant and equipment, locations for storing rail line, drainage pipes and stockpile covering. All remaining or unconsolidated old and unused polythene will be collected for recycling or disposal, depending on condition. Any remaining older and immobile plant will be brought in from bog and removed off site. Any remaining hazardous waste oils, fluids and batteries will be removed off site by qualified appropriate hazardous waste contractors. All remaining unused drainage pipes will be gathered up for reuse, recycling or disposal. All remaining, unconsolidated unused rail line sections will be collected from the bog and stored at the main access location for dismantling.

### 2.6.1.3 Standard Methodology for Rehabilitation Activities

The proposed Clooniff **Rehabilitation** will be undertaken using standard Best Practices in peatland restoration. These are based on published information in the Irish context, Methodologies developed through Rehabilitation trials, Best Practices employed elsewhere in Europe on peatland rehabilitation and restoration but also the experience of 40 years of research on the after-use development and rehabilitation of the Bord na Móna cutaway bogs (Clarke, 2010; Bord na Móna, 2016), including examples such as the BnM Raised Bog Restoration Project<sup>9</sup> -see also **Section 2.8.2** Sources of Information.

In terms of rehabilitation the ecological and site information collected during Bord na Móna ecological baseline surveys, additional site visits, stakeholder input, and monitoring and desktop analysis forms the basis for the planning of peatland rehabilitation at Clooniff Bog, along with:

- Significant international engagement during this period with other countries in relation to best-practise regarding peatland rehabilitation and after-use through the International Peatland Society and the Society for Ecological Restoration (Joosten & Clarke, 2002; Clarke & Rieley, 2010; Gann et al., 2019); and
- Consultation and engagement with internal and external stakeholders.
- GIS Mapping
- BnM drainage surveys
- Bog topography
- Hydrological modelling

#### Bog Rehabilitation Techniques or Methods

The key interventions to be applied to deep peat cutover bog restoration/rehabilitation is re-wetting peat to encourage natural colonisation of typical vegetation and the development of *Sphagnum*-rich peat-forming vegetation communities. The key interventions to be applied to areas of shallow residual peat prone to flooding, and areas of exposed marl or underlying substrate are effectively those to target the production of wetlands, or fen forming habitats. Some areas of residual peat, due to modelled water levels will effectively only be subject to water level management. Areas of marginal and higher elevated ground within the former production area, such as headlands will also be subject to drain blocking and fertiliser application. Certain prescriptions will require management to ensure water-levels remain close to the surface of the peat for most of the year (100mm ± 50mm).

Several different approaches can be taken to this type of restoration/rehabilitation, and the rehabilitation packages with different rehabilitation/restoration intensities to managing suitable hydrological conditions are proposed (see **Table 6**) with detailed drawings presented in **Appendix D**.

Note the table below excludes constrained areas and rehabilitation categories with no intervention.

<sup>9</sup> Bord na Móna 2014. Blocking Drains in Irish raised bogs. The Bord na Móna Raised Bog Restoration Project. Cris, R. Buckmaster, S. Bain, C. Reed, M. (Eds) (2014) Global Peatland Restoration demonstrating SUCCESS. IUCN UK National Committee Peatland Programme, Edinburgh. <http://www.iucn-uk-peatlandprogramme.org/sites/www.iucn-uk-peatlandprogramme.org/files/IUCNGlobalSuccessApril2014.pdf>

**Table 6: Rehabilitation Categories**

Cutover Bog	
DPT3	More intensive drain blocking (7/100 m) & field reprofiling & blocking outfalls and managing overflows
DPT4	Berms and field re-profiling (45m x 60m cell) + blocking outfalls and managing overflows + drainage channels for excess water + <i>Sphagnum</i> inoculation
DCT2	Regular drain blocking (max 3/100m) +blocking outfalls and managing water levels with overflow pipes+ targeted fertiliser treatment
WLT3	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site + constructing larger berms to re-wet cutaway + transplanting Reeds and other rhizomes
WLT4	More intensive drain blocking (max 7/100 m), + blocking outfalls and managing overflows + transplanting Reeds and other rhizomes

The constituent prescriptions which combine to form each respective rehabilitation package are further described below, namely;

1. Regular Drain Blocking (3/100m)
2. Intensive Drain Blocking (7/100m)
3. Blocking Outfalls
4. Managing Water levels with overflow pipes
5. Field Reprofiling
6. Berms and field reprofiling (45m x 60m cell)
7. Construction of boundary berms and management of water levels with taps
8. Drainage channels for excess water
9. Cut and fill cell bunding (30m x 30m cell)
10. Sphagnum Inoculation
11. Retention of Hydraulic Breaks

A full set of Detailed Drawings for the Proposed Rehabilitation Works Methodologies are included in **Appendix D**.

#### 1. Regular Drain Blocking (3/100m)

This measure can be applied to cutover bog, cutaway bog and drained raised bog with different environmental characteristics. It can be applied to residual peat of various depths including deep cutover peat. The main objective is to place peat blockages in drains to raise water levels, re-wetting peat and slowing water movements through the site. Slowing water movement will have additional benefits of reducing fluvial carbon loss (via water) and also improving water quality leaving the site by reducing emissions of silt and ammonia.

The number of peat blockages per 100m is determined by the topography of the site, but an allowance has been estimated at on average 3 blocks per 100m of field drain. The methodology follows NPWS guidelines published by the National Parks and Wildlife Service (Mackin *et al.*, 2017<sup>10</sup>) and in line with methodologies originally developed by McDonagh (1997).

In all instances peat blockages will be installed using a specially adapted tracked machine. The process involves clearing the drain and creating a 'key' in the drain sides in order to ensure a tight seal is maintained.

<sup>10</sup> [https://www.npws.ie/sites/default/files/publications/pdf/IWM99\\_RB\\_Restoration\\_Best%20Practice%20Guidance.pdf](https://www.npws.ie/sites/default/files/publications/pdf/IWM99_RB_Restoration_Best%20Practice%20Guidance.pdf)

The drain is subsequently blocked with peat taken from a nearby ‘borrow pit’ and involves placing layer after layer of peat until it is built up to above the ground surface, after which it is covered with a ‘scraw’ of vegetation (where available). Each peat blockage takes approximately 5mins to complete.

1. Before building of drain blocks, the sides and bottom of the ditch is cleaned using the excavator to remove dry degraded peat, to ensure a good peat-to-peat contact. ( If any vegetation present, it should be carefully removed and left aside for replacement at the end of the process.)

2. Cut key in either side of the drain approximately 500mm deep, and ensure that it is wider than the actual drain. Remove 500mm of peat from bottom of the drain also and place behind the machine for replacement later.

3. Open an area behind machine to be used as a borrow pit. Avoid using the surface layer of peat (top 100-200mm) which is likely to be very permeable. Only use the deeper, more compacted peat to build the drain block. ( If any vegetation present, it should be carefully removed and left aside for replacement at the end of the process.)

4. Dig out peat from the borrow pit and place into the drain compacting in 300mm layers. Compact the peat firmly using the excavator bucket before laying more peat from the borrow pit.

5. Build the drain block up at least 300mm-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries. ( Take any vegetation removed in step 1 and step 3 and place on the top of the drain block, to help bind and stabilise the drain block.)

6. Backfill the borrow pit with the peat extracted from the bottom of the drain in step 2. Press down on the sides of the peat borrow hole with the excavator bucket to grade the sides of the borrow pit.

This enhanced measure's main objective is to block drains with peat drain blocks to raise water levels, re-wetting peat and slowing water movements through the bog.

**NOTES:**  
 1. REQUIRED DIMS ONLY TO BE TAKEN FROM THIS DRAWING.  
 2. REFER TO RELEVANT SITE PLAN TO ENSURE SENSITIVE DRAIN BLOCKS HAVE BEEN INSTALLED DOWNSTREAM PRIOR TO COMMENCING ANY REPELABLE WORK, TO RETAIN ANY SILT THAT MAY ENTER THE DRAIN.  
 3. REFER TO RELEVANT SITE PLAN FOR ALL OF DRAIN BLOCKS SPECIFIED PER YEAR DRAIN LENGTH.  
 4. REFER TO RELEVANT SITE PLAN FOR SPECIFIC FINISHED GROUND LEVELS TO BE ACHIEVED.  
 5. ALL DETAILS TO BE AGREED WITH BORD NA MÓNA OPERATORS PRIOR TO CONSTRUCTION.  
 6. OPERATORS TO CONFORM WITH ALL STANDARD OPERATING PROCEDURES.  
 7. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATIONS OF THE REHABILITATION PLAN AND NATURE SCIENTIFIC STATEMENT REQUIREMENTS HEREIN & APPLICABLE ARCHAEOLOGY REPORTS AND ANY OTHER SPECIFIC ECOLOGICAL REQUIREMENTS OR ENVIRONMENTAL REPORTS FOR THE BOG.

**PROJECT:** Peatland Climate Action Scheme  
**TITLE:** Rehabilitation Method WLT 4 Peat Drain Blocking

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Drawn By	Checked By	Drawn Date	Checked Date	Approval
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PA	PA	10/06/21	10/06/21	AS
PA	PA	10/06/21	10/06/21	AS
PA	PA	10/06/21	10/06/21	AS

PCAS-0100-011

Figure 7: Completed Peat blockage (reproduced from Mackin *et al.*, 2017)

2. Intensive Drain Blocking (max 7/100m)

This measure can be applied to cutover bog, cutaway bog and drained raised bog with different environmental characteristics. It can be applied to residual peat of various depths including deep cutover peat. The main objective is to block drains with peat barriers to raise water levels, re-wetting peat and slowing water movements through the site. Slowing water movement will have additional benefits of reducing fluvial carbon loss (via water) and also improving water quality leaving the site by reducing emissions of silt and ammonia.

The number of peat blockages per 100m is determined by the topography of the site, but an allowance has been estimated at a maximum of 7 blocks per 100m of field drain. The methodology follows NPWS guidelines published by the National Parks and Wildlife Service (Mackin *et al.*, 2017) and in line with methodologies originally developed by McDonagh (1997).

The increased number of peat blockages (compared with the standard measures) will benefit re-wetting and trapping silt on cutaway with slightly greater slopes and will further slow the movement of water from these sites. Methods are as per 1 but blockages are at a higher frequency along the length of the drainage feature.



### 3. Blocking Outfalls

The key objective from targeted blocking of outfalls within a bog is to re-wet peat but to manage water-levels at an appropriate level for the development of wetland and peatland vegetation. This measure optimises re-wetting of cutaway. This measure also has additional benefits of reducing fluvial carbon loss (via water) and also improving water quality leaving the site by reducing emissions of silt and ammonia.

Targeted blocking of outfalls is suitable for bogs or portions of bogs that have already had a period of natural colonisation, minimising disturbance to pioneer habitats that are already developing. It is also appropriate for locations where there is establishing habitats and where former drainage infrastructure is already starting to break down. Hydrological modelling and an understanding of site drainage is required to identify appropriate locations for targeted drain-blocking to maximise re-wetting. Drains are blocked at these locations using an excavator by lifting pipes and filling holes with peat or local sub-soils.

Again, the key objective is to manage water-levels at 0-10 cm above the peat surface for as much of the year as possible. Some deeper water is inevitable due to heterogenous topography of the cutaway. This measure can be particularly effective as outfall pipes generally run perpendicular to field drains to catch and transport water off the bog. The outfalls have been piped through high fields. Blocking pipes at the high fields means that the high fields can be converted to natural berms or embankments, creating a compartmented wetland.

### 4. Managing water levels with overflow pipes

This prescription is associated strongly with the blocking of outfalls. Following the blocking of outfalls, some high fields may require overflow pipes to be installed to manage water levels, with taps, at the required height above peat surface and/or in instances where a series of high fields have been flooded using the cascade effect, the lowermost field may require the outfall to be piped and managed to facilitate access for example. Overflow pipes will typically be new, 100mm plastic pipes.

Overflow pipes are installed using an excavator.



**Figure 8: Examples of installed overflow pipes**

### 5. Field Reprofiling

The concept of field re-profiling is to level the surface of the individual peat production fields to allow more uniform coverage of water at an ideal depth (c.100mm  $\pm$  50mm) for vegetation colonisation and in particular the development of mosses that will accelerate the trajectory towards naturally functioning peatland ecosystems. It can be applied to residual peat of various depths including deep cutover peat.

Peat production fields generally have a convex camber toward the edges and have a heterogeneous topography. It is usual for the drains and edges of the fields to become wet whilst the high centres of the

fields remain dry. Small hollows within the peat fields will retain surface water for longer. This enhanced measure will target the development of a flat or concave topography that will help the retention of shallow surface water. This approach will be combined with other measures such as drain blocking to re-wet peat to increase the cover of shallow surface water and re-wetted peat on the former production fields. In general, peat production fields will still have a prevailing slope (they will be flatter or convex, but not level).

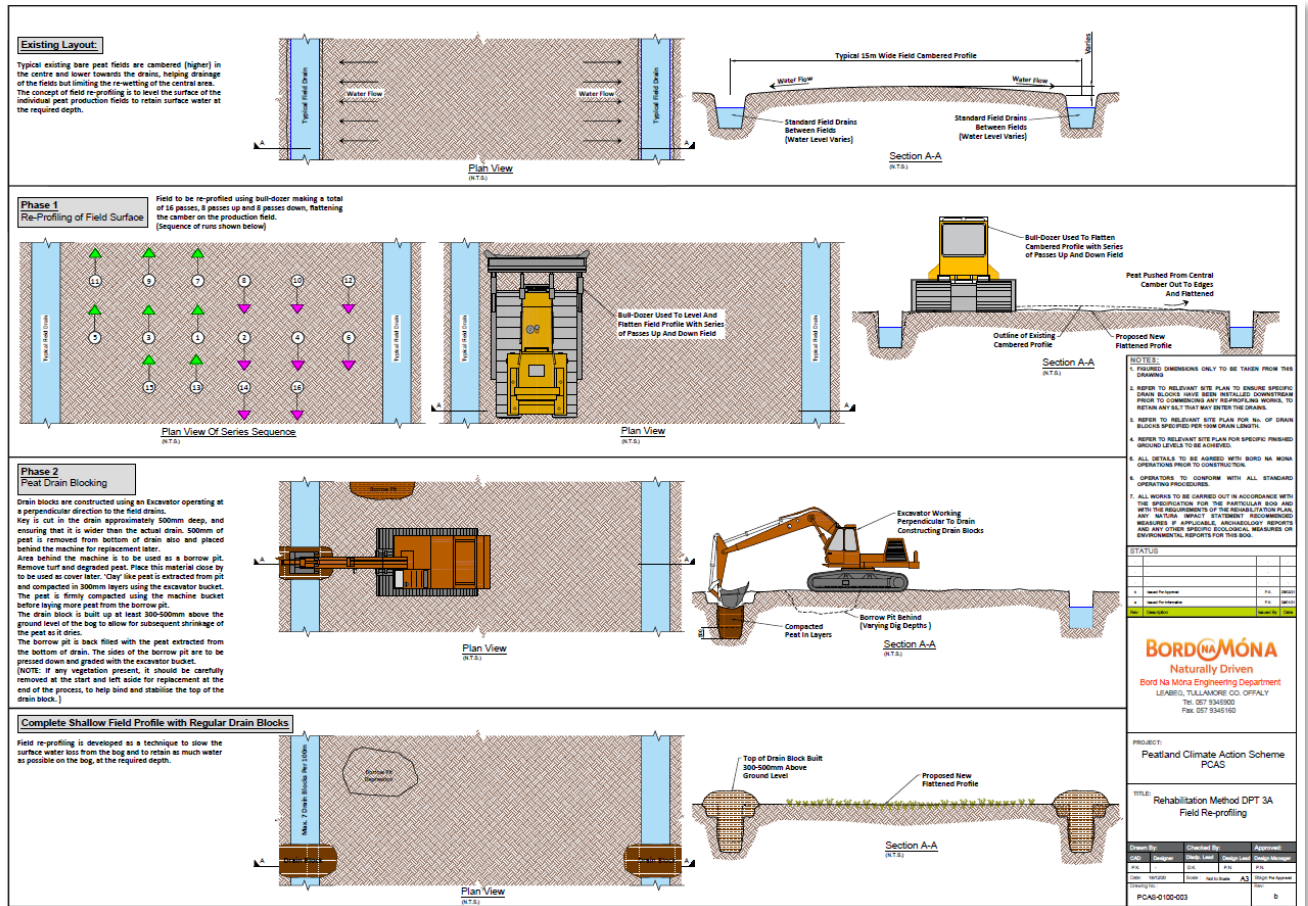


Figure 9: Indicative methodology for field profiling DPT3

This method uses a bull dozer or screw leveller to remove the high central camber from individual production fields and deposit the peat on the lower-lying edges of the same production field and partially in the drains (see Figure 9). It is not intended to completely infill the drains but the drains will be blocked with peat dams. It is planned with the peat extracted from the borrow pit. The drain block is built up at least 300-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries. The borrow pit is back filled with the peat extracted from the bottom of drain. The sides of the borrow pit are to be pressed down and graded with the excavator bucket. (NOTE: If any vegetation present, it should be carefully removed at the start and left aside for replacement at the end of the process, to help bind and stabilise the top of the drain block.)

Field re-profiling is developed as a technique to slow the surface water loss from the bog and to retain as much water as possible on the bog, at the required depth.

On cutaway with increased slopes it will be more advantageous to create shallow depressions. Any depressions will be 10-20cm deep, and a maximum of 20m long (although natural topography may require flexibility in sizing). Depressions can be separated by a strip of undisturbed peat 1-2 m wide.

An alternative to using a dozer is to use a screw-leveller to create a 'clean cut' into a field of deep peat. Any peat which has been thrown to the side is then using to infill adjacent drains using a dozer. This is combined with drain blockages at set intervals, finger berms to prevent sheet flow of water, and cross berms, possibly keyed across the peat fields.

In general, water will still flow across the surface of the re-profiled peat field depending on the prevailing slope but will be retained for longer in the depressions, encouraging the development of wetland habitats. The increased depression will increase the area of optimal hydrological conditions. On more level ground, it will be more straightforward to re-wet larger areas with a more homogenous topography. Slowing water



movement will have additional benefits of reducing fluvial carbon loss (via water) and also improving water quality leaving the site by reducing emissions of silt and ammonia.

#### 6. Berms and field reprofiling (45m x 60m cell)

This measure seeks to create large flat areas or cells of shallow water on bare peat, across multiple fields that are enclosed by shallow berms to retain shallow surface water. The creation of cells will help retain surface water, keeping peat wet and will further slow water movement through the cutaway.

The width of each cell will typically be four fields wide. The centre of former cambered peat production field will be used one 'side' of the cell. Drains within the cell will be infilled. A bull dozer will be used to level and flatten the base of the cell and to infill the drains. The bull-dozer will be used to remove the camber from the former peat production fields and to create a flat and level surface. Laser levels will be mounted on bull-dozers to allow the machine drivers to move peat and create flat surfaces.

Alternatively, a similar process but utilising a screw leveller to remove the cambered surface may be undertaken.

Berms will be formed across or perpendicular to the fields using materials from the cell floor. These berms will be relatively shallow (30 cm high) and will be at least 4-5 m wide. These berms will act to enclose the cell and to retain shallow surface water. Pipes will be used to manage overflows and prevent bund erosion.

The berms will be constructed using an excavator and the trench-bunding technique may be used. The trench bunding technique involves digging a new trench as a 'foundation' or key for the bund. Material is then repacked into the trench and then built up to create a bund. Additional material for the bund will be supplied by the surrounding area. The trench bunding technique improves the overall strength of the bund by creating a foundation and also reduces sub-surface flows through the banded area.

The exact dimensions of the cells will be dependent upon the topography of the site and the heights of the various peat fields. For example, it may be appropriate to have cells that are only two fields wide where two low fields have higher fields on either side. It may not be appropriate to equalise the levels of two adjacent fields where there is a significant height difference. The length of the cells may be shorter if the fields are on a steeper gradient to that the base of the cells is flat to retain water. Such flexibility is essential to maximise water retention on site and minimise machinery and peat movements. This enhanced measure requires more intensive planning to adapt it towards varying topography.

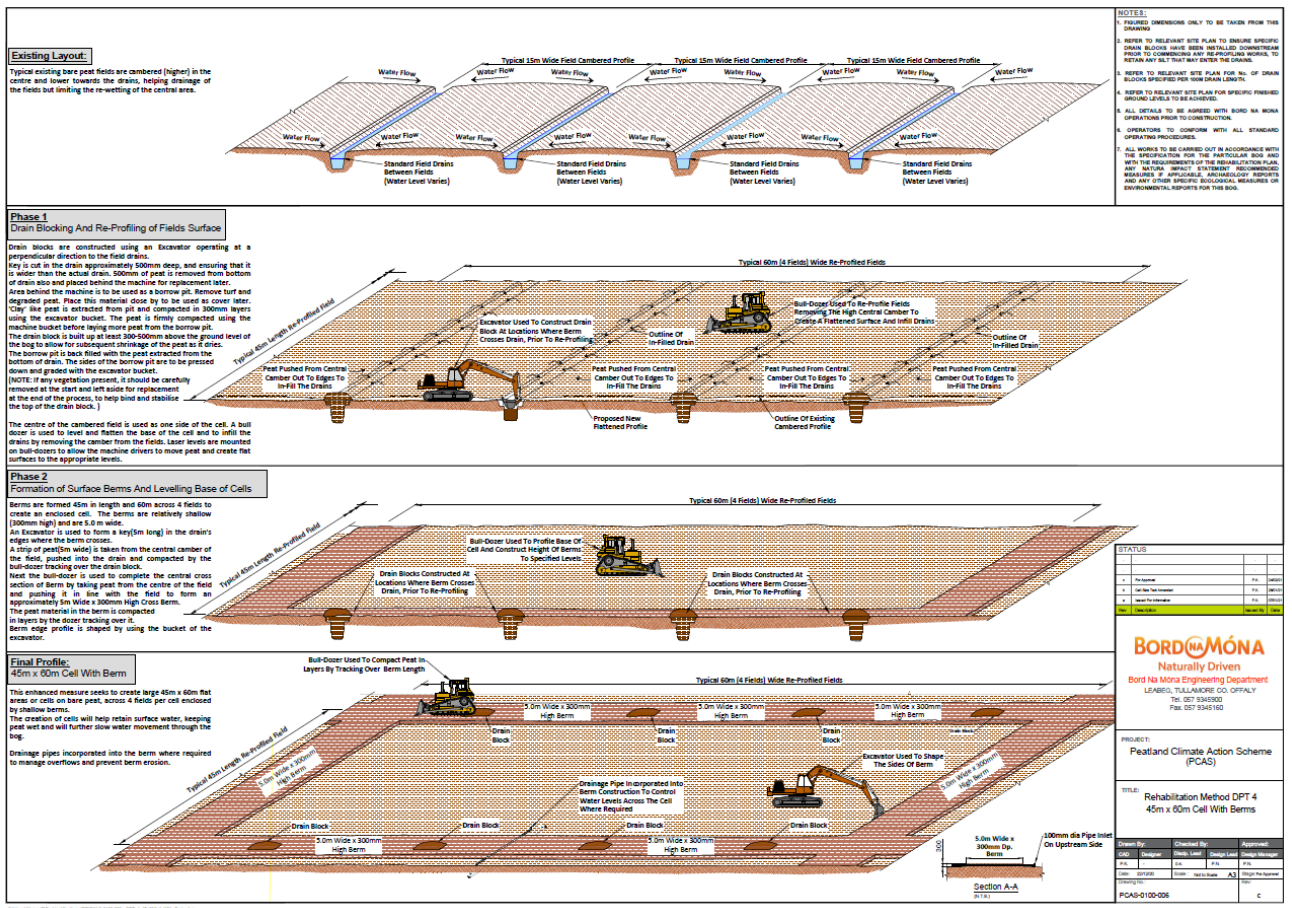


Figure 10: Indicative methodology for DPT4

7. Drainage channels for excess water

New drainage channels (swales) are appropriate to help manage larger volumes of water at large sites during high rainfall events. The main objective is not to drain any residual peat but to manage excess water and prevent significant flooding. Swales (shallow wide drainage channels) are a common measure used in the design and construction of constructed wetlands. They may only get occasional use during the year during periods of high rainfall.

At some Bord na Móna sites, once drains and pipes are blocked water can rise to inappropriate levels due to the localised topography (basins). Permanent deeper water can inhibit the development of wetland or peatland vegetation and large open bodies of water are not encouraged, where possible.

In some instances, 'taps' can be cut between peat fields to allow water flow/reduce volumes of water from one part of the bog to another.

This measure will allow greater management of water levels across the cutaway, the benefits of which are listed above and will help protect newly created infrastructure (cell bunds). Hydrological modelling will be key to design these new drainage channels.

8. Cut and fill cell bunding (30m x 30m cell)

This is an intensive engineering approach to peatland rehabilitation that looks to modify the topography substantially to optimise suitable hydrological conditions for the development of peat-forming communities. It will also have additional benefits of reducing fluvial carbon loss (via water) and also improving water quality leaving the site by reducing emissions of silt and ammonia.

The cut and fill cell bunding approach aims to create 'saucers' or flat bunded areas (cells) on peat with berms to hold shallow water at appropriate levels. Each cell is approximately 30 x 30 m and laser levels will be used

on excavators and bulldozers to aid the construction of flat cells surrounded by slightly convex berms. As cells are constructed production field drains will be infilled with peat. Cells will be sized relatively small to prevent wave erosion affecting the development of moss growth.

Bunds will be constructed using an excavator at a level approximately 30cm higher than the cell floor and will be about 4-5 m in width. Bunds may be constructed using the trench bunding approach described above. When the bund is constructed using this drier peat, it is compacted by the excavator's tracks to ensure that the bund retains shallow water in the cell. The top surface level of the bunds are constructed with a high level of accuracy (level along the extent of length bounding the cell). This is essential as surface water eventually overflows the bunds at later stages when drainage pipes become less functional.

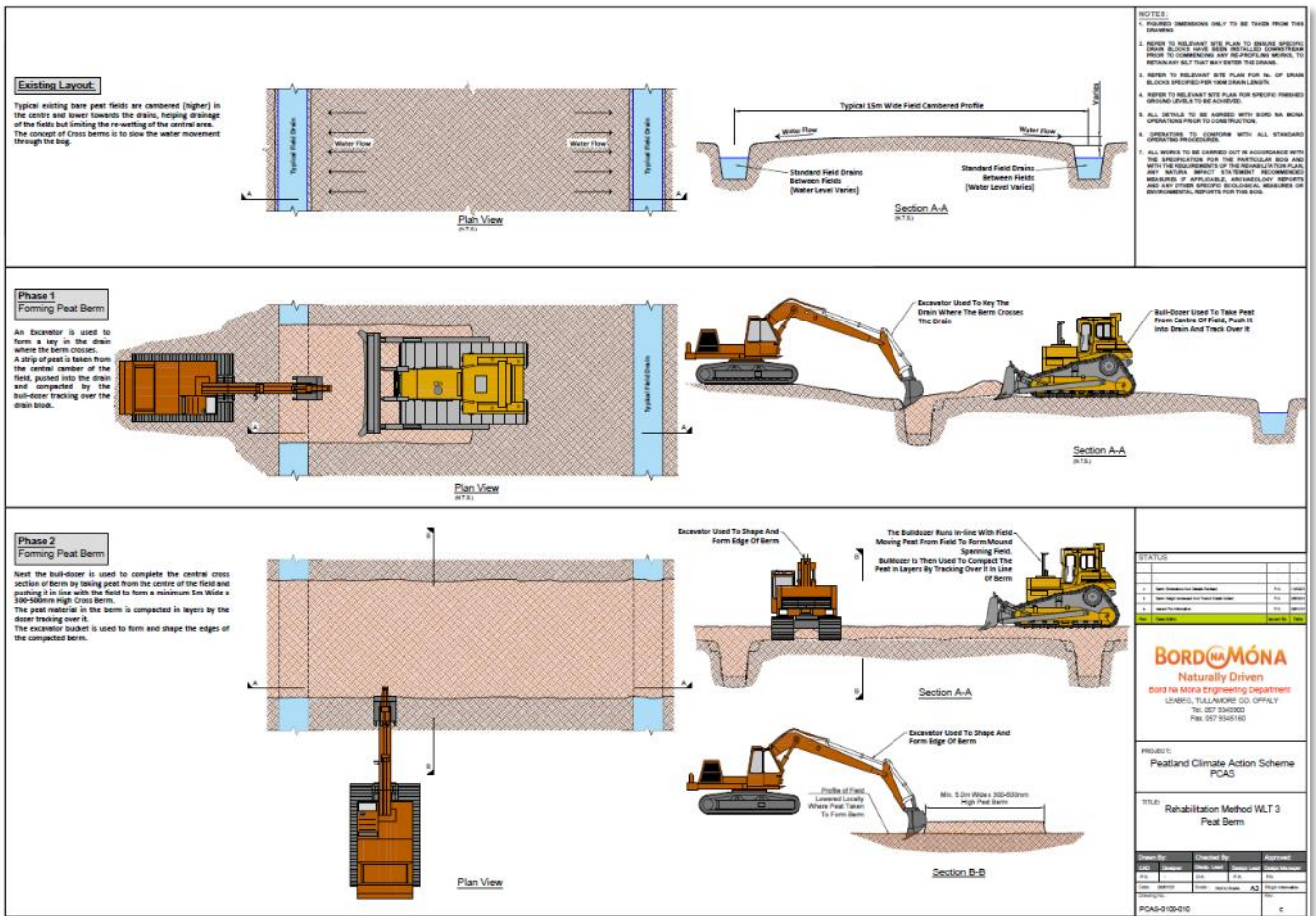


Figure 11: Rehabilitation Method WLT3 Peat Berm

When bunds are being constructed, drainage pipes are added (1 per cell) to channel flow from pond to pond down the site gradient. The drainage pipes include a 90-degree elbow and a section of straight pipe on the up-flow side to control the level of water in the cell at the desired level below the top level of the berm. Drainage pipes are important to prevent erosion of the bund during initial phases however, once the bunds are stabilised, the pipes became redundant as the vegetation within the pond establishes to a point where it hinders water flow to the pipe.

9. Sphagnum Inoculation

The main objective of this enhanced rehabilitation intervention is to accelerate the rate of natural colonisation of Sphagnum moss at suitable sites by introducing donor material. The presence of Sphagnum-rich vegetation on peatlands brings significant benefits as this is considered a potential carbon sink.

There is potential to use Sphagnum inoculation to establish and diversify selected small areas on target sites with Sphagnum species, which in turn, and in combination with natural colonisation, can then naturally

colonise the remaining deep peat cutover bog area. *Sphagnum* inoculation should only be used in appropriate environmental conditions (water-logged, deep peat with stable water levels and with more acidic water chemistry).

It is proposed to use locally sourced *Sphagnum* and procured donor material, sourced from older established Bord na Móna cutover bog sites where possible, to inoculate Bord na Móna deep peat cutover bogs. Small amounts (handfuls) will be distributed into the newly created cells on deep peat cutover bog. This material can be planted into the soft peat or scattered into shallow water. The use of significant volumes of *Sphagnum* donor material is constrained by the small amount of suitable donor material and donor sites. It is also proposed to use *Sphagnum* donor material developed in greenhouses (e.g. Beadaplugs), where suitable donor material can be made available, and where this is required.

There are significant benefits for climate action from establishing *Sphagnum*-rich peatland vegetation communities. These have been found to quickly develop as carbon sinks (> 10 year). This enhanced measure will be used in combination with some of the other enhanced re-wetting measures (cut and fill cell bunding) to accelerate and optimise the development of *Sphagnum*-rich vegetation on suitable deep peat cutaway sites.

#### 10. Retention of Hydraulic Breaks

To sustain hydrological continuity through the margins of the proposed rehabilitation and decommissioning site and to avoid flooding of adjacent lands, it is proposed to retain certain key hydraulic breaks (drains) along the margins of the bog site and to regrade some drains along the boundaries of the site. These works will be completed to retain peripheral surface water drainage around the margins of the bog rehabilitation sites allowing hydrological flow from lands upstream of the site to areas downstream of the rehabilitation site. These works may require localised instream excavation, widening and regrading of existing drains with tracked excavators.

#### 11. Construction of Boundary Berm

It is proposed to construct a boundary berm around the southern and south-eastern margins of Coolumber Bog. This will be constructed to avoid flooding of the Coolumber Bog area from the adjoining callows area.

See **Appendix D** for the full suite of Methodology Drawings.

A breakdown of the extent of deep peat rehabilitation packages is provided in **Table 7**, below.

Deep Peat Cutover Bog		Extent (Ha)
DPT3	More intensive drain blocking (7/100 m) & field reprofiling & blocking outfalls and managing overflows	71.28
DPT4	Berms and field re-profiling (45m x 60m cell) + blocking outfalls and managing overflows + drainage channels for excess water + Sphagnum inoculation	33.31

**Table 7 Extent of Deep Peat Rehabilitation proposed at Clooniff.**

A breakdown of the extent of wetland, dry cutaway rehabilitation types and silt ponds is provided in **Table 8**, below.

Dry Cutaway and Wetland		Extent (Ha)
DCT2	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes + targeted fertiliser treatment	46.74
WLT3	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site + constructing larger berms to re-wet cutaway + transplanting Reeds and other rhizomes	209.26
WLT4	More intensive drain blocking (max 7/100 m), + blocking outfalls and managing overflows + transplanting Reeds and other rhizomes	71.21
n/a	Silt ponds	3.9

**Table 8 Extent of Dry Cutaway and Wetland proposed at Clooniff.**



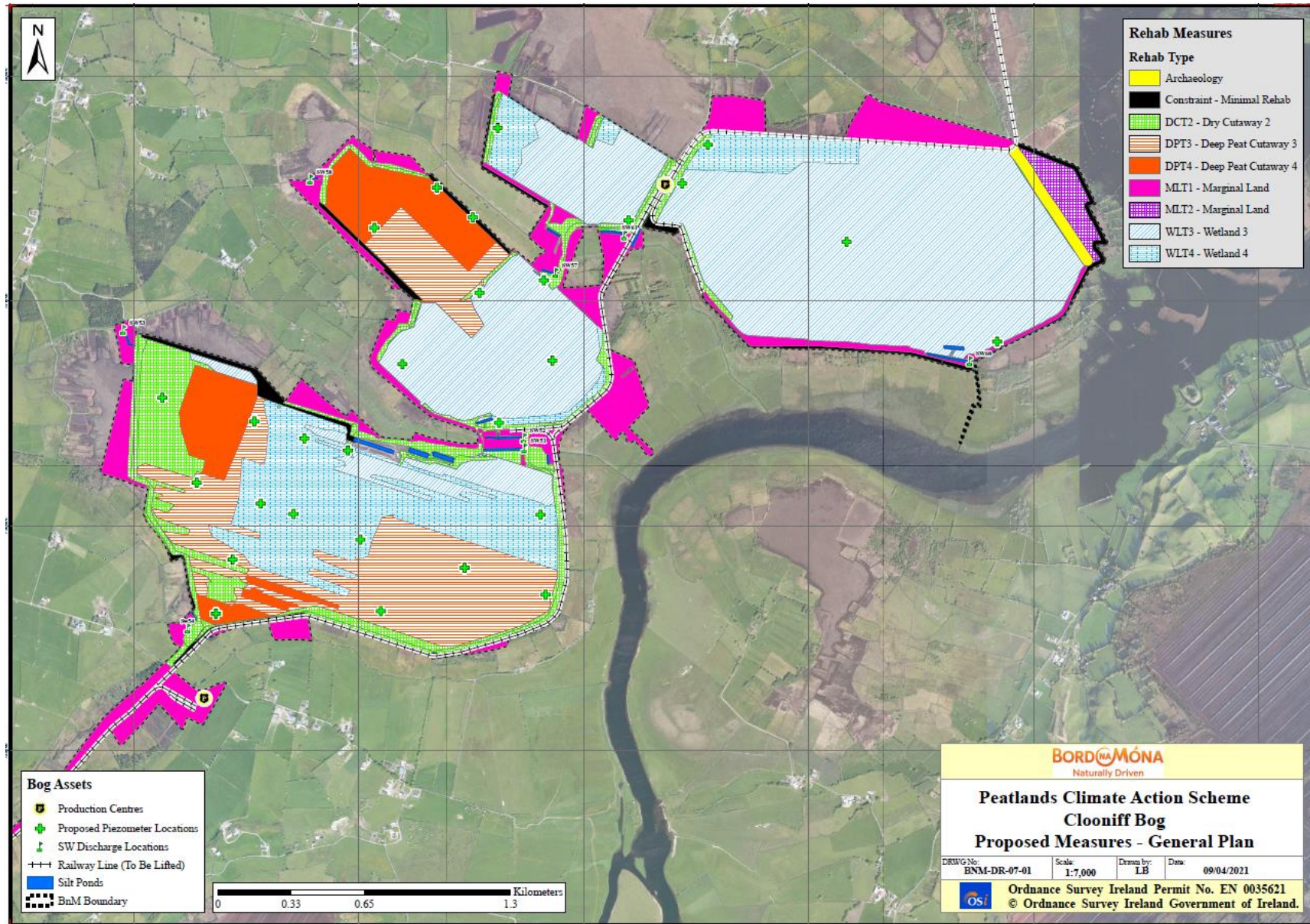


Figure 12: Proposed Enhanced (PCAS) - General Plan



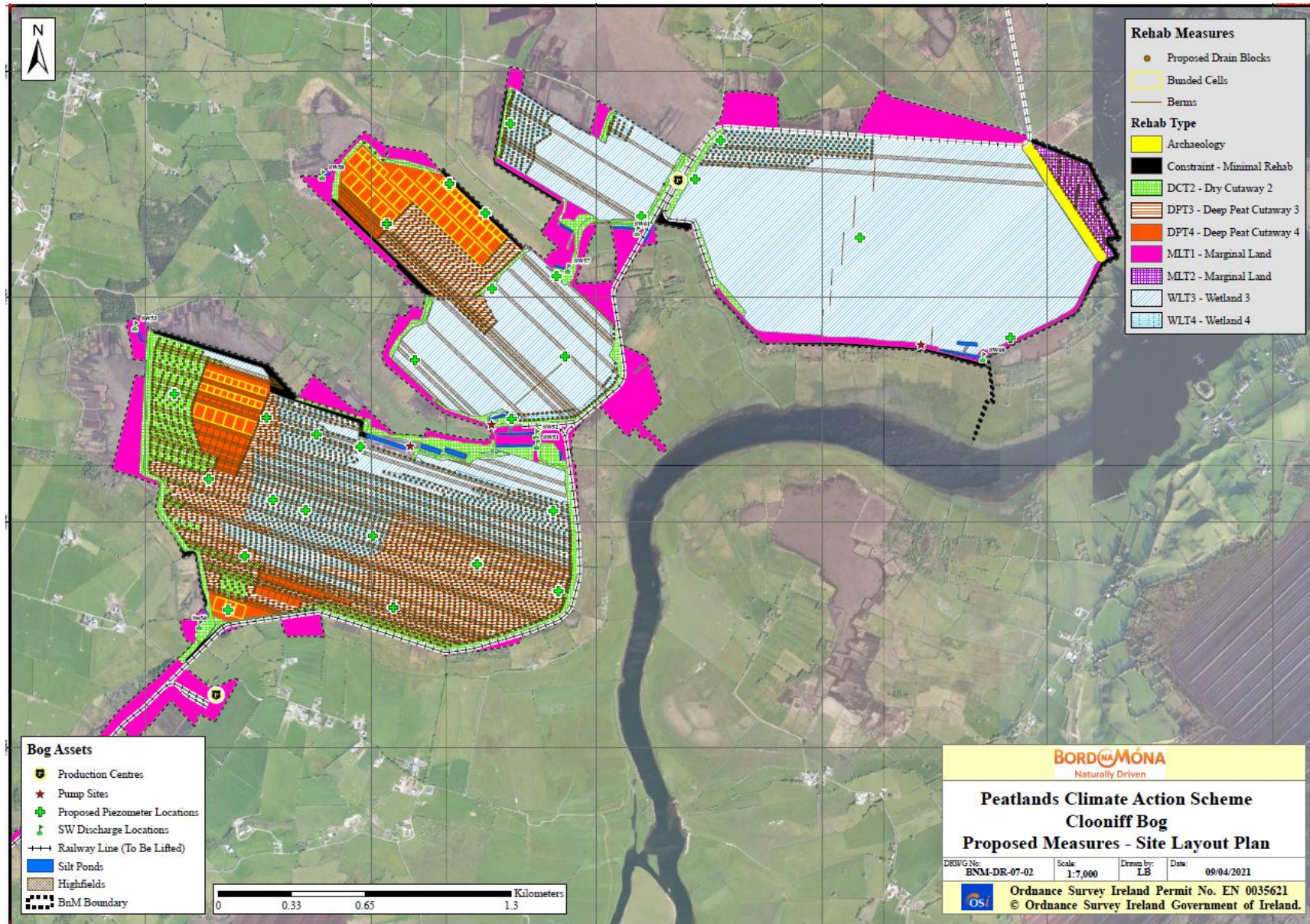


Figure 13: Site Layout Plan

#### **2.6.1.4 Decommissioning and Rehabilitation Timescale and Resource Requirements**

##### Duration

**Decommissioning** activities will be completed within a period of 12 months and are scheduled to be completed before the end of April 2022.

**Rehabilitation** activities will be completed within a period of approximately 12 months. In general activities proposed for FY22 i.e. 2021 will be carried out between the months of April and October inclusive.

The duration of activities provided are approximate and may be slightly shorter or longer, depending on weather conditions and progress on rehabilitation prescriptions. Activities may cease for the winter months due to rainfall and poor ground conditions, in line with typical BNM work practice and H&S requirements. In any case, the rehabilitation period will not be longer than 1 year .

##### **2.6.1.4.1 Hours of Work**

Normal Decommissioning and Rehabilitation times will be daylight hours between 08.00 and 17.30hrs Monday to Friday.

#### **2.6.1.5 Use of Natural Resources**

**Land Requirement:** There is no land requirement in respect of **decommissioning**. In total **rehabilitation** activities will take place on 436.5 hectares of land. As rehabilitation through stabilisation and land cover change is the primary objective, no 'negative quality' land take is associated with Rehabilitation. No land take is required for e.g. the storage of vehicles – vehicles are typically left in situ at points of work or on 'headlands'.

**Water:** No additional water is required for either decommissioning or rehabilitation.

##### **Soils/Peat:**

Regarding **decommissioning** some peat or topsoil material which is contaminated may be removed in line with Schedule 2 of the IPC license. This is considered negligible in magnitude.

During **rehabilitation**, minor quantities of existing peat will be excavated from drainage trenches and/or an immediately adjacent borrow pit at peat dam locations and immediately used to form peat blockages. Borrow pits are re-instated, as the final step in dam creation, by the excavator driver profiling the surrounding peat/scraw into place over the excavated borrow pit. In each instance the magnitude of extracted peat is negligible. Similarly, the installation of overflow pipes may require excavation of minor quantities of peat, and/or subsoil dependant on location (Insertion of peat blockages/overflow pipes may interact with underlying subsoils where peat depths are shallow). All material used will be from the immediate vicinity and no transport of material will be required.

Existing bare peat surfaces will be re-profiled in line with pre-defined 'levels' where required to 'rewet' areas of currently dry peat. This may be through use of a dozer or a screw leveller. Dozers will be used to create 'speed bumps' or dams across existing drainage channels adjacent to re-profiled areas, by 'dozing' peat displaced in re-profiling into place at pre-defined dam locations. Dozers may also be used to infill drains with peat displaced by screw levelling. For any prescriptions such as the creation of banded 'cells', certain fields will be re-profiled into a succession of tiered cells with separating bunds or dams; in some instances, these may be 'keyed', to avoid sub-surface water flow, and ensure cells retain the target depth of water.

Peat will also be utilised to infill any blocked outfalls or raised drainage pipes.

**Hydrocarbons** will be used on-site during decommissioning and rehabilitation activities and will be limited to the diesel or petrol fuel and mechanical oils used by any onsite site machinery and equipment.



### 2.6.1.6 Emissions & Wastes during Rehabilitation

**Dust, Noise, Vibration:** Dust, noise and localised vibration along access routes arising from the arrival and departure of **decommissioning** vehicles or **rehabilitation** machinery will be localised to the access tracks or rail line, occur in low volumes and last for a negligible duration – it is common practice on BnM working bogs to leave vehicles *in situ* once on site, therefore daily trips into and out of the bog are not expected. Dust and noise limits are currently set on IPC licenses.

Regarding rehabilitation, the extent of dust, noise and localised vibration from individual machines creating peat dams to block drains or blocking outfalls is momentary in duration and therefore considered negligible in magnitude. Reprofilling the surfaces of exposed peat using a ‘dozer’ or ‘screw leveller’ and creating ‘speed bump’ blockages or infilling drains produces a higher potential for the release of dust during drier periods, however the duration of this is expected to be brief (i.e. with effects lasting less than a day). Enhanced measures where bunded cells are created may take longer duration.

Durations overall are expected over a 12 month period at Clooniff Bog or until rehabilitation is complete.

Fuel and drainage pipes will be delivered. No blasting or piling is required.

**Wastes:** General waste will arise from the presence of staff. Very small quantities of chemical waste will be generated, this waste is limited to solid waste oil, such as oily rags.

**Welfare Facilities:** Welfare facilities are available at Clooniff Bog. Where required, Portaloos and additional welfare facilities may be added to the Clooniff site. This may be required to accommodate guests or additional workers during the summer months and to assist with social distancing requirements during the ongoing Covid-19 pandemic.

### 2.6.2 Operational Stage

**Duration:** Once constructed and commissioned, the proposed Decommissioning and Rehabilitation will remain permanently in place.

**Operational Activities:** Operational activities will mainly comprise non-intrusive environmental & ecological monitoring (including surface water monitoring, vegetation monitoring but also the use of drones to provide catalogues of aerial photography), and may also include minimal works such as repairs to existing peat blockages, adjustment of overflow pipes (where required) and or fertilisation to increase successional rates. Maintenance of existing silt ponds to reduce emissions to local water bodies, as conditioned by the existing IPC license, will still be required. Activities to retain the function of drainage channels operating as hydraulic breaks along the site boundary, to include drainage channel cleaning, removal of trees, debris etc.

**Operational Access:** Operational access will be through the Cloonbeggaun townland, where existing infrastructure is already in place via access tracks to facilitate the previous peat extraction.

**Timing of Operational Activities:** It is expected that scheduled inspection and maintenance activities will be carried out by a 2-4 person team, typically for 1 day per month, for the foreseeable future. Limited access may occur to inspect and manage water levels within the rewetted peatland areas.

**Use of Natural Resources:** During the Operational Stage, there is limited requirement for the use of natural resources – negligible quantities of peat or subsoil may be used to repair existing or create additional drain blocks.

**Emissions & Wastes:** During the Operation Stage of Rehabilitation there will be negligible exhaust fumes, dust and noise emitted by maintenance vehicles and or other equipment such as drones during occasional maintenance works, such as to outflows.

### Fugitive emissions to air

Collectively, ceasing industrial peat production, re-wetting and re-vegetating will minimise any risk of emission to air from dust. During the operational stage of Peatland Rehabilitation, typical emission of dust from exposed peat to air is expected to cease.

### Carbon Emissions

Following rehabilitation and into the early operational stage Clooniff Bog may continue to be a carbon source, however as habitats stabilise following intervention, the bog is expected to, over time, become a carbon sink in part.

### 2.6.3 Other Projects and Plans with Potential to Cause In-Combination Effects

The location of the proposed Clooniff Bog decommissioning and rehabilitation does not overlap the footprint of any other existing projects or plans.

Other bogs within the larger Bog Group will also be subject to both decommissioning and rehabilitation to meet IPC license conditions. This has the potential to result in in-combination effects from the release of hydrocarbons, emissions to air and water.

Peat extraction through turbarry occurs around the margins of Clooniff Bog and at other locations within 15km. This has the potential to result in in-combination effects from the release of hydrocarbons, emissions to air and water, and through modification to drainage regimes.

Planned solar farms have been consented near Athlone and Castlegar Co, Roscommon.

A planning search of the National Planning Database found a number of proposed or consented developments within the vicinity of Clooniff Bog, including private dwellings or amendments to private dwellings, an application by Cignal Infrastructure Ltd to construct a 27 metre high multi-user lattice tower telecommunications structure at the Derrineel townland and a number of agricultural led planning applications such as for slatted sheds/ amendments to existing farm infrastructure etc.

There are 3 no. local authority jurisdictions within 15km of Clooniff Bog (Roscommon County Council, Galway County Council and Offaly County Council). All local authorities have County Development Plans and/or plans relating to Heritage and Biodiversity.

There is a current ongoing NPWS Raised Bog Restoration Project which may include at some date some raised bogs within 15km of Clooniff Bog. Restoration activities at these bogs may have the potential for in combination effects with decommissioning and rehabilitation at Clooniff Bog, however there is no currently known temporal or spatial overlap between any planned restoration activities and the decommissioning and rehabilitation of Clooniff Bog.

Operational phase disturbance or mortality/barrier effect pathways to avifaunal species are not predicted from the proposed rehabilitation works. Therefore there is no source for in-combination effects with other future developments which may themselves result in potential mortality / barrier effects.

#### 2.6.3.1 Other BnM Bog Group Decommissioning and Rehabilitation

Other BnM bogs within the larger Blackwater group will also be subject to decommissioning and rehabilitation to meet the various, pertinent, IPC license conditions, however, currently, the only known temporal overlap between these proposed activities elsewhere in the Blackwater group is at the following bogs:

- Belmont Bog – Located 6.3km south-east of Clooniff Bog. Belmont Bog supports connectivity to the downstream sections of Middle Shannon Callows SPA and River Shannon Callows SAC via Blackwater (Shannonbridge)\_020 watercourse.
- Castlegar Bog – Located 13.2km north-west and upstream of Clooniff Bog. Adjoins and partially overlaps the River Suck Callows SPA, which in turn provides connectivity to downstream sections of the Middle Shannon Callows SPA and River Shannon Callows SAC. Castlegar Bog supports remote connectivity to downstream sections of the Middle Shannon Callows SPA and River Shannon Callows SAC.
- Garryduff Bog – Located 3.3km south of Clooniff. Adjoins the southern boundary of the River Suck Callows SPA, which in turn provides connectivity to downstream sections of the Middle Shannon Callows SPA and River Shannon Callows SAC. The north-western and south-eastern boundaries of Garryduff Bog Complex adjoin the Middle Shannon Callows SPA and River Shannon Callows SAC.

- Kellysgrove Bog – Located 3.4km south-west of Clooniff. Adjoins southern boundary of River Suck Callows SPA, which in turn provides connectivity to downstream sections of the Middle Shannon Callows SPA and River Shannon Callows SAC.
- Kilmacshane Bog – Located 6.8km south-east of Clooniff. The eastern boundary of Kilmacshane Bog partially overlaps the Middle Shannon Callows SPA and River Shannon Callows SAC.

The proposed rehabilitation works at each of these sites were subject to Screening for Appropriate Assessment. All of these sites screened out at Stage 1 screening assessment, with the exception of proposed works for Castlegar Bog. The proposed rehabilitation works at Castlegar Bog were subject to NIS which included detailed design and mitigation measures to avoid adverse effects on European Sites. All other PCAS bogs over the remaining duration of the scheme will also be subject to appropriate assessment.

The construction phase of decommissioning and rehabilitation at these bogs may overlap those proposed for Clooniff Bog. All of the above bog sites within the Blackwater Group support connectivity with the downstream areas of the Middle Shannon Callows SPA and River Shannon Callows SAC.

The Operational stage of Clooniff Bog Decommissioning and Rehabilitation will overlap the Rehabilitation stage of other bogs within the Blackwater Bog group however the expected magnitude of any effects from Clooniff Bog at this lifecycle stage are evaluated as insufficient to result in in-combination effects. The possibility of likely significant in combination effects can reasonably be excluded on this basis.

As outlined, bog sites within the Blackwater Group proposed for decommissioning and rehabilitation in 2021, support connectivity with the downstream areas of the Middle Shannon Callows SPA and River Shannon Callows SAC. The decommissioning and rehabilitation of any other bogs within the greater Blackwater Group will be subject to Appropriate Assessment and it is considered the requisite mitigation will be in place should the potential for any adverse effects on European site integrity be identified as part of the Appropriate Assessment process. This should also identify the potential for any sequential in-combination pathways, in particular should temporal overlap exist.

### **2.6.3.2 Turbary**

Licensed turbary occurs at various locations within 15km of Clooniff Bog, including several locations where the pathways for downstream in combination effects on European Sites may exist, primarily via drainage to EPA blue line watercourses to facilitate turbary. Unauthorised private turbary also occurs in discrete localised plots to the north of Clooniff Bog at the Cloonbeggaun townland and south-west of Clooniff Bog at Cornaveagh townland.

### **2.6.3.3 NPWS Raised Bog Restoration at Barroughter Bog SAC (Site Code: 000231) and Cloonmoylan Bog SAC (Site Code: 000248)**

Both Barroughter Bog SAC and Cloonmoylan Bog SAC are located south of Clooniff Bog and are located within the River Shannon catchment. Both bogs are identified as part of the Cessation of Turf Cutting Compensation Scheme for SACs, and may possibly be subject to restoration and rehabilitation works in the short-term.

An Appropriate Assessment (of the National Raised Bog SAC Management Plan 2017-2022) has been carried out in accordance with Regulation 42(11) and 42(12) of the European Communities (Birds and Natural Habitat) Regulations 2011-2015 and has had regard to the findings of the Natura Impact Statement, the conservation and management measures set out in the National Raised Bog SAC Management Plan 2017-2022 and which constitute plan-level mitigation measures, and the submissions and observations received on the (draft) National Raised Bog SAC Management Plan<sup>11</sup>. One of the primary mitigation elements proposed

<sup>11</sup> [https://www.npws.ie/sites/default/files/general/AA%20Determination%20NRBMP%202017\\_2022\\_0.pdf](https://www.npws.ie/sites/default/files/general/AA%20Determination%20NRBMP%202017_2022_0.pdf)

is that screening for appropriate assessment and if necessary appropriate assessment will be carried out in relation to any site specific/project level measures including restoration measures and turf-cutting. If AA of a project at site level determines that adverse effects are likely, or cannot be ruled out, the project will either not be pursued or, where considered appropriate, the derogation steps of Article 6(4) will apply, but only in a case in which there are imperative reasons of overriding public interest (IROPI) requiring a project to proceed, there are no less damaging alternative solutions, and compensatory measures have been identified that can be put in place.

On this basis, it is assumed that the appropriate level of Appropriate Assessment has or will be carried out in respect of any future proposed restoration activities at the above bog, and that any required mitigation to avoid adverse effects on European Site integrity will be in place.

#### **2.6.3.4 Agricultural Activity**

Given the proximity of Clooniff Bog to the River Shannon, there is potential for agricultural activities and their respective emissions to air (noise as a source of disturbance) and water (sediment, runoff, deleterious materials) to combine with source effects from decommissioning and rehabilitation at Clooniff Bog. Most of these activities are not subject to Appropriate Assessment, and form part of the existing baseline environment.

#### **2.6.3.5 Local Authority Development Plans**

The following development plans have been identified:

- Roscommon County Development Plan 2014-2020
- Roscommon County Development Plan 2021 – 2027
- County Roscommon Heritage Plan 2017-2021
- Galway County Development Plan 2015-2021
- Galway County Biodiversity and Heritage Plan 2017-2022
- Offaly County Development Plan 2014-2020
- Offaly County Development Plan 2021-2027
- Offaly Heritage Plan 2017-2021

It is assumed that the above, or any other plans including those currently at draft status, will be subject to the requirement for Appropriate Assessment which can reasonably be assumed to provide mitigation to avoid adverse effects on European Sites.

#### **2.6.3.6 Proposed Solar Farms at Rathlegg Castlerea Co. Roscommon (17295) and Taduff West, Taduff East Creagh and Curraghaleen , Athlone South , Co. Roscommon (2036).**

Two proposed solar farms located in upstream catchments of Clooniff Bog.

##### **Solar Farm (17295)**

The development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of a Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works. The application site is upstream of the River Suck Callows SPA and is located within the River Suck catchment. The planners report (available online) provides an Appropriate Assessment which considers that 'no element of the proposed project alone, or in combination with other plans or projects is likely to have significant effects on conservation objectives of European Sites'.

**Solar Farm (2036)**

The development of a solar PV panel array comprising photovoltaic panels on ground mounted frames within a site area of 70 hectares, 19no. single storey inverter/transformer stations, 1no. single storey DSO substation and DSO access road, 1no. single storey customer substation, 1no. single storey spare parts container, boundary security fencing with access gates, CCTV security cameras, associated electrical cabling and ducting, upgraded and new access tracks and all associated ancillary development and landscaping works on land at. The planners report (available online) refers to the Ecology report prepared for this development as follows 'that there will be no significant direct, indirect, secondary or in-combination effects on an Natura 2000 site as a result of the proposed development'.

**2.6.3.7 Proposed Battery Storage Facility at Roaun, Co. Galway**

In August 2017, Roscommon County Council granted permission for grid system service facility within a total site area of up to 0.55 hectares , to include 1 no. single storey electrical substation building, 1 no. customer switchgear container, 15 no. electrical inverter/transformer station modules (SKIDS) 10 no. containerised battery storage modules on concrete support structures, 20 no. heating, ventilation and air conditioning units (HVAC units) and all associated site works. The planners report available online includes an Appropriate Assessment Screening undertaken by the Competent Authority. The Screening concludes that the proposed development will have no impacts upon the integrity of any area that has been designated as a Natura 2000 site.

**2.6.3.8 Other Projects or Activities**

The likelihood of cumulative interaction with other plans or projects is considered low, due to limited temporal or spatial overlap; the absence of hydrological connectivity or shared hydrological catchment with many of the other plans or projects described, the separation distance or setback buffers between the described plans or projects and European Sites, and the requirement for Appropriate Assessment for other plans or projects, such as private dwellings, forestry entrances, slatted sheds, masts and amendments to existing planning consents, which can reasonably be assumed to provide mitigation to avoid adverse effects on European Sites. Nonetheless the possibility of secondary effects from activities forming part of decommissioning or rehabilitation at Clooniff Bog cannot be excluded – a precautionary approach is taken.



## 2.7 European Sites under consideration

### 2.7.1 Distance of the Project to European Sites

For the proposed Clooniff Bog decommissioning and rehabilitation, a limited zone of potential impact is predicted, due to the relatively small scale, duration and localised nature of the activities proposed.

Nevertheless, a precautionary 15km distance was chosen to evaluate the potential for effects (alone and in-combination) on European Sites.

There are **13 European Sites** - 10 Special Area's of Conservation (SAC) and 3 Special Protection Area (SPA) - **within 15km of Clooniff Bog**. The locations of these European Sites are illustrated in **Figure 14: European Sites within 15km of Clooniff Bog** and **Figure 15: Proximal , adjacent or overlapping European Sites**. The proposed overlap between the Middle Shannon Callows SPA and the River Shannon Callows SAC and the proposed rehabilitation works are presented in **Figure 16**.

The distances from the Clooniff bog rehabilitation site and comment on hydrological connectivity provided in **Table 9**.

**Table 9: Proximity of the proposed Clooniff Bog to European Sites**

European Site (SAC or SPA)	Site Code	Distance from the Development*	Hydrological Connectivity (Y/N: If Yes Downstream or Upstream connectivity relative to Clooniff Bog)
River Shannon Callows SAC	000216	Partially overlapping the Coolumber section of Clooniff Bog; i.e. the north-easternmost bog parcel.	Y:Downstream via the Ballydangan_020 and Shannon (Upper)_120 and Shannon (Upper)_130 watercourses
Mongan Bog SAC	000580	1.5km east of Clooniff at its closest point.	N: No, located upstream of the proposed works.
Fin Lough SAC	000576	2.9km south-east of Clooniff at its closest point.	N: No, located upstream of the proposed works.
Pilgrim's Road Esker SAC	001776	1.9km east of Clooniff at its closest point.	N: No, located upstream of the proposed works.
Moyclare Bog SAC	000581	10.7km south-east of Clooniff at its closest point.	N: No hydrological connectivity between the proposed bog rehabilitation site and this European Site.
Ferbane Bog SAC	000575	11.3km east south-east of Clooniff at its closest point.	N: No hydrological connectivity between the proposed bog rehabilitation site and this European Site.
Crosswood Bog SAC	002337	11.3km north-east of Clooniff at its closest point.	N: No hydrological connectivity between the proposed bog rehabilitation site and this European Site.
Ballynamona Bog And Corkip Lough SAC	002339	11.3km north/north-west of Clooniff at its closest point.	N: No hydrological connectivity between the proposed bog rehabilitation site and this European Site.
Castlesampson Esker SAC	001625	8.8km north-west of Clooniff at its closest point.	N: No hydrological connectivity between the proposed bog rehabilitation site and this European Site.
Lough Ree SAC	000440	11.1km north/north-east of Clooniff at its closest point.	N: No hydrological connectivity between the proposed bog rehabilitation site and this European Site.

European Site (SAC or SPA)	Site Code	Distance from the Development*	Hydrological Connectivity (Y/N: If Yes Downstream or Upstream connectivity relative to Clooniff Bog)
Middle Shannon Callows SPA	004096	Partially overlapping the Coolumber section of Clooniff Bog; i.e. the north-easternmost bog parcel.	Y: Downstream via the Ballydangan_020 and Shannon (Upper)_120 and Shannon (Upper)_130 watercourses.
River Suck Callows SPA	004097	2.7km south of Clooniff at its closest point.	Y: Potential downstream connectivity via the main channel of the River Shannon and its associated floodplain.
Lough Ree SPA	004064	10.9km north/north-east of Clooniff at its closest point.	N: No hydrological connectivity between the proposed bog rehabilitation site and this European Site.

\*All distances cited are the closest straight line distance as measured using GIS.

The Qualifying Interests/Special Conservation Interests and locational context for each of the thirteen European Sites examined in this Screening Report are provided in **Table 10**.

The Site Synopsis and Conservation Objectives for each site are available in full on the National Parks & Wildlife Service website at <https://www.npws.ie/protected-sites> and references including date of access, are included in **Section 4**. Conservation Objectives were reviewed to inform the current appraisal – in particular to identify any possible sensitivities and resultant pathways for likely significant effects.

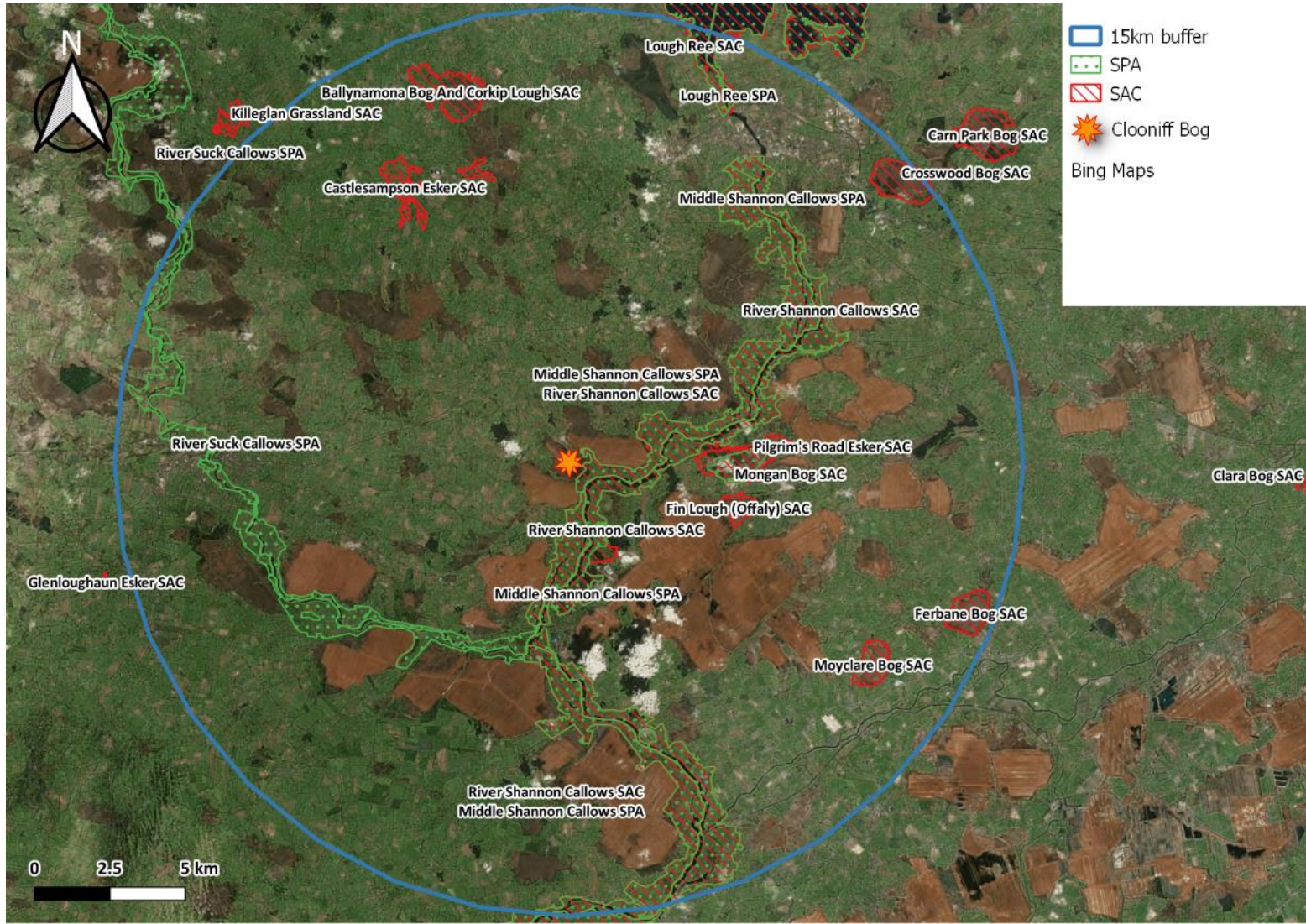


Figure 14: European Sites within 15km of Clooniff Bog





Figure 15: Proximal, adjacent or overlapping European Sites



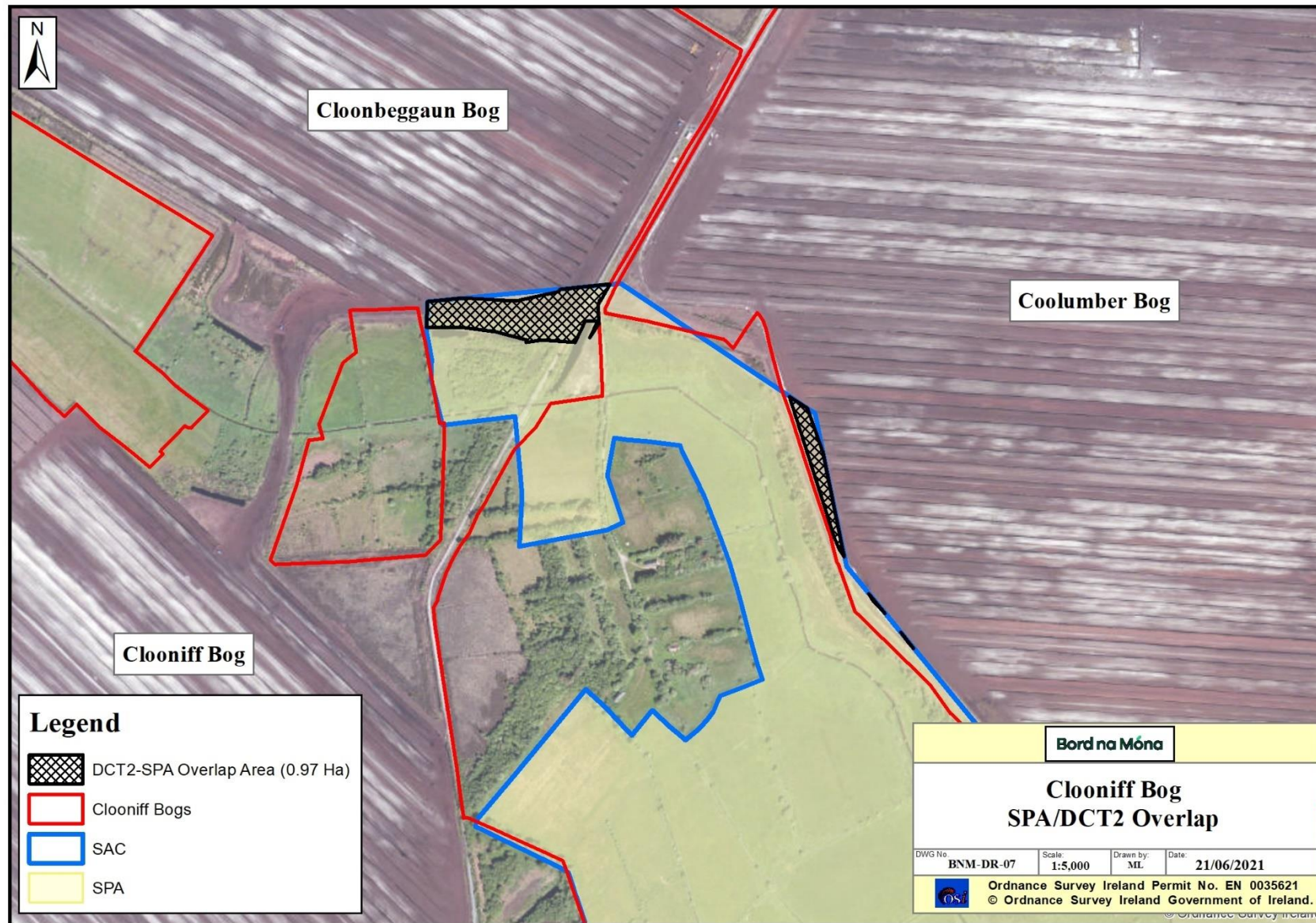


Figure 16: Proposed DCT2 works and extent of overlap (0.97ha) with Middle Shannon Callows SPA

Table 10: Description of European Sites within a 15km radius of Clooniff Bog

	European Site Name and Code	Qualifying Interest / Special Conservation Interest and Code *denotes a priority habitat	Summary Description (from Site Synopsis) <sup>12</sup>	Data Source – Conservation Objectives Supporting Form
1	River Shannon Callows SAC (000216)	<p>[6410] <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>)</p> <p>[6510] Lowland hay meadows (<i>Alopecurus pratensis</i>, <i>Sanguisorba officinalis</i>)</p> <p>[8240] Limestone pavements*</p> <p>[91E0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>)*</p>	<p>The River Shannon Callows is a long and diverse site which consists of seasonally flooded, semi-natural, lowland wet grassland, along and beside the river between the towns of Athlone and Portumna. It is approximately 50 km long and averages about 0.75 km wide (reaching 1.5 km wide in places). Along much of its length the site is bordered by raised bogs (many, but not all, of which are subject to large-scale harvesting), esker ridges and limestone-bedrock hills. The soils grade from silty alluvial to peat. This site has a common boundary, and is closely associated, with two other sites with similar habitats, River Suck Callows and Little Brosna Callows (NPWS, 2013a).</p>	<p>NPWS (2021) River Shannon Callows SAC 000216. Version date: 23.03.2021. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 09.04.2021</p>
2	Mongan Bog SAC (000580)	<p>[7110] Raised Bog (Active)*</p> <p>[7120] Degraded raised bogs still capable of natural regeneration</p> <p>[7150] Depressions on peat substrates of the <i>Rhynchosporion</i></p>	<p>Mongan Bog is a midland raised bog of medium size situated immediately east of the monastic site of Clonmacnoise, Co. Offaly, and 12 km south of Athlone. It is situated in a basin, surrounded on 95% of its perimeter by high ground on mineral soil. Mongan Bog is of high conservation importance as it is a good example of a raised bog site which contains examples of the Annex 1 habitats active raised bog, degraded raised bog and depressions on peat substrates (<i>Rhynchosporion</i>). It is mostly intact and has classic hummock and pool formations over a large proportion of the surface. It has several features of special zoological interest. Scenically it is part of an area rich in intact natural features (callows, eskers, limestone pavement) which enhances its importance further. The ongoing intensive research on aspects of</p>	<p>NPWS (2013) River Mongan Bog SAC 000580. Version date: 29.08.2013. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 26.11.2020</p>

<sup>12</sup> Site Synopses for River Shannon Callows SAC, Middle Shannon Callows SPA and River Suck Callows SPA are presented in **Appendix C**.

European Site Name and Code	Qualifying Interest / Special Conservation Interest and Code *denotes a priority habitat	Summary Description (from Site Synopsis) <sup>12</sup>	Data Source – Conservation Objectives Supporting Form	
			bog ecology at the site reinforces its international importance (NPWS, 2013b).	
3	Fin Lough SAC (000576)	[1013] Geyer's Whorl Snail <i>Vertigo geyeri</i> [7230] Alkaline fens	Fin Lough is a shallow limestone lake surrounded by a complex of wetland habitats, 7 km north-east of Shannonbridge in Co. Offaly. The name Fionn Loch, "White Lake", probably derives from the white colour of the lake bottom caused by marl deposits. It is a shallow lake, about 16 ha in extent (in winter) and bounded to the north and east by the Clonfinlough esker ridge, and to the south and west by Blackwater Bog, which is now largely cut-over. The lake and its surrounding wetland communities are arranged in distinct zones reflecting wetness and substrate. They include open water, reedswamp, tall sedge, alkaline fen, fen-bog transition, swamp woodland and bog. The transition from calcium-rich lake to reedbed, to fen, to bog is relatively intact in some areas, which is exceptional for this part of the country (NPWS, 2013c).	NPWS (2013) River Fin Lough SAC 000576. Version date: 29.08.2013. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 26.11.2020
4	Pilgrim's Road Esker SAC (001776)	[6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	Pilgrim's Road Esker SAC is a narrow esker ridge extending 2 km east from Clonmacnoise in Co. Offaly. The site is adjacent to the River Shannon Callows, to the north, and Mongan raised bog, to the south. The western area includes Bunthulla Hill (north of the road) and Hanging Hill (south of the road); the central area runs along both sides of the summit ridge before widening out eastwards to include a substantial area of esker grassland centred on the site of an old ring-fort. Pilgrim's Road Esker is the most scenically impressive esker in the midlands and the one best known to the public. Orchid-rich calcareous grassland is a rare habitat in Ireland and is listed as a priority habitat under Annex I of the E.U. Habitats Directive. Furthermore the population of the	NPWS (2014) Pilgrim's Road Esker SAC 001776. Version date: 23.01.2014. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 26.11.2020



European Site Name and Code	Qualifying Interest / Special Conservation Interest and Code *denotes a priority habitat	Summary Description (from Site Synopsis) <sup>12</sup>	Data Source – Conservation Objectives Supporting Form
			rare Green-winged Orchid is the largest known in Ireland (NPWS, 2014).
5	Moyclare Bog SAC (000581)	<p>[7110] Raised Bog (Active)*</p> <p>[7120] Degraded raised bogs still capable of natural regeneration</p> <p>[7150] Depressions on peat substrates of the Rhynchosporion</p>	<p>Moyclare Bog is a small raised bog situated 4 km west of Ferbane in Co. Offaly. Its mean height above sea level is 54 m. On the western edge of the bog, a low peat face with no perimeter drain lies adjacent to wet peaty pasture, which has a spring-line at its junction with mineral soil. The water from this spring disappears under the peat dome of the bog. The site occurs in close proximity to a number of important raised bogs close to the floodplain of the River Shannon. Whilst relatively small, Moyclare bog is a site of high conservation value as it is relatively intact and contains examples of the Annex I habitats active raised bog, degraded raised bog and depressions on peat substrates (Rhynchosporion). The uncut peat dome has an unusually high proportion of active raised bog.</p> <p>NPWS (2013) Moyclare Bog SAC 000581. Version date: 2.09.2013. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 26.11.2020</p>
6	Ferbane Bog SAC (000575)	<p>[7110] Raised Bog (Active)*</p> <p>[7120] Degraded raised bogs still capable of natural regeneration</p> <p>[7150] Depressions on peat substrates of the Rhynchosporion</p>	<p>Ferbane Bog is a relatively large, domed, raised bog located about 10 km east of Shannonbridge in Co. Offaly. It is underlain by low permeability Waulsortian limestone and clay-rich tills. Ferbane Bog is a good example of a raised bog and is of considerable conservation significance. Active raised bogs are becoming increasingly rare in Ireland, and Europe, and are listed as a priority habitat on Annex I of the E.U. Habitats Directive (NPWS, 2013e).</p> <p>NPWS (2013) Ferbane Bog SAC 000575. Version date: 29.08.2013. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 26.11.2020</p>
7	Crosswood Bog SAC (002337)	<p>[7110] Raised Bog (Active)*</p> <p>[7120] Degraded raised bogs still capable of natural regeneration</p>	<p>Crosswood Bog is situated approximately 5 km east of Athlone, Co. Westmeath, mainly in the townlands of Crosswood, Glenaghanvoneen, and Creggan Lower. The site comprises a raised bog that includes both areas of high bog and cutover bog. The northern margin of the bog lies along the southern side of the Dublin-Galway</p> <p>NPWS (2014) Crosswood Bog SAC 002337. Version date: 9.01.2014. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>

European Site Name and Code	Qualifying Interest / Special Conservation Interest and Code *denotes a priority habitat	Summary Description (from Site Synopsis) <sup>12</sup>	Data Source – Conservation Objectives Supporting Form
		railway line. Crosswood Bog is a site of considerable conservation significance as it comprises a raised bog, a rare habitat in the E.U. and one that is becoming increasingly scarce and under threat in Ireland. This site supports a good diversity of raised bog microhabitats, including hummock/hollow complexes, pools and wooded flushes. Furthermore, it supports a population of the rare bog moss <i>Sphagnum pulchrum</i> . Active raised bog is listed as a priority habitat on Annex I of the E.U. Habitats Directive. Priority status is given to habitats and species that are threatened throughout the E.U. Ireland has a high proportion of the total E.U. resource of this habitat type (over 60%) and so has a special responsibility for its conservation at an international level (NPWS, 2014b).	Accessed online 26.11.2020
8	Ballynamona Bog and Corkip Lough SAC (002339)	[3180] Turloughs* [7110] Raised Bog (Active)* [7120] Degraded Raised Bog [7150] Rhynchosporion Vegetation [91D0] Bog Woodland*	Ballynamona Bog and Corkip Lough is a site of considerable conservation significance as it consists of a raised bog, a rare habitat in the E.U. and one that is becoming increasingly scarce and under threat in Ireland. Ireland has a high proportion of the total E.U. resource of raised bog (over 60%) and so has a special responsibility for its conservation at an international level. Active raised bog, bog woodland and turlough are listed as priority habitats on Annex I of the E.U. Habitats Directive (NPWS, 2014c).  NPWS (2014) Ballynamona Bog and Corkip Lough SAC 002339. Version dated 09.01.2014. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 30.07.2020
9	Castlesampson Esker SAC (001625)	[3180] Turloughs* [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco Brometalia</i> ) (* important orchid sites)*	Castlesampson Esker is a complex site with esker, turlough and raised bog all found. The esker is the most westerly of an important group of eskers centred on Adrnacloon Hill in south-east Co. Roscommon, 9 km west of Athlone. It forms a steep-sided, crescent-shaped hill composed of glacial gravels, situated on the south side of a metalled road. Although gravel is being quarried all around the esker  NPWS (2013) Castlesampson Esker SAC 001625. Version date: 06.11.2013. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 26.11.2020

	European Site Name and Code	Qualifying Interest / Special Conservation Interest and Code *denotes a priority habitat	Summary Description (from Site Synopsis) <sup>12</sup>	Data Source – Conservation Objectives Supporting Form
			and gravel pits occur within the site, the esker ridge itself is largely intact and fairly undisturbed. Lying to the east of the esker is a raised bog, whilst to its west is a turlough. The Castlesampson Esker site is of high conservation for the proximity and juxtaposition of esker, raised bog and turlough. The esker itself is of high importance for its almost intact structure (something which is very rare in Irish eskers), its relatively undisturbed state and for the presence of good quality, species-rich dry calcareous grassland, a habitat that is listed with priority status on Annex I of the E.U. Habitats Directive.	
10	Lough Ree SAC (000440)	<p>[1355] Otter <i>Lutra lutra</i></p> <p>[3150] Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation</p> <p>[6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)</p> <p>[7120] Degraded raised bogs still capable of natural regeneration</p> <p>[7230] Alkaline fens</p> <p>[8240] Limestone pavements</p> <p>[91A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles</p> <p>[91D0] Bog woodland*</p>	Lough Ree is the third largest lake in Ireland and is situated in an ice-deepened depression in Carboniferous limestone on the River Shannon system between Lanesborough and Athlone. The site spans Counties Longford, Roscommon and Westmeath. Some of its features (including the islands) are based on glacial drift. It has a very long, indented shoreline and hence has many sheltered bays. Although the main habitat, by area, is the lake itself, interesting shoreline, terrestrial and semi-aquatic habitats also occur. Lough Ree and its adjacent habitats are of major ecological significance. Some of the woodlands around the lake are of excellent. St John's Wood is particularly important; it is one of the very few remaining ancient woodlands in Ireland. The lake itself is an excellent example of a mesotrophic to moderate-eutrophic system, supporting a rare fish species and a good diversity of breeding and wintering birds (NPWS, 2019).	NPWS (2013) Lough Ree SAC 000440. Version date: 23.08.2019. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 26.11.2020
11	Middle Shannon Callows SPA (004096)	<p>[A038] Whooper Swan <i>Cygnus cygnus</i></p> <p>[A050] Wigeon <i>Anas penelope</i></p> <p>[A122] Corncrake <i>Crex crex</i></p>	The Middle Shannon Callows SPA is a long and diverse site which extends for approximately 50 km from the town of Athlone to the town of Portumna; it lies within	NPWS (2012) Middle Shannon Callows SPA 004096. Version date: 10.1.2012. National Parks and Wildlife

	European Site Name and Code	Qualifying Interest / Special Conservation Interest and Code *denotes a priority habitat	Summary Description (from Site Synopsis) <sup>12</sup>	Data Source – Conservation Objectives Supporting Form
		[A140] Golden Plover <i>Pluvialis apricaria</i> [A142] Lapwing <i>Vanellus vanellus</i> [A156] Black-tailed Godwit <i>Limosa limosa</i> [A179] Black-headed Gull <i>Chroicocephalus ridibundus</i> [A999] Wetland and Waterbirds	Counties Galway, Roscommon, Westmeath, Offaly and Tipperary. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Whooper Swan, Wigeon, Corncrake, Golden Plover, Lapwing, Black-tailed Godwit and Black-Headed Gull. It is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds	Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 26.11.2020
12	River Suck Callows SPA (004097)	[A038] Whooper Swan <i>Cygnus cygnus</i> [A050] Wigeon <i>Anas penelope</i> [A140] Golden Plover <i>Pluvialis apricaria</i> [A142] Lapwing <i>Vanellus vanellus</i> [A395] Greenland White-fronted Goose <i>Anser albifrons flavirostris</i> [A999] Wetland and Waterbirds	The River Suck Callows SPA is a linear, sinuous site comprising a section of the River Suck from Castlecoote, Co. Roscommon to its confluence with the River Shannon close to Shannonbridge, a distance of approximately 70 km along the course of the river. The river forms part of the boundary between Counties Galway and Roscommon. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Whooper Swan, Greenland Whitefronted Goose, Wigeon, Golden Plover and Lapwing.	NPWS (2014) River Suck Callows SPA 004097. Version date: 23.03.2021. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 09.04.2021
13	Lough Ree SPA (004064)	[A004] Little Grebe <i>Tachybaptus ruficollis</i> [A038] Whooper Swan <i>Cygnus cygnus</i> [A050] Wigeon <i>Anas penelope</i> [A052] Teal <i>Anas crecca</i> [A053] Mallard <i>Anas platyrhynchos</i> [A056] Shoveler <i>Anas clypeata</i> [A061] Tufted Duck <i>Aythya fuligula</i> [A065] Common Scoter <i>Melanitta nigra</i> [A067] Goldeneye <i>Bucephala clangula</i> [A125] Coot <i>Fulica atra</i>	Situated on the River Shannon between Lanesborough and Athlone, Lough Ree is the third largest lake in the Republic of Ireland. It lies in an ice-deepened depression in Carboniferous Limestone. Some of its features (including the islands) are based on glacial drift. The main inflowing rivers are the Shannon, Inny and Hind, and the main outflowing river is the Shannon. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Whooper Swan,	NPWS (2014) Lough Ree SPA 004064. Version date: 30.5.2015. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 26.11.2020

European Site Name and Code	Qualifying Interest / Special Conservation Interest and Code *denotes a priority habitat	Summary Description (from Site Synopsis) <sup>12</sup>	Data Source – Conservation Objectives Supporting Form
	[A140] Golden Plover <i>Pluvialis apricaria</i> [A142] Lapwing <i>Vanellus vanellus</i> [A193] Common Tern <i>Sterna hirundo</i> [A999] Wetland and Waterbirds	Wigeon, Teal, Mallard, Shoveler, Tufted Duck, Common Scoter, Goldeneye, Little Grebe, Coot, Golden Plover, Lapwing and Common Tern (NPWS, 2015).	

## 2.8 Sources of Information & Consultation

### 2.8.1 Consultation

Consultation seeks to engage an audience of relevant stakeholders at both a national and local level.

To inform the current Rehabilitation Plan, both national and local stakeholders, including neighbours whose land adjoins Clooniff Bog and local representatives of national bodies (such as Regional National Parks and Wildlife Service staff) and relevant offices in County Councils (such as the Heritage or Environmental Offices) have been contacted. Any identified local interest groups have been sought and informed of the opportunity to engage with this rehabilitation plan, and when identified have been invited to submit their comments or observations in relation to the proposed rehabilitation at Clooniff Bog (see Appendix B).

See **Section 4** of the Rehabilitation Plan included as **Appendix B** for a full consultation report.

Formal consultation has been undertaken with NPWS regarding proposed Decommissioning and Rehabilitation Plans, including protected Sites. The findings and feedback from the consultation process have been fed into the final rehabilitation and decommissioning plans. Due cognisance was also given to information available on the NPWS website at:

<https://www.npws.ie/development-consultations#>.

In addition, two meetings were held with the EAU to discuss consultation with the Minister in accordance with Regulation 42(9) of the European Communities (Birds and Natural Habitats) Regulations, 2011.

### 2.8.2 Sources of Information

Other sources of Information, which were considered during this Screening evaluation, included both desktop studies and fieldwork:

- Review of the Conservation Objectives, Site Synopsis and Site boundary information for the European Sites within with study area;
- Review of OSI Discovery Mapping for the 15km study area around Clooniff Bog;
- Review of EPA online mapping for watercourse features (<https://gis.epa.ie/EPAMaps/>);
- Review of location and layout mapping for proposed Rehab;
- Review of the detailed description of proposed Decommissioning and Rehabilitation measures, including methodologies specific to the main categories of land types under consideration, which occur in cutaway bogs;
- Review of other plans and projects within 15km
- Review of the results of previous Ecological Surveys of Clooniff Bog, along with recent confirmatory site visits; and

Additional on-line resources were also incorporated into the desk study, including:

- Review of the National Biodiversity Data Centre (NBDC) webmapper;
- Inland Fisheries Ireland (IFI) Reports;
- Environmental Protection Agency database ([www.epa.ie](http://www.epa.ie));
- EPA Guidance on Requests for Alterations to a Licensed Industrial or Waste Activity;
- BirdWatch Ireland online data (including I-WeBS and CBS datasets; [www.birdwatchireland.ie](http://www.birdwatchireland.ie));
- Geological Survey of Ireland - National Draft Bedrock Aquifer map;
- Geological Survey of Ireland - Groundwater Database ([www.gsi.ie](http://www.gsi.ie));
- National Parks & Wildlife Services Public Map Viewer ([www.npws.ie](http://www.npws.ie));
- Water Framework Directive catchments.ie/maps/ Map Viewer ([www.catchments.ie](http://www.catchments.ie));
- OPW Indicative Flood Maps ([www.floodmaps.ie](http://www.floodmaps.ie)),
- CFRAM Preliminary Flood Risk Assessment (PFRA) maps ([www.cfram.ie](http://www.cfram.ie));
- River Basin Management Plan for Ireland 2018 – 2021;
- Bord na Móna Annual Report 2019;
- Spatial data in respect of Article 17 reporting, available online at <https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17>.
- Spatial data in respect of Article 12 reporting, available online at <https://www.npws.ie/maps-and-data/habitat-and-species-data/article-12-data>.
- Available data on Greenland White-fronted Geese such as annual reporting by the Greenland White-fronted Goose Study and National Parks and Wildlife Service.

Planning peatland rehabilitation also takes account of research, experience and engagement with other peatland restoration and rehabilitation projects and peatland research including Irish, UK, European and International best-practise guidance (full citations are in the References **Section 4**):

- Bord na Móna Biodiversity Action Plan
- Anderson *et al.* (2017). An overview of the progress and challenges of peatland restoration in Western Europe.
- Bonn *et al.* (2017). Peatland restoration and ecosystem services- science, policy and practice.
- Carroll *et al.* (2009). Sphagnum in the Peak District. Current Status and Potential for Restoration. Moors for the Future Report No 16.
- Clark & Rieley (2010). Strategy for responsible peatland management.
- Eades *et al.* (2003). The Wetland Restoration Manual.
- Farrell & Doyle (2003). Rehabilitation of Industrial Cutaway Atlantic Blanket Bog, NW Mayo, Ireland.
- Gann *et al.* (2019). International Principles and Standards for the practice of Ecological Restoration.
- Hinde *et al.* (2010). Sphagnum re-introduction project: A report on research into the re-introduction of Sphagnum mosses to degraded moorland. Moors for the Future Research Report 18.
- Joosten & Clarke (2002). Wise Use of mires and peatlands – Background and Principles including a framework for Decision-making.
- Lindsay (2010). Peatbogs and Carbon: a Critical Synthesis to Inform Policy Development in Oceanic Peat Bog Conservation and Restoration in the Context of Climate Change.
- Mackin *et al.* (2017). Best practice in raised bog restoration in Ireland. Irish Wildlife Manuals, No. 99. National Parks and Wildlife Service,
- McBride *et al.* (2011). The Fen Management Handbook, (2011), Scottish Natural Heritage.
- McDonagh (1996). Drain blocking by machines on Raised Bogs. Unpublished report for National Parks and Wildlife Service.
- NPWS (2017a). National Raised bog Special Areas of Conservation management plan 2017-2022. Department of Arts, Heritage and the Gaeltacht.



- Quilty & Rochefort (2003). Peatland Restoration Guide, second edition. Canadian Sphagnum Peat Moss Association and New Brunswick Department of Natural Resources and Energy.
- Renou-Wilson *et al.* (2011). BOGLAND - Sustainable Management of Peatlands in Ireland. STRIVE Report No 75 prepared for the Environmental Protection Agency.
- Schouten (2002). Conservation and Restoration of Raised Bogs: Geological, Hydrological and Ecological Studies. Dúchas - The Heritage Service of the Department of the Environment and Local Government, Ireland;
- Thom (2019). Conserving Bogs – Management Handbook.
- Wheeler & Shaw (1995). Restoration of Damaged Peatlands – with Particular Reference to Lowland Raised Bogs Affected by Peat Extraction.
- Wittram *et al.* (2015). A Practitioners Guide to *Sphagnum* Reintroduction. Moors for the Future Partnership.

## 2.9 Potential Sources, Pathways and Timing of Impacts to European Sites (SACs & SPAs)

### 2.9.1 Potential Sources, Pathways and Timing of Impacts to SACs

#### 2.9.1.1 Direct Impact to Habitats within the SAC

There is partial spatial overlap between Clooniff Bog and River Shannon Callows SAC (See **Figure 15**). Due to the proximity and overlap between the Clooniff Bog and the River Shannon Callows SAC, **there is potential for loss or fragmentation of habitats or loss of connectivity of habitats within a SAC. Although habitats where both the SAC and likely rehabilitation measures** (all within the category of 'Marginal Lands') **overlap do not comprise 'callows', rather marginal areas of remnant high bog or cutaway with respective drainage, access tracks and infrastructure, a precautionary approach is taken**, and therefore, there is **potential for direct impacts to the SAC** to occur. Other SAC's can be excluded from consideration in respect of direct effects.

#### 2.9.1.2 Indirect loss or degradation of terrestrial or aquatic habitats within SAC boundaries

**Sources (all outside SAC boundaries):** Movement of soil or peat, machinery; earthworks, excavations, installation of pipes/ temporary overburden storage, cleaning of silt ponds, removal of waste and/or raw material, lifting of rail; use of fuels, chemicals or fertiliser.

Working within watercourses and drainage channels along the site boundary / periphery to retain the function of hydraulic barriers between the site and the surrounding environment and to sustain the flow of surface water around the margins of the site. Such works may require localised instream works, mobilisation of particulate matter, local excavations within drainage channels, machinery works within and adjacent to watercourses. A water quality map for Clooniff Bog is presented in **Figure 3** and on site drainage and silt ponds are presented in **Figure 18**.

**Pathway:** Surfacewater runoff flow paths to receiving drainage systems, downstream watercourses

#### **Potential Clooniff Bog Decommissioning and Rehabilitation Impact/Pathway Connectivity:**

The identified impact sources could possibly reduce water quality or aquatic habitat quality in the local context, where all works are located outside of and at a distance from any designated SAC. The closest SAC is the River Shannon Callows SAC, which adjoins and partially overlaps sections of the Clooniff Bog site. Clooniff Bog also supports hydrological connectivity to this European Site through its drainage channel and water attenuation network.

The current appraisal evaluates the possibility for any effects in downstream hydrologically connected SAC European Sites through sediment/contaminant/nutrient laden runoff, or the spread of invasive species, with regard to any indirect habitat loss, reduction in habitat extent, or degradation effects (i.e. to habitat quality) in respect of Qualifying Interests.

**Timing of Impacts:** The potential for impact sources arising from the project only relates to the stage (i.e. Decommissioning and Rehabilitation), when groundworks and use of machinery will take place for a limited duration - in this instance expected to be within a 12 months period. Once decommissioning and rehabilitation are complete, the decommissioned and rehabilitated Clooniff Bog will require some monitoring, generally involving visual inspections of habitat succession, sometimes using drones, and any ongoing scheduled maintenance such as of silt ponds, or collection of water samples. Due to the negligible (both in terms of source magnitude but also duration) and non-intrusive nature of operational activities, there is no potential for the operational phase of the proposed decommissioning and rehabilitation to cause effects to European Sites.

### 2.9.1.3 **Indirect or ex-situ disturbance or displacement of Qualifying Interests**

**Sources (all outside SAC boundaries):** Decommissioning and Rehabilitation activities; movement of construction machinery and vehicles including rail; presence of personnel; noise and vibration and/or visual intrusion from construction works and construction machinery; failure of berms and/or visual intrusion from construction works and construction machinery; berm failure during operational phase.

Working within watercourses and drainage channels along the site boundary / periphery to retain the function of hydraulic barriers between the site and the surrounding environment and to sustain the flow of surface water around the margins of the site. Such works may require localised instream works, mobilisation of particulate matter, local excavations within drainage channels, machinery works within and adjacent to watercourses.

**Pathway:** contact (direct contact with BnM personnel or machinery during site works), air (through its ability to transmit noise effects), visibility (on site presence of BnM personnel)

**Potential Clooniff Bog Decommissioning and Rehabilitation Impact/Pathway Connectivity:** The impact sources identified above may result in possible localised impacts occurring within the local context of the decommissioning and rehabilitation area during the construction phase. Any such impacts resulting in disturbance or displacement effects on Annex II species listed as Qualifying Interests of SACs (e.g. Otter) would be *ex situ*. Clooniff Bog adjoins the River Shannon Callows SAC in parts. Otters utilising the nearby adjoining floodplains of the River Shannon Callows SAC (and their associated watercourses; e.g. Ballydangan\_020 and Shannon Upper\_130) may experience ex-situ disturbance effects as a result of the proposed rehabilitation works.

**Timing of Impacts:** As outlined above, the potential for effects only relates to the construction stage of decommissioning and rehabilitation. The scale and duration of any operational phase sources of disturbance or displacement are considered insufficient to result in likely significant effects.

### 2.9.1.4 **Indirect or ex-situ mortality of Qualifying Interests**

**Sources (all outside SAC boundaries):** Decommissioning and Rehabilitation activities; movement of construction machinery and vehicles including rail; presence of personnel; noise and vibration and/or visual intrusion from construction works and construction machinery; failure of berms and/or visual intrusion from construction works and construction machinery; berm failure during operational phase.

Working within watercourses and drainage channels along the site boundary / periphery to retain the function of hydraulic barriers between the site and the surrounding environment and to sustain the flow of surface water around the margins of the site. Such works may require localised instream works, mobilisation of particulate matter, local excavations within drainage channels, machinery works within and adjacent to watercourses.

**Pathway:** contact (direct contact with BnM personnel or machinery during site works)

**Potential Clooniff Bog Decommissioning and Rehabilitation Impact/Pathway Connectivity:** The impact sources identified above may result in possible localised impacts occurring within the local context of the decommissioning and rehabilitation area during the construction phase. Any such impacts resulting in disturbance or displacement effects on Annex II species listed as Qualifying Interests of SACs (e.g. Otter) would be *ex situ* and separated from any European Site. There are no impact sources identified which would extend outside of the local extent of the works area which could indirectly result in mortality of Qualifying Interests of any SAC.

**Timing of Impacts:** As outlined above, the potential for effects only relates to the construction stage of decommissioning and rehabilitation. The scale and duration of any operational phase sources of disturbance or displacement are considered insufficient to result in likely significant effects.

#### **2.9.1.5 Other Projects with Potential to Cause Cumulative Impacts to SAC sites**

**Sources (all outside SAC boundaries):** Decommissioning and Rehabilitation activities; movement of construction machinery and vehicles including rail; presence of personnel; noise and vibration and/or visual intrusion from PCAS activities.

Working within watercourses and drainage channels along the site boundary / periphery to retain the function of hydraulic barriers between the site and the surrounding environment. Such works may require localised instream works, mobilisation of particulate matter, local excavations within drainage channels, machinery works within and adjacent to watercourses.

**Pathway:** contact (direct contact with BnM personnel or machinery during site works), air (through its ability to transmit noise effects), visibility (on site presence of BnM personnel)

**Potential Clooniff Bog Decommissioning and Rehabilitation Impact/Pathway Connectivity:** The identified impact sources could possibly reduce water quality or aquatic habitat quality in the local context, where all works are located outside of and at a distance from any designated SAC.

The current appraisal evaluates the possibility for any effects in downstream hydrologically connected SAC European Sites through sediment/contaminant/nutrient laden runoff, or the spread of invasive species, with regard to any indirect habitat loss, reduction in habitat extent, or degradation effects (i.e. to habitat quality) in respect of Qualifying Interests.

The disturbance related impact sources identified above may result in possible localised impacts occurring within the local context of the decommissioning and rehabilitation area during the works phase.

**Timing of Impacts:** It is considered that during the decommissioning and rehabilitation stages at Clooniff Bog, the possibility exists for any inadvertent release of silt or other degrading materials to possibly combine with downstream effects from other projects. Although expected to be localised and limited in magnitude, disturbance effects on Otter may combine with other localised sources such as related to Turbary and agriculture to result in increased effects on ex-situ populations. Significant effects during operation can be screened out.

### **2.9.2 Potential Sources, Pathways and Timing of Impacts SPAs**

#### **2.9.2.1 Direct Impacts to Habitats within SPAs**

Due to the proximity and overlap between the Clooniff Bog and the Middle Shannon Callows Special Protection Area (See **Figure 16**, displaying extent of DCT2 works within and adjoining Middle Shannon Callows SPA), **there is potential for loss or fragmentation of habitats or loss of connectivity of habitats within a Special Protection Area. Although habitats where both the SPA and likely rehabilitation measures (all within the category of 'Marginal Lands') overlap do not comprise 'callows', rather marginal areas of remnant high bog or cutaway with respective drainage, access tracks and infrastructure, a precautionary approach is taken, and therefore, there is potential for direct impacts to the SPA to occur.** Other SPA's can be excluded from consideration in respect of direct effects.

#### **2.9.2.2 Indirect loss, reduction or degradation of terrestrial or aquatic habitats within SPA sites**

**Sources (some but not all inside SPA boundaries):** Movement of soil or peat, machinery; earthworks, excavations, temporary overburden storage, cleaning of silt ponds, installation of overflow pipes, removal of waste and/or raw material, lifting of rail; use of fuels, chemicals or fertiliser.

**Pathway:** Surfacewater runoff flow paths to receiving drainage systems, downstream watercourses

**Potential Clooniff Bog Decommissioning and Rehabilitation Impact/Pathway Connectivity:** The identified impact sources could reduce water quality or aquatic habitat quality in the local context – with some of this potentially occurring within at least 1 no. SPA boundary; i.e. Middle Shannon Callows SPA. The current appraisal evaluates the possibility of any effects in overlapping or immediately adjacent SPA's in addition to downstream hydrologically connected SPAs through sediment/contaminant/nutrient laden runoff, changes to hydrological regimes or morphology of supporting watercourses, or through the spread of invasive species, regarding any indirect (effective) habitat loss or degradation effects to Special Conservation Interests.

The proposed Decommissioning and Rehabilitation at Clooniff overlaps one SPA boundary which drains to the Shannon (Lower)\_SC\_020 sub-catchment. Effects on this SPA and, on one hydrologically connected, downstream SPA (River Suck Callows SPA), are evaluated to determine the potential (or not) for significant effects.

**Timing of Impacts:** The potential for impact sources arising from the PCAS activities only relates to the Decommissioning and Rehabilitation Stage, when groundworks and use of machinery will take place for a limited duration - in this instance expected to be up to 12 months. Once decommissioning and rehabilitation are complete, the decommissioned and rehabilitated Clooniff Bog will require minimal monitoring, generally involving visual inspections of habitat succession, sometimes using drones, and any ongoing scheduled maintenance such as of silt ponds. Due to the negligible (both in terms of source magnitude but also duration) and non-intrusive nature of operational activities, there is no potential for the operational phase of the proposed decommissioning and rehabilitation to cause significant effects to European Sites.

### **2.9.2.3 Indirect or ex-situ disturbance/displacement of bird species of Special Conservation Interest**

**Sources (some but not all inside SPA boundaries):** Decommissioning and Rehabilitation activities; movement of construction machinery and vehicles including rail; installation of overflow pipes; presence of personnel; noise and vibration and/or visual intrusion from PCAS activities.

Working within watercourses and drainage channels along the site boundary / periphery to retain the function of hydraulic barriers between the site and the surrounding environment. Such works may require localised instream works, mobilisation of particulate matter, local excavations within drainage channels, machinery works within and adjacent to watercourses.

**Pathway:** contact (direct contact with BnM personnel during site works), air (through its ability to transmit noise effects), visibility (on site presence of BnM personnel)

**Potential Clooniff Bog Decommissioning and Rehabilitation Impact/Pathway Connectivity:** The impact sources identified above, in addition to the impact pathways are evaluated with regard to potential in-situ or ex-situ disturbance or displacement effects on bird species listed as Special Conservation Interests of the SPA sites.

Parts of Clooniff Bog adjoin and overlap the Middle Shannon Callows SPA. In addition, the proposed works at Clooniff Bog supports potential hydrological connectivity and relative proximity (<3.0km) to the River Suck Callows SPA via the River Shannon catchment and its associated floodplain.

SCI species associated with these European Sites may experience ex-situ disturbance/displacement as a result of the proposed decommissioning and rehabilitation works.

**Timing of Impacts:** As outlined above, the potential for effects only relates to the decommissioning and rehabilitation Stage as source magnitude during any operational phase activities can be screened out. In terms of Timing of Effects, this is limited to the migratory (September to November for Autumn and March to mid-



May for Spring) and winter period (October to March) when most of the SCI species for which these sites are designated are present<sup>13</sup>.

#### **2.9.2.4 Other Projects with Potential to Cause Cumulative Impacts to SPA sites**

The potential for the construction phase of the proposed Clooniff bog decommissioning and rehabilitation to cause cumulative effects with other plans or projects is evaluated with regard to impact pathways which may be connected to SPA sites within the zone of influence.

**Sources (all outside SPA boundaries):** Decommissioning and Rehabilitation activities; movement of construction machinery and vehicles including rail; presence of personnel; noise and vibration and/or visual intrusion from works and machinery.

Working within watercourses and drainage channels along the site boundary / periphery to retain the function of hydraulic barriers between the site and the surrounding environment. Such works may require localised instream works, mobilisation of particulate matter, local excavations within drainage channels, machinery works within and adjacent to watercourses.

**Pathway:** contact (direct contact with BnM personnel during site works), air (through its ability to transmit noise effects), visibility (on site presence of BnM personnel)

#### **Potential Clooniff Bog Decommissioning and Rehabilitation Impact/Pathway Connectivity:**

The identified impact sources could reduce water quality or aquatic habitat quality in the local context, where some works are located within an SPA, or in locations where pathways exist to downstream SPA's. The current assessment evaluates the possibility of any effects in adjacent or overlapping or downstream hydrologically connected SPAs through sediment/contaminant/nutrient laden runoff or through the spread of invasive species, regarding any indirect habitat loss or degradation effects to Special Conservation Interests, in combination with other plans or projects. Disturbance related impact sources identified above, in addition to the impact pathways are evaluated with regard to potential ex-situ disturbance or displacement effects on bird species listed as Special Conservation Interests of the SPA sites, specifically in terms of plans or projects which may act as sources of similar sources of effects and where similar pathways exist.

**Timing of Impacts:** The potential for in combination impact sources arising from the project only relates to the works stage (i.e. Decommissioning and Rehabilitation), when groundworks and use of machinery will take place for a limited duration -in this instance expected to be up to 12 months. For disturbance to SCI species, the potential for effects only relates to the works stage of decommissioning and rehabilitation as source magnitude during any operational phase activities can be screened out. In terms of Timing of Effects, this is limited to the migratory (September to November for Autumn and March to mid-May for Spring) and winter period (October to March) or breeding period, as applicable, when most of the SCI species for which these sites are designated are present.

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<sup>13</sup> Periods are as defined in the SNH document 'Survey Methods for use in assessing the impacts of onshore windfarms on bird communities'. (2005). SNH, Battleby, Scotland.

## 2.10 Screening Evaluation of the Potential for Effects on European Sites (SACs & SPAs)

The Screening evaluation is based on a conceptual site model which identifies potential impact source-pathways between the described Clooniff Bog decommissioning and rehabilitation and each European Site. This allows for an assessment of any potential for significant effects on the Qualifying Interests / Special Conservation Interests and their respective Conservation Objectives.

The following impact source-pathways for the ten SAC sites are evaluated in relation to any potential for significant effects (**Table 11** below):

- Direct impacts to habitats within the River Shannon Callows SAC;
- Indirect loss or degradation of terrestrial or aquatic habitats within SAC sites (during the construction and operational phases), alone and in combination; and
- Indirect or ex-situ disturbance or displacement of species of Qualifying Interest, alone and in combination.

The following impact source-pathways for the three SPA sites are evaluated in relation to any potential for significant effects (**Table 12** below):

- Direct Impacts to Habitats within the Middle Shannon Callows SPA;
- Indirect loss, reduction or degradation of terrestrial or aquatic habitats within SPA sites (during the construction and operational phases), alone and in combination; and
- Indirect or ex-situ disturbance/ displacement of bird species listed as Special Conservation Interests, alone and in combination.

As described in **Section 2.9.1.1** and **2.9.1.2**, there is **potential for direct effects to habitats** within SPA and SAC sites due to the partial overlap between the Clooniff Bog site and Middle Shannon Callows SPA and River Shannon Callows SAC.

The evaluation of potential for in-combination effects with regard to Other Plans or Projects includes the plans or projects described in **Section 2.6.3**.

**Table 11: Evaluation of Possibly Significant Effects to the ten SAC sites**

	European Site	Separation Distance from Clooniff Bog	Hydrological Connection – Yes/No	<p><b>Evaluation of the potential for Clooniff Bog decommissioning and rehabilitation, either alone or in combination with other plans or projects, to cause either of the following effects to the ten SAC Sites:</b></p> <ol style="list-style-type: none"> <li>1. Direct effects to Qualifying Interest habitats or species of an SAC Site (i.e. species mortality, habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC</li> <li>2. Indirect loss or degradation of terrestrial or aquatic habitats within the SAC site;</li> <li>2. Indirect/ex-situ disturbance or displacement of species of Qualifying Interest.</li> <li>3. Indirect or ex-situ mortality of Qualifying Interests</li> </ol>
1	River Shannon Callows SAC (000216)	Adjoining the Coolumber section of Clooniff Bog; i.e. the north-easternmost bog parcel.	Y:Downstream via the Ballydangan_020 and Shannon (Upper)_120 and Shannon (Upper)_130 watercourses	<p><b>1: Screened In – Clooniff Bog partially overlaps with this European Site. As a result, there is the possibility for direct loss, reduction or degradation of terrestrial or aquatic habitats within, or in close proximity to, the SAC</b></p> <p>Notwithstanding the fact that habitats where this SAC overlaps Clooniff Bog Decommissioning and Rehabilitation activities do not comprise ‘callows’ or their associated Annex I habitats; i.e. <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]; Lowland hay meadows (<i>Alopecurus pratensis</i>, <i>Sanguisorba officinalis</i>) [6510]; Limestone pavements* [8240]; Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)* [91E0], the proximity and the presence of hydrological connectivity between proposed activities and this European Site means possible pathways for effects are identified.</p> <p><b>2: Screened In - Possibility for indirect loss, reduction or degradation of terrestrial or aquatic habitats within, or in close proximity to, the SPA</b></p> <p>Due to proximity and the presence of hydrological connectivity between proposed activities and this European Site possible pathways for effects are identified.</p> <p><b>3: Screened In - Possibility for indirect or ex-situ disturbance or displacement of species of Qualifying Interests</b></p> <p>Due to the presence of hydrological connectivity between proposed activities and this European Site, possible pathways for localised effects on (ex-situ) Otter (a species of Qualifying Interest for this European Site) are identified, which cannot be screened out in the absence of measures to avoid harmful effects.</p> <p><b>4: Screened In - Possibility for indirect or ex-situ mortality to species of Qualifying Interests</b></p> <p>Due to the presence of hydrological connectivity and overlap between proposed activities and this European Site, possible pathways for localised effects on (ex-situ) mortality to species of Qualifying Interest (i.e. otter) are identified, which cannot be screened out in the absence of measures to avoid harmful effects such as accidental or inadvertent mortality when carrying out certain works e.g. cleaning of silt ponds.</p>

	European Site	Separation Distance from Clooniff Bog	Hydrological Connection – Yes/No	<p><b>Evaluation of the potential for Clooniff Bog decommissioning and rehabilitation, either alone or in combination with other plans or projects, to cause either of the following effects to the ten SAC Sites:</b></p> <ol style="list-style-type: none"> <li>1. Direct effects to Qualifying Interest habitats or species of an SAC Site (i.e. species mortality, habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC</li> <li>2. Indirect loss or degradation of terrestrial or aquatic habitats within the SAC site;</li> <li>2. Indirect/ex-situ disturbance or displacement of species of Qualifying Interest.</li> <li>3. Indirect or ex-situ mortality of Qualifying Interests</li> </ol>
2	Mongan Bog SAC (000580)	1.5km east of Clooniff at its closest point.	N: No, located upstream of the proposed works.	<p><b>1: Screened Out – No likelihood for direct effects to Qualifying Interest habitats of an SAC Site (i.e. habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC</b></p> <p>The proposed works are not located within or in proximity to this European Site. Therefore there will be no direct impacts to this European Site.</p> <p><b>2: Screened Out - Possibility for indirect loss, reduction or degradation of terrestrial or aquatic habitats within, or in close proximity to, the SAC</b></p> <p>Due to the separation distance to this SAC and the lack of hydrological connectivity, possible pathways for indirect loss, reduction or degradation of terrestrial / aquatic habitats within or in close proximity to Clooniff Bog can be excluded.</p> <p><b>3: Screened Out - No potential for indirect or ex-situ disturbance or displacement of species of Qualifying Interests</b></p> <p>The proposed works located 1.5km from this European Site. There are no species of Qualifying Interest listed for this European Site. Therefore there will be no indirect or ex-situ disturbance effects in this regard.</p> <p><b>4: Screened Out - No potential for indirect or ex-situ mortality to species of Qualifying Interests</b></p> <p>The proposed works located 1.5km from this European Site. There are no species of Qualifying Interest listed for this European Site. Therefore there will be no indirect or ex-situ effects in this regard.</p>
3	Fin Lough SAC (000576)	2.9km south-east of Clooniff at its closest point.	N: No, located upstream of the proposed works.	<p><b>1: Screened Out – No likelihood for direct effects to Qualifying Interest habitats of an SAC Site (i.e. habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC</b></p> <p>The proposed works are not located within or in proximity to this European Site. Therefore there will be no direct impacts to this European Site.</p> <p><b>2: Screened Out – Possibility for indirect loss, reduction or degradation of terrestrial or aquatic habitats within, or in close proximity to, the SAC</b></p> <p>Due to the separation distance to this SAC and the lack of hydrological connectivity, possible pathways for indirect loss, reduction or degradation of terrestrial / aquatic habitats within or in close proximity to Clooniff Bog can be excluded.</p> <p><b>3: Screened Out - No potential for indirect or ex-situ disturbance or displacement of species of Qualifying Interests</b></p>

	European Site	Separation Distance from Clooniff Bog	Hydrological Connection – Yes/No	<p><b>Evaluation of the potential for Clooniff Bog decommissioning and rehabilitation, either alone or in combination with other plans or projects, to cause either of the following effects to the ten SAC Sites:</b></p> <p>1. Direct effects to Qualifying Interest habitats or species of an SAC Site (i.e. species mortality, habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC</p> <p>2. Indirect loss or degradation of terrestrial or aquatic habitats within the SAC site;</p> <p>2. Indirect/ex-situ disturbance or displacement of species of Qualifying Interest.</p> <p>3. Indirect or ex-situ mortality of Qualifying Interests</p>
				<p>Due to the separation distance to this SAC, possible pathways for disturbance or displacement effects to associated QI species can be excluded. Furthermore, the QI species for this habitats is Geyer's Whorl Snail <i>Vertigo geyeri</i>, a molluscan species with highly specified habitat requirements (alkaline fens and tufa formations), none of which are present within the proposed works areas.</p> <p><b>4: Screened Out - No potential for indirect or ex-situ mortality to species of Qualifying Interests</b></p> <p>The proposed works located 1.5km from this European Site. The QI species for this habitats is Geyer's Whorl Snail <i>Vertigo geyeri</i>, a molluscan species with highly specified habitat requirements (alkaline fens and tufa formations), none of which are present within the proposed works areas.</p>
4	Pilgrim's Road Esker SAC (001776)	1.9km east of Clooniff at its closest point.	N: No, located upstream of the proposed works.	<p><b>1: Screened Out – No likelihood for direct effects to Qualifying Interest habitats of an SAC Site (i.e. habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC</b></p> <p>The proposed works are not located within or in proximity to this European Site. Therefore there will be no direct impacts to this European Site.</p> <p><b>2: Screened Out - Possibility for indirect loss, reduction or degradation of terrestrial or aquatic habitats within, or in close proximity to, the SAC</b></p> <p>Due to the separation distance to this SAC and the lack of hydrological connectivity, possible pathways for indirect loss, reduction or degradation of terrestrial / aquatic habitats within or in close proximity to Clooniff Bog can be excluded.</p> <p><b>3: Screened Out - No potential for indirect or ex-situ disturbance or displacement of species of Qualifying Interests</b></p> <p>The proposed works located 1.9km from this European Site. There are no species of Qualifying Interest listed for this European Site. Therefore there will be no indirect of ex-situ disturbance effects in this regard.</p> <p><b>4: Screened Out - No potential for indirect or ex-situ mortality to species of Qualifying Interests</b></p> <p>The proposed works located 1.9km from this European Site. There are no species of Qualifying Interest listed for this European Site. Therefore there will be no indirect of ex-situ effects in this regard.</p>



	European Site	Separation Distance from Clooniff Bog	Hydrological Connection – Yes/No	<p><b>Evaluation of the potential for Clooniff Bog decommissioning and rehabilitation, either alone or in combination with other plans or projects, to cause either of the following effects to the ten SAC Sites:</b></p> <ol style="list-style-type: none"> <li>1. Direct effects to Qualifying Interest habitats or species of an SAC Site (i.e. species mortality, habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC</li> <li>2. Indirect loss or degradation of terrestrial or aquatic habitats within the SAC site;</li> <li>2. Indirect/ex-situ disturbance or displacement of species of Qualifying Interest.</li> <li>3. Indirect or ex-situ mortality of Qualifying Interests</li> </ol>
5	Moyclare Bog SAC (000581)	10.7km south-east of Clooniff at its closest point.	N: No hydrological connectivity between the proposed bog rehabilitation site and this European Site.	<p><b>1: Screened Out – No likelihood for direct effects to Qualifying Interest habitats of an SAC Site (i.e. habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC</b></p> <p>The proposed works are not located within or in proximity to this European Site. Therefore there will be no direct impacts to this European Site.</p> <p><b>2: Screened Out - Possibility for indirect loss, reduction or degradation of terrestrial or aquatic habitats within, or in close proximity to, the SAC</b></p> <p>Due to the separation distance to this SAC and the lack of hydrological connectivity, possible pathways for indirect loss, reduction or degradation of terrestrial / aquatic habitats within or in close proximity to Clooniff Bog can be excluded.</p> <p><b>3: Screened Out - No potential for indirect or ex-situ disturbance or displacement of species of Qualifying Interests</b></p> <p>The proposed works located 10.7km from this European Site. There are no species of Qualifying Interest listed for this European Site. Therefore there will be no indirect or ex-situ disturbance effects in this regard.</p> <p><b>4: Screened Out - No potential for indirect or ex-situ mortality to species of Qualifying Interests</b></p> <p>The proposed works located 10.7km from this European Site. There are no species of Qualifying Interest listed for this European Site. Therefore there will be no indirect or ex-situ effects in this regard.</p>
6	Ferbane Bog SAC (000575)	11.3km east south-east of Clooniff at its closest point.	N: No hydrological connectivity between the proposed bog rehabilitation site and this European Site.	<p><b>1: Screened Out – No likelihood for direct effects to Qualifying Interest habitats of an SAC Site (i.e. habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC</b></p> <p>The proposed works are not located within or in proximity to this European Site. Therefore there will be no direct impacts to this European Site.</p> <p><b>2: Screened Out - Possibility for indirect loss, reduction or degradation of terrestrial or aquatic habitats within, or in close proximity to, the SAC</b></p> <p>Due to the separation distance to this SAC and the lack of hydrological connectivity, possible pathways for indirect loss, reduction or degradation of terrestrial / aquatic habitats within or in close proximity to Clooniff Bog can be excluded.</p> <p><b>3: Screened Out - No potential for indirect or ex-situ disturbance or displacement of species of Qualifying Interests</b></p>

	European Site	Separation Distance from Clooniff Bog	Hydrological Connection – Yes/No	<p><b>Evaluation of the potential for Clooniff Bog decommissioning and rehabilitation, either alone or in combination with other plans or projects, to cause either of the following effects to the ten SAC Sites:</b></p> <p>1. Direct effects to Qualifying Interest habitats or species of an SAC Site (i.e. species mortality, habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC</p> <p>2. Indirect loss or degradation of terrestrial or aquatic habitats within the SAC site;</p> <p>2. Indirect/ex-situ disturbance or displacement of species of Qualifying Interest.</p> <p>3. Indirect or ex-situ mortality of Qualifying Interests</p>
				<p>The proposed works located 11.3km from this European Site. There are no species of Qualifying Interest listed for this European Site. Therefore there will be no indirect or ex-situ disturbance effects in this regard.</p> <p><b>4: Screened Out - No potential for indirect or ex-situ mortality to species of Qualifying Interests</b></p> <p>The proposed works located 11.3km from this European Site. There are no species of Qualifying Interest listed for this European Site. Therefore there will be no indirect or ex-situ effects in this regard.</p>
7	Crosswood Bog SAC (002337)	11.3km north-east of Clooniff at its closest point.	N: No hydrological connectivity between the proposed bog rehabilitation site and this European Site.	<p><b>1: Screened Out – No likelihood for direct effects to Qualifying Interest habitats of an SAC Site (i.e. habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC</b></p> <p>The proposed works are not located within or in proximity to this European Site. Therefore there will be no direct impacts to this European Site.</p> <p><b>2: Screened Out - Possibility for indirect loss, reduction or degradation of terrestrial or aquatic habitats within, or in close proximity to, the SAC</b></p> <p>Due to the separation distance to this SAC and the lack of hydrological connectivity, possible pathways for indirect loss, reduction or degradation of terrestrial / aquatic habitats within or in close proximity to Clooniff Bog can be excluded.</p> <p><b>3: Screened Out - No potential for indirect or ex-situ disturbance or displacement of species of Qualifying Interests</b></p> <p>The proposed works located 11.3km from this European Site. There are no species of Qualifying Interest listed for this European Site. Therefore there will be no indirect or ex-situ disturbance effects in this regard.</p> <p><b>4: Screened Out - No potential for indirect or ex-situ mortality to species of Qualifying Interests</b></p> <p>The proposed works located 11.3km from this European Site. There are no species of Qualifying Interest listed for this European Site. Therefore there will be no indirect or ex-situ effects in this regard.</p>
8	Ballynamona Bog and Corkip Lough SAC (002339)	11.3km north/north-west of Clooniff at	N: No hydrological connectivity between the	<p><b>1: Screened Out – No likelihood for direct effects to Qualifying Interest habitats of an SAC Site (i.e. habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC</b></p> <p>The proposed works are not located within or in proximity to this European Site. Therefore there will be no direct impacts to this European Site.</p>

	European Site	Separation Distance from Clooniff Bog	Hydrological Connection – Yes/No	<p><b>Evaluation of the potential for Clooniff Bog decommissioning and rehabilitation, either alone or in combination with other plans or projects, to cause either of the following effects to the ten SAC Sites:</b></p> <ol style="list-style-type: none"> <li>1. Direct effects to Qualifying Interest habitats or species of an SAC Site (i.e. species mortality, habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC</li> <li>2. Indirect loss or degradation of terrestrial or aquatic habitats within the SAC site;</li> <li>3. Indirect/ex-situ disturbance or displacement of species of Qualifying Interest.</li> <li>4. Indirect or ex-situ mortality of Qualifying Interests</li> </ol>
		its closest point.	proposed bog rehabilitation site and this European Site.	<p><b>2: Screened Out - Possibility for indirect loss, reduction or degradation of terrestrial or aquatic habitats within, or in close proximity to, the SAC</b>                      Due to the separation distance to this SAC and the lack of hydrological connectivity, possible pathways for indirect loss, reduction or degradation of terrestrial / aquatic habitats within or in close proximity to Clooniff Bog can be excluded.</p> <p><b>3: Screened Out - No potential for indirect or ex-situ disturbance or displacement of species of Qualifying Interests</b>                      The proposed works located 11.3km from this European Site. There are no species of Qualifying Interest listed for this European Site. Therefore there will be no indirect of ex-situ disturbance effects in this regard.</p> <p><b>4: Screened Out - No potential for indirect or ex-situ mortality to species of Qualifying Interests</b>                      The proposed works located 11.3km from this European Site. There are no species of Qualifying Interest listed for this European Site. Therefore there will be no indirect of ex-situ effects in this regard.</p>
9	Castlesampson Esker SAC (001625)	8.8km north-west of Clooniff at its closest point.	N: No hydrological connectivity between the proposed bog rehabilitation site and this European Site.	<p><b>1: Screened Out – No likelihood for direct effects to Qualifying Interest habitats of an SAC Site (i.e. habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC</b>                      The proposed works are not located within or in proximity to this European Site. Therefore there will be no direct impacts to this European Site.</p> <p><b>2: Screened Out - Possibility for indirect loss, reduction or degradation of terrestrial or aquatic habitats within, or in close proximity to, the SAC</b>                      Due to the separation distance to this SAC and the lack of hydrological connectivity, possible pathways for indirect loss, reduction or degradation of terrestrial / aquatic habitats within or in close proximity to Clooniff Bog can be excluded.</p> <p><b>3: Screened Out - No potential for indirect or ex-situ disturbance or displacement of species of Qualifying Interests</b>                      The proposed works located 8.8km from this European Site. There are no species of Qualifying Interest listed for this European Site. Therefore there will be no indirect of ex-situ disturbance effects in this regard.</p> <p><b>4: Screened Out - No potential for indirect or ex-situ mortality to species of Qualifying Interests</b>                      The proposed works located 8.8km from this European Site. There are no species of Qualifying Interest listed for this European Site. Therefore there will be no indirect of ex-situ effects in this regard.</p>

	European Site	Separation Distance from Clooniff Bog	Hydrological Connection – Yes/No	<p><b>Evaluation of the potential for Clooniff Bog decommissioning and rehabilitation, either alone or in combination with other plans or projects, to cause either of the following effects to the ten SAC Sites:</b></p> <ol style="list-style-type: none"> <li>1. Direct effects to Qualifying Interest habitats or species of an SAC Site (i.e. species mortality, habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC</li> <li>2. Indirect loss or degradation of terrestrial or aquatic habitats within the SAC site;</li> <li>2. Indirect/ex-situ disturbance or displacement of species of Qualifying Interest.</li> <li>3. Indirect or ex-situ mortality of Qualifying Interests</li> </ol>
10	Lough Ree SAC (000440)	11.1km north/north-east of Clooniff at its closest point.	N: No hydrological connectivity between the proposed bog rehabilitation site and this European Site.	<p><b>1: Screened Out – No likelihood for direct effects to Qualifying Interest habitats of an SAC Site (i.e. habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC</b>                      The proposed works are not located within or in proximity to this European Site. Therefore there will be no direct impacts to this European Site.</p> <p><b>2: Screened Out - Possibility for indirect loss, reduction or degradation of terrestrial or aquatic habitats within, or in close proximity to, the SAC</b>                      Due to the separation distance to this SAC and the lack of hydrological connectivity, possible pathways for indirect loss, reduction or degradation of terrestrial / aquatic habitats within or in close proximity to Clooniff Bog can be excluded.</p> <p><b>3: Screened Out - No potential for indirect or ex-situ disturbance or displacement of species of Qualifying Interests</b>                      The proposed works located 11.1km from this European Site. Disturbance or displacement of QI species associated with Lough Ree SAC will not occur due to the separation distance between Clooniff Bog and this European Site.</p> <p><b>4: Screened Out - No potential for indirect or ex-situ mortality to species of Qualifying Interests</b>                      The proposed works located 11.1km from this European Site. Indirect or ex-situ mortality of QI species associated with Lough Ree SAC (Otter) will not occur due to the separation distance between Clooniff Bog and this European Site.</p>

**Table 12: Evaluation of Possibly Significant Effects to the three SPA sites**

	European Site	Separation Distance from Clooniff Bog	Hydrological Connection – Yes/No	Evaluation of the potential for Clooniff Bog decommissioning and rehabilitation, either alone or in combination with other plans or projects, to cause either of the following effects to the three SPA Sites: <ol style="list-style-type: none"> <li>1. Direct Impacts to Habitats within SPAs (i.e. disturbance, displacement, mortality)</li> <li>2. Indirect loss, reduction or degradation of terrestrial or aquatic habitats within or in close proximity to the SPA site; (i.e. through habitat loss, degradation, fragmentation or reduction/loss of connectivity of suitable habitat, or through a reduction in prey item species)</li> <li>3. Indirect or Ex-Situ disturbance or displacement of bird species of Special Conservation Interest (i.e. through disturbance, displacement or mortality of SCI species).</li> </ol>
1	Middle Shannon Callows SPA (004096)	0m	Yes: Downstream via the Ballydangan_020 and Shannon (Upper)_120 and Shannon (Upper)_130 watercourses.	<p><b>1: Screened In - Possibility for direct loss, reduction or degradation of terrestrial or aquatic habitats within, or in close proximity to, the SPA</b></p> <p>Notwithstanding the fact that habitats where this SPA overlaps Clooniff Bog Decommissioning and Rehabilitation activities do not comprise ‘callows’, the overlap, proximity and the presence of hydrological connectivity between proposed activities and this European Site means possible pathways for direct effects are identified.</p> <p><b>2: Screened In - Possibility for indirect loss, reduction or degradation of terrestrial or aquatic habitats within, or in close proximity to, the SPA</b></p> <p>Due to proximity and the presence of hydrological connectivity between proposed activities and this European Site possible pathways for effects are identified.</p> <p><b>3: Screened In - Possibility for indirect or ex-situ disturbance or displacement effects of bird species of Special Conservation Interest</b></p> <p>Bird species of Special Conservation Interests for this SPA include (wintering): Whooper Swan (<i>Cygnus cygnus</i>) [A038]; Wigeon (<i>Anas penelope</i>) [A050]; Corncrake (<i>Crex crex</i>) [A122]; Golden Plover (<i>Pluvialis apricaria</i>) [A140]; Lapwing (<i>Vanellus vanellus</i>) [A142]; Black-tailed Godwit (<i>Limosa limosa</i>) [A156] and Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]; Wetland and Waterbirds [A999]..</p> <p>Due to proximity, it is considered that it cannot be ruled out that migratory (in transit) or wintering individuals of the SCI Species may be attracted to wetland habitats at and adjoining Clooniff Bog, and hence be subject to possible disturbance events, dependant on timing. Screening in is on a precautionary basis, in line with the precautionary principle. SCI Species including</p>



	European Site	Separation Distance from Clooniff Bog	Hydrological Connection – Yes/No	<p><b>Evaluation of the potential for Clooniff Bog decommissioning and rehabilitation, either alone or in combination with other plans or projects, to cause either of the following effects to the three SPA Sites:</b></p> <p>1. Direct Impacts to Habitats within SPAs (i.e. disturbance, displacement, mortality)</p> <p>2. Indirect loss, reduction or degradation of terrestrial or aquatic habitats within or in close proximity to the SPA site; (i.e. through habitat loss, degradation, fragmentation or reduction/loss of connectivity of suitable habitat, or through a reduction in prey item species)</p> <p>3. Indirect or Ex-Situ disturbance or displacement of bird species of Special Conservation Interest (i.e. through disturbance, displacement or mortality of SCI species).</p>
				<p>Corncrake and Black-tailed Godwit are unlikely to utilise the Clooniff Bog site or its environs and therefore are unlikely to be subject to disturbance or displacement effects as a result of the proposed rehabilitation practices</p>
2	River Suck Callows SPA (004097)	2.7km south	Yes - potential downstream connectivity via the main channel of the River Shannon and its associated floodplain.	<p><b>1. Screened Out - Possibility for direct loss, reduction or degradation of terrestrial or aquatic habitats within the SPA</b></p> <p>Due to the separation distance to this SPA, possible pathways for direct effects can be excluded.</p> <p><b>2: Screened In - Possibility for indirect loss, reduction or degradation of terrestrial or aquatic habitats within, or in close proximity to, the SPA</b></p> <p>Notwithstanding the separation distance to this SPA due to the presence of hydrological connectivity between proposed activities and this European Site, possible pathways for effects are identified.</p> <p><b>3: Screened In - Possibility for indirect or ex-situ disturbance or displacement effects of bird species of Special Conservation Interest</b></p> <p>Bird species of Special Conservation Interests for this SPA include Whooper Swan, Wigeon, Golden Plover, Lapwing and Greenland White-fronted Goose along with ‘wetland and waterbirds’. Due to proximity, it is considered that it cannot be ruled out that migratory (in transit) or wintering individuals of the SCI Species may be attracted to wetland habitats at and adjoining Clooniff Bog, and hence be subject to possible disturbance events, dependant on timing. Screening in is on a precautionary basis, in line with the precautionary principle. Bird species identified at Clooniff Bog during 2020 and 2021 are presented in <b>Section 2.5.2.2 and 2.5.3</b>. With the exception of Greenland White-fronted Goose, all SCI species for the River Suck Callows were identified using the Coolumber section of the Clooniff Bog site during the December 2020 site walkover surveys. Greenland White-fronted Goose has not been recorded using the callow lands between Athlone and Shannonbridge since the 1990s and it is thought the callows and adjoining raised bog habitats have been abandoned as feeding and roosting habitat. This is due to ongoing peat harvesting and turbary which removed important feeding and refuge sites between Athlone and Shannonbridge; flooding and development between Ballinasloe and Shannonbridge as well as various sources of disturbance in and near the callows area. At present, potential</p>

	European Site	Separation Distance from Clooniff Bog	Hydrological Connection – Yes/No	<p><b>Evaluation of the potential for Clooniff Bog decommissioning and rehabilitation, either alone or in combination with other plans or projects, to cause either of the following effects to the three SPA Sites:</b></p> <p>1. Direct Impacts to Habitats within SPAs (i.e. disturbance, displacement, mortality)</p> <p>2. Indirect loss, reduction or degradation of terrestrial or aquatic habitats within or in close proximity to the SPA site; (i.e. through habitat loss, degradation, fragmentation or reduction/loss of connectivity of suitable habitat, or through a reduction in prey item species)</p> <p>3. Indirect or Ex-Situ disturbance or displacement of bird species of Special Conservation Interest (i.e. through disturbance, displacement or mortality of SCI species).</p>
				<p>usage of the Clooniff site and its environs by Greenland White-fronted Geese results from overflying birds or temporary staging during seasonal migration.</p>
3	Lough Ree SPA (004064)	10.9km north/north-east of Clooniff at its closest point.	No hydrological connectivity between the proposed bog rehabilitation site and this European Site.	<p><b>1. Screened Out - Possibility for direct loss, reduction or degradation of terrestrial or aquatic habitats within the SPA</b> Due to the separation distance to this SPA, possible pathways for direct effects can be excluded.</p> <p><b>2: Screened Out - Possibility for indirect loss, reduction or degradation of terrestrial or aquatic habitats within, or in close proximity to, the SPA</b> Due to the separation distance to this SPA, possible pathways for indirect loss, reduction or degradation of terrestrial habitats within or in close proximity to Clooniff can be excluded.</p> <p><b>3: Screened Out - Possibility for indirect or ex-situ disturbance or displacement effects of bird species of Special Conservation Interest</b> Due to the separation distance to this SPA, possible pathways for disturbance or displacement effects to SCI species of Lough Ree SPA can be excluded. Lough Ree SPA is located 10.9km north/north-east of Clooniff Bog. In accordance with Scottish Natural Heritage (SNH) Guidance<sup>14</sup> on assessing connectivity with SPA sites, the proposed rehabilitation works at Clooniff are considered to be outside of the core winter foraging range for the SCI species of Lough Ree SPA. Therefore, there is no risk of the Greenland White-fronted Goose flocks at Lough Ree SPA utilising Clooniff Bog as a core foraging area. Therefore, there will be no risk of significant ex-situ disturbance or displacement effects of SCI species to Lough Ree SPA as a result of the proposed bog rehabilitation</p>

<sup>14</sup> Scottish Natural Heritage (2016) Assessing Connectivity with Special Protection Areas (SPAs) Guidance/

	European Site	Separation Distance from Clooniff Bog	Hydrological Connection – Yes/No	<p><b>Evaluation of the potential for Clooniff Bog decommissioning and rehabilitation, either alone or in combination with other plans or projects, to cause either of the following effects to the three SPA Sites:</b></p> <ol style="list-style-type: none"> <li>1. Direct Impacts to Habitats within SPAs (i.e. disturbance, displacement, mortality)</li> <li>2. Indirect loss, reduction or degradation of terrestrial or aquatic habitats within or in close proximity to the SPA site; (i.e. through habitat loss, degradation, fragmentation or reduction/loss of connectivity of suitable habitat, or through a reduction in prey item species)</li> <li>3. Indirect or Ex-Situ disturbance or displacement of bird species of Special Conservation Interest (i.e. through disturbance, displacement or mortality of SCI species).</li> </ol>
				<p>works. Once rehabilitation measures at Clooniff Bog are completed, pathways for future disturbance/displacement are expected to be negligible, and can be readily screened out.</p>

## 2.11 Screening for Appropriate Assessment: Conclusion Statement

The Screening Evaluation provided herein has examined the potential for any effects arising via source pathway linkages with regard to connectivity to designated European Sites (SACs and SPAs) within the zone of influence of all predicted Project impacts. An extended buffer zone of 15km was further considered, in line with NPWS guidance (DoEHLG, 2009), for evaluation of effects on any European Site which may arise associated with the proposed decommissioning and rehabilitation of Clooniff Bog, as required. There is a total of 13 European sites located within the 15km zone of consideration:

1. River Shannon Callows SAC (000216)
2. Mongan Bog SAC (000580)
3. Fin Lough SAC (000576)
4. Pilgrim's Road Esker SAC (001776)
5. Moyclare Bog SAC (000581)
6. Ferbane Bog SAC (000575)
7. Crosswood Bog SAC (002337)
8. Ballynamona Bog and Corkip Lough SAC (002339)
9. Castlesampson Esker SAC (001625)
10. Lough Ree SAC (000440)
11. Middle Shannon Callows SPA (004096)
12. River Suck Callows SPA (004097)
13. Lough Ree SPA (004064)

Following screening it can reasonably be concluded that **there is no likelihood of significant effects to ten of the above European Sites** because of the proposed project, either alone or in-combination with other plans or projects. **Therefore, the potential for significant effects on ten European Sites has been excluded, the Project has been 'Screened Out' from the Appropriate Assessment process, no Appropriate Assessment is required.**

Following screening it can reasonably be concluded that **there is likelihood of significant effects to three of the above European Sites** as a result of the proposed project, either alone or in-combination with other plans or projects. **Therefore, the potential for significant effects on any European Sites has not been excluded, and Appropriate Assessment is required in respect of the following European Sites:**

- River Shannon Callows SAC (Site Code: 000216)
- Middle Shannon Callows SPA (Site Code: 004096)
- River Suck Callows SPA (Site Code: 004097)

**A Stage 2 Appropriate Assessment Report follows in respect of these three European Sites.**

## 3 STAGE 2: APPROPRIATE ASSESSMENT

### 3.1 Introduction to Stage 2

Following screening to inform the requirement for Appropriate Assessment, the potential for significant effects, could not be excluded, with regard to the following three European Sites:

1. River Shannon Callows SAC (Site Code 000216)
2. Middle Shannon Callows SPA (Site Code: 004096)
3. River Suck Callows SPA (Site Code: 004097)

This section comprises a detailed appraisal of the impacts of the proposed Clooniff Bog Decommissioning and Rehabilitation (either directly or indirectly) or in-combination with other projects or plans, on the integrity of the above listed European Sites, and is considered with respect to their conservation objectives and to their structure and function.

An overview of Clooniff Bog proposed Decommissioning and Rehabilitation is provided in **Section 2.2** and see also the document included as **Appendix B** of this report.

#### 3.1.1 Current Status of the Qualifying or Special Conservation Interests of the European Sites under consideration

##### 3.1.1.1 River Shannon Callows SAC (Site Code 000216)

The site-specific conservation objectives of the River Shannon Callows SAC aim to define favourable conservation condition for the particular habitat or species at that site. These objectives and conditions are considered in **Table 13** below in respect of the Qualifying Interests of River Shannon Callows SAC which were screened in for further evaluation. Further consideration is provided in **Table 13** to each Qualifying Interest and the potential for the proposed project to support connectivity and potentially impact this feature of Qualifying Interest.

The conservation objectives of River Shannon Callows SAC are available in full on the National Parks & Wildlife Service website at <https://www.npws.ie/protected-sites>.

The conservation objectives reproduced in the table below were sourced from NPWS (2021) Conservation objectives for River Shannon Callows SAC [000216]. Generic Version 8.0. Department of Housing, Local Government and Heritage - Version Date 23/03/2021<sup>15</sup>. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht and should be read in conjunction with any other supporting documentation on the referenced website as provided above.

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<sup>15</sup> [https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO000216.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000216.pdf)



**Table 13: Conservation Objectives of the River Shannon Callows SAC (Site Code 000216)**

Code and Qualifying Interest	Current Reporting (2019 <sup>16</sup> )	Article 17 Status	Conservation Objective	Potential Connectivity Source-Pathway-Receptor Link
<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinia caerulea</i> ) (6410)	Overall trend in conservation status deteriorating.		To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected	These Annex I habitats are potentially located in downstream sections of the River Shannon Callows SAC, especially within and along the floodplain areas of the River Shannon main channel. The proposed rehabilitation works support potential connectivity to the River Shannon and the River Shannon Callows SAC via receiving watercourses within the and adjoining the study area; i.e the Shannon Upper_120 and Shannon Uppr_130 watercourses.  Therefore, there is a potential source-pathway-receptor link between the proposed rehabilitation works and these habitats of Qualifying Interest for the River Shannon Callows SAC.
Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> ) (6510)	Overall trend in conservation status deteriorating.		To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected	
Alkaline fens (7230)	Overall trend in conservation status deteriorating.		To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected	
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, <i>Alnus incana</i> , <i>Salix alba</i> )* (91E0)	Overall trend in conservation status deteriorating.		To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected	
Otter ( <i>Lutra lutra</i> ) (1355)	Overall trend in conservation status improving.		To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected	

<sup>16</sup> 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

Code and Qualifying Interest	Current Article 17 Reporting Status (2019 <sup>16</sup> )	Conservation Objective	Potential Connectivity Source-Pathway-Receptor Link
			the proposed rehabilitation works and these habitats of Qualifying Interest for the River Shannon Callows SAC.
Limestone pavements* (8240)	Overall trend in conservation status stable.	To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected	Limestone pavements are not water dependent or nutrient sensitive habitats and therefore the potential hydrological connectivity between the rehabilitation works and this Annex I habitat will not contribute to significant negative effects. Therefore, the proposed works will not impact or contribute to significant negative effects to this Annex I habitat.

### 3.1.1.2 Middle Shannon Callows SPA (Site Code 004096)

The Middle Shannon Callows SPA is designated in respect of the following Special Conservation Interests:

- Whooper Swan (*Cygnus cygnus*) [A038]
- Wigeon (*Anas penelope*) [A050]
- Corncrake (*Crex crex*) [A122]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Lapwing (*Vanellus vanellus*) [A142]
- Black-tailed Godwit (*Limosa limosa*) [A156]
- Black-headed Gull (*Chroicocephalus ridibundus*) [A179]
- Wetland and Waterbirds [A999]

#### Corncrake (*Crex crex*) [A122]

Regarding Corncrake, no breeding has occurred by this species within the Middle Shannon Callows and the former breeding population within the SPA is now considered extinct. In 2002, 2003, 2006, 2007, 2008 and 2012 heavy rainfall led to flooding events during the Corncrake breeding season. This contributed to an acute level of breeding failure, and led to severe declines in Corncrake numbers; from 23 in 2005 to just one in 2011 and 2012. While 2013 saw an increase in the number of calling males to 2 (during the census period), just one calling male was recorded in 2014 and finally in 2015, for the first time no Corncrake was heard on the Shannon Callows<sup>17</sup>. The year 2018, was the fourth consecutive year in which no birds were recorded in the Shannon Callows<sup>18</sup>. Given the remaining population is focused heavily in two core areas of Donegal and West Connacht, with migration flyways to these likely to be coastal in nature (A. Copland personal communication) it is considered that pathways for effects to this species from any proposed activities at **Clooniff Bog** can reasonably be excluded.

#### Whooper Swan (*Cygnus cygnus*) [A038]

The latest Article 12 reporting data available from NPWS in respect of Whooper Swan relates to the period 2010. The wintering population size for this period, based on a best estimate of the number of individuals wintering was 10,520. Trends, both short term (2000-2010) and long-term (1986-2010) were all positive and increasing. The main pressures and threats comprise *Utility and service lines, renewable abiotic energy use, modification of cultivation practices, other agriculture activities, outdoor sports and leisure activities, recreational activities, and other forms of pollution* (sources relating to lead poisoning referenced only).

Results of the Irish Wetland Bird Survey (IWeBS<sup>19</sup>) for the winter period 2009/10 – 2015/16 report a population size (ROI) of 11,852 individuals (from Crowe *et al.*, 2015), of which 4,052 were associated with the SPA network. The peak (2011-2015) population associated with the Shannon Callows was 305 birds. The 2015 swan census recorded a peak of 386 individuals for the River Suck.

<sup>17</sup> NPWS (2015) A framework for Corncrake Conservation to 2022. National Parks and Wildlife Service, Department of Arts, Heritage & the Gaeltacht. Available online at:

<https://www.npws.ie/sites/default/files/publications/pdf/A%20Framework%20for%20Corncrake%20Conservation%20to%202022%20%28Nov2015%29.pdf>

<sup>18</sup> Duffy, M. (2018) The Corncrake Conservation Project Annual Report. 2018. Available online at:

<https://www.npws.ie/sites/default/files/general/corncrake-report-2018.pdf>

<sup>19</sup> Lewis *et al.* (2019). Irish Wetland Bird Survey: Waterbird Status and Distribution 2009/10-2015/16. Irish Wildlife Manuals, No. 106. National Parks and Wildlife Service, Department of culture, Heritage and the Gaeltacht, Ireland.

Regarding connectivity to Clooniff Bog and potential linkage between the River Suck and the Shannon Callows, Scottish Natural Heritage (SNH)<sup>20</sup> recommends a core range of 5km from nighttime roosts be assumed in respect of foraging Whooper Swan during the winter months when establishing connectivity between a proposed wind farm development and nearby SPA's. However, it is also accepted that the distribution of the Whooper Swan population wintering in Ireland may change over the winter months, possibly due to birds dispersing southwards (as the winter progresses) from their original arrival grounds<sup>21</sup>.

Suitable habitat (improved grazing fields) for Whooper Swan does occur in the vicinity of the Clooniff Bog, subject to flood levels. Outside of the River Shannon and its associated floodplain, pastoral fields comprise a small patchwork interspersed with areas of degraded bog and poor draining land contributing less than optimal grazing / foraging grounds. Whooper Swan were identified foraging within Coolumber Bog and adjacent areas of Clooniff Bog during the December 2020 site walkover survey. Therefore a precautionary approach is required as likely significant effects on Whooper Swan which may utilise Coolumber Bog and adjacent / proximal areas of the Middle Shannon Callows cannot be reasonably excluded. Therefore, in line with the precautionary approach it is considered that likely significant effects may occur to Whooper Swan which cannot be excluded from consideration in terms of the SPA's identified for which this species is a Special Conservation Interest (SCI).

#### Wigeon (*Anas penelope*) [A050]

The latest Article 12 reporting data available from NPWS in respect of Wigeon relates to the period 2006-2011. The wintering population size for this period, based on a five-year mean was 56,350 of which 43,746 occurred within the SPA network. Trends, both short term (1999-2011) and long-term (1987-2011) were all negative and decreasing. The main pressures and threats comprise *outdoor sports and leisure activities, recreational activities, renewable abiotic energy use, marine and freshwater aquaculture, hunting and collection of wild animals* (terrestrial), *pollution to surface waters, marine water pollution, other forms of pollution, invasive non-native species, human induced changes in hydraulic conditions and other ecosystem modifications*.

Results of the Irish Wetland Bird Survey (IWeBS) for the winter period 2009/10 – 2015/16 report a population size (ROI) of 50,452 individuals of which 38,514 were associated with the SPA network, and describes long term declines in the wintering population of Wigeon in Ireland. The peak count in the period 2011-15 for the Shannon Callows was 1,351; whilst for the River Suck in the same period, the peak count was 3385.

No species-specific guidance is available with which to establish connectivity distances to SPA's, however, a foraging distance of up to 16km is stated in Cramp 1977-1993. Wigeon are almost entirely vegetarian feeding on mainly leaves, stems, stolons, bulbils and rhizomes of plants. Suitable foraging and roosting habitat occurs adjacent to Clooniff Bog along the River Suck. Wigeon were identified foraging within Coolumber Bog during December site walkover survey. In line with a precautionary approach, potential connectivity to the Middle Shannon Callows is assumed.

#### Golden Plover (*Pluvialis apricaria*) [A140]

The latest Article 12 reporting data available from NPWS in respect of Golden Plover relates to the period 2006-2011. The wintering population size for this period, based on a five-year mean was conservatively 99,870 individuals of which 81,907 occurred within the SPA network. Trends in the short term (1999-2011) were negative in quality and decreasing, however over the long-term (1987-2011) unknown. The main pressures and

<sup>20</sup><https://www.nature.scot/sites/default/files/2018-08/Assessing%20connectivity%20with%20special%20protection%20areas.pdf>

<sup>21</sup> Wernham, C.V., Toms, M.P., Marchant, J.H., Clark, J.A. Sutherland, G.M. & Baillie, S.R. (eds). 2002. *The Migration Atlas; movements of the birds of Britain and Ireland*. T. & A.D. Poyser, London.

threats comprise *renewable abiotic energy use, modification of cultivation practices, marine and freshwater aquaculture, outdoor sports and leisure activities, recreational activities, and marine water pollution.*

Results of the Irish Wetland Bird Survey (IWeBS) for the winter period 2009/10 – 2015/16 report a population size (ROI) of 80,707 individuals of which 63,123 were associated with the SPA network, and describes long terms declines in the wintering population of Golden Plover in Ireland, possibly due to short-stopping. The peak count in the period 2011-15 for the Shannon Callows was 7,610; no count data has been published for the River Suck in the same period – however a peak of 600 is noted for the River Suck for the period 1994/95 – 2000/01 (Crowe, 2005).

Golden Plover feed on a variety of soil and surface-living invertebrates, principally beetles and earthworms, but also plant material such as berries, seeds and grasses, and in winter are known to be attracted to mown grass or close-grazed pastures, stubbles, fallows, harvest-fields and other farmlands of open character, including flood lands (Cramp 1977-1993). Golden Plover will utilise cutaway bog for diurnal roosting. Suitable habitat therefore is available for this species along the River Shannon adjacent to Clooniff Bog (foraging and roosting), and within the bog boundary (for roosting only). Golden Plover were identified at Coolumber Bog during the December 2020 site walkover survey.

No species-specific guidance is available with which to establish connectivity distances to wintering bird-based SPA's, however, a foraging range of up to 11km is cited in respect of breeding season foraging, and it is also known that cold weather can result in movements of Golden Plover during the winter. In line with a precautionary approach potential connectivity is assumed between Clooniff Bog and the SPA's identified for which this species is a Special Conservation Interest or SCI; i.e. Middle Shannon Callows SPA and the River Suck Callows SPA.

#### Lapwing (*Vanellus vanellus*) [A142]

The latest Article 12 reporting data available from NPWS in respect of Lapwing relates to the period 2006-2011. The wintering population size for this period, based on a five-year mean was 88,580 individuals of which 69,488 occurred within the SPA network. Trends in the short term (1999-2011) and long-term (1987-2011) were negative in quality and decreasing. The main pressures and threats comprise *renewable abiotic energy use, modification of cultivation practices, marine and freshwater aquaculture, outdoor sports and leisure activities, recreational activities, and marine water pollution.*

Results of the Irish Wetland Bird Survey (IWeBS) for the winter period 2009/10 – 2015/16 report a population size (ROI) of 69,823 individuals of which 48,232 were associated with the SPA network, and describes long term declines in the wintering population of Lapwing in Ireland. The peak count in the period 2011-15 for the Shannon Callows was 7,672; for the River Suck in the same period – a peak of 1400 is noted however the Suck is classified as no longer supporting numbers of National Importance.

Lapwing feed on chiefly small invertebrates, which live on or in the ground. During the winter, they utilise habitats such as arable fields and pastures in addition to coastal and estuarine habitats. Suitable habitat is available for this species along the River Shannon and its associated floodplain adjacent to **Clooniff Bog**. To this end, 25 Lapwing were identified using the ephemeral wetland habitat at Coolumber in December 2021 and a Lapwing pair were identified using Coolumber in April 2021. No species-specific guidance is available with which to establish connectivity distances to wintering bird-based SPA's, however, it is also known that cold weather can result in movements of Lapwing during the winter. In line with a precautionary approach potential connectivity is assumed between Clooniff Bog and the SPA's identified for which this species is a Special Conservation Interest or SCI.



**Black-tailed Godwit (*Limosa limosa*) [A156]**

The latest Article 12 reporting data available from NPWS in respect of Black-tailed Godwit relates to the period 2006-2011. The wintering population size for this period, based on a five-year mean was 18,080 individuals of which 16,752 occurred within the SPA network. Trends in the short term (1999-2011) and long-term (1987-2011) were positive in quality and increasing. The main pressures and threats comprise marine and freshwater aquaculture, *renewable abiotic energy use, fishing and harvesting aquatic resources, modification of cultivation practices, outdoor sports and leisure activities, recreational activities, human induced changes in hydraulic conditions and marine water pollution.*

Results of the Irish Wetland Bird Survey (IWeBS) for the winter period 2009/10 – 2015/16 report a population size (ROI) of 17,862 individuals of which 16,575 were associated with the SPA network, and describes a sustained population increase and range expansion over the last century in Ireland. The peak count in the period 2011-15 for the Shannon Callows was 220; no count data has been published for the River Suck in the same period – however a peak of 2 is noted for the River Suck for the period 1994/95 – 2000/01 (Crowe, 2005). The Site Synopses for the River Suck SPA cites a figure of 24 as recorded within said SPA. A record of 10+ birds exists in respect of Lough Croan Turlough, to the north-west of Clooniff Bog, from December 2012. Black-tailed Godwit were not observed using the Clooniff Bog site (including the vast ephemeral wetland area at Coolumber) during the December 2020 and March 2021 walkover survey.

In Ireland, Black-tailed Godwits are known to undertake movements during the winter between sites to feed on freshwater grassland, for example the Blackwater Callows, which is 25km inland from surrounding SPA's such as at Cork Harbour, Ballymacoda and Dungarvan has supported birds which also utilised the aforementioned nearby coastal complexes<sup>22</sup>. As suitable habitat is present along the River Shannon (callows) adjacent to **Clooniff Bog** and in line with a precautionary approach potential connectivity is assumed between Clooniff Bog and the Middle Shannon Callows SPA for which this species is a Special Conservation Interest or SCI.

**Black-headed Gull (*Chroicocephalus ridibundus*) [A179]**

Black-headed Gull is a SCI species for the middle Shannon Callows SPA in respect of wintering birds. The latest Article 12 reporting data available from NPWS in respect of Black-headed Gull relates to the period 2006-2011. The wintering population size for this period, based on a five-year mean was 50181 individuals of which 39252 occurred within the SPA network. Trends in the short term (1999-2011) and long-term (1987-2011) were unknown. The main pressures and threats comprise marine and freshwater aquaculture, *Marine water pollution, fishing and harvesting aquatic resources, renewable abiotic energy use, and other ecosystem modifications.* The North & West European Population is thought to be stable or declining (Wetlands International, 2018).

Results of the Irish Wetland Bird Survey (IWeBS) for the winter period 2009/10 – 2015/16 are limited in respect of this species insofar as counting of Black-headed Gulls is optional, and no recent counts are available for the Middle Shannon Callows or the River Suck. Crowe, 2015 describes a peak count of 1284 for the Shannon Callows in the period 1994/95 – 2000/01; for the same period the peak count for the River Suck is 240.

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<sup>22</sup> Hayhow, D.B. (2009). *Consequences of winter habitat use in a migratory shorebird. Thesis submitted for the degree of Doctor of Philosophy at the University of East Anglia, Norwich, 2009.* Available at: [https://ueaeprints.uea.ac.uk/id/eprint/10607/1/Thesis\\_hayhow\\_d\\_2009.pdf](https://ueaeprints.uea.ac.uk/id/eprint/10607/1/Thesis_hayhow_d_2009.pdf)

Habitats utilised by this species during the winter months include inland, moist grasslands, where food such as insects and earthworms can be collected. Suitable habitat is present adjacent to Clooniff Bog in the form of grazed, callows grassland. Black-headed Gull were identified using the ephemeral wetland area at Coolumber during the December 2020 walkover survey.

No species-specific guidance is available with which to establish connectivity distances to wintering bird-based SPA's, however, the species has been described as developing seasonal patterns of movements between foraging areas and secure roosts 'many km' distant; and recorded travelling up to 25-30km to a nocturnal, wintertime, roost (Cramp 1977-1993). On this basis, and in line with the natural connectivity via a hydrological corridor, it is considered that's individuals which may occur at Clooniff Bog or its environs cannot reasonably be excluded from occurrence within the Middle Shannon Callows SPA. In line with a precautionary approach potential connectivity is assumed between Clooniff Bog and the SPA's identified for which this species is a Special Conservation Interest or SCI.

#### **Wetland and Waterbirds [A999]**

The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the wetland area contained in the SPA and the waterbirds that utilize this resource are of special conservation interest for 'Wetland & Waterbirds'. In addition to the Special Conservation Interests described above, the Site Synopsis for the Middle Shannon Callows SPA describes a wide range of species as utilizing the site, including Mute Swan, Teal, Tufted Duck, Dunlin, Curlew and Redshank. The callow grasslands present in the SPA provide optimum feeding grounds for these various species of waterfowl, while many of the birds also roost or rest within the (European) site. Other wetland bird species, such as Snipe, Moorhen and Grey Heron utilise the Clooniff Bog site, particularly the areas of ephemeral wetland on cutover bog, drainage channels and watercourses.

Wetland habitats do occur within the Clooniff Bog boundary, outside the peat extraction areas and adjacent to the River Shannon, and as they occur within the Middle Shannon Callows SPA (also designated for wetland and waterbirds), are assumed to be attractive to a similar assemblage of waterbirds. Mute Swan, Teal, and Curlew are also described in the Site Synopsis for the River Suck Callows SPA for example.

It is assumed that due to connectivity from the individual species described above, potential connectivity between Clooniff Bog and the Middle Shannon Callows exists in respect of the 'waterbirds' element of this SCI.

#### **3.1.1.3 River Suck Callows SPA (Site Code 004097)**

The River Suck Callows SPA is designated in respect of wintering:

- Whooper Swan (*Cygnus cygnus*) [A038]
- Wigeon (*Anas penelope*) [A050]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Lapwing (*Vanellus vanellus*) [A142]
- Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]
- Wetland and Waterbirds [A999]

Whooper Swan, Wigeon, Golden Plover and Lapwing have already been described. As Clooniff Bog supports relative proximity and potential hydrological connectivity to the River Suck Callows SPA, connectivity between proposed activities and the River Suck SPA in respect of these SCI species is assumed.

#### **Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]**

The River Suck Callows SPA is an important site for wintering waterfowl. Of particular note is the nationally important Greenland White-fronted Goose flock (293 – five year mean peak for the period 1994/95 to 1998/99) which congregates mainly in the middle reaches of the river (from Site Synopses).

The latest Article 12 reporting data available from NPWS in respect of (wintering) Greenland White-fronted Geese relates to the period 2012. The wintering population size for this period, based on a complete count was 12173 individuals of which up to 12,140 occurred within the SPA network.

Trends in the short term (1999-2011) are considered to be negative and decreasing; in the long-term (1987-2011) numbers in 2012 represented an increase on those present in 1983. The main pressures and threats are; *changes in biotic conditions, modification of cultivation practices, annual and perennial non-timber crops, renewable abiotic energy use, utility and service lines, improved access to site, marine and freshwater aquaculture, Outdoor sports and leisure activities, recreational activities, hunting and collection of wild animals (terrestrial), Marine water pollution, grazing, agriculture activities not referred to above, forest planting on open ground, interspecific faunal relations, changes in abiotic conditions and other forms of pollution.*

Results of the Irish Wetland Bird Survey (IWeBS) for the winter period 2009/10 – 2015/16 report a current (winter 2017/18) population size (ROI) of 9,500 individuals of which 9,346-9,428 were associated with the SPA network. The report describes acute declines in numbers both nationally and internationally since 1999. The overall population decline in recent years has been attributed to chronic low breeding productivity, which has been particularly evident in the Irish Flocks (Fox et al., 2018, cited in Lewis et al., 2019). IWeBS counts for the period 2009/10-2015/16 recorded Geese at 33 sites included the River Suck which was surveyed aerially, however the mean peak for the River Suck across the period was below the threshold for significance at a National Level (100).

In the winter period 2018/19, the Spring population census (2019) recorded 7,436 birds wintering in Wexford and 1,899 in the rest of Ireland, total 9,335<sup>23</sup>. Numbers at the River Suck on this census were relatively unchanged (109 birds recorded). Lough Croan and Four Roads Turlough are the two main sites for the River Suck flock (around 130+ were present over the winter period 2019/20 – BWI, Personal communication to Bord na Móna). However, it is considered that movements up and down the Suck or to locations in closer proximity to Clooniff Bog cannot be excluded. A record exists of 58 birds in the townland of Dalysgrove, located ca 16km north-west of Clooniff Bog<sup>24</sup>.

Greenland White-fronted Geese are traditionally associated with peatlands, mires and raised bogs during the winter months, where favored food items such as Common Cotton Grass *Eriophorum angustifolium*, White beaked sedge *Rhynchospora alba* occur (Fox & Stroud, 2002). In Ireland, birds use both raised bogs and river flood plains or 'callows', where most feeding occurs on grasslands. Habitat loss and disturbance pressure are seen as restricting the range of flocks. Birds roost at night on bogs, flooded areas or near lakes, typically up to 100m from water, and occasionally roost in open fields. Feeding can take place at night. Greenland White fronted Geese fed on the callow habitats at Coolumber up until the 1980s. However, surveys and usage trends of Greenland White-fronted Goose flocks between Athlone to Shannonbridge and Ballinasloe to Shannonbridge over the past twenty-five years have noted the abandonment of the callows and the adjoining raised bog areas as regular feeding and foraging habitats. This is due to ongoing peat harvesting and turbarry which removed important feeding and refuge sites between Athlone and Shannonbridge; flooding and development between Ballinasloe and Shannonbridge as well as various sources of disturbance in and near the callows area. At present, potential usage of the Clooniff site and its environs by Greenland White-fronted Geese results from overflying birds or temporary staging during seasonal migration.

In terms of establishing connectivity, SNH recommends that usage of suitable foraging habitats may occur up to 8km from known roosts. On this basis and in line with a precautionary approach it is assumed that Greenland White-fronted Geese may occur in suitable habitat within the SPA which is located 2.7km south (and within potential foraging range) of Clooniff Bog. Therefore, Greenland White-fronted Geese flocks associated with the River Suck Callows SPA could utilise the peatland or adjacent habitats associated with Clooniff Bog.

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<sup>23</sup> Fox, T., Francis, I., Norriss, D., Walsh, A. (2019). Report of the 2018/2019 International Census of Greenland White-fronted Geese. Greenland White-Fronted Goose Study and National Parks and Wildlife Service. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Wexford Wildfowl Reserve, North Slob, Wexford, Ireland.

<sup>24</sup> Heery, S. (2018) Birds in Central Ireland. 6<sup>th</sup> mid Shannon Bird Report. 2012-2016. BirdWatch Ireland, Kilcoole, County Wicklow.

**Wetland and Waterbirds [A999]**

The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the wetland area contained in the SPA and the waterbirds that utilize this resource are of special conservation interest for 'Wetland & Waterbirds'. In addition to the Special Conservation Interests described above, the Site Synopsis for the River Suck Callows SPA describes a wide range of species as utilizing the site, including Mute Swan, Teal, Mallard, Black-tailed Godwit, Curlew and Black-headed Gull.

It is assumed that due to connectivity from the individual species described above (in particular Greenland White-fronted Geese), connectivity exists between wetlands present in or near Clooniff Bog in respect of 'Wetland and Waterbirds' as an SCI.

**3.1.2 Threats and Pressures of European Sites**

Threats and pressures published for the River Shannon Callows SAC, Middle Shannon Callows SPA and the River Suck Callows SPA are presented in **Table 14**, **Table 15** and **Table 16** below.

**Table 14 – Threats and Pressures for River Shannon Callows SAC (000216)**

<b>Rank<sup>25</sup></b>	<b>Threat Pressure<sup>26</sup></b>	<b>Inside (i) / Outside (o) / Both (b)</b>
L	G01 - Outdoor sports and leisure activities, recreational activities	i
M	J02.11 - Siltation rate changes, dumping, depositing of dredged deposits	i
M	J02.05.02 - Modifying structures of inland water courses	i
L	F03.01 - Hunting	b
M	A04.01 - Intensive grazing	i
L	C01.03.02 - Mechanical removal of peat	i
L	J02.01 - Landfill, land reclamation and drying out, general	i
H	A03.03 - Abandonment / lack of mowing	i
L	G05.01 - Trampling, overuse,	i
M	B02.02 - Forestry clearance	i
L	D01.01 - Paths, tracks, cycling tracks	i
M	K03.04 - Predation	b
H	A04.03 - Abandonment of pastoral systems, lack of grazing	i

<sup>25</sup> Threat, pressure and impact ranking provided on Natura 2000 data form: H – High, M - Medium, L - Low

<sup>26</sup> Threat code sourced from Natura 2000 data form and follows reference list provided on threats, pressures and activities for European sites

Rank <sup>25</sup>	Threat Pressure <sup>26</sup>	Inside (i) / Outside (o) / Both (b)
H	A07 - Use of biocides, hormones and chemicals	i
L	A04.02.05 - Non intensive mixed animal grazing	i
L	A10.01 - Removal of hedges and copses or scrub	i
L	J02.05 - Modification of hydrographic functioning, general	i
H	J02.04.01- Flooding	i
M	A08 - Fertilisation	i
L	B06 - Grazing in forests/ woodland	i

**Table 15 – Threats and Pressures for Middle Shannon Callows SPA (004096)**

Rank	Threat / Pressure	Inside (i) / Outside (o) / Both (b)
L	A04.03 - Abandonment of pastoral systems, lack of grazing	i
H	E01 - Urbanised areas, human habitation	o
H	G01.01 - Outdoor sports and leisure activities, recreational activities	i
L	F03.01 - Hunting	i
M	G01.02 - Walking, horseriding and non-motorised vehicles	i
H	D01.05 - Bridge, viaduct	i
M	A08 - Fertilisation	o
H	A04 - Grazing	i
L	A08 - Fertilisation	i
M	F02.03 - Leisure fishing	i
L	D01.01 - Paths, tracks, cycling tracks	i

**Table 16 – Threats and Pressures for River Suck Callows SPA (004097)**

Rank	Threat / Pressure	Inside (i) / Outside (o) / Both (b)
H	A04 - Grazing	o



Rank	Threat / Pressure	Inside (i) / Outside (o) / Both (b)
L	F03.01 - Hunting	i
M	A03 - Mowing / cutting of grassland	i
H	A08 - Fertilisation	o
M	A04 - Grazing	i
M	G01.01 - Outdoor sports and leisure activities, recreational activities	i
L	F02.03 - Leisure fishing	i
M	A08 - Fertilisation	i
L	B - Sylviculture, forestry	o
M	E01.03 - Dispersed habitation	o

### 3.1.3 Conservation Objectives for the relevant European Sites

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and;
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and;
- the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

## 3.2 Summary of Impact Pathways screened in for examination at Stage 2

The impact pathways presented in **Table 17** to Qualifying Interests/Special Conservation Interests are examined in relation to each of the three European Sites under consideration, in order to evaluate the effect of Clooniff Bog Decommissioning and Rehabilitation, if any, on the integrity of each of the five European Sites.

**Table 17: Qualifying Interests/Special Conservation Interests and Impact Pathways examined at Stage 2**

European Site	Qualifying Interest/Special Conservation Interest for evaluation at Stage 2	Impact examined at Stage 2
River Shannon Callows SAC (Site Code 000216)	[1355] Otter ( <i>Lutra lutra</i> ) [6410] <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinia caerulea</i> ) [6510] Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> ) [8240] Limestone pavements* [91E0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> )*	a) Direct effects to features of Qualifying Interest within or ex-situ the SAC b) Indirect/ex-situ disturbance or displacement of species of Qualifying Interest. c) Indirect loss or degradation of terrestrial or aquatic habitats within the SAC d) Indirect/ex-situ mortality to species of Qualifying Interest.
Middle Shannon Callows SPA (Site Code 004096)	Whooper Swan ( <i>Cygnus cygnus</i> ) [A038] Wigeon ( <i>Anas penelope</i> ) [A050] Golden Plover ( <i>Pluvialis apricaria</i> ) [A140] Lapwing ( <i>Vanellus vanellus</i> ) [A142] Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156] Black-headed Gull ( <i>Chroicocephalus ridibundus</i> ) [A179] Wetland and Waterbirds [A999]	a) Direct impacts to habitats within SPA b) Indirect loss, reduction or degradation of terrestrial or aquatic habitats within or in close proximity to the SPA site; c) Indirect or Ex-Situ disturbance or displacement of bird species of Special Conservation Interest.
River Suck Callows SPA (004097)	A038] Whooper Swan <i>Cygnus cygnus</i> [A050] Wigeon <i>Anas penelope</i> [A140] Golden Plover <i>Pluvialis apricaria</i> [A142] Lapwing <i>Vanellus vanellus</i> [A395] Greenland White-fronted Goose <i>Anser albifrons flavirostris</i> Wetland and Waterbirds [A999]	a) Indirect loss, reduction or degradation of terrestrial or aquatic habitats within or in close proximity to the SPA site; b) Indirect or Ex-Situ disturbance or displacement of bird species of Special Conservation Interest.

### 3.3 Evaluation of potentially adverse impacts at Stage 2 (Alone & In Combination)

Evaluations are generally grouped between those which impact habitats (direct or indirect based on where secondary habitat degradation potentially occurs, i.e. within a European Site boundary or outside) and then species (disturbance/displacement or mortality). Mortality is only considered relevant in respect of Otter as bird species can evade contact with operating machinery. Disturbance or displacement to the key avian receptors which comprise SCI's and form part of the 'Wetland and Waterbirds' SCI is dealt with collectively. Potentially adverse impacts on wetlands as part of 'Wetlands and Waterbirds' are addressed under the treatment of indirect loss, reduction or degradation of terrestrial or aquatic habitats. Potentially adverse secondary effects on waterbirds as part of 'Wetlands and waterbirds' are evaluated under 'Indirect or Ex-Situ disturbance or displacement of bird species of Special Conservation Interest.'

The following evaluations are based on known sensitivities and best available scientific knowledge. Likely disturbance to wintering and passage wildfowl is based on flight initiation distances/Minimum Approach Distances (MADS) from peer reviewed publications.

In combination evaluations are based on the other plans or projects described in **Section 2.6.3**.

### **3.3.1 Direct effects to Qualifying Interest habitats or species of an SAC Site (i.e. species mortality, habitat loss, fragmentation, degradation, loss/reduction in connectivity) within or ex-situ the SAC**

#### **3.3.1.1 Alone**

Pathways for direct effects to habitats with a European Site, occur in the context of the River Callows SAC- the only SAC to partially overlap the proposed decommissioning and rehabilitation extent at Clooniff Bog. Furthermore, it is only applicable to the overlapping areas at the south-western corner of Coolumber Bog, as works are not proposed for the riparian zone or any callows grassland in the vicinity of the study area. Habitats potentially impacted comprise a small area of remnant high bog and establishing birch woodland / scrub around the margin of extracted cutaway.

No land use change is proposed for habitats within the SAC, with the only activities to overlap the SAC comprising site access and personnel / machinery movement. Silt ponds can be accessed from existing cutaway bog or previously used tracks. Direct effects on habitats within the SAC are evaluated as negligible in magnitude, reversible and unlikely to impact on Conservation Objectives. It should be noted, that the proposed rehabilitation works will enhance suitable foraging conditions for otter (a QI species of this SAC) as the measures establish.

#### **3.3.1.2 In Combination**

There is potential for cumulative effects from other plans or projects which may result in similar source-impact-pathways through direct overlap with the River Shannon Callows SAC.

The decommissioning and rehabilitation of Clooniff Bog by BnM, occurs immediately adjacent to (and partially overlaps) the River Shannon Callows SAC boundary – no rehabilitation works, or activities are proposed within the SPA however.

All other plans or projects identified are subject to Appropriate Assessment and it is assumed that in-combination effects are therefore unlikely, due to the requirement for mitigation if likely significant/potentially adverse effects are identified.

#### **3.3.1.3 Stage 2 Evaluation**

Adverse direct effects on the integrity of the SAC/Conservation Objectives (alone or in combination) are evaluated as unlikely.

### **3.3.2 Indirect/ex-situ disturbance or displacement of species of Qualifying Interest (Otter)**

#### **3.3.2.1 Alone**

Otter are rated as a very high sensitivity receptor (based on International importance ratings) and do not tolerate disturbance at or near holts (breeding dens) that are in active use (breeding may occur at any time of the year, but most likely during the Summer/early Autumn period). When Otters are not breeding, records suggest that Otters are less sensitive to human disturbance (Chanin, 2013). This could include the disturbance of animals at resting places (couches) but also at natal holts.

The site walkover surveys and mammal survey undertaken in April 2021 did not identify otter (or signs of otter usage) at Clooniff Bog or its environs. The general unsuitability of areas subject to decommissioning and rehabilitation constrains usage. However Otter may utilise existing silt ponds or open areas of watercourses located upstream and downstream of the site and between the peatland basins. The likelihood of otter disturbance and displacement during the proposed works are considered to be low and highly unlikely. Should otter utilise the watercourses at the margins of the site (such as the Shannon Upper\_020 and Ballydangan\_020) on an occasional or temporary basis, then disturbance effects as a result of the proposed works would be most likely to occur during daylight hours. Such disturbance effects are highly unlikely, however should they occur, they would be considered to be temporary and indirect. Such disturbance and displacement effects, should they occur, will not be adverse.

Were the impacts described above to occur within an SAC watercourse it may result in direct adverse effects on QI Species and Conservation objectives such as a decline in range and/or distribution and numbers of individuals within the SAC catchment.

In instances where this impact occurs outside or ex-situ the SAC it may, dependant on source magnitude, degree of hydrological connectivity and presence or absence of mitigating measures in line with tried and tested methods, have secondary adverse effects on connected or supporting populations for downstream but ecologically connected Otter.

#### **3.3.2.2 In Combination**

There is potential for cumulative effects from other plans or projects which may result in similar source-impact-pathways to Otter within other tributaries or within the River Suck/River Shannon complex.

The decommissioning and rehabilitation of Clooniff Bog by BnM, which is also within the River Shannon catchment, may result in likely significant/ potentially adverse effects on Otter; this project is known to temporally overlap works proposed for Kilmacshane, Garryduff and Belmont Bogs.

In the absence of mitigation measures to avoid/reduce harmful effects, the order of cumulative effects is that of all projects combined, notwithstanding that it is assumed that Appropriate Assessment and mitigation measures, if required, will be undertaken and put in place.

Additional sources of disturbance such as baseline agricultural activities or existing turbary are considered unlikely to result in in combination adverse effects, due to habituation, described tolerance and occurrence during primarily daylight hours.

All other plans or projects identified are subject to Appropriate Assessment and it is assumed that in-combination effects are therefore unlikely, due to the requirement for mitigation if potentially adverse effects are identified.

#### **3.3.2.3 Stage 2 Evaluation**

In the absence of measures to avoid/reduce harmful effects, the magnitude of effects (alone and in combination) is evaluated as low, with the possibility of adverse effects on European Sites/Conservation Objectives considered unlikely.

### **3.3.3 Indirect/ex-situ mortality to species of Qualifying Interest (Otter)**

#### **3.3.3.1 Alone**

Otter are rated as a very high sensitivity receptor (based on International importance ratings) and may be sensitive to mortality through inadvertent collision with moving vehicles or machinery, in particular during

hours of darkness. There are no known Otter holts at Clooniff Bog, and the general unsuitability of areas subject to decommissioning and rehabilitation no doubt constrains usage, however Otter may utilise existing silt ponds or open areas of watercourses located upstream and downstream of the site and between the peatland basins; i.e. Shannon (Upper)\_130 and Ballydangan\_020.

Indirect and ex-situ mortality of otter are more likely in respect of foraging or resting animals, primarily within aquatic habitats but also within adjacent riparian corridors and /or whilst crossing the bog/ utilising drains in close proximity to proposed works. Many of the watercourses (including drainage for historic peat extraction) present whilst not within an SAC boundary, are ultimately hydrologically connected to a downstream SAC which includes Otter as a Qualifying Interest; i.e. River Shannon Callows SAC.

Were the impacts described above to occur within an SAC watercourse it may result in direct adverse effects on QI Species and Conservation objectives such as a decline in range and/or distribution and numbers of individuals within an SAC - however this is not applicable in respect of Clooniff Bog Decommissioning and Rehabilitation.

In instances where this impact occurs outside or *ex-situ* an SAC it may, dependant on source magnitude, degree of hydrological connectivity and presence or absence of mitigating measures in line with tried and tested methods, have secondary adverse effects on connected or supporting populations for downstream but ecologically connected Qualifying Interest (QI) species, thus affecting Site Integrity/Conservation Objectives similarly.

#### **3.3.3.2 In combination**

There is potential for cumulative effects from other plans or projects which may result in similar source-impact-pathways to Otter within other tributaries or within the River Shannon Callows SPA.

The decommissioning and rehabilitation of Clooniff Bog by BnM, which is also River Shannon catchment, may result in likely significant/potentially adverse effects on Otter; this project is known to temporally overlap works proposed for Kilmacshane, Garryduff and Belmont Bogs, all of which are located in the downstream catchment of Clooniff Bog.

In the absence of mitigation measures to avoid/reduce harmful effects, the order of cumulative effects is that of both projects combined, notwithstanding that it is assumed that Appropriate Assessment and mitigation measures, if required, will be undertaken and put in place.

Additional sources of disturbance such as baseline agricultural activities are considered unlikely to result in in combination adverse effects.

All other plans or projects identified are subject to Appropriate Assessment and it is assumed that in-combination effects are therefore unlikely, due to the requirement for mitigation if potentially adverse effects are identified.

#### **3.3.3.3 Stage 2 Evaluation**

In the absence of measures to avoid/reduce harmful effects, the magnitude of effects (alone and in combination) is evaluated as low, with low possibility of adverse effects on European Sites/Conservation Objectives evaluated.



### **3.3.4 Indirect loss, reduction or degradation of aquatic habitats within the SAC and consequent effects to reliant aquatic species of Qualifying Interest**

Aquatic habitats and species in this instance refers to the water dependent and nutrient sensitive habitats and species of Qualifying Interest for the River Shannon Callows SAC downstream of Clooniff Bog; *Molinia* meadows (6410), Lowland hay meadows (6510), Alkaline Fens (7230), Alluvial forests (91E0) and otter (1355). Deterioration in water quality within Clooniff Bog and the downstream watercourses as a result of the proposed works, could result following the release of sediment or silt laden water from the site to the receiving watercourses; i.e. the Shannon Upper\_120 and Ballydangan\_120 watercourses and further downstream to the River Shannon main channel. Siltation of the receiving watercourses could effect the in-situ and / or reliant QI species for the River Shannon Callows SAC such as the QI habitats and species listed above.

Decommissioning and Rehabilitation at Clooniff Bog will require direct excavation of the banks and bed of the existing drainage channels (peat production drains) to facilitate drain blocking, levelling of existing stock piles, reprofiling areas of cutover peat to remove preferential flowpaths to drainage channels, movement of peat to create various dams/speedbumps and cell bunds, regulate pumping to facilitate creation of wetlands. It will require the use of machinery and involve the removal of waste, including raw material, potentially contaminated soils or peat, railway infrastructure, and fuel.

Potential impacts to downstream connected aquatic ecology receptors could occur in the absence of best practice measures of mitigation being implemented during and following the proposed rehabilitation works.

#### **3.3.4.1 Water quality effects due to sedimentation or the release of deleterious materials**

##### Alone

Erosion and deposition are natural process in watercourses varying naturally throughout the year. However, additional sediment contributions entering the watercourse, such as from Decommissioning and Rehabilitation in, adjacent to or upstream of individual watercourses, could have negative implications for the receiving aquatic environment and could contribute to nutrient enrichment of the receiving watercourse and habitat degradation. These impacts may be mobilised downstream and affect river reaches at a distance from the physical works. Effects on these receptors may in turn affect downstream aquatic QI habitats and species for the River Shannon Callows SAC. In addition, water quality effects due to contamination by fuels, oils or cementitious material has the potential to lead to direct toxicity events to QI species, or sub-lethal degradation and loss of aquatic habitat quality.

The release of large volumes of sediment and /or deleterious materials to aquatic habitats upstream of an SAC may reduce the quality of aquatic habitat resource for QI species, and/or result in effective habitat loss should QI species cease to utilise degraded habitats.

Overall effects may reduce the suitability of the receiving waters as a resource for QI species and the degrade water dependent and nutrient sensitive QI habitats, thus affecting Site Integrity and/or Conservation Objectives – particularly those which seek to maintain or restore the favourable conservation condition of the QI habitat / species at the River Shannon Callows SAC.

##### In combination

There is potential for cumulative effects from other plans or projects which may result in similar source-impact-pathways to waterbodies upstream of or within the SAC's under consideration.

The decommissioning and rehabilitation of Clooniff Bog by BnM, may result in likely significant/potentially adverse effects on water quality.

In the absence of mitigation measures to avoid/reduce harmful effects, the order of cumulative effects is that of both projects combined, notwithstanding that it is assumed that Appropriate Assessment and mitigation measures, if required, will be undertaken and put in place.

Various sources of water-quality related effects - with linkage to activities such as Agriculture or Turbary - within the SAC constitute activities requiring consent (ARC) of the minister and therefore are unlikely to result in combination adverse effects

All other plans or projects (including Agricultural activities outside the remit of the ARC process) identified are subject to Appropriate Assessment/and or consented mitigation measures and it is assumed that in-combination effects are therefore unlikely, due to the requirement for mitigation if potentially adverse effects are identified.

### Stage 2 Evaluation

In the absence of measures to avoid/reduce harmful effects, the magnitude of effects (alone and in combination) is evaluated as high, with adverse effects on European Sites/Conservation Objectives evaluated as likely.

#### **3.3.4.2 Alteration of flow regimes or changes to watercourse morphology**

##### Alone

Watercourse morphology relates to the shape of a watercourse channel, its bed and banks and how erosion, transportation of water, sedimentation and the composition of riparian vegetation changes this shape over time. In the absence of mitigation there is potential for sediment deposition at a scale which may alter tributary channel morphology within or ex-situ an SAC thus reducing the suitability of receiving (downstream) aquatic habitats and species of Qualifying Interest. Such occurrences could affect Site Integrity and/or Conservation Objectives for a European Site – particularly those which seek to maintain or restore the favourable conservation condition of aquatic habitats and species at the designated SAC.

The following Hydrological effects may occur to the local environment at Clooniff Bog as a result of the proposed works and may influence flow regimes to the receiving environment and receiving watercourses. These include:

- Increases in groundwater levels which may affect neighbouring lands across hydraulic gradients;
- Reductions in conveyance capacity around or through Clooniff Bog, or;
- Marginal alteration of topographical catchments, also resulting in flooding as a result of increased run-off.

Increased flooding and consequent run-off to lands adjacent to and surrounding Clooniff Bog could result in increased run-off of potential pollutants to the receiving watercourses; i.e. the Shannon Upper\_120 and Ballydangan\_120 watercourses, both of which provide remote connectivity between the site and the River Shannon Callows SAC. Changes to the hydrological regime (reductions or increases in run-off) could result in consequent effects to ex-situ water dependent species using the downstream areas of the River Shannon main channel. Increased flow volumes / regimes to receiving watercourses may change localised watercourse morphology (as a result of localised erosion / scouring) which could contribute ex-situ effects to QI species using the downstream areas of the River Shannon, particularly otter.

**In combination**

There is potential for cumulative effects from other plans or projects which may result in similar source-impact-pathways to waterbodies upstream of or within the SAC under consideration.

In the absence of mitigation measures to avoid/reduce harmful effects, the order of cumulative effects is that of both projects combined, notwithstanding that it is assumed that Appropriate Assessment and mitigation measures, if required, will be undertaken and put in place.

Various sources of flow regime or water morphology related effects, with linkage to activities such as Agriculture or Turbary, within the SAC constitute activities requiring consent (ARC) of the minister and therefore are unlikely to result in in combination adverse effects.

All other plans or projects identified are subject to Appropriate Assessment/and or consented mitigation measures and it is assumed that in-combination effects are therefore unlikely, due to the requirement for mitigation if potentially adverse effects are identified.

**Stage 2 Evaluation**

In the absence of measures to avoid/reduce harmful effects, the magnitude of effects (alone and in combination) is evaluated as high, with adverse effects on European Sites/Conservation Objectives evaluated as likely.

**3.3.5 Direct Impacts to Habitats within SPAs****3.3.5.1 Alone**

Pathways for direct effects to habitats with a European Site, occur in the context of the Middle Shannon Callows SPA - the only SPA to partially overlap the proposed decommissioning and rehabilitation extent at Clooniff Bog. Furthermore, it is only applicable to the overlapping areas at the south-western corner of Coolumber Bog, as works are not proposed for the riparian zone or any callows grassland in the vicinity of the study area. Habitats potentially impacted comprise a small area of remnant high bog and establishing birch woodland / scrub around the margin of extracted cutaway.

No land use change is proposed for habitats within the SPA, with the only activities to overlap the SPA comprising site access and personnel / machinery movement. Silt ponds can be accessed from existing cutaway bog or previously used tracks. Direct effects on habitats within the SPA are evaluated as negligible in magnitude, reversible and unlikely to impact on Conservation Objectives. It should be noted, that the proposed rehabilitation works will create suitable foraging, feeding and roosting habitat for SCI species in the long term as proposed measures establish.

**3.3.5.2 In combination**

There is potential for cumulative effects from other plans or projects which may result in similar source-impact-pathways through direct overlap with the Middle Shannon Callows SPA.

The decommissioning and rehabilitation of Clooniff Bog by BnM, occurs immediately adjacent to (and partially overlaps) the Middle Shannon Callows SPA boundary – no rehabilitation works, or activities are proposed within the SPA however.

Various sources of land use change within the SPA - with linkage to activities such as Agriculture and Turbary - constitute activities requiring consent (ARC) of the minister and therefore unlikely to result in in combination adverse effects.

All other plans or projects identified are subject to Appropriate Assessment and it is assumed that in-combination effects are therefore unlikely, due to the requirement for mitigation if likely significant/potentially adverse effects are identified.

### **3.3.5.3 Stage 2 Evaluation**

Adverse effects on the integrity of the SPA/Conservation Objectives (alone or in combination) are evaluated as unlikely.

### **3.3.6 Indirect loss, reduction or degradation of terrestrial or aquatic habitats within or in close proximity to the SPA site**

Terrestrial habitat in this instance refers to the habitats within and adjoining Clooniff bog which may be utilised by SCI species as feeding resources, e.g. Callows grassland, cutover bog and high bog areas used by feeding Swans and waterfowl, or habitats containing invertebrate prey items for which species such as Lapwing or Golden Plover or other waterbirds may forage – both within, in close proximity to, or upstream of the SPA's under consideration. Riparian habitats i.e. the interface between the aquatic habitat, the bankside vegetation and terrestrial environment are also considered here.

Aquatic habitat relates to instream features supporting aquatic biodiversity (bed substrate, morphology, water quality, etc.) both within and in close proximity to an SPA. Watercourses are highly sensitive to change, containing sensitive aquatic ecological receptors including fisheries, and a diverse macroinvertebrate community which provides feeding resources for various fauna.

Decommissioning and Rehabilitation (hereafter D&R) at Clooniff Bog will require direct excavation of the banks and bed of the existing drainage channels (peat production drains) to facilitate drain blocking, levelling of existing stock piles, reprofiling areas of cutover peat to remove preferential flowpaths to drainage channels, movement of peat to create various dams/speedbumps and cell bunds, regulate pumping to facilitate creation of wetlands. It will require the use of machinery and involve the removal of waste, including raw material, potentially contaminated soils or peat, railway infrastructure, and fuel.

#### **3.3.6.1 Water quality effects due to sedimentation or the release of deleterious materials**

##### Alone

Erosion and deposition are natural process in watercourses varying naturally throughout the year. However, additional sediment contributions entering the watercourse, such as from D&R in, adjacent to or upstream of individual watercourses, could have negative implications for fish and invertebrates due to physical damage and reduced feeding/foraging, as well as negative impacts due to compaction of spawning gravels by sediment causing mortality impacts for salmonid eggs (affecting recruitment) and interfering with invertebrate life stages within gravel substrates (interstitial spaces). These impacts may be mobilised downstream and affect river reaches at a distance from the physical works. Effects on these receptors may in turn affect SCI species /waterbirds or QI species of mammals (e.g. Otter) which utilise fish and invertebrates as food resources. In addition, water quality effects due to contamination by fuels, oils or cementitious material has the potential to lead to direct toxicity events, or sub-lethal degradation of aquatic habitat quality.

The release of large volumes of sediment and /or deleterious materials to habitats adjacent to, within, or upstream from an SPA may reduce the quality of terrestrial and riparian habitats as foraging or roosting resources for SCI's, and/or result in effective habitat loss should SCI's cease to utilise degraded habitats.

Overall effects may reduce the suitability of the receiving waters as a resource for SCI's, thus affecting Site Integrity and/or Conservation Objectives – particularly those which seek to maintain or restore the favourable

conservation condition of the wetland habitat at the designated SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

#### In combination

There is potential for cumulative effects from other plans or projects which may result in similar source-impact-pathways to waterbodies upstream of or within the SPA's under consideration.

The decommissioning and rehabilitation of Clooniff Bog by BnM, which is also within the River Shannon but also upstream of the River Suck Callows SPA, may result in likely significant/potentially adverse effects on water quality; this project is known to temporally overlap works proposed for Kilmacshane, Garryduff and Belmont Bogs, all of which are located in the downstream catchment of Clooniff Bog.

In the absence of mitigation measures to avoid/reduce harmful effects, the order of cumulative effects is that of all projects combined, notwithstanding that it is assumed that Appropriate Assessment and mitigation measures, if required, will be undertaken and put in place.

Various sources of water-quality related effects - with linkage to activities such as Agriculture or Turbary - within the SPA constitute activities requiring consent (ARC) of the minister and therefore are unlikely to result in in combination adverse effects.

All other plans or projects identified are subject to Appropriate Assessment/and or consented mitigation measures and it is assumed that in-combination effects are therefore unlikely, due to the requirement for mitigation if potentially adverse effects are identified.

#### Stage 2 Evaluation

In the absence of measures to avoid/reduce harmful effects, the magnitude of effects (alone and in combination) is evaluated as high, with adverse effects on European Sites/Conservation Objectives evaluated as likely.

### **3.3.6.2 Alteration of flow regimes or changes to watercourse morphology**

#### Alone

Watercourse morphology relates to the shape of a watercourse channel, its bed and banks and how erosion, transportation of water, sedimentation and the composition of riparian vegetation changes this shape over time. In the absence of mitigation there is potential for sediment deposition at a scale which may alter tributary channel morphology within or ex-situ an SPA thus reducing the suitability of receiving habitats for SCI's and affect Site Integrity and/or Conservation Objectives – particularly those which seek to maintain or restore the favourable conservation condition of the wetland habitat at the designated SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

#### In combination

There is potential for cumulative effects from other plans or projects which may result in similar source-impact-pathways to waterbodies upstream of or within the SPA's under consideration.

The decommissioning and rehabilitation of Clooniff Bog by BnM, which is also within the River Shannon catchment and upstream of the River Suck Callows SPA, may result in likely significant/potentially adverse effects on water quality; this project is known to temporally overlap works proposed for Kilmacshane, Garryduff and Belmont Bogs, all of which are located in the downstream catchment of Clooniff Bog.



In the absence of mitigation measures to avoid/reduce harmful effects, the order of cumulative effects is that of both projects combined, notwithstanding that it is assumed that Appropriate Assessment and mitigation measures, if required, will be undertaken and put in place.

Various sources of flow regime or water morphology related effects, with linkage to activities such as Agriculture or Turbary, within the SPA constitute activities requiring consent (ARC) of the minister and therefore are unlikely to result in in combination adverse effects.

All other plans or projects identified are subject to Appropriate Assessment/and or consented mitigation measures and it is assumed that in-combination effects are therefore unlikely, due to the requirement for mitigation if potentially adverse effects are identified.

### Stage 2 Evaluation

In the absence of measures to avoid/reduce harmful effects, the magnitude of effects (alone and in combination) is evaluated as high, with adverse effects on European Sites/Conservation Objectives evaluated as likely.

#### **3.3.6.3 Spread of invasive species**

##### Alone

Invasive aquatic species include non-native, terrestrial invasive species such as Rhododendron, Japanese knotweed or Himalayan balsam, invasive riparian vegetation (such as Japanese knotweed) and also fish and mobile invertebrate fauna (such as Asian clam, Signal crayfish, or non-native shrimp species). Aquatic invasive species may be introduced to unaffected catchments or spread within infected watercourses to hydrologically connected SPA's during the course of instream works or transported via excavated material by site machinery.

Aquatic invasive species have the potential for significant ecosystem disturbance, disrupting the predator/prey balance or causing habitat disruption within aquatic systems. The spread of aquatic invasive species is not restricted in extent to the footprint of construction/instream works but can be transported both upstream (mobile species and 3<sup>rd</sup> party transport) and downstream (hydrological transport) within a watercourse, potentially extending throughout the catchment.

Non-native, invasive species potentially affecting the aquatic environment can also include terrestrial species which compromise bank integrity, riparian structural diversity and riparian invertebrate production contributing to habitat diversity and feeding inputs within the aquatic system.

Were the impacts described above to occur within, in close proximity to, or upstream of an SPA watercourse it may result in adverse effects on SCI'S and Conservation objectives such as the resource status and favourable condition of SCI habitat, by virtue of effects to structure and composition of SCI habitat, an altered hydrological regime and through secondary effects on prey item species, affecting the supporting habitat quality for SCI Species.

In instances where this impact occurs it may, dependant on source magnitude, degree of hydrological connectivity and presence or absence of mitigating measures in line with tried and tested methods, have secondary adverse effects on supporting habitats and/or species for ecologically connected SCI's, thus affecting Site Integrity/Conservation Objectives similarly.

##### In combination

There is potential for cumulative effects from other plans or projects which may result in similar source-impact-pathways to the SPA's under consideration.

The decommissioning and rehabilitation of Clooniff Bog by BnM, which is also within the River Shannon catchment and upstream of the River Suck Callows SPA, may result in likely significant/potentially adverse effects on supporting habitats similarly; this project is known to temporally overlap works proposed for Clooniff Bog.

In the absence of mitigation measures to avoid/reduce harmful effects, the order of cumulative effects is that of both projects combined, notwithstanding that it is assumed that Appropriate Assessment and mitigation measures, if required, will be undertaken and put in place.

Various sources of vectors for the introduction of invasive species, with linkage to activities such as Agriculture or Turbary, within the SPA constitute activities requiring consent (ARC) of the minister and therefore are unlikely to result in in combination adverse effects.

All other plans or projects identified are subject to Appropriate Assessment/and or consented mitigation measures and it is assumed that in-combination effects are therefore unlikely, due to the requirement for mitigation if potentially adverse effects are identified.

### Stage 2 Evaluation

In the absence of measures to avoid/reduce harmful effects, the magnitude of effects (alone and in combination) is evaluated as high, with adverse effects on European Sites/Conservation Objectives evaluated as likely.

### **3.3.7 Indirect or Ex-Situ disturbance or displacement of bird species of Special Conservation Interest.**

#### **3.3.7.1 Alone**

Disturbance/displacement can result in effective habitat loss, which, should it be permanent or irreparable and within the boundary of an SPA, is considered to adversely affect the integrity of the European Site(s) and its conservation objectives – particularly the maintenance or restoration of the favourable conservation condition of the bird species listed as Special Conservation Interests for these SPAs.

Short term disturbance events, or events which promote weak responses in SCI's outside the SPA, may be significant but dependant on availability of displacement habitat and specific species tolerance to disturbance, may not adversely affect an ecologically meaningful proportion of the SCI population and hence European Site integrity. However, a precautionary approach is taken throughout given the possible scale and extent of sources of disturbance (in the absence of mitigating measures such as timing works to avoid sensitive periods), and the presence of certain species for which sensitivity to disturbance is higher.

As the construction phase of decommissioning and rehabilitation will involve the use of heavy machinery, disturbance/displacement effects on waterbirds listed as Special Conservation Interests for the various SPA's to which possible connectivity has been established has been identified as a potential source impact pathway for likely significant effects, and in the absence of protective measures potentially adverse effects on European Site Integrity/Conservation Objectives.

Seeing as the construction phase is expected to be of a temporary to short-term duration, the disturbance effects are considered similarly temporary to short term in duration. Due however to the proximity of suitable SCI habitat to the proposed works, and the possibility of works taking place during the winter/migration season,

the potential for adverse effects through the disturbance/displacement of wintering or passage wildfowl is considered and examined herein.

To determine if disturbance effects are likely, a literature review looked at the tolerances of bird species to disturbance. Although these distances, often referred to as the Minimum Approach Distance (MAD; a function of observed Flight Initiation Distances (FID)) are not considered to be the best determinant of whether disturbance will affect birds, they nevertheless remain the most effective approach for establishing set-back distances (or buffers) to limit disturbance effects around areas where birds occur. Livezey et al. (2016) reviewed a substantial number of such studies between 2009 and 2015 where FIDs had been calculated for the species groups which are pertinent for the current appraisal, including non-breeding Anseriformes (wildfowl, including Greenland White-fronted Goose, Whooper Swan, Teal, Shoveler and Mallard) and Charadriiformes (waders including Golden Plover, Lapwing, Curlew, Black-tailed Godwit and gulls such as Black-headed Gull). As it offers the most comprehensive review currently available, the MADs presented in Livezey et al., (2016) in respect of motorised vehicles and/or pedestrians (with the highest MAD from either selected) were considered an appropriate basis for use in the current appraisal; these were 123.2m for Anseriformes and 42.2m in Charadriiformes.

Regarding Greenland White-fronted geese, it is acknowledged that the usage of the River Suck tributary floodplain, despite declines in use of associated bog systems, may be influenced by the absence of major sources of disturbances along the river channel. Greenland White fronted Geese fed on the callow habitats at Coolumber up until the 1980s. However, surveys and trends of Greenland White-fronted Goose flocks between Athlone to Shannonbridge and Ballinasloe to Shannonbridge over the past twenty-five years have noted the abandonment of the callows and the adjoining raised bog areas as regular feeding and foraging habitats. This is due to ongoing peat harvesting and turbary which removed important feeding and refuge sites between Athlone and Shannonbridge; flooding and development between Ballinasloe and Shannonbridge as well as various sources of disturbance in and near the callows area. At present potential usage of the Clooniff site and its environs by Greenland White-fronted Geese results from overflying birds or temporary staging during seasonal migration.

Disturbance in general plays a pronounced role in the winter ecology of Greenland White-fronted Geese because of extensive fragmentation of traditional feeding ranges. Recent changes in individual flock differences in Ireland were correlated with number and size of feeding sites but also disturbance rate, and the use of individual feeding sites may relate to relative levels of disturbance. Detailed studies also showed that wintering Greenland white-fronted geese tended to avoid strip of grassland within 75m of a busy road but fed right up to sea wall embankment. Effects of such disturbance were detectable up to 150m from field margins (Fox & Stroud, 2002). This figure (i.e 150m) is higher than that cited in Livezey et al. (123.2m in respect of Anseriformes and motorised vehicles) and is considered more suitable as a MAD for this species, in line with species specific information.

An evaluation of the significant effects due to noise and disturbance resulting from the proposed development on SCI species potentially occurring in proximity to Clooniff is presented in **Table 18**.

**Table 18 SCI Disturbance evaluation**

SCI	MAD (m)	Sensitivity	Notes
Greenland White-fronted Goose	150.0	Foraging/ Roosting	Suitable habitat within 150m of activities and usage cannot be precluded; significant disturbance effect. Based on desk

SCI	MAD (m)	Sensitivity	Notes
			based data for Greenland White-fronted Goose trends near the Clooniff Bog site (See <b>Section 3.1.1.3</b> ) potential for occurrence and consequent disturbance is considered to be low. Greenland White-fronted Goose not identified within the Clooniff site during the 2020 and 2021 site walkover surveys.
Whooper Swan	123.2	Foraging/ Roosting	Suitable habitat within 123.2m of works and usage cannot be precluded; significant disturbance effect. Whooper Swan identified within the Clooniff site during the 2020 and 2021 site walkover surveys.
Shoveler	123.2	Foraging/ Roosting	suitable habitat within 123.2m of works and usage cannot be precluded; significant disturbance effect. Shoveler not identified within the Clooniff site during the 2020 and 2021 site walkover surveys.
Wigeon	123.2	Foraging/ Roosting	suitable habitat within 123.2m of works and usage cannot be precluded; significant disturbance effect. Wigeon identified within the Clooniff site during the 2020 and 2021 site walkover surveys.
Mallard	123.2	Foraging/roosting	Suitable habitat within 123.2m of works and usage cannot be precluded; significant disturbance effect. Mallard identified within the Clooniff site during the 2020 and 2021 site walkover surveys.
Teal	123.2	n/a	Suitable habitat within 123.2m of works and usage cannot be precluded; significant disturbance effect. Teal identified within the Clooniff site during the 2020 and 2021 site walkover surveys.
Lapwing	42.2	Foraging/roosting	Suitable habitat within 42.2m of works and usage cannot be precluded; significant disturbance effect. Lapwing identified within the Clooniff site during the 2020 and 2021 site walkover surveys.
Golden Plover	42.2	Foraging	Suitable habitat within 42.2m of works and usage cannot be precluded; significant disturbance effect. Golden Plover identified within the Clooniff site during the 2020 and 2021 site walkover surveys.  Roosting birds which might utilise cutaway peat are excluded as sufficient displacement habitat is available - significant effects are unlikely.
Curlew	42.2	Foraging/ roosting	Suitable habitat within 42.2m of works and usage cannot be precluded; significant disturbance effect. Curlew was not

SCI	MAD (m)	Sensitivity	Notes
			identified within the Clooniff site during the site walkover surveys.
Black-tailed Godwit	42.2	Foraging/ roosting	Suitable habitat within 42.2m of works and usage cannot be precluded; significant disturbance effect. Black-tailed Godwit was not identified within the Clooniff site during the site walkover surveys.
Black-headed Gull	42.2	Foraging/Roosting	Suitable habitat within 42.2m of works and usage cannot be precluded; significant disturbance effect. Black-headed Gull identified foraging over ephemeral wetland on expansive cutover bog areas at Coolumber.
Wetland and waterbirds	123.2*	Foraging/Roosting	Suitable habitat present and usage cannot be precluded; significant disturbance effect.

\* MAD for Anseriformes utilised as all Site Synopses include at least one other member of this order.

### 3.3.7.2 In combination

There is potential for cumulative effects from other plans or projects which may result in similar source-impact-pathways to the SCI's under consideration, and their respective SPA's (i.e. River Suck Callows SPA).

The decommissioning and rehabilitation of Clooniff Bog by BnM, which is also within the River Shannon and upstream of the River Suck Callows SPA, may result in likely significant/potentially adverse effects on SCI's similarly; this project is known to temporally overlap works proposed for Kilmacshane, Garryduff and Belmont Bogs, all of which are located in the downstream catchment of Clooniff Bog.

In the absence of mitigation measures to avoid/reduce harmful effects, the order of cumulative effects is that of both projects combined, notwithstanding that it is assumed that Appropriate Assessment and mitigation measures, if required, will be undertaken and put in place.

Additional sources of disturbance such as baseline agricultural activities /turbary within or in close proximity to the SPA's under consideration, and in suitable habitat for SCI's, are considered in the large part unlikely to result in in combination adverse effects- primarily due to habituation to these background baseline activities. In instances where sources of disturbance greater than baseline levels occur within SPA's they may constitute Activities Requiring Consent and thus be regulated in terms of the likelihood of significant effects stemming from these.

All other plans or projects identified are subject to Appropriate Assessment and it is assumed that in-combination effects are therefore unlikely, due to the requirement for mitigation if potentially adverse effects are identified.

### 3.3.7.3 Stage 2 Evaluation

In the absence of measures to avoid/reduce harmful effects, the magnitude of effects (alone and in combination) is evaluated as high, with adverse effects on European Sites/Conservation Objectives evaluated as likely.

It is acknowledged that, following decommissioning and rehabilitation, the presence of an undisturbed wetland habitat the size of **Clooniff Bog**, may provide foraging opportunities, attract wildfowl species as a refugium, and/or act as a disturbance buffer to birds utilising the River Shannon corridor / floodplain. These positive



quality effects may ultimately positively impact the SCI's and benefit the Conservation Objectives of the adjacent SPA. For the avoidance of doubt however, this is not considered in the evaluation above, nor is any reliance placed on this in the consideration of effects.

## 3.4 Mitigation Measures

### 3.4.1 Description of the measure

#### 3.4.1.1 Best Practice Environmental Control Measures to be applied to Decommissioning and Rehabilitation Works

The following Best Practice Environmental Control measures are to be applied as standard to ensure compliance with IPC license Conditions:

- Bog restoration/rehabilitation works will be restricted to within the footprint of the proposed rehabilitation works area.
- The proposed rehabilitation works will have due regard to noise limits and hours of operation (i.e. dusk and dawn) to minimise any potential disturbance on resident and local fauna that utilise the site and immediate environs.
- A standard operating procedure overseen by the Project Ecologist will be in place for all PCAS activities to avoid any significant effects on breeding birds. This will include ground nesting birds and will apply to silt pond cleaning, and cutaway activities. Restriction zones will be in place to avoid effects on any identified ground nesting birds/waterfowl as appropriate.
- All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (SI 359/1996).
- The proposed works will be restricted to daylight hours and there will be no requirement for artificial lighting.
- Silt ponds will be inspected and maintained as per the IPC Licence.
- During periods of heavy precipitation and run-off, works will be halted.
- Works will be carried out using a suitably sized machine and, in all circumstances, excavation depths and volumes will be minimised where possible.
- All machines will be regularly checked and maintained prior to arrival at the site to prevent hydrocarbon leakage.
- Hoses and valves will be checked regularly for signs of wear and will be closed and securely locked when not in use.
- Fuelling and lubrication of equipment shall only be carried out in designated areas away from surface water drainage features and ecologically sensitive areas.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.
- All waste will be sorted by the works crews, managed within the site in designated waste disposal facilities, and removed to a licenced waste facility, in line with BnM Standard operating practice.
- Vehicles will never be left unattended during refuelling.
- No direct discharges to waters will be made. No washings from vehicles, plant or equipment will be carried out on site.
- All plant refuelling will take place using mobile fuel bowsers. Only dedicated trained and competent personnel will carry out refuelling operations.

- All fuels required for machinery and equipment will be stored in a designated location, away from main traffic activity, at the nearest BnM Compound. All fuel will be stored in bunded, locked storage containers. Diesel or petrol fuel and mechanical oils will also be used by site vehicles.
- Mobile storage such as fuel bowsers will be bunded to 110% capacity to prevent spills. Tanks for bowsers and generators shall be double skinned. When not in use, all valves and fuel trigger guns from fuel storage containers will be locked. All pumps using fuel or containing oil will be locally and securely bunded where there is the possibility of discharge to waters.
- Potential impacts caused by spillages etc. during rehabilitation works will be reduced by keeping spill kits and other appropriate equipment on-site.
- Site works will be carried out in accordance with 'best practice'. In order to ensure compliance and implementation of 'best practice', these measures will be communicated to relevant Bord na Móna staff and updated as required.
- All waste water will be removed by a licenced waste contractor to a licenced waste water treatment facility.
- Any fertiliser used will be Rock Phosphate and will not be applied in the following conditions:
  1. The land is waterlogged;
  2. The land is flooded, or it is likely to flood;
  3. The land is frozen, or covered with snow;
  4. Heavy rain is forecast within 48 hours (forecasts will be checked from Met Éireann).
  5. The ground slopes steeply and there is a risk of water pollution, when factors such as surface run-off pathways, the presence of land drains, the absence of hedgerows to mitigate surface flow, soil condition and ground cover are taken into account.
- No fertiliser will be spread on land within 2 metres of a surface watercourse- this will be extended to 10m should any locations exist where spreading is required on bare peat and the surface slope suggests higher rates of potential runoff.
- Buffer zones in respect of waterbodies, as specified on <https://gis.epa.ie/EPAMaps/>, will be adhered with at all times with regard to fertiliser application.

The below image / flow chart (**Figure 17**) provides Bord na Móna's proposed clean up procedures for fuel/oil and peat.

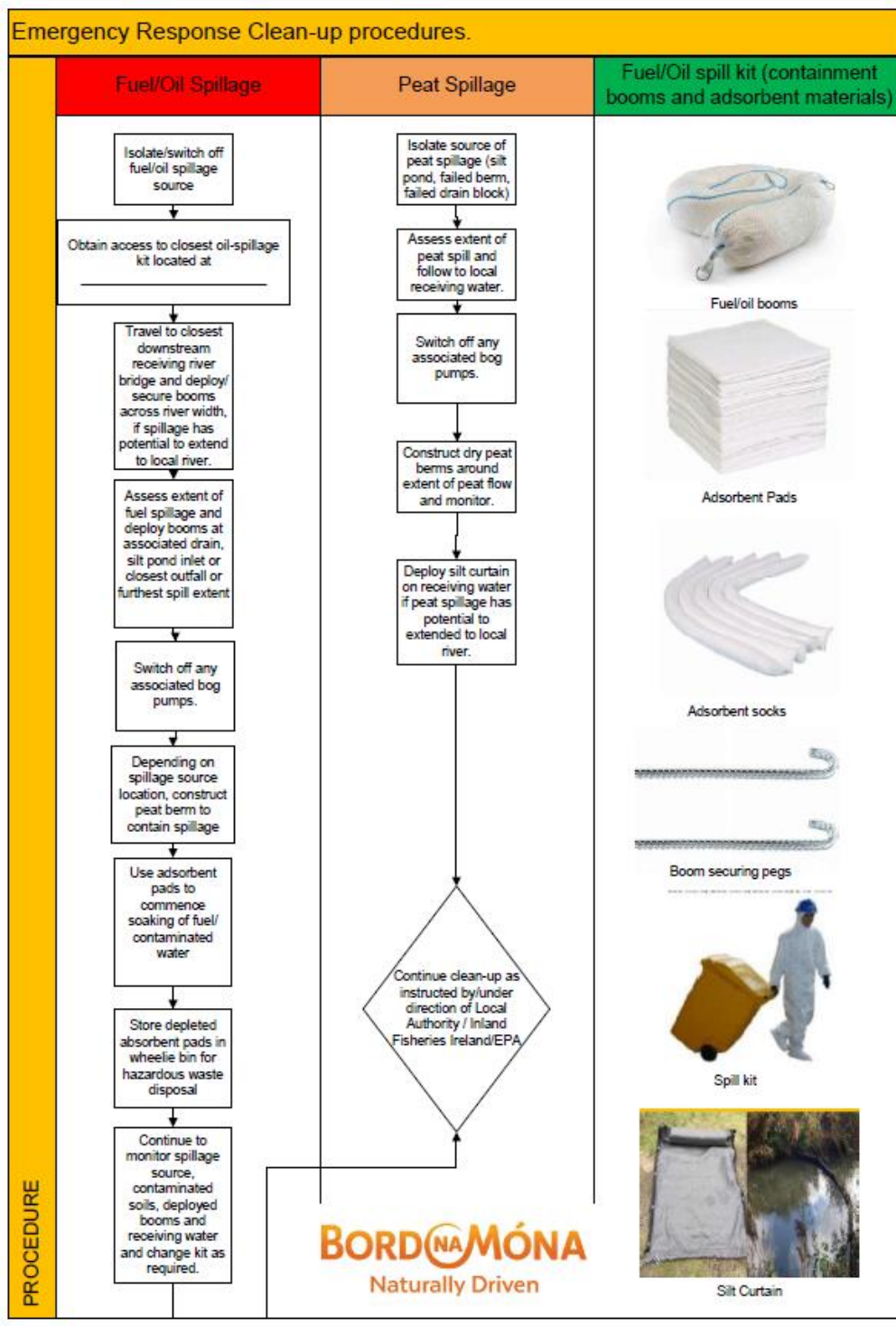
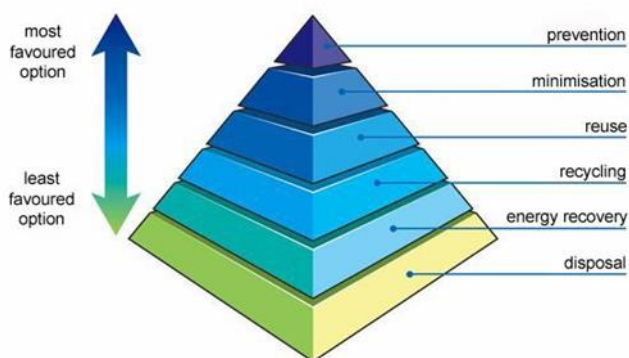


Figure 17: BnM Emergency Response Clean Up Procedures

### 3.4.1.2 Best Practice Measures around the treatment of Waste

Condition 7 of the IPC licence for Peat Extraction at Clooniff Bog requires waste items to be disposed of or recovered as follows:

- Disposal or recovery of waste shall take place only as specified in Schedule 2(i) Hazardous Wastes for Disposal/Recovery and Schedule 2(ii) Other Wastes for Disposal/Recovery of this licence and in accordance with the appropriate National and European legislation and protocols. No other waste shall be disposed of/recovered either on-site or off-site without prior notice to, and prior written agreement of, the Agency.
- Waste sent off-site for recovery or disposal shall only be conveyed to a waste contractor, as agreed by the Agency, and only transported from the site of the activity to the site of recovery/disposal in a manner which will not adversely affect the environment.
- A full record, which shall be open to inspection by authorized persons of the Agency at all times, shall be kept by the licensee on matters relating to the waste management operations and practices at this site. This record shall as a minimum contain details of the following:
  - The names of the agent and transporter of the waste.
  - The name of the persons responsible for the ultimate disposal/recovery of the waste.
  - The ultimate destination of the waste.
  - Written confirmation of the acceptance and disposal/recovery of any hazardous waste consignments sent off-site.
  - The tonnages and EWC Code for the waste materials listed in Schedule 2(i) Hazardous Wastes for Disposal/Recovery and Schedule 2(ii) Other Wastes for Disposal/Recovery sent off-site for disposal/recovery.
  - Details of any rejected consignments.
- A copy of this Waste Management record shall be submitted to the Agency as part of the AER for the site.
- As required by the licence, these waste items will be removed for recycling or disposal, using external contractors with the required waste collection permits, as agreed by the EPA, with waste records maintained as required for inspection by authorized persons of the EPA at all times.
- Where possible, Bord na Móna will utilize the appropriate waste hierarchy to identify waste that can be reused or recycled ahead of disposal.



- The validation of the success of condition 10.1 is carried out through an Independent Closure Audit (ICA), followed by and EPA Exit Audit (EA) and the eventual partial or full surrender of the licence.



These best practice measures have been included for the protection of watercourses in the receiving environment, downstream connected European Sites (River Shannon Callows SAC / Middle Shannon Callows SPA) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

#### **3.4.1.3 Best Practice & Biosecurity**

Rhododendron (*Rhododendron ponticum*) present in amongst the marginal habitats of the site and was identified during the December 2020 site walkover survey to the south of Coolumber Bog on the margins of a local access track. This species is listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011). Rhododendron has the potential to colonise portions of the cutaway following the cessation of peat harvesting activities.

The potential for importation or introduction of non-native plant species (such as Japanese Knotweed, Himalayan Balsam, etc.) has been identified. Section 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 prohibits the introduction and dispersal of invasive alien species (particularly plant species) listed on Part 1 (third column) of the 'Third Schedule'.

This section aims to reduce the risk from, and impacts of, invasive species and protecting biodiversity on lands under Bord na Móna ownership. Rehabilitation and decommissioning in the bog will have due regard to the relevant biosecurity measures outlined below:

- Records of problematic invasive species within the various bog units will be marked out with signs to highlight areas of infestation to personnel.
- All plant machinery will be restricted from disturbing known colonies of invasive species.
- All plant machinery will avoid unnecessary crossings to adjoining lands.
- For any material entering the site, the supplier must provide an assurance that it is free of invasive species.
- All plant and equipment employed on the proposed works (e.g. diggers, tracked machines, footwear etc.) must be thoroughly cleaned down using a power washer unit, and washed into a dedicated and contained area prior to arrival on site and on leaving site to prevent the spread of invasive aquatic / riparian species such as (but not limited to) Japanese knotweed (*Fallopia japonica*) and Himalayan Balsam (*Impatiens glandulifera*). A sign off sheet must be maintained by the contractor to confirm cleaning;
- Good site hygiene will be employed to prevent the introduction and spread of problematic invasive alien plant species (i.e. Japanese Knotweed (*Fallopia japonica*), Himalayan Balsam (*Impatiens glandulifera*), Himalayan Knotweed (*Persicaria wallichii*), etc.) by thoroughly inspecting and washing vehicles prior to entering the works area.

The biosecurity measures outlined above are in line with best practice guidelines issued by the National Roads Authority (NRA, 2010) – The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads and broadly based on the Environment Agency's (2013) – The Knotweed Code of Practice: Managing Japanese Knotweed on Development Sites (Version 3, amended in 2013, accessed on the Environment Agency's website on the 11th of July 2016).

In addition to the above, Best Practise measures around the prevention and spread of Crayfish plague will be adhered with throughout all rehabilitation works and activities.

- All water quality monitoring equipment which has been used in water will be treated with a disinfectant or a strong saline solution and then thoroughly dried (ideally over 24 hours) BEFORE being used in water again.
- Check, Clean, Dry protocol will be adhered with before and after visiting a river or lake for monitoring, in line with Best Practice<sup>27</sup> or for activities such as Sphagnum inoculation.
- Virkon Aquatic will be available as required.

These best practice measures have been included for the protection of watercourses in the receiving environment, downstream connected European Sites (River Shannon Callows SAC / Middle Shannon Callows SPA) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

#### 3.4.1.4 Silt Ponds

Silt Ponds – 16 no. Silt ponds with a total volume of 24091.56m<sup>3</sup> and area of 2.9ha are in place at Clooniff Bog and connected to the existing drainage network. These silt ponds, already stipulated and in use as mitigation measures in respect of Peat Extraction under IPC license, will continue to function as the primary intervention in terms of sediment release to receiving waterbodies. It should be noted, that the silt pond network at Clooniff Bog will not be the sole mitigation measure to attenuate silt laden waters emanating from the site during the project construction and operational phases. The design of the PCAS scheme requires the creation of internal drain blocking measures (including terminal dams), which will in itself reduce the possibility of surface run-off to the receiving environment during the rehabilitation works. Once rehabilitation works are completed and the bog has been rehabilitated, the bog will act as a natural repository for surface water, regulating and slowing the movement of surface water from Clooniff Bog to the receiving environment. It is considered that the silt pond network will provide further attenuation and regulation to those measures associated with the PCAS measures during the project construction phase and the rewetted peatland habitat during the project's operational phase.

Regular cleaning and reporting on same already forms part of annual (AER) reporting submitted to EPA. All Silt Ponds at Clooniff Bog are currently compliant with EPA requirements. **Table 19** below, and **Figure 18** overleaf summarise and illustrate the onsite Silt Pond locations, the latter also illustrates the current flow regime within the main drainage network (into which any other drains also feed). Continued maintenance and reporting on same will be reported on annually until IPC license Surrender.

**Table 19 Silt Ponds in use at Clooniff Bog**

Bog Name	IPC License Reference	Pond No.	Area (m <sup>2</sup> )	Volume (m <sup>3</sup> )
Cloonibeggaun	502_01	CB135	915.37	1373.65
Cloonibeggaun	502_01	CB136	462.93	694.70
Clooniff	502_01	CL124A	1586.55	2379.83
Clooniff	502_01	CL125A	1637.57	2456.35
Clooniff	502_01	CL126	547.48	821.22
Clooniff	502_01	CL126A	1174.49	1761.73
Clooniff	502_01	CL129	296.26	444.39
Coolumber	502_01	CL133	844.91	1267.37
Coolumber	502_01	CL134	1584.16	2377.27
Coolumber	502_01	CL134B	1194.03	1791.05
Clooniff	502_01	CN124	2793.28	4189.92
Clooniff	502_01	CN125	1624.17	2436.26
Clooniff	502_01	CN127	672.53	1008.80

<sup>27</sup> <https://www.biodiversityireland.ie/projects/invasive-species/crayfish-plague/>

Bog Name	IPC License Reference	Pond No.	Area (m <sup>2</sup> )	Volume (m <sup>3</sup> )
Clooniff	502_01	CN128	97.92	146.88
Clooniff	502_01	CN131	431.64	647.47
Clooniff	502_01	CN132	196.44	294.67
		<b>Total</b>	16059.73	24091.56

The above capacity is considered sufficient for the purposes of decommissioning and rehabilitation.

The attenuation of silt and particulate matter generated as a result of the proposed works is a key mitigation measure for the proposed rehabilitation and decommissioning works. The main source of potential impact to influence significant adverse effects to the downstream areas of the River Shannon Callows SAC relate to particulate matter run-off from the site, during the rehabilitation works. A key consideration in this regard will be drain blocking as described in **Section 3.4.1.5** below. This methodology relies on the placement of terminal dams at the extremity of the drain; i.e. that closest to watercourse within the receiving environment. The securing of strategic peat dams will allow the hydraulic separation between the proposed rehabilitation works and the receiving and downstream aquatic environment, and in so doing isolating these works from sensitive ecological and environmental receptors within the project zone of influence and in the case of Clooniff Bog and European Sites within the project Zone of Influence.

These mitigation measure has been included for the protection of watercourses in the receiving environment, downstream connected European Sites (River Shannon Callows SAC / Middle Shannon Callows SPA) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

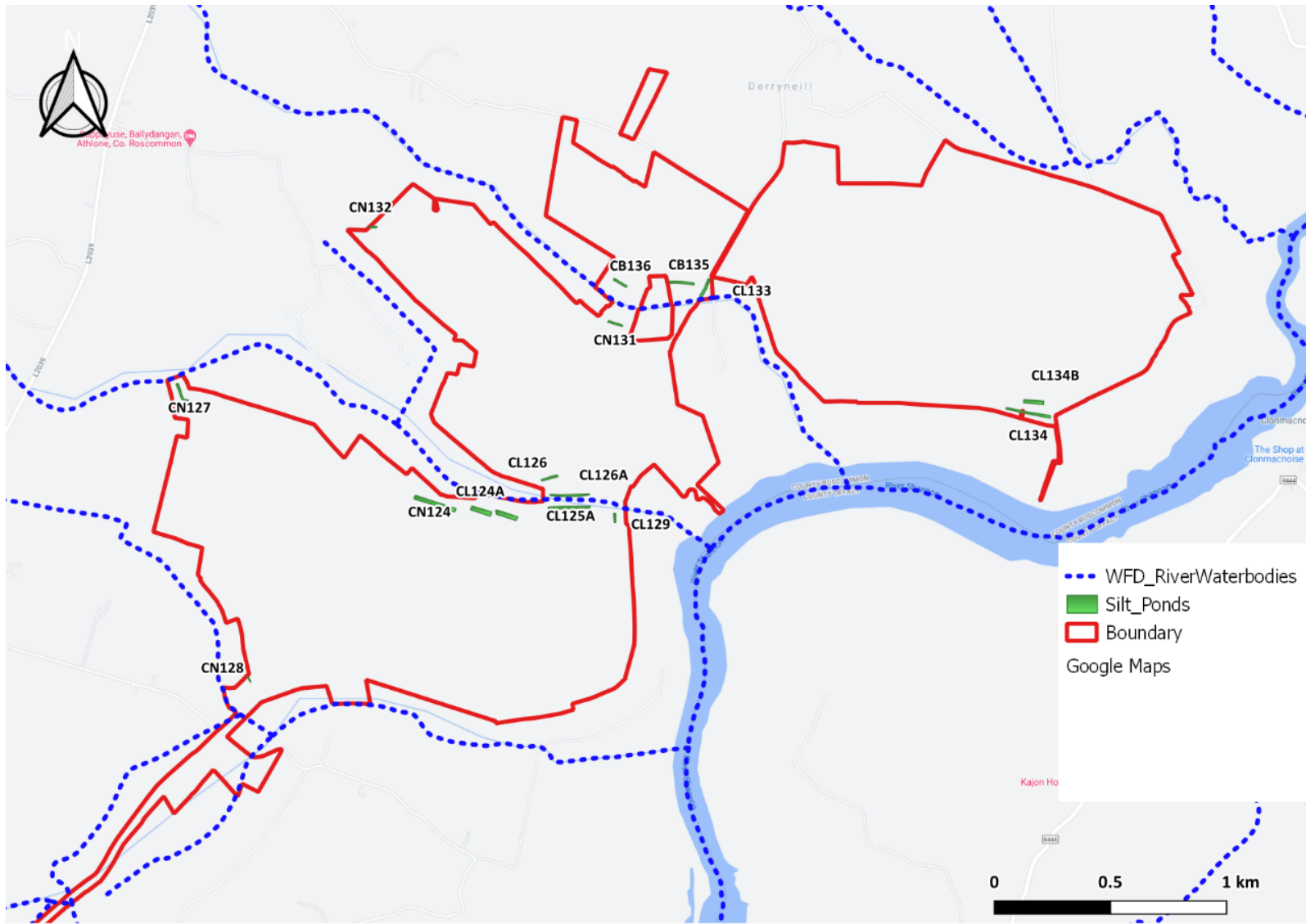


Figure 18: Clooniff Site Drainage and Silt Ponds

### **3.4.1.5 Measures to avoid runoff when carrying out drain blocking**

The principal mitigation for proposed rehabilitation works at Clooniff Bog will involve securing the works area from the receiving environment when rehabilitation works are ongoing. This will include the creation of terminal dams at the margins of the rehabilitation works. These dams will secure the works area from the receiving environment, in particular downstream watercourses and waterbodies. These terminal dams are an integral part of the rehabilitation design works and comprise mitigation by design.

- All Silt ponds will be cleaned prior to the commencement of upstream drain blocking.
- When blocking drains, terminal dams i.e. the dams at the extremity of the drain and closest to any hydrologically connected watercourses, will be blocked first with AT MINIMUM 2 IN SERIES STANDARD DAMS, to prevent sediment release from subsequent dam insertion. This will form a hydraulic barrier between subsequent drain works and other rehabilitation works at the bog and the receiving and surrounding environment.
- The functionality and efficacy of these terminal dams will be monitored by the Project Ecologist/Environmental Supervisor and audited by the project engineering team. If the structural competency of the terminal dams become compromised, additional mitigation will be secured on site, such as silt fencing or additional check dams.
- Dams will be inspected during periods of dry weather to ensure no 'cracking' of peat has occurred which might allow for discharge.
- Discharge from all rehabilitated areas will be directed into silt ponds.
- Outfalls and overflow pipes from e.g. bunded cells will be directed into silt ponds.
- An Emergency Response Plan will be available in the event of any inadvertent release of a large volume of sediment.
- The above will be overseen by a suitably qualified Environmental Supervisor with support from members of the BnM Ecology Team.

This mitigation measure has been included for the protection of watercourses in the receiving environment, downstream connected European Sites (River Shannon Callows SAC / Middle Shannon Callows SPA) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

### **3.4.1.6 Measures for cleaning Silt Ponds within EPA Blue line features**

Cleaning of silt ponds integrated into or adjoining EPA Blue line features, such as the Shannon Upper\_120 and Shannon Upper\_130 watercourses, will follow the below best practice measures.

- Consideration of seasonal restrictions for instream works (works to commence between April / May – October inclusive) and requirement to liaise / notify Inland Fisheries Ireland (IFI) in advance of cleaning works commencing.
- Cleaning works to align with best practice measures, including BnM Standard Operating Procedures (SOPs) for works within and near watercourses, works with hydrocarbons, biosecurity measures when working at and different watercourses and waterbodies.
- Cognisance of capture of non-target aquatic species (Crayfish, lamprey, small fish etc.) within the dredged material and the secure rescue and translocation of these species downstream of the pond cleaning works. Cleaning of silt ponds will be completed under licence (where required) and in accordance with strict biosecurity measures. Silt ponds will be cleaned from the inlet point to the outlet point allowing fish and aquatic life to migrate downstream as the works progress. The silt pond cleaning works and species translocation efforts will be overseen by a suitably qualified Project Ecologist or Environmental Supervisor and ongoing monitoring undertaken by the project ecologist.

- Excavated silt material will be placed at least 20m away from the blue line feature and will be deposited into corralled berms and thereafter secured into the nearby ground with the back of the machine excavator bucket, to ensure particulate matter is not mobilised during or following rainfall events.

It should be noted, that the silt pond network at Clooniff Bog will not be the sole mitigation measure to attenuate silt laden waters emanating from the site during the project construction and operational phases. The design of the PCAS scheme requires the creation of internal drain blocking measures, which will in itself reduce the possibility of surface run-off to the receiving environment during the rehabilitation works. However, the functionality of a silt pond feature is based on its capacity to assimilate and attenuate ongoing surface water flows. Silt ponds need to be cleaned and emptied regularly to ensure they have sufficient capacity to operate efficiently.

Once rehabilitation works are completed and the bog has been rehabilitated, the bog will act as a natural repository for surface water, regulating and slowing the movement of surface water from Clooniff Bog to the receiving environment. It is considered that the silt pond network will provide further attenuation and regulation to those measures associated with the PCAS measures during the project construction phase and the rewetted peatland habitat during the project's operational phase.

This mitigation measure has been included for the protection of watercourses in the receiving environment, downstream connected European Sites (River Shannon Callows SAC / Middle Shannon Callows SPA) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

#### **3.4.1.7 Silt Control Design Features**

Further detail is provided in this section on the proposed wetland attenuation area near the south-eastern corner of Clooniff Bog, in addition to silt control measures for Clooniff Bog (See Figure 19).

It is anticipated that once the pump near the south-eastern corner of the site is turned off, water levels within the nearby bog area will rise. Therefore, it is proposed to create an attenuation area at this location that will allow the settlement and subsequent controlled release of attenuated water from this section of the bog. This measure will also provide optimum water depth in this area for proposed rehabilitation measures. The development of the (bespoke to PCAS) attenuation area in this location is a bespoke silt attenuation measure that will inadvertent release of silt as a result of flood related pathways.



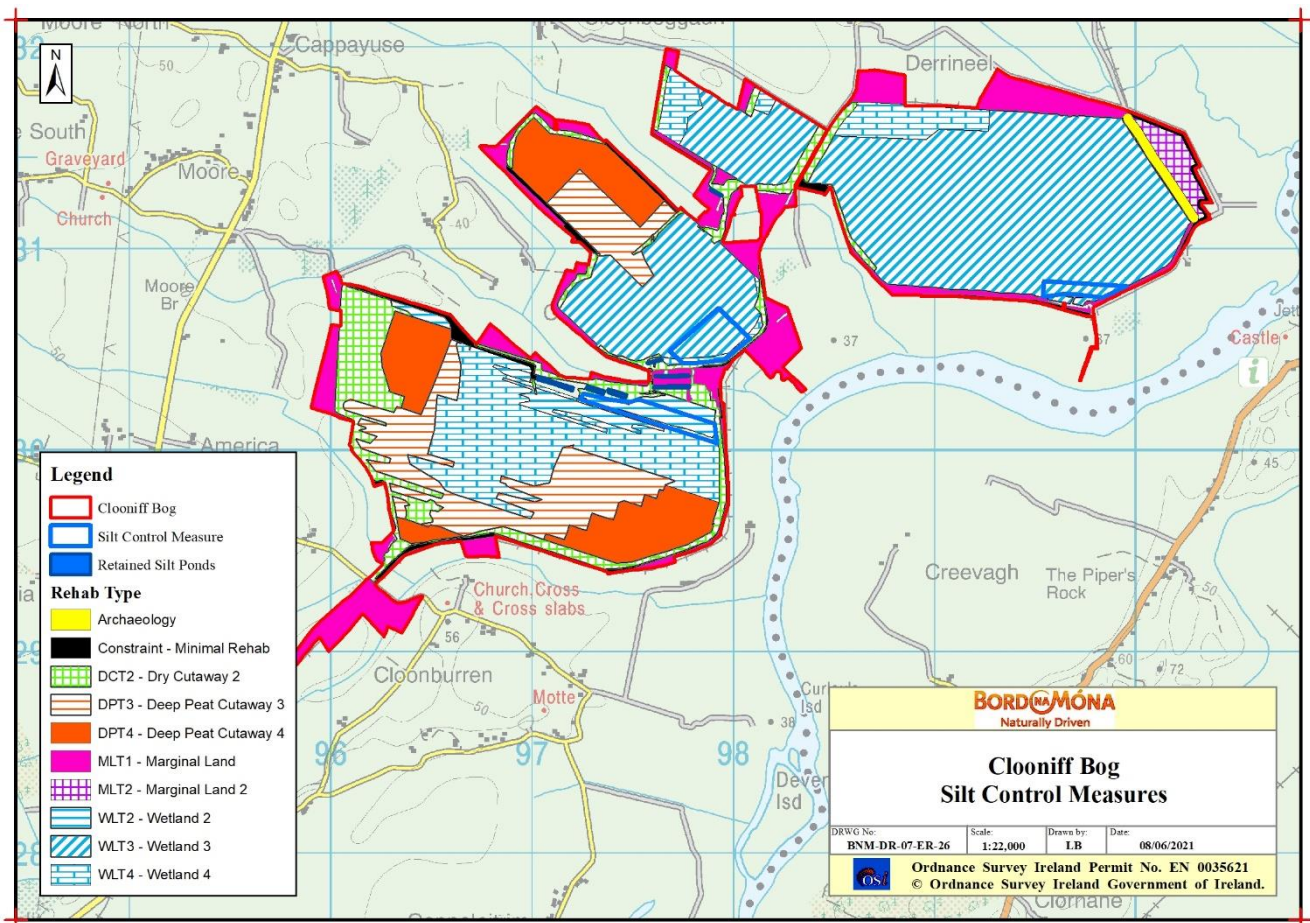


Figure 19 – Silt Control Measures for Clooniff Bog

#### 3.4.1.8 Mortality or disturbance to Otter

- Confirmatory surveys for active Otter holts and breeding activity will be carried out 150m upstream and downstream of suitable habitat prior to the commencement of works in close proximity.
- Should it be confirmed all works within 150m of an active otter holt, will be carried out during daylight hours and outside of 2 hours after sunrise or before sunset during summer and outside of 1 hours after sunrise or before sunset during winter.
- No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding otter Holts, and light work will not take place within 15m of such holts, except under license.
- The prohibited area associated with otter holts, should they be located in confirmatory surveys, will, where appropriate, be protected from any inadvertent disturbance from any works or personnel occurring nearby such as at a silt pond and declared as 'Ecology Restriction Zone' with no mention of otters to any onsite staff.
- Appropriate awareness of the purpose of the excluded area will be conveyed through toolbox talks with site staff and sufficient signage will be placed on each possible access point. All contractors or operators on site will be made fully aware of the procedures pertaining to Ecology Restriction Zones and subject to audits and non-conformance records in the event of non-compliance, to be included in reports submitted to Local Authorities and relevant Statutory Consultees.
- All PCAS activities will be carried out during daylight hours.
- All works will be carried out and completed in compliance with Bord na Mona's Standard Operating Procedure for otter (**Appendix G**).

This mitigation measure has been included for the avoidance of ex-situ effects to otter, a feature of Qualifying Interest for the River Shannon Callows SAC.

#### **3.4.1.9 Mitigation when undertaking flood avoidance measures and retention of hydraulic barriers**

The following mitigation and best practice measures will be undertaken at the Clooniff Bog site. Although drain blocking and consequent and hydrological rewetting of the Clooniff Bog site will occur, it is not intended to rewet or hydrologically alter adjoining lands or those areas surrounding the Clooniff Bog site. To this end, the following mitigation measures will be implemented:

- Maintenance of peripheral drains and where required, provision of additional drains, to create hydraulic barriers between the site and the receiving environment. This will mean that lands and local drainage patterns associated with the margins of the BnM site will be maintained;
- Maintenance of specified internal drains to avoid flooding where required to maintain existing drainage of adjacent lands. In some instances this may include re-grading or widening of specific existing drains which currently act as preferential flow paths through the bog.
- Monitoring of adjacent lands will also be specified.

This mitigation measure has been included for the protection of watercourses in the receiving environment, downstream connected European Sites (Middle Shannon Callows SPA / River Shannon Callows SAC) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

A map of displaying hydraulic breaks and flood defences is presented in **Figure 20** below. Existing flood defences are in place at Clooniff Bog, depicted by the black dashed line on **Figure 20**. The Green line displays proposed new hydraulic breaks, while the blue line depicts existing hydraulic breaks requiring maintenance.

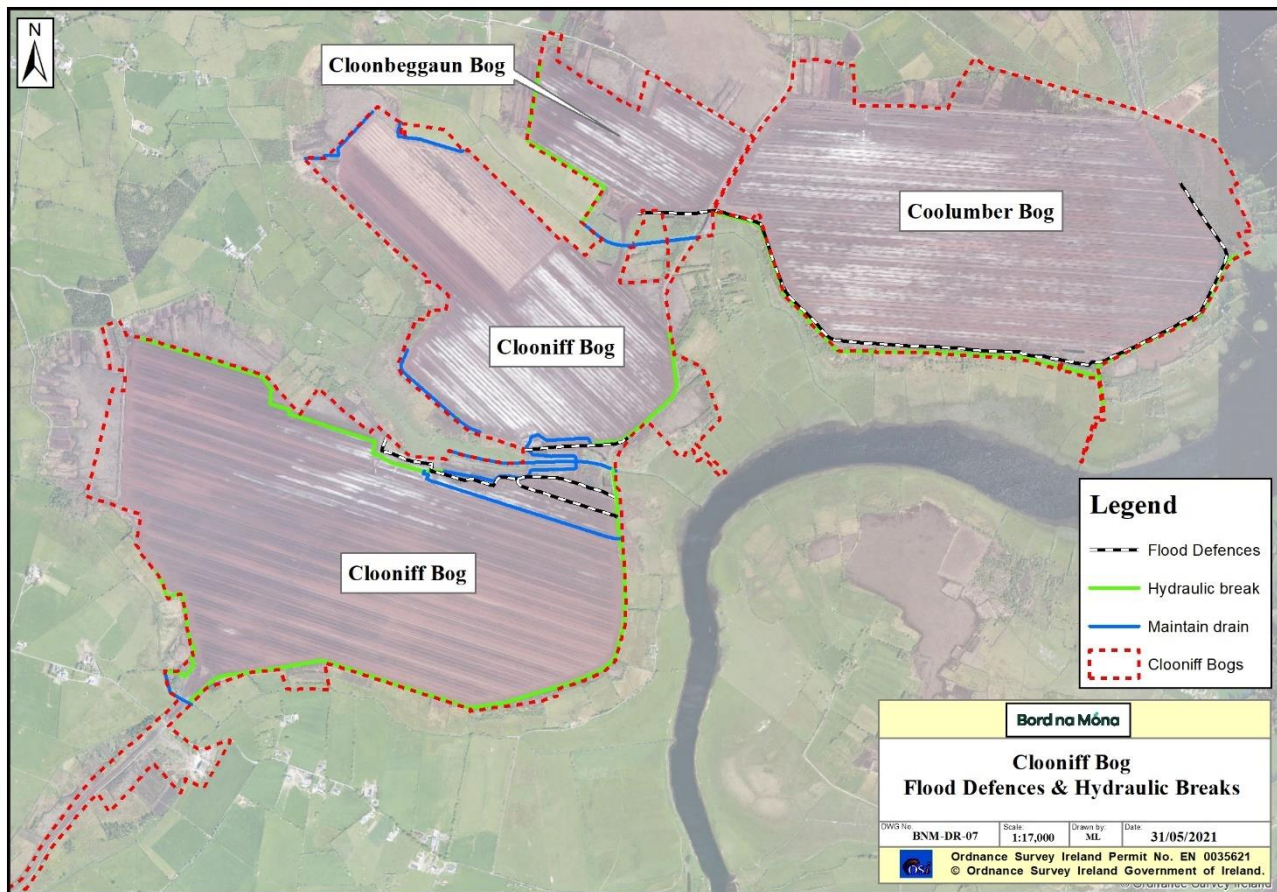


Figure 20: Flood Defences and Hydraulic Breaks

#### 3.4.1.10 Mitigation during upgrade of boundary or peripheral drains outside of the proposed rehabilitation footprint

Boundary drains may require upgrading to retain their functionality as hydraulic breaks between the site and adjoining lands. These works will be completed during periods of low flow and will follow the below sequencing:

- Prior to commencement of channel works, at least 2 no. check dams will be placed at the downstream end of the drainage channel to control the flow of suspended sediment downstream to receiving watercourses.
- The most downstream check dam will comprise locally sourced turves and double bagged sand bags to initially secure and check downstream flow within the channel. At least 10m upstream of this check dam, a peat dams will be created and keyed into the adjoining drainage channel banks following the methodologies presented in **Section 2.6.1.3**.
- The build-up of silt material upstream of the constructed check dams will be monitored during upgrade works and the silt material will be removed from the drainage channel during works as it builds up. The material will be removed from the channel, spread and levelled into the adjacent field, a minimum of 10m from the nearest drain.
- The constructed check dams will be inspected during periods of dry weather to ensure no 'cracking' of peat has occurred which might allow for discharge.

- Upon completion of the upgrade works, all silt will be removed from the drainage channel immediately upstream of the 2 standard drain blocks prior their removal. The 2 standard drain blocks will only be removed once all upgrade works are completed and once all water within the channel is suitably settled with no evidence of suspended solids within the water column.
- Where a new drain is required, it will be formed and established prior to connecting the drainage channel to wider drainage network. Only once it has formed and become established, with the bed and banks stabilised will it be connected to the wider drainage network. This approach will minimise to a negligible level the potential for suspend solids to be generated in waters within the new drainage channel and conveyed downstream to receiving watercourses and European Sites.
- An Emergency Response Plan will be available in the event of any inadvertent release of a large volume of sediment.

The set up of these features will be overseen by a suitably qualified Ecologist/Ecological Clerk of Works and ongoing monitoring undertaken by the project ecologist.

This mitigation measure has been included for the protection of watercourses in the receiving environment, downstream connected European Sites (Middle Shannon Callows SPA / River Shannon Callows SAC) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

#### **3.4.1.11 Mitigation through Design - Emergency Response Plan for Berm Failure**

The below mitigation measures will be put in place when constructing and working with berm features as part of the bog rewetting and rehabilitation process. The berm design adopts an empirical design approach. It is proposed to apply proven sizes, proportions, materials, and assemblies from existing successful rehabilitation measures and flood defense berm features carried out in the past by Bord na Mona. This represents mitigation for the proposed rehabilitation works through design; i.e. integrating key design principles into the rehabilitation efforts to restrict potential berm failure and consequent run-off to the receiving environment. Further details on berm design and mitigation incorporated into berm design is provided in **Chapter 7 of Appendix E - Engineering and Rehabilitation Design Specification**. Further to the above, **Figure 17** above presents an Emergency Response procedures to address peat spillage in the unlikely event of berm failure. See also Chapter 7 of Appendix E.

- The selection of an appropriate drain block spacing.
- Drain blocks are formed at a minimum of 300mm higher than the adjacent ground level and are relatively wide to create a relatively strong structure out of peat that will mitigate water flow eroding the drain block construction.
- The provision of a key in the drain ensures a tight seal is maintained and a strong structure is developed to mitigate the formation of preferential flow paths around the edges of the drain block.
- Operators assigned to this work element are familiar with the technique and process and provide effective robust drain blocks. The operators are experienced and capable of adapting to the particular conditions encountered within the bog.
- Qualified, experienced Engineers overseeing the works during the installation phase ensure that quality procedures of the various elements are implemented and effectively meet the standards for quality service and performance.



#### **3.4.1.12 Mitigation through maintenance and avoidance:**

- Ongoing monitoring of completed peat drain blocks in the weeks after formation will ensure they have consolidated.
- The risk associated with peat drain block failure from an environmental and rehabilitation measures impact is generally categorised as low as a peat drain block failure will result in an impact that is localised and silt control measures are provided upstream of all discharge points. There is an allowance for a reactive approach to remediation measures where required.
- A post rehabilitation Lidar and imagery survey will take place which will capture any areas where failures occurred resulting in remediation measures in a particular area if required. The Lidar survey will be implemented when the rehabilitation measures have been in place for a reasonable period of time allowing areas of weakness or potential concern to become apparent.
- In the event of a peat drain block failure, the adjacent peat drain blocks will generally have sufficient capacity to accommodate any additional hydrostatic pressures generated ensuring the negative impact is localised.
- If, after heavy rainfall, significant water flows in the drains cause localised drain block failure, the regular and frequent placing of drain blocks along the drain further downstream will mitigate the impact to the immediate area.
- As peat drain blocks are designed to retain water on the cutover resulting in a reduction in discharge into the boundary drains, preventing any negative impacts on adjacent agricultural land.

Further to the above, **Figure 17** above presents an Emergency Response procedures to address peat spillage in the unlikely event of berm failure.

This mitigation measure has been included for the protection of watercourses in the receiving environment, downstream connected European Sites (Middle Shannon Callows SPA / River Shannon Callows SAC) and their nutrient sensitive and water dependent habitats and species of Qualifying Interest.

#### **3.4.1.13 Measures to avoid disturbance or displacement to SCI bird species**

##### Birds

- An Ecological Restriction Zone will be adopted as part of the proposed rehabilitation works. This will include a buffered area ca. 150m from suitable seasonal wetland areas and cutover peatland habitats that supported (or has the capacity to support) feeding over-wintering avifauna within Clooniff and Coolumber Bogs – see **Figure 21** overleaf. Any potential disturbance to SCI birds outside of this Ecological Restriction Zone within Clooniff Bog are considered to be reversible and not significant. The proposed Ecological Restriction Zone supports a large area of ephemeral standing water at Coolumber Bog, in addition to two areas of cutover bog that support smaller numbers Whooper Swan for roosting and feeding purposes. PCAS activities will be restricted within this zone for the non-breeding period associated with the SCI species for which potentially adverse effect pathways exist.
- The extent of restriction will be overseen by the Project Ecologist dependant on water levels within the Ecological Restriction Zone and the usage of the site by avifauna. Works restrictions may be required between the months of October to March inclusive. The timing and duration of the restrictions and works practices during this period will be considered through ongoing liaison between the Project Ecologist and the project team.

- Once an Ecological Restriction Zone is operational, no PCAS scheme activities will take place within the prescribed zone. Travel and access within these sections of the site to undertake cleaning or maintenance activities may be permitted as they are likely to be intermittent, short term and of low intensity and duration. General usage will be restricted to use of existing rail and travel passes. All will be overseen by the Project Ecologist
- The timing restrictions associated with the Ecological Restriction Zone will be communicated to staff through toolbox talks, incorporated into the EMP for the project and visual markers will be placed on the peat extraction area to delineate the avoidance zone.
- Locations of these restriction zones will also be presented to the machine drivers via the built-in GPS tablet and ESRI application and the machine drivers will use this technology to avoid entering any restricted areas.
- Conformance will be audited through compliance checks by the Project Ecologist (with 'stop-works' authority).
- A standard operating procedure overseen by the Project Ecologist will be in place for all PCAS activities to avoid any significant effects on breeding birds. This will include ground nesting birds and will apply to silt pond cleaning, and cutaway activities. Restriction zones will be in place to avoid effects on any identified ground nesting birds/waterfowl as appropriate.



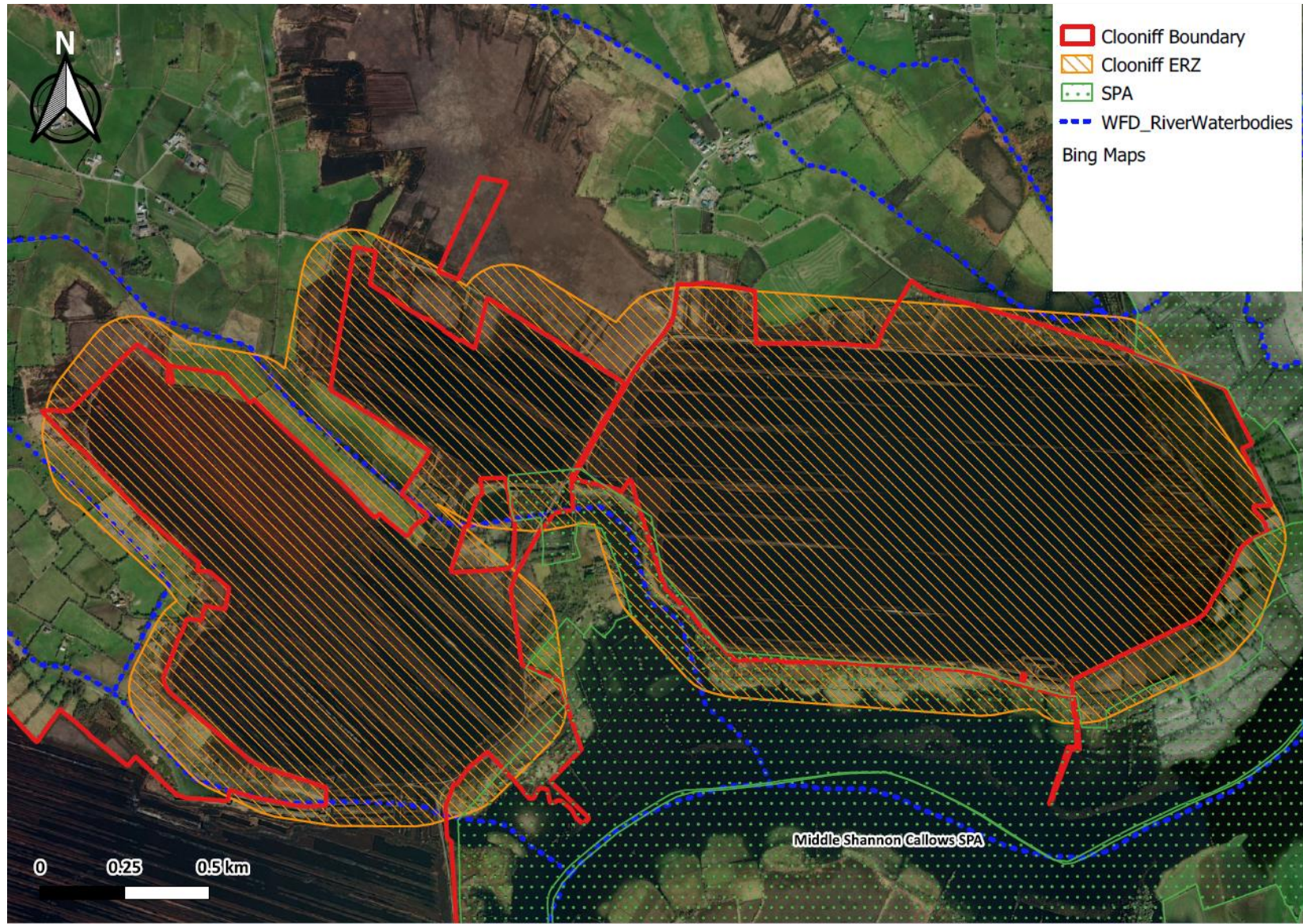


Figure 21: Ecological Restriction Zone in respect of overwintering avifauna

### 3.4.2 Effectiveness of these measures

The Mitigation Measures (Project Design Measures, Management Plans, Environmental Emergency Response Measures and Best Practice Measures), listed in **Section 3.4.1** above, have been developed by the hydrological/drainage and ecological expert members of the Decommissioning and Rehabilitation project team in Bord na Móna and use best practice water quality protection techniques which are tried and tested regularly across the country. Furthermore, a suitably qualified Environmental Supervisor will be employed during the construction stage to monitor the effectiveness of these measures on a daily basis. The Environmental Supervisor will be supported and assisted by members of the BnM Ecology Team as required. An Environmental Management Plan (EMP) has also been prepared for the proposed works (See **Appendix F**).

The watercourse crossing, drainage and water quality measures have been developed using relevant legislation, guidance and literature including:

#### 3.4.2.1 Watercourse crossing works and aquatic habitat protection guidance

- Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries during PCAS activities in and Adjacent to Waters;
- NRA (2008) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes; and,
- OPW (2013) Construction, Replacement or Alteration of Bridges and Culverts.
- EPA Ireland; Managing the Impact of Fine Sediment on River Ecosystems

#### 3.4.2.2 Pollution Prevention Guidance Notes (PPGs) & Guidance for Pollution Prevention (GPP)<sup>28</sup>

- PPG 1: Understanding your environmental responsibilities - good environmental practices
- GPP 2: Above ground oil storage tanks
- PPG 3: Use and design of oil separators in surface water drainage systems
- GPP 4: Treatment and disposal of wastewater where there is no connection to the public foul sewer
- GPP 5: Works and maintenance in or near water
- PPG 6: Working at construction and demolition sites
- PPG 7: Safe storage - The safe operation of refuelling facilities
- GPP 8: Safe storage and disposal of used oils
- GPP 8: Safe storage and disposal of used oils
- GPP 8: Safe storage and disposal of used oils
- GPP 19: Vehicles: Service and Repair
- GPP 21: Pollution incident response planning
- GPP 22: Dealing with spills
- GPP 26 Safe storage - drums and intermediate bulk containers
- PPG 27: Installation, decommissioning and removal of underground storage tanks

<sup>28</sup><https://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-pgps-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/>



### 3.4.2.3 Construction Industry Research and Information Association (CIRIA)<sup>29</sup>

- CIRIA Report C502 Environmental Good Practice on Site;
- CIRIA Report C532 Control of Water Pollution from Construction Sites: Guidance for consultants and contractors;
- CIRIA Report C648 Control of Pollution from Linear Construction Project; Technical Guidance;
- CIRIA Handbook C650 Environmental good practice on site;
- CIRIA Handbook C651 Environmental good practice on site checklist;
- CIRIA Report C609 - SuDS – hydraulic, structural & water quality advice; and,
- CIRIA Report C697 – The SuDS Manual.

### 3.4.2.4 Invasive Species Guidance

- Managing Japanese knotweed on development sites - The Knotweed Code of Practice produced by the Environmental Agency (2013)<sup>30</sup>;
- NRA Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (2010)<sup>31</sup>;
- Managing Invasive Non-native Plants in or near Freshwater, Environment Agency (2010)<sup>32</sup>;
- Best Practice Management Guidelines Japanese knotweed *Fallopia japonica*, Invasive Species Ireland (2015);
- IFI Biosecurity Protocol for Field Survey Work, Inland Fisheries Ireland (2010)<sup>33</sup>.

### 3.4.2.5 Guidance relating to Bird Disturbance

- Livesey et al., (2016) Database of bird flight initiation distances to assist in estimating effects from human disturbance and delineating buffer areas. *Journal of Fish and Wildlife Management* 7: 181–191.
- Scottish National Heritage (2009) Monitoring the impact of onshore wind farms on birds - January 2009. Guidance Note.
- Scottish National Heritage (2016) Dealing with Construction and birds. Guidance Version 3.
- Scottish National Heritage (2017) Survey Methods for Use in Assessing the Impacts of Onshore Windfarms on Bird Communities. Version 2. <https://www.nature.scot/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms>
- Fox, T. & Stroud, D.A. (2002). The Greenland White-fronted Goose *Anser albifrons flavoristis*. BWP Update 4:65-88.
- Hayhow, D.B. *Consequences of winter habitat use in a migratory shorebird*. Thesis submitted for the degree of Doctor of Philosophy at the University of East Anglia, Norwich, 2009

<sup>29</sup> Available from <https://www.ciria.org/>

<sup>30</sup> <http://cfins.scrf.co.uk/wp-content/uploads/2014/06/2013-code-of-practice.pdf>

<sup>31</sup> <https://www.tii.ie/technical-services/environment/construction/Management-of-Noxious-Weeds-and-Non-Native-Invasive-Plant-Species-on-National-Road-Schemes.pdf>

<sup>32</sup> <https://www.midsussex.gov.uk/media/1725/managing-invasive-non-native-plants.pdf>

<sup>33</sup> <https://www.fisheriesireland.ie/Biosecurity/biosecurity-protocol-for-field-survey-work.html>

#### 3.4.2.6 **Guidance relating to Mammal Disturbance**

- OPW (2013) Construction, Replacement or Alteration of Bridges and Culverts<sup>34</sup>.
- National Roads Authority. Guidelines for the treatment of Otters prior to the construction of National Road Schemes. <https://www.tii.ie/tii-library/environment/construction-guidelines/Guidelines-for-the-Treatment-of-Otters-prior-to-the-Construction-of-National-Road-Schemes.pdf>

#### 3.4.3 **Implementation of Mitigation Measures**

The Mitigation Measures (Project Design measures, Management Plans, Environmental Emergency Procedures and Best Practice Measures) will be implemented by the Project Manager/PSCS and BnM Project Staff during the Decommissioning and Rehabilitation stage. Implementation of the Mitigation Measures, will be implemented under an Environmental Management Plan for Clooniff Bog Decommissioning and Rehabilitation.

All protection measures have been designed in line with Best Practice and constitute the Best Available techniques following scientific literature and field baseline verification. As such there is a very high degree of confidence in their likely success.

Implementation of the mitigation measures for the Decommissioning and Rehabilitation activities will be the responsibility of Bord na Móna Operations and supervision of the works will be carried out by this Bord na Móna Department incorporating Area leaders, Operations Managers and Project Supervisor Construction Stage (PSCS).

In addition, implementation of the mitigation measures will be monitored and inspected by Bord na Móna Environmental, Ecology and Engineering Departments, who are independent of Bord na Móna Operations. Project Ecologists, Engineers and Environmental Compliance Officers will be appointed for each bog and they will ensure that measures are carried out in accordance with an Site-Specific Environmental Management Plan which sets out the required mitigation measures for each bog and defines the pertinent individual roles. The Ecologist, Environmental Compliance Officer, Engineer, H & S Manager, Site Supervisor and PSCS will have a 'stop works' authority.

#### 3.4.4 **Degree of confidence in the likely success of the mitigation measure**

All protection measures have been designed in line with Best Practice and constitute the Best Available techniques following scientific literature and field baseline verification. As such there is a very high degree of confidence in their likely success.

#### 3.4.5 **Monitoring of the Implementation and Effectiveness of the Mitigation Measures**

A degree of Monitoring is required under Condition 10.1 of the IPC license under which Peat Extraction and now Decommissioning and Rehabilitation is to take place. This environmental monitoring carried out during the aftercare and maintenance period of Decommissioning and Rehabilitation, has to ensure no Environmental Pollution has been caused, and is subject to an Independent Closure Audit (ICA) followed by an EPA Exit Audit (EA) in order to facilitate IPC License surrender.

This programme for monitoring, aftercare and maintenance has been designed to meet the Conditions of the IPC Licence and is defined as:

- There will be **initial quarterly monitoring assessments** of the site to determine the general status of the site, the condition of the silt-ponds, assess the condition of the rehabilitation work, monitoring of

<sup>34</sup><https://www.gov.ie/en/publication/957aa7-consent-requirements-constructionalteration-of-watercourse-infrastru/>

any potential impacts on neighbour's land, general land security, boundary management, dumping and littering.

- The number of these site visits will reduce after 2 years to bi-annually and then after 5 years to annual visits.
- These monitoring visits will also consider any requirements, if required, for further practical rehabilitation measures.
- The **baseline condition of the site will be established** post-rehabilitation implementation by using an aerial drone survey to take an up to date aerial photo, when rehabilitation is completed. The extent of bare peat will be assessed using this baseline data, and habitat maps will be updated, if required.
- A **water quality monitoring programme** at the bog will be established. The main objective of this water quality monitoring programme will be to establish a baseline and then monitor the impact of peatland rehabilitation on water quality from the bog. Monitoring of key environmental variables will include: Ammonia, Phosphorous, Suspended solids (silt), pH and conductivity. Water quality samples will be collected from the main drainage system from the bog at a designated point, before water leaves the site. Water quality samples will be collected at monthly intervals.
- If, after three years, key criteria for successful rehabilitation are being achieved and critical success factors are being met, then the water quality monitoring programme will be reviewed, with consideration of potential ongoing research on site. The water quality data, the drone surveys and the habitat mapping will be collated and will be submitted to the EPA as part of the final validation report.
- If, after three years, key criteria for successful rehabilitation have **not** been achieved and critical success factors have **not** been met, then the rehabilitation measures and status of the site will be evaluated and enhanced, where required. This evaluation may indicate no requirement for additional enhancement of rehabilitation measures but may demonstrate that more time is required before key criteria for rehabilitation has been achieved. Monitoring of water quality will then also continue for another period to be defined.
- Where other uses are proposed for the site, these will be assessed by Bord na Móna in consultation with interested parties. Other after-uses can be proposed for licensed areas and must go through the appropriate assessment process and planning procedures.

#### **3.4.6 How any mitigation failure will be addressed**

The Mitigation measures prepared specifically for this project have been designed in line with Best Practice and constitute the Best Available techniques following scientific literature and Best Practice. The Mitigation Measures are considered to be robust and proven measures which will avoid adverse effects to European Sites.

On this basis, it can be confidently concluded that failures in the mitigation measures and their prescribed outcomes will be avoided.

Nonetheless contingency measures will be in place for unforeseen events such as oil/fuel spillages, water pollution or any inadvertent release of sediment. This will ensure any unforeseen potentially adverse effects are identified in a timely manner and appropriate remedial action taken immediately. The Ecologist, Environmental Compliance Officer, Engineer, H & S Manager, Site Supervisor and PSCS will have a 'stop-works' authority to temporarily stop works over part of the site to avoid an infringement of the Environmental Commitments or an unforeseen environmental event. Works will not be allowed to re-commence until the issue is resolved.

### 3.5 Evaluation of the impact of Clooniff Bog Decommissioning and Rehabilitation on the Integrity of the European Sites under consideration

Using the checklist in the **Table 20** below, the proposed Clooniff Bog Decommissioning and Rehabilitation Plan, as described in Appendix B, both alone and in-combination with other projects, for adverse impacts on the integrity of the European Sites under consideration is examined, following the implementation of the measures described herein.

**Table 20: Integrity of European Site checklist**

<i>Does the project or plan have the potential to: Yes/No</i>	<b>Middle Shannon Callows SPA (Site Code 004096)</b>	<b>River Shannon Callows SAC (Site Code 000216)</b>	<b>River Suck Callows SPA (Site Code 004097)</b>
- cause delays in progress towards achieving the conservation objectives of the site?	No	No	No
- interrupt progress towards achieving the conservation objectives of the site?	No	No	No
- disrupt those factors that help to maintain the favourable conditions of the site?	No	No	No
- interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the site?	No	No	No
- change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure and/or function of the site?	No	No	No
- interfere with predicted or expected natural changes to the site (such as water dynamics or chemical composition)?	No	No	No
- reduce the area of key habitats?	No	No	No
- reduce the population of key species?	No	No	No
- change the balance between key species?	No	No	No
- reduce diversity of the site?	No	No	No
- result in disturbance that could affect population size or density or the balance between key species?	No	No	No



### 3.6 Conclusion

This Natura Impact Statement has been prepared to provide sufficient objective scientific information in support of the proposed development, in order to allow an Appropriate Assessment determination in the context of Article 6(3) of the Habitats Directive. The report has been prepared in order to evaluate the significance of potential effects on European sites from the proposed decommissioning and rehabilitation of Clooniff Bog, as described in Appendix B, alone and in-combination with other developments.

Appropriate Assessment Stage One Screening of all European sites identified within a 15km radius of the proposed development evaluated that the potential for significant effects on the Special Conservation Interests or Qualifying Interests of three no. European Sites could not be excluded. In particular, the potential for indirect effects via a deterioration in water quality, and from disturbance to /displacement to fauna.

Thus, the respective elements were brought forward for further critical examination in the Natura Impact Statement Report to inform the Appropriate Assessment process.

Following examination and analysis, and taking account of the protective measures proposed, the potential for

- disturbance and displacement of SCI waterbird species occurring within the Middle Shannon Callows SPA and River Suck Callows SPA were found not to result in adverse effects due to the protective measures around timing and scheduling of works, such as the implementation of an exclusion zone during the period when SCI's may present (**Section 3.4.1.13**). This exclusion zone (150m) is selected based on the largest Minimum Approach Distance or MAD for the SCI species under consideration and constitutes Best Available Scientific knowledge.
- Impacts to water dependent and nutrient sensitive Annex I habitats and species of River Shannon Callows SAC as a result of deterioration in water quality. These habitats and species are as follows: *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinia caerulea*) (6410), Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) (6510), Alkaline fens (7230), Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)\* (91E0), Otter (*Lutra lutra*) (1355)
- Disturbance and / or displacement of the otter population associated with the River Shannon Callows SAC.

The key protective measure being retention of silt laden water and potentially deleterious materials associated with the decommissioning and rehabilitation works to the project footprint. The attenuation of silt and particulate matter generated as a result of the proposed works is a key mitigation measure for the proposed rehabilitation and decommissioning works. The main source of potential impact to influence significant adverse effects to the downstream areas of the Middle Shannon Callows SPA and River Shannon Callows SAC relate to particulate matter run-off from the site, during the rehabilitation works. A key consideration in this regard will be drain blocking as described in **Section 3.4.1.5**. This methodology relies on the placement of terminal dams at the extremity of the drain; i.e. that closest to watercourse within the receiving environment. The securing of strategic peat dams will allow the hydraulic separation between the proposed rehabilitation works and the receiving and downstream aquatic environment, and in so doing isolating these works from sensitive ecological and environmental receptors within the project zone of influence and in the case of Clooniff Bog and the Middle Shannon Callows SPA / River Shannon Callows SAC. Other key mitigation measures include the standard best practice environmental control measures, measures to avoid berm failure, the utilisation of existing surface water management infrastructure and the provision of further bespoke surface water management and mitigation measures.

There are no significant effects identified which would adversely affect the Special Conservation Interests or conservation objectives of the various SPA's under consideration with regard to the densities, range or conservation status of the waterbird species and their supporting wetland habitats.

There are no significant effects identified which would adversely affect the Qualifying Interests or conservation objectives of the various SAC's under consideration with regard to the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.

The provisions of Article 6 of the 'Habitats' Directive 92/43/EC (2000) defines integrity as the 'coherence of the sites ecological structure and function, across its whole area, or the habitats, complex of habitats and/or population of species for which the site is classified'. It is clear that, given the application of prescribed protective measures for the avoidance of impacts and the implementation of the required mitigation measures, the proposed development will not give rise to adverse effects on the integrity of any of the identified European sites evaluated herein.

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## Appendix A FONSE: Finding of No Significant Effects Report (FONSE)

In accordance with the EC (2001) guidance document, *Assessment of plans and projects significantly affecting Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*, A Finding of No Significant Effects Report has been completed for the proposed Decommissioning and Rehabilitation Plan for Clooniff Bog. The standard matrix for this report provided in Annex 2 of the guidance document was followed. Line items in italics are taken directly from the guidance document.

Finding of No Significance Effects Report	
<i>Name and location of the Natura 2000 sites</i>	<p>The Screening Evaluation provided herein has examined the potential for any effects arising via source pathway linkages with regard to connectivity to designated European Sites (SACs and SPAs) within the zone of influence of all predicted Project impacts. An extended buffer zone of 15km was further considered, in line with NPWS guidance (DoEHLG, 2009), for evaluation of effects on any European Site which may arise associated with the proposed decommissioning and rehabilitation of Clooniff Bog, as required. There is a total of 13 European sites located within the 15km zone of consideration:</p> <ul style="list-style-type: none"> <li>- River Shannon Callows SAC (000216)</li> <li>- Mongan Bog SAC (000580)</li> <li>- Fin Lough SAC (000576)</li> <li>- Pilgrim’s Road Esker SAC (001776)</li> <li>- Moyclare Bog SAC (000581)</li> <li>- Ferbane Bog SAC (000575)</li> <li>- Crosswood Bog SAC (002337)</li> <li>- Ballynamona Bog And Corkip Lough SAC(002339)</li> <li>- Castlesampson Esker SAC (001625)</li> <li>- Lough Ree SAC (000440)</li> <li>- Middle Shannon Callows SPA (004096)</li> <li>- River Suck Callows SPA (004097)</li> <li>- Lough Ree SPA (004064)</li> </ul>
<i>Description of the project or plan</i>	<p><b>Overview:</b> Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Blackwater bog group (Ref. P0502-01). As part of Conditions 10.1 and 10.2 of this license, respectively, decommissioning and rehabilitation must be undertaken to ensure the permanent rehabilitation of the bog lands within the licensed area. Clooniff bog is part of the Blackwater bog group. Clooniff Bog is located in Co. Roscommon.</p> <p>A document titled ‘Clooniff Bog Cutaway Bog Decommissioning and Rehabilitation Plan 2021’ has been prepared specifically to describe the proposed decommissioning and rehabilitation measures at <b>Clooniff Bog</b> as appended to this document as Appendix B.</p>

Finding of No Significance Effects Report	
	<b>Purpose:</b> The decommissioning and Rehabilitation of <b>Clooniff Bog</b> as required under IPC license.
<i>Is the Project or Plan directly connected with or necessary to the management of the site (provide details)?</i>	No
<i>Are there other projects or plans that together with the project of plan being assessed could affect the site (provide details)?</i>	<p>Yes: In addition to the proposed decommissioning and rehabilitation plan the following projects were considered:</p> <ol style="list-style-type: none"> <li>1 Other BnM Bog Group Decommissioning and Rehabilitation</li> <li>2 NPWS Raised Bog Restoration at Barroughter Bog SAC and Cloonmoylan Bog SAC</li> <li>3 Agricultural Activity</li> <li>4 Turbary</li> <li>5 Agriculture</li> <li>6 Local Authority Development Plans</li> <li>7 Local and Regional Amenity Developments</li> <li>8 Local small residential and agricultural developments, extensions, alterations</li> </ol>
The Assessment of Significant Effects	
<i>Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site</i>	<p>Disturbance of SCI species using sections of Clooniff Bog and environs, within and ex-situ of the Middle Shannon Callows SPA.</p> <p>Disturbance of QI species using upstream, adjoining and downstream sections of the site and Lough Ree SAC.</p> <p>Indirect effects to downstream sections of the River Shannon Callows SAC and their component water dependent and nutrient sensitive habitats and species as a result of run-off to receiving watercourses during the rehabilitation works (such as siltation, hydrocarbons etc.).</p>
<i>Explain why these effects are not considered significant</i>	<p>Following examination and analysis, and taking account of the protective measures proposed, the potential for disturbance and displacement of SCI waterbird species occurring within Middle Shannon Callows SPA were found not to result in adverse effects due to the protective measures around timing and scheduling of works, such as the implementation of an Ecological Restriction Zone exclusion zone during the period when SCI's may present. This exclusion zone is selected based on the largest Minimum Approach Distance or MAD for the SCI species under consideration and constitutes Best Available Scientific knowledge.</p>

<b>Finding of No Significance Effects Report</b>			
	<p>The key protective measure being retention of silt laden water and potentially deleterious materials associated with the decommissioning and rehabilitation works to the project footprint. The attenuation of silt and particulate matter generated as a result of the proposed works is a key mitigation measure for the proposed rehabilitation and decommissioning works. The main source of potential impact to influence significant adverse effects to the downstream areas of the River Shannon Callows SAC relate to particulate matter run-off from the site, during the rehabilitation works. A key consideration in this regard will be drain blocking. This methodology relies on the placement of terminal dams at the extremity of the drain; i.e. that closest to watercourse within the receiving environment. The securing of strategic peat dams will allow the hydraulic separation between the proposed rehabilitation works and the receiving and downstream aquatic environment, and in so doing isolating these works from sensitive ecological and environmental receptors within the project zone of influence and in the case of Clooniff Bog and the River Shannon Callows SAC and Middle Shannon Callows SPA.</p>		
<b>Name of Agency or Body Consulted</b>	<b>Summary of Response</b>		
NPWS	<p>Formal consultation has been undertaken with NPWS regarding proposed Decommissioning and Rehabilitation Plans, including protected Sites. The findings and feedback from the consultation process have been fed into the final rehabilitation and decommissioning plans. Due cognisance was also given to information available on the NPWS website at:</p> <p><a href="https://www.npws.ie/development-consultations#">https://www.npws.ie/development-consultations#</a>.</p> <p>In addition, two meetings were held with the EAU to discuss consultation with the Minister in accordance with Regulation 42(9) of the European Communities (Birds and Natural Habitats) Regulations, 2011.</p>		
<b>Data Collected to Carry out the Assessment</b>			
<i>Who carried out the assessment</i>	<i>Sources of Data</i>	<i>Level of assessment completed</i>	<i>Where can the full results of the assessment be accessed and viewed</i>
<b>Delichon Ecology</b>	A combination of consultation, desktop studies and field surveys.	Screening for Appropriate Assessment  Appropriate Assessment – Natura Impact Statement	Bord na Móna, Leabeg, Blueball, Tullamore, Co. Offaly, R35 P304.

## **Appendix B Clooniff Bog: Cutaway Bog Decommissioning and Rehabilitation Plan 2020**



# Clooniff Bog

## Cutaway Bog Decommissioning and Rehabilitation Plan 2021



This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0502-01:

*“The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for permanent rehabilitation of the cutaway boglands within the licensed area.”*

*This licence condition requires Bord na Móna agree with the EPA the measures that will provide for rehabilitation, i.e. stabilisation of Clooniff Bog upon cessation of peat production and compliments the licence requirement to decommission the site.*

**Rehabilitation** generally comprises site stabilisation with natural colonisation with or without targeted management.

*In addition, to preparing this document to comply with Condition 10 of IPC Licence Ref. P0502-01, due regard was also given to the proposed Peatlands Climate Action Scheme (PCAS) announced by the Minister. This Scheme will see the Minister support, via the Climate Action Fund, Bord na Móna in developing a package of measures, ‘the proposed Scheme’, for enhanced decommissioning, rehabilitation and restoration of cutaway peatlands referred to as, the Peatlands Climate Action Scheme’. However, only the additional costs associated with the additional and enhanced rehabilitation, i.e. measures which go beyond the existing standard mandatory decommissioning and rehabilitation requirements arising from Condition 10 will be eligible for support. The additional costs of the proposed Scheme will be supported by Government through the Climate Action Fund, administered by the Department of Environment, Climate and Communications (DECC), while the National Parks and Wildlife Service (NPWS) will act as the Scheme regulator.*

*While this document outlines the enhanced rehabilitation measures planned for Clooniff Bog, measures which goes beyond that required by Condition 10 in the Licence, the list of interventions necessary to comply with the ‘standard’ requirement of Condition 10 (in the absence of the proposed Scheme) is also included. The inclusion of the ‘standard’ rehabilitation together with the enhanced rehabilitation in this document allows the Scheme Regulator to distinguish and objectively determine the specific measures (and their associated costs) eligible for support under the proposed Scheme.*

*Bord na Móna have defined the key rehabilitation outcome at Clooniff Bog as environmental stabilisation, re-wetting and setting the bog on a trajectory towards development of naturally functioning peatland habitats.*

*Any consideration of any other future after-uses for Clooniff Bog, such as amenity, are beyond the scope of this document but will be conducted in adherence to the relevant planning guidelines and consultation with relevant authorities and will be considered within the framework of this rehabilitation plan.*

### Document Control Sheet

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<b>Rev.</b>	<b>1.0</b>	<b>Author(s):</b>		<b>Checked By:</b>		<b>Approved By:</b>
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## SUMMARY

**Name of bog:** Clooniff                      **Area:** 530.3 ha

### Site description:

- Clooniff Bog was drained and developed for industrial peat production in the 1970s and has been in active peat production since the 1975. Peat production ceased in 2019.
- Clooniff Bog comprises four separate bog sub-units which have been managed differently over the course of production and development at the site.
- Much of the former peat production footprint is bare peat and contains active drainage channels; other areas are cutaway and some wetland vegetation has developed.
- Clooniff has a pumped hydrological regime. It is expected that when pumping is reduced or stopped that water levels will rise significantly across parts of the site. This has already occurred across a portion of the site.
- Where deep peat remains at Clooniff Bog, depths are up to 2.5m, although some parts the peat has been removed entirely to expose mineral deposits underlying the peat.
- The site is located adjacent to the River Shannon Callows and several designated conservation sites. In winter, the site can be inundated with water corresponding to winter flood levels on the River Shannon (the site forms part of the River Shannon floodplain).

### Rehabilitation goals and outcomes

Bord na Móna is committed to discharging the obligations arising from Condition 10 of the IPC licence.

- Meeting condition of the IPC licence;
- Stabilisation or improvement in water quality parameters (e.g. suspended solids);
- Optimising hydrological conditions for **climate action benefits as part of PCAS**. This will be achieved via intensive **re-wetting**.
- Optimising hydrological conditions for the development of wetlands, Reed swamp and fen on shallow cutaway peat, and eventually naturally functioning wetland and peatland habitats.
- Optimising hydrological conditions for the development of embryonic *Sphagnum*-rich vegetation communities in suitable deep residual peat areas.
- Rehabilitation will support the National Policies on Climate Action and GHG mitigation by maintaining and enhancing the current condition peat storage capacity of the bog (locking the carbon into the ground). In time, it is expected that the bog will develop its carbon sink function, in part, as *Sphagnum* communities develop across the bog. It will also support Ireland's commitments towards Water Framework Directive and the National River Basin Management Plan 2018-2021 and future National River Basin Management Plans.

### Scope of rehabilitation

The principal scope of this rehabilitation plan is defined by:

- The area of Clooniff Bog.
- EPA IPC Licence - Ref. P0502-01. As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The key objective of 'rehabilitation', as required by this licence, is achieved by the **environmental stabilisation** of the bog.
- **The proposed Scheme (PCAS)** includes enhanced measures which are designed to exceed/meet the standard stabilisation requirements as defined by the IPC Licence and to enhance the ecosystem services of Clooniff Bog, in particular, optimising **climate action benefits**.
- The local environmental conditions of this bog.
- The key goals and outcomes of rehabilitation at this bog outlined above.



- To minimise potential impacts on neighbouring land, some boundary drains around Clooniff Bog will be left unblocked as blocking boundary drains could affect adjacent land.

### Criteria for successful rehabilitation:

The Criteria for successful rehabilitation for IPC Licence validation and for climate action verification have been defined as:

- Rewetting of peat in the former area of industrial peat production to slow water movement across the site to retain silt, accelerating the development of vegetation cover via natural colonisation, and reducing the area of bare exposed peat (IPC Licence validation) through the creation of compatible wetlands, Reed swamp, fen, embryonic *Sphagnum*-rich habitats and other wetland and peatland habitats.
- Stabilising or reducing potential emissions to water (IPC Licence validation).
- Reducing pressure from peat production on the local river catchment (WFD).
- Optimising the extent of suitable hydrological conditions to optimise climate action (Climate action verification).
- Reduction in carbon emissions (Climate action verification).
- Setting the site on a trajectory towards establishment of a mosaic of compatible habitats including fen, Reed swamp, heath, scrub, Birch woodland and peatland communities, where conditions are suitable, and eventually towards a carbon sink (Climate action verification). These habitats will generally establish initially as pioneer vegetation. It will take some time for stable naturally functioning habitats to fully develop at Clooniff Bog.
- Improvement in biodiversity and ecosystem services. (Climate action verification).

Meeting climate action verification criteria and monitoring of these criteria is dependent on support from the Climate Action Fund or other sources of funding.

### Summary of measures:

The below section is a summary of measures proposed for rehabilitation.

- Planning actions, including developing a detailed site plan and carrying out a hydrological and drainage assessment.
- Carry out an ecological appraisal of the potential impacts of the planned rehabilitation.
- Carry out proposed measures, which will be a combination of pump management, outfall adjustment, drain blocking, peat field re-profiling, cell-bunding and fertiliser applications targeting headlands, high fields and other areas (where needed).
- Initial hydrological modelling indicates that a significant part of the site will develop a mosaic of wetland habitats with deeper water, when pumping is reduced or stopped. Hydrological management will look to optimise summer water levels to maximise the development of wetland vegetation (< 0.5 m where possible). Water-levels will be adjusted at outfalls.
- Phase 2 measures may include seeding of targeted vegetation and inoculation of *Sphagnum*, and further water level management
- Silt ponds will continue to be maintained during rehabilitation and decommissioning.
- Evaluate success of short-term rehabilitation measures outlined above and remediate, where necessary.
- Decommissioning of silt-ponds will be assessed and carried out, where required.

### Timeframe:

- 2020-2021: Short-term planning actions.
- 2020: Short-term practical actions.

- 2021-2024: Any Long term practical actions; Evaluate success of short-term rehabilitation measures outlined above and remediate, where necessary.
- 2024: Decommission silt-ponds, if necessary.

### Budget and Costing

- The rehabilitation plan outlined in this document is predicated on the understanding that it is the Minister's intention to support, via the Climate Action Fund, Bord na Móna in developing a package of measures, 'the proposed Scheme', for enhanced decommissioning, rehabilitation and restoration of cutaway peatlands referred to as, the Peatlands Climate Action Scheme'. *However, only the additional costs associated with the additional and enhanced rehabilitation, i.e, measures which go beyond the existing standard mandatory decommissioning and rehabilitation requirements arising from Condition 10 will be eligible for support.*
- In relation to the pre-existing Condition 10 IPC Licence requirement to carry out what can be termed the 'standard' decommissioning and rehabilitation, Bord na Móna maintains a Provision on its balance sheet to pay for these future costs when industrial peat extraction ceases. This is updated every year. For more information see the Bord na Móna Annual Report (Bord na Móna 2020). Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence.

### Monitoring, after-care and maintenance

The monitoring, after-care and maintenance programme for Clooniff Bog, as required to meet Condition 10 of the IPC Licence, is defined as:

- Quarterly monitoring assessments of the site to determine the general status of the site, assess the condition of the rehabilitation work, assess the progress of natural colonisation, monitoring of any potential impacts on neighbouring land and general land security. The number of site visits will reduce after 2 years to bi-annually. These site visits will assess the need for additional rehabilitation, if needed.
- **Water quality monitoring** will be established. Monitoring of key water quality parameters will include: pH, Flow, Suspended Solids, Total Solids, Total Phosphorus, Total Ammonia, Colour & COD

### Additional Monitoring:

- The monitoring and validation of re-vegetation via natural colonisation and changes in bog condition will be carried out using an aerial survey, after rehabilitation measures are implemented. It is proposed that sites can be monitored against this baseline in the future.
- Biodiversity Ecosystem services will be monitored using specific indicators.
- Carbon emissions monitoring only be carried out on a small proportion of BnM sites to develop better understanding of carbon emissions and GHG emission factors from different types of BnM sites and will be developed on association with other established research programmes. Reduction in carbon emissions will be modelled by a combination of habitat condition assessment and application of appropriate carbon emission factors derived from other sites. Baseline monitoring (habitat condition) will be carried after rehabilitation is completed (during the Scheme). It is proposed that sites can be monitored against this baseline in the future.
- Monitoring as part of Climate Action Verification is dependent on support from the Climate Action Fund or other external funding.

### Validation and IPC Licence surrender

Reporting to the EPA will continue until the IPC License is surrendered. The bog will be included in the full licence surrender process as per the Guidance to Licensees on Surrender, Cessation and Closure of Licensed Sites EPA, 2012, when:

- The planned rehabilitation has been completed.
- Water quality monitoring demonstrates that water quality of discharge is stabilising or improving.
- The site has been environmentally stabilised.

## 1. INTRODUCTION

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Blackwater bog group (Ref. P0502-01). As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The bog is part of the Blackwater bog group (see Appendix I for details of the bog areas within the Blackwater Bog Group). Clooniff Bog is located in Co. Roscommon.

This plan is a specific rehabilitation plan for the bog and outlines:

- Description of site management and status;
- Main issues and approaches to rehabilitation;
- Consultation to date with interested parties;
- Interaction with other policy and legislative frameworks (Appendix VI);
- The planned rehabilitation goals and outcomes;
- The scope of the rehabilitation plan;
- Criteria which define the successful rehabilitation and critical success factors required for successful rehabilitation;
- Proposed rehabilitation actions;
- Proposed timeframe to implement these actions;
- Budget and Costings; and
- Associated aftercare, maintenance and monitoring.

It is proposed by Government that Bord na Móna carry out a Peatlands Enhanced Decommissioning, Rehabilitation and Restoration Scheme on its peatlands. Note this proposal is also known colloquially as the 'Peatlands Climate Action Scheme' (PCAS). The additional costs of the proposed Scheme will be supported by Government through the Climate Action Fund, administered by the Department of Environment, Climate and Communications (DECC), while the National Parks and Wildlife Service (NPWS) will act as the Scheme regulator. Bord na Móna have identified a footprint of 33,000 ha as peatlands suitable for this scheme. This proposed Scheme will significantly go beyond what is required to meet rehabilitation and decommissioning obligations (Appendix VII & IX) under existing EPA IPC licence conditions. Improvements supported by the Scheme will ensure that environmental stabilisation is achieved (meaning IPC obligations are met), and importantly, significant additional benefits, particularly relating to climate action and other ecosystem services, will also be delivered.

Only the costs associated with the additional, enhanced and accelerated rehabilitation, i.e. those measures which go beyond the existing decommissioning and rehabilitation requirements arising from Condition 10, will be eligible for support under the proposed Scheme. Bord na Móna have now announced the complete cessation of industrial peat production across its estate (January 2021).

It is expected that the PCAS will have benefits accruing from biodiversity provision, water quality and storage attenuation as well as increased carbon storage, reduced carbon emissions and acceleration towards carbon sequestration. The Scheme will also facilitate monitoring of carbon fluxes (Greenhouse Gases and fluvial carbon) in selected areas (in addition to other established Research programmes), to monitor changes in where the improvements will accelerate the trajectory towards a naturally functioning peatland ecosystem.

It is envisaged that the proposed Scheme will support a combination of activities, interventions, or measures which accelerate the original timelines including:

- more intensive management of water levels through drain-blocking and cell bunding;

- re-profiling that will deliver suitable conditions for development of wetlands, fens and bog habitats;
- targeted fertiliser applications,
- seeding of targeted vegetation; and
- proactive inoculation of suitable peatland areas with *Sphagnum*.

These are collectively designed to optimise hydrological conditions (ideally and where possible water-levels <10 cm) for climate action benefits and to accelerate the trajectory of the site towards a naturally functioning ecosystem, and eventually a reduced carbon source/carbon sink again. In some areas of dry cutaway this trajectory will be significantly longer and it is not feasible in the short-term to re-wet some areas, which will develop other habitats. Other areas will naturally have deeper water). The key to optimising climate action benefits is the restoration of suitable hydrological conditions and more intensive intervention means that the extent of suitable hydrological conditions can be optimised.

These measures are designed to encourage the development of peat-forming habitats, where possible. They are also designed to further slow the movement of water across the site (with the site acting similarly to a constructed wetland), slowing the release of water (improving local water attenuation) and water quality is also expected to improve as the site returns to a naturally functioning peatland ecosystem. The measures will also accelerate the development of new habitats for a range of species under pressure in the wider landscape and will have the potential to develop habitats (e.g. Annex I raised bog, wetlands that support wader water birds of conservation interest) that will contribute towards the delivery of national biodiversity objectives.

Clooniff Bog is proposed to be part of this proposed Scheme and this rehabilitation plan outlines the approach taken.

### 1.1 Constraints and Limitations

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0502-01:

*“The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for permanent rehabilitation of the cutaway boglands within the licensed area.”*

It also seeks to outline measures to optimise climate action and other ecosystem services benefits, mainly through hydrological management.

This document covers the area of **Clooniff Bog**.

Biodiversity and ecosystem services have been identified as the current primary land-use at Clooniff Bog. The future use of Clooniff Bog has not been defined by Bord na Móna. Bord na Móna will continue to review the future after-use of its land-bank. Any consideration of any other future after-uses for Clooniff Bog, will be conducted in adherence to the relevant planning legislation and consultation with relevant authorities and will be considered within the framework of this rehabilitation plan.

Industrial peat extraction at Clooniff Bog ceased in 2019. Bord na Móna do not intend to carry out any industrial peat production at this site in the future, so industrial peat extraction is permanently ceased. Currently the majority of the former peat production area is bare peat. The combination of active enhanced rehabilitation measures and natural colonisation will quickly establish pioneer vegetation and will be planned to accelerate environmental stabilisation. Nevertheless, it will take some time (30-50 years) for naturally functioning peatland ecosystems to fully re-establish.

Parts of Clooniff Bog (outside the areas owned and under the control of Bord na Móna) are currently used by domestic turf cutters to harvest peat. These areas are ecologically and hydrologically linked to the area owned by Bord na Móna where rehabilitation is planned. It is beyond the scope of this rehabilitation plan to address turf cutting issues on Clooniff Bog that are outside of the control of Bord na Móna. Nevertheless, Bord na Móna are aware of such issues which may constrain the proposed rehabilitation actions, and this rehabilitation plan considered potential impacts of these on the delivery of the stated objectives.

Rehabilitation in other areas of the bog may also be constrained due to other property issues or issues such as rights of way.



## 2. METHODOLOGY

This rehabilitation plan was developed with a combination of desktop and field surveys, consultations with internal and external stakeholders and cognisance of the proposed Scheme (PCAS). The development of this rehabilitation plan considered **recently published** guidance issued by the EPA in 2020 – **Guidance on the process of preparing and implementing a bog rehabilitation plan**.

The ecological information and site information collected during the Bord na Móna ecological baseline survey, additional site visits and monitoring and desktop analysis forms the basis for the development of the rehabilitation plan for the bog, along with:

- Experience of 40 years of research on the after-use development and rehabilitation of the Bord na Móna cutaway bogs (Clarke, 2010; Bord na Móna, 2016);
- Significant international engagement during this period with other counties in relation to best-practise regarding peatland rehabilitation and after-use through the International Peat Society and the Society for Ecological Restoration (Joosten & Clarke, 2002; Clarke & Rieley, 2010; Gann *et al.*, 2019);
- Consultation and engagement with internal and external stakeholders;
- GIS Mapping;
- BNM drainage surveys;
- Bog topography and LIDAR data;
- Hydrological modelling; and
- The development of a **Methodology Paper (draft) outlining the proposed Scheme (PCAS)**. This rehabilitation includes enhanced measures defined in the Methodology Paper which are designed to exceed the standard stabilisation requirements as defined by the IPC Licence and to enhance the ecosystem services of the bog, in particular, optimising **climate action benefits**.

### 2.1 Desk Study

The desk study involved collecting all relevant environmental and ecological data for the study area. The development of the rehabilitation plan also takes account of research, experience and engagement with other peatland restoration and rehabilitation projects and peatland research including Irish, UK, European and International best-practise guidance (full citations are in the References Section):

- Anderson *et al.* (2017). An overview of the progress and challenges of peatland restoration in Western Europe.
- Barry, T.A. et al (1973). A survey of cutover peats and underlying mineral soils. Soil Survey Bulletin No. 30. Dublin, Bord na Móna and An Foras Taluntais.
- Bonn *et al.* (2017). Peatland restoration and ecosystem services- science, policy and practice.
- Carroll *et al.* (2009). *Sphagnum* in the Peak District. Current Status and Potential for Restoration. Moors for the Future Report No 16.
- Clark & Rieley (2010). Strategy for responsible peatland management.
- Eades *et al.* (2003). The Wetland Restoration Manual.
- Farrell & Doyle (2003). Rehabilitation of Industrial Cutaway Atlantic Blanket Bog, NW Mayo, Ireland.
- Gann *et al.* (2019). International Principles and Standards for the practice of Ecological Restoration.
- Hinde *et al.* (2010). *Sphagnum* re-introduction project: A report on research into the re-introduction of *Sphagnum* mosses to degraded moorland. Moors for the Future Research Report 18.

- Joosten & Clarke (2002). Wise Use of mires and peatlands – Background and Principles including a framework for Decision-making.
- Lindsay (2010). Peatbogs and Carbon: a Critical Synthesis to Inform Policy Development in Oceanic Peat Bog Conservation and Restoration in the Context of Climate Change.
- Mackin *et al.* (2017). Best practice in raised bog restoration in Ireland. Irish Wildlife Manuals, No. 99. National Parks and Wildlife Service,
- McBride *et al.* (2011). The Fen Management Handbook (2011), Scottish Natural Heritage.
- McDonagh (1996). Drain blocking by machines on Raised Bogs. Unpublished report for National Parks and Wildlife Service.
- NPWS (2017a). National Raised Bog Special Areas of Conservation management plan. Department of Arts, Heritage and the Gaeltacht.
- Quinty & Rochefort (2003). Peatland Restoration Guide, second edition. Canadian *Sphagnum* Peat Moss Association and New Brunswick Department of Natural Resources and Energy.
- Regan, *et al.* (2020). Ecohydrology, Greenhouse Gas Dynamics and Restoration Guidelines for Degraded Raised Bogs. EPA Research Report. Prepared for the Environmental Protection Agency by Trinity College Dublin.
- Renou-Wilson *et al.* (2011). BOGLAND - Sustainable Management of Peatlands in Ireland. STRIVE Report No 75 prepared for the Environmental Protection Agency.
- Schouten (2002). Conservation and Restoration of Raised Bogs: Geological, Hydrological and Ecological Studies. Dúchas - The Heritage Service of the Department of the Environment and Local Government, Ireland;
- Thom (2019). Conserving Bogs – Management Handbook.
- Wheeler & Shaw (1995). Restoration of Damaged Peatlands – with Particular Reference to Lowland Raised Bogs Affected by Peat Extraction.
- Wittram *et al.* (2015). A Practitioners Guide to Sphagnum Reintroduction. Moors for the Future Partnership.

Additional on-line resources were also incorporated into the desk study, including:

- Blackwater Integrated Pollution Control Licence;
- Blackwater Annual Environmental Reports;
- Review of the National Biodiversity Data Centre (NBDC) webmapper;
- Inland Fisheries Ireland (IFI) Reports;
- Environmental Protection Agency database ([www.epa.ie](http://www.epa.ie));
- EPA Guidance on Requests for Alterations to a Licensed Industrial or Waste Activity
- BirdWatch Ireland online data (including I-WeBS and CBS datasets; [www.birdwatchireland.ie](http://www.birdwatchireland.ie));
- Geological Survey of Ireland - National Draft Bedrock Aquifer map;
- Geological Survey of Ireland - Groundwater Database ([www.gsi.ie](http://www.gsi.ie));
- National Parks & Wildlife Services Public Map Viewer ([www.npws.ie](http://www.npws.ie));
- Water Framework Directive catchments.ie/maps/ Map Viewer ([www.catchments.ie](http://www.catchments.ie));
- OPW Indicative Flood Maps ([www.floodmaps.ie](http://www.floodmaps.ie)),
- CFRAM Preliminary Flood Risk Assessment (PFRA) maps ([www.cfram.ie](http://www.cfram.ie)),
- River Basin Management Plan for Ireland 2018 – 2021;
- Bord na Móna Annual Report 2020;

- Spatial data in respect of Article 17 reporting, available online at <https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17>.

## 2.2 Consultation

A number of stakeholders have been identified during the course of Bord na Móna's rehabilitation and Biodiversity Action Plan activities and are contacted during the rehabilitation planning process for their views. See Section 4.

## 2.3 Field Surveys

Bord na Móna carried out a baseline ecological survey of all of its properties in 2009-2012 and developed habitat maps. As part of this exercise, Clooniff Bog was surveyed in March 2012. The site was re-surveyed in 2016. The latest confirmatory visit took place in September 2020. This rehabilitation plan is informed by the original baseline survey as well as subsequent site walk-over surveys and visits, and updates to baseline data.

Habitat mapping followed best-practise guidance from Smith et al. (2011). Map outputs including all habitat maps and target notes were produced using GIS software application packages (ArcGIS). General marginal habitats and other habitats that had not been modified significantly by industrial peat extraction were classified using Fossitt *et al.* (2000). Plant nomenclature for vascular plants follows Stace (2010), while mosses and liverworts nomenclature follows identification keys published by the British Bryological Society (2010). A more detailed Bord na Móna classification system was developed for classifying pioneer cutaway habitats as Fossitt categories were deemed not to be detailed enough for cutaway bog (much of cutaway bog could be classified as Cutover Bog - PB4). Much of the pioneer cutaway vegetation is still at an early stage of its development and cannot be assigned to Fossitt Level 3 categories yet.

A detailed ecological survey report for Clooniff Bog is contained in Appendix II.

### 3. SITE DESCRIPTION

Clooniff Bog is located approximately 4 km to the north of Shannonbridge in Co. Roscommon, on the western banks of the River Shannon (see Figure 3.1). The surrounding landscape is a mosaic primarily consist of low-lying agricultural land (pasture) interspersed with other raised bogs, many of which have also been managed by Bord na Móna for peat production with some areas utilised for domestic turf-cutting. The River Shannon is immediately adjacent to the east and south corner of the site and parts of Clooniff form part of the flood plain of the River Shannon, regularly flooding during winter and at other times when the water levels on the river are high.

A rail line connects Clooniff bog with Cornafulla Bog to the north and to Cornaveagh Bog to the south. There is also road access to the site, with the several small public roads adjacent to the south, west and north of Clooniff Bog. The only infrastructure on-site, apart from the rail links and associated machinery access roads and tracks, is a small tea centre.

The bog comprises four distinct areas: southern, central, north-western and north eastern (See Figure 3.1 & 8.1). The north-western area is also called Cloonbeggane Bog (sub-site) and north-eastern area is also known as Coolumber Bog (sub-site).

#### 3.1 Status and Situation

##### 3.1.1 Site history

Clooniff Bog was drained and developed for industrial peat production in the 1970s and has been in active peat production since the 1975. Industrial peat production ceased in 2019. The peat was harvested from this site was used for fuel peat for West Offaly Power (WOP) in Shannonbridge.

##### 3.1.2 Current land-use

Industrial peat production has now permanently ceased at this bog. Biodiversity and ecosystem services have been identified as the primary land use at Clooniff Bog by Bord na Móna. The entire bog is not within the ownership of Bord na Móna and domestic turf cutting is having an impact on the bog, both within and outside the BnM boundary. A bog railway crosses through this site (Figure 3.5).

The River Shannon flows within close proximity to the eastern boundary of the site and two narrow strips of land (under BnM ownership) extend from the site to the River Shannon.

There are several known right of ways (ROWs) on this bog. These are generally located along the margin of the site and will not be impacted by rehabilitation.

##### 3.1.3 Socio-Economic conditions

Bord na Móna has historically been a vital employer for the rural community of the Midlands of Ireland. Bord na Móna compiled a report on the role of peat extraction in the midlands historically in which they report that in 1986, by the end of Bord na Móna's Third Development Programme, a total of twenty-three work locations had been established around the country. The company had an average employment of approximately 4,688 in the mid 1980's, with a peak employment of 6,100 during the production season, which placed it among the country's largest commercial employers. The importance of such levels of employment were largely due to its regional concentration in the Midlands and the lack of alternative employment opportunities at the time.

According to the Energy Crop Socio-Economic Study undertaken by Fitzpatrick Associates in 2011, there were an estimated 1,443 jobs supported by the peat-to-power industry in Ireland at the time, some 81% of which were located in the catchment areas of the three peat-fired generating stations (Lough Ree, West Offaly, and Edenderry Power Stations). These constituted jobs in the plants and in peat extraction, jobs indirectly supported in upstream supply industries and jobs induced through the trickle-down effects of the wages and salaries of those supported directly or indirectly.

In respect of Clooniff Bog, jobs included in the above study would have included those to facilitate extraction of peat at this site, and associated processing and transfer to the relevant power station.

As the primary employer in many Midland counties, Bord na Móna played a central role in building communities through several initiatives, including Education bursaries, support of local sporting clubs, the provision of community gain funds, charity programmes and the provision and building of amenity areas.”

These job numbers have now declined with the cessation of peat extraction at this bog. It is anticipated that the proposed scheme (PCAS) will provide some employment for a team of workers at this site for a period of time (> 1 year).



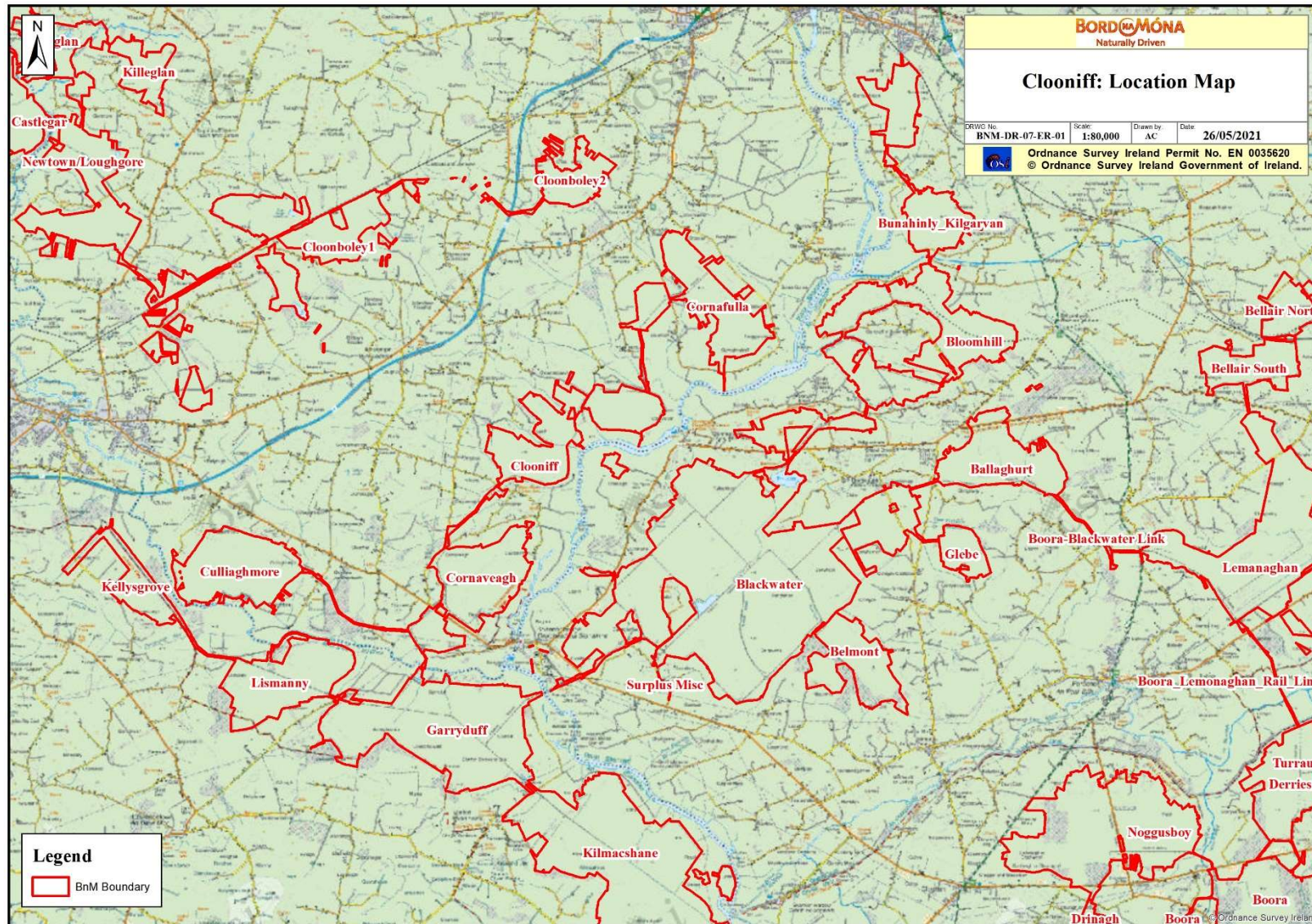


Figure 3.1 Location of Clooniff Bog in context to other Bord na Móna bogs and surrounding area





Figure 3.2 Aerial photo of Clooniff Bog (2020).

## 3.2 Geology and Peat Depths

### 3.2.1 Sub-soil geology

The majority of the underlying geology at Clooniff Bog is massive unbedded lime-mudstone, with a small area on the eastern site of dark muddy limestone and shale<sup>1</sup>. The underlying soils and sub-soils are classed as 'Raised Bog Cutover Peat'. The peat is underlain by glacial deposits interbedded with glacio-fluvial deposits over limestone bedrock. The glacial deposits generally consist of grey gravelly clay/silt. Some lacustrine deposits (lake-deposits) are also present under peat (lacustrine shell marl).

### 3.2.2 Peat type and depths

Although Clooniff Bog has been in commercial peat production for over 40 years, different parts of the bog have been developed at different times. The central and north-eastern sections are predominantly cutaway, with only small pockets of residual peat depth in excess of 2m. By contrast, the southern and north-western section have relatively larger deposits of residual peat, with large parts of the peat in these areas in excess of 2.5m deep (Figure 8.2).

## 3.3 Key Biodiversity Features of Interest

The majority of Clooniff Bog within the Bord na Móna boundary is bare peat as this site was in production until 2019 (see Figure 3.2). The River Shannon flows within close proximity to the eastern boundary of the site and two small streams flow through the site with a third stream flowing along the southern boundary of the site.

### 3.3.1 Current habitats

Although the majority of the site is classified as bare peat, many of the field drains support wetland plants such as Common Reed (*Phragmites australis*) as the dominant vegetation type. Marginal habitats include Birch woodland (WN7), remnant sections of raised bog (PB1), scrub (WS1) and cutaway bog (PB4). The remnant sections are generally small and are dry with a dominance of Ling Heather *Calluna vulgaris*. Coolumber Bog has been out of peat production for a longer period and has already developed pioneer cutaway vegetation dominated by Bog Cotton and Sedges, with Reeds.

The streams that flow through the site have been canalised and supports a small number of aquatic plant species. Riparian vegetation was mainly composed of Willow (*Salix* sp.), Common Reed and Reed Canary Grass (*Phalaris arundinacea*). A number of silt ponds are located adjacent to the streams.

A habitat map of the site is shown in Figure 3.4.

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<sup>1</sup> <https://www.gsi.ie/en-ie/data-and-maps/Pages/Bedrock.aspx>





Figure 3.3. View of the typical milled peat surface with existing drainage across Clooniff Bog

### 3.3.2 Species of conservation interest

Otter activity is high along the streams on-site and there is frequent evidence of Otter tracks, spraint and fish remains. It is likely that an Otter “couch” is situated on the site. Evidence of Badger and Pine Marten using the site have also been noted, and coarse fish including Bream and Roach have been observed in waterbodies on site.

Curlew, Lapwing, Redshank, Common Sandpiper, Ringed Plover and Snipe have all been recorded on Coolumber Bog during the summer. Given the habitat availability, it is likely that Lapwing, Ringed Plover and Snipe all breed on this site, and possible that both Redshank and Common Sandpiper also breed at Coolumber Bog. The Curlew (and possibly Redshank) records are more likely to relate to breeding birds from the adjacent Shannon Callows using this site for roosting, foraging or loafing if disturbed off the callows grassland where they more typically nest. Black-headed Gull have also been recorded on Coolumber Bog, but do not currently appear to be nesting on this site.

In winter, large numbers of wildfowl, particularly Mallard and Teal have been recorded on-site. Coolumber Bog is inundated during the winter from the River Shannon, and it is possible that wintering waterfowl associated with this site will use Clooniff Bog, and particularly Coolumber Bog, during the winter if the site is inundated.

### 3.3.3 Invasive species

Invasive alien species known to occur at the subject bog (or desktop review suggests presence is likely), and for which reasonably foreseeable source impact pathways for dispersal may result from the proposed PCAS are described here.

A broad range of common garden escapees/Invasive Alien Species are occasionally detected on or close to former peat production sites. All invasive flora species detected will be treated in line with Best Practice during PCAS activities, where necessary (Appendix V).

There are records of Rhododendron (*Rhododendron ponticom*) present in amongst the marginal habitats of the site. This species is listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011). Rhododendron has the potential to colonise portions of the site following the cessation of peat harvesting activities.

No other invasive alien species, as listed under Regulation (EU) 1143/2014 on the prevention and management of the introduction and spread of invasive alien species, likely to be further dispersed during or as a result of PCAS activities, has been recorded at Clooniff Bog.

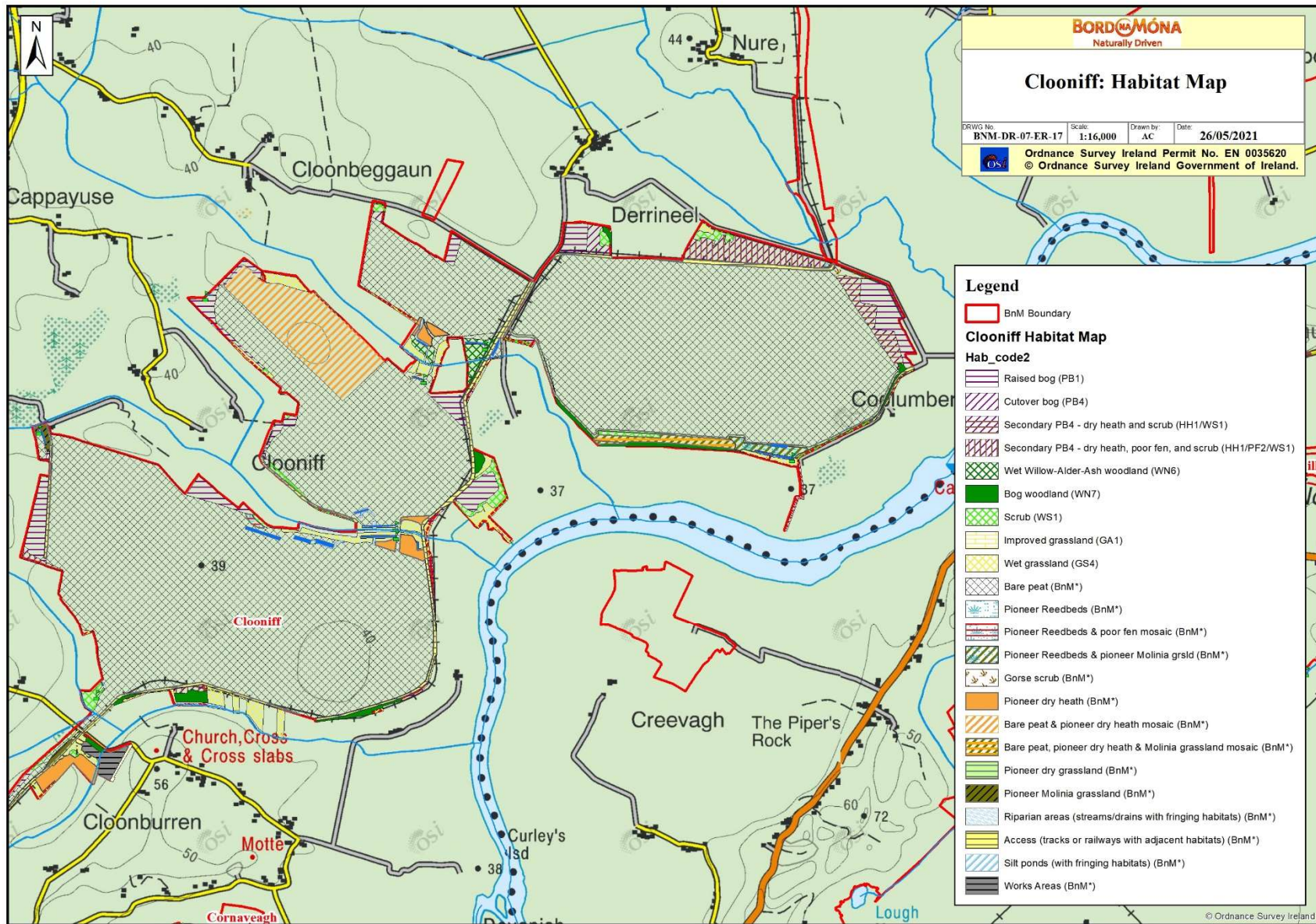


Figure 3.4. Habitat map of Clooniff Bog showing Bord na Móna habitat categorisation



### 3.4 Statutory Nature Conservation Designations

Clooniff Bog partially overlaps with the River Shannon Callows SAC and pNHA (NPWS Site Code: 000216) and Middle Shannon Callows SPA (NPWS Site Code: 004096) on the western periphery of the site as a whole and along the southern edge of Coolumber Bog (Figure 3.5). The River Shannon Callows SAC (and pNHA) is designated for grasslands (Molinia and Lowland Hay Meadows) as well as alluvial woodland and Otter. The Middle Shannon Callows SPA is designated for the assemblage of wintering wildfowl, many species of which occur in internationally and nationally important numbers as well, in addition to breeding Corncrake. It is also noted as being important for breeding waders and a range of other nationally scarce species such as breeding Shoveler, Quail and Whinchat.

#### 3.4.1 Other Nature Conservation Designations

The Ramsar Convention entered into force in Ireland on 15<sup>th</sup> March 1985. Ireland currently has 45 sites/wetlands designated as Wetlands of International Importance (Ramsar Sites). These cover a surface area of 66,994ha. There are no Ramsar Sites in the local vicinity of Clooniff Bog (i.e. within 3km) The closest Ramsar Sites to Clooniff Bog include Mongan Bog and Clara Bog.

<https://www.arcgis.com/apps/MapTour/index.html?appid=cd6e1a247bdc4179b9dfc0461e950f1e#>



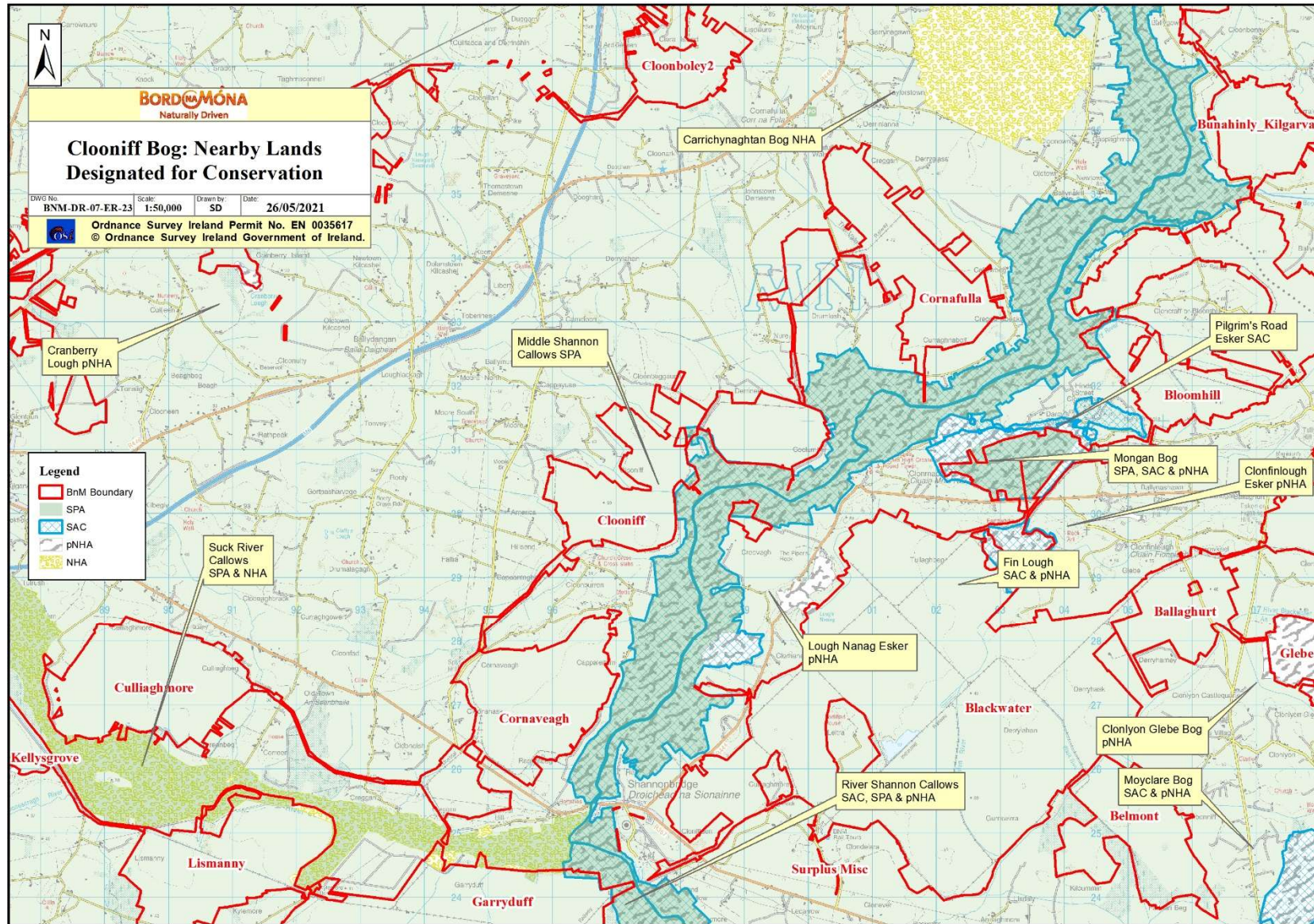


Figure 3.5 Location of Clooniff in context to other Bord na Móna bogs and designated lands in the surrounding area.

### 3.5 Hydrology and Hydrogeology

Clooniff Bog is located in the Upper River Shannon catchment. The majority of the bog is drained by four watercourses that flow west to east in the vicinity of the bog. To the south, the southern side of the southern bog sub-site drains into the Rooty (and subsequently the Hillsend) streams; between the southern and central section, the bog drains in to the Moore North stream and the central and two northern bog sections drain in to the Ballydangan stream which flows between the north-west and central bog sub-sections and to the south-west of Coolumber Bog. Coolumber Bog also drains directly into the River Shannon. There is another watercourse on the northern edge of Coolumber Bog, the Derinneel stream, but this does not appear to be linked to any of the drainage systems on this bog. All the streams flow into the River Shannon.

Clooniff Bog currently has a pumped drainage regime. It is expected that when pumping is reduced or stopped that water levels will increase across a significant portion of the site. Initial hydrological modelling indicates that the 4 sub-sites all have basins that will develop a mosaic of wetland habitats when pumping is reduced or stopped. Coolumber Bog is expected to revert to a mosaic of wetland habitat with deeper water (> 2 m).

Six silt ponds are present at the edges of the various bog sub-sections where they drain in to the respective watercourses:

- On the southern edge of the southern section where it drains in to the Rooty stream;
- On the northern edge of the southern section and southern and western edge of the central section where they drain into the Moore North stream;
- On the northern edge of the central section, southern edge of the north-western section and south-west corner of Coolumber Bog where they drain in to the Ballydangan stream; and
- On the southern edge of Coolumber Bog where it drains in to the River Shannon.

The bog is located in an area with a locally important bedrock aquifer (Li) with Bedrock that is moderately productive only in local zones (EPA map-viewer). An aquifer is an underground body of water-bearing rock or unconsolidated materials (gravel or sand) from which groundwater can be extracted in useful amounts. GSIs Aquifer classes are divided into three main groups based on their resource potential, and further subdivided based on the type of openings through which groundwater flows. There are nine aquifer categories in total. Locally important aquifers are capable of supplying locally important abstractions (e.g. smaller public water supplies, group schemes), or good yields (100-400 m<sup>3</sup>/d). This data gives an indication of sub-surface deposits (bedrock and unconsolidated materials) in terms of their groundwater resource potential and dominant groundwater flow type.

The bog is largely located in an area mapped by GSI as of low groundwater vulnerability, although parts of the periphery of Clooniff are mapped as being of moderate vulnerability (GSI Mapviewer). Groundwater Vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. Groundwater vulnerability maps are based on the type and thicknesses of subsoils (sands, gravels, glacial tills (or boulder clays), peat, lake and alluvial silts and clays), and the presence of karst features. Groundwater is most at risk where the subsoils are absent or thin and, in areas of karstic limestone, where surface streams sink underground at swallow holes. These data indicate there is generally low risk of any groundwater contamination occurring at this site, although care must be taken if working at the site periphery.

The peat is underlain by glacial deposits interbedded with glacio-fluvial deposits over limestone bedrock. The glacial deposits generally consist of grey gravelly clay/silt. The bog water table across the site is expected to be

high when bog drains are locked, and perched above the underlying regional groundwater table. The ability of the shallow peat water to interact with the underlying regional groundwater flows is limited by the permeability of the underlying glacial deposits. As such the potential for bog restoration to interact or impact on underlying groundwater is very low.

### 3.6 Emissions to surface-water and water-courses

#### 3.6.1 Clooniff Bog Drainage

Clooniff bog surface water outlets discharge to the Upper Shannon water body IE\_SH\_26 S021800, via a number of feeder streams, including the Hillsend, Ballydangan and Moore streams, and also direct to the Shannon.

Peat extraction was identified as pressure in the second cycle of the river basin management plan in some of these feeder stream, but are not indicated as remaining so in the third cycle, currently under preparation, however the main receiving water body, the Shannon upper 120, is highlighted as remaining under pressure from peat extraction.

Details of silt ponds, associated surface water emission points and those being monitored and sampled as part of the PCAS scheme are detailed on the attached Water Quality Map.

There is a robust monitoring program to track and verify any changes in baseline water quality conditions pre and post decommissioning and rehabilitation so that the success or otherwise can be tracked and verified for the National Parks & Wildlife Service, Environmental Protection Agency and Local Authority Water Program, amongst a range of stakeholders.

The main emission limit value associated with this bog is 35mg/l suspended solids, with trigger levels for ammonia of 4.27mg/l and COD 100mg/l.

From an analysis of any monitoring over the past 3 yrs. of the IPC licence environmental monitoring of some of the discharges from this bog, indicate that results were under the ELV for SS and trigger level for ammonia. In some incidents, there have been COD results of above 100 mg/l, more related to natural sub-soil/surface water interactions.

Bog	SW	Monitoring	pH	SS mg/l	TS mg/l	Ammonia mg/l	TP mg/l	COD mg/l	Colour
Clooniff	SW-58	Q1 19	6.5	12	222	<0.02	0.11	138	264
Clooniff	SW-54	Q2 19	6.2	<5	150	<0.02	0.06	57	353
Clooniff	SW-54	Q1 18	6.2	5	136	0.56	0.05	79	253
Clooniff	SW-54	Q1 17	6.5	5	106	0.43	0.05	89	279
Clooniff	SW-58	Q1 17	6.7	5	70	0.07	0.05	65	285
Clooniff	SW-51	Q2 17	7.4	17	174	2.5	0.05	110	252
Clooniff	SW-52	Q2 17	7.4	10	230	1.2	0.05	106	191
Clooniff	SW-53	Q2 17	7.1	5	130	0.02	0.05	97	359
Clooniff	SW-57	Q2 17	8.5	35	196	0.04	0.05	93	96
Clooniff	SW-61	Q2 17	7.9	5	336	0.06	0.05	33	64

Table 3.1. Water quality data at Clooniff Bog.

### 3.6.2 *Decommissioning and Rehabilitation Programme Water Quality Monitoring.*

The licence obligation of quarterly sampling regime on a selected number of ponds to be sampled over a 3 year cycle will not be sufficient to be able to appropriately track the changing water chemistry that will occur as part of this enhanced rehabilitation programme, so this sampling regime will occur on a monthly basis.

In order to assist in monitoring surface water quality from this bog, it was agreed to increase the existing licence monitoring requirements of the IPC Licence, to sampling for the same parameters every month.

This new sampling programme commenced in November 2020 and is enabling a baseline to be established, with sampling to progress during the scheduled works, and for a period of up to 2 years post rehabilitation. Depending on the period required to confirm that the main two parameters, suspended solids and ammonia as remaining compliant with the licence emission and trigger limit values and there is an improving trajectory in these two parameters i.e. reduction in concentration, the monitoring programme and intensity will be periodically reviewed and amended.

In the preparation of this monitoring programme, Bord na Moña have been providing the Local Authority Water Programme (LAWPRO) with details of the surface water emissions points associated with this bog and will be amending some of the proposed monitoring locations on foot of this engagement. LAWPRO have in turn provided details of their 2021 monitoring programme and these are included in the WQ map in appendix x

This is necessary to ensure that there is alignment with the WFD monitoring programme and that where possible, the monitoring programme will enable any improvements in water quality or establishing trends to be quantified against any available WFD monitoring data. It will also enable the periodic sharing of data which will inform the monitoring reports, success criteria and enable LAWPRO under the Water Framework Directive to track any changes in pressures and be aware of changes in water chemistry.

This enhanced monitoring programme will aim to include a minimum of 70% of a bogs drainage catchments, whatever number of surface water outlets these include.

Monitoring results will be maintained, trended every six months and reported on each year and as required, as part of the requirement to report on Condition 10.1 of the IPC Licence on Bog Rehabilitation in the Annual Environmental Report, and will be provided to LAWPRO and the EPA as required to inform progress and national monitoring requirements under the WFD. These results will also be available in April each year as a requirement of the Annual Environmental Report at [www.epa.ie](http://www.epa.ie).

The parameters to be included as per condition 6.2 of the IPC Licence include monthly monitoring for pH, Flow, Suspended Solids, Total Solids, Total Phosphorus, Total Ammonia, Colour & COD. In addition, DOC has been included as a parameter to try and identify any changes in carbon in the surface water, and where required by LAWPRO, to assist in investigating other changes in water chemistry, the series of parameters can be reviewed and amended.

### 3.6.3 *Success criteria:*

The key water quality success criteria associated with this enhanced rehabilitation are as follow:

- That there is a stabilizing/improving concentration of suspended solids and ammonia in discharges from Bord na Moña sites, associated with the measures undertaken to stabilize the peat surface by the blocking of the internal drainage system and the maximized rewetting of the peat surface.
- Receiving water bodies have been classified under the River Basin Management Plan and this classification includes waters that are At Risk from peatlands and peat extraction. The success criteria will be that



the At Risk classification will see improvements in the associated pressures from this peatland or if remaining At Risk, that there is an improving trajectory in the pressure from this peatland.

With regard to predicting and estimating likely trends that might materialize or could be considered as a target, monitoring of surface water ammonia emissions from Longfordpass bog in Littleton over 3 yrs., post cessation of peat extraction with ongoing rehabilitation, were considered. These are indicating a downward trend in Ammonia concentrations.

As the monthly monitoring program at Cloniff continues in 2021 during the rehabilitation works, and data from the 2020 monitoring program is compiled, further trending will be produced to verify any ongoing trends.

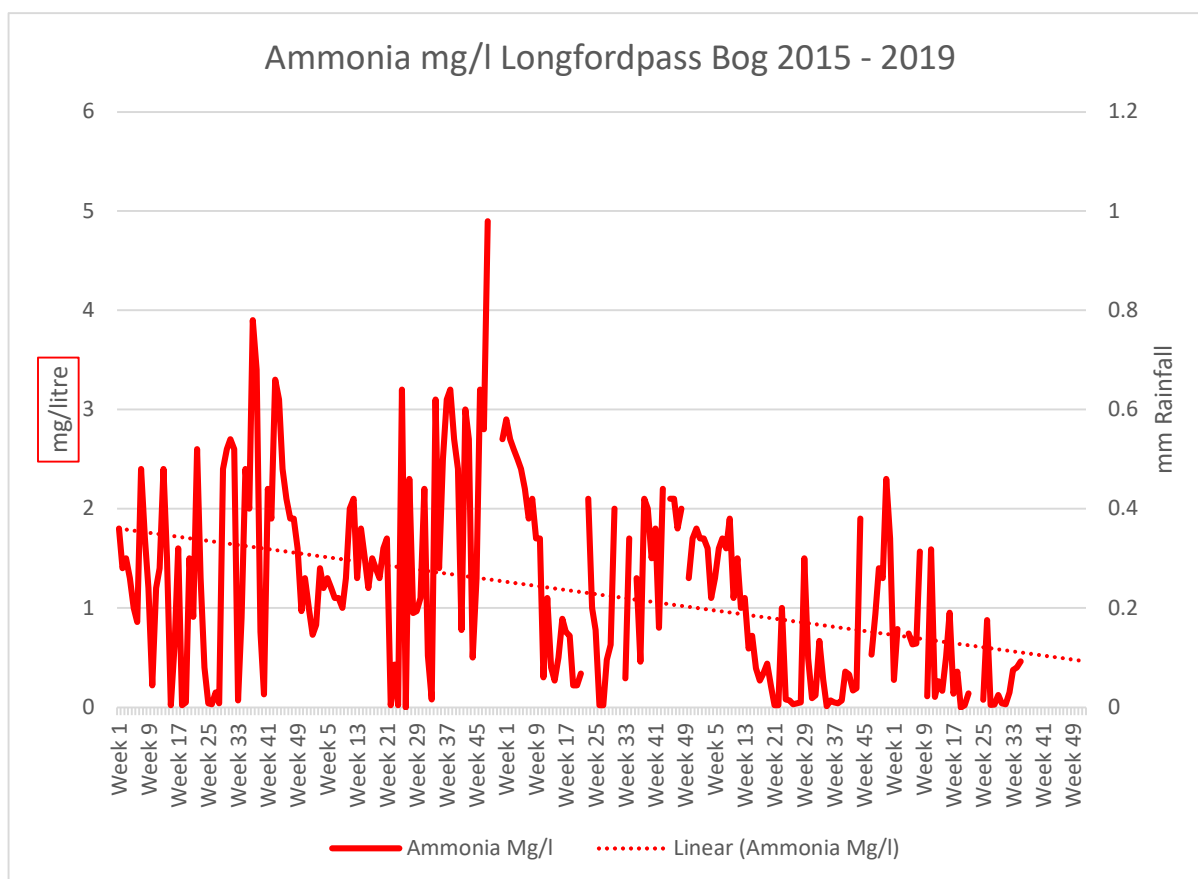
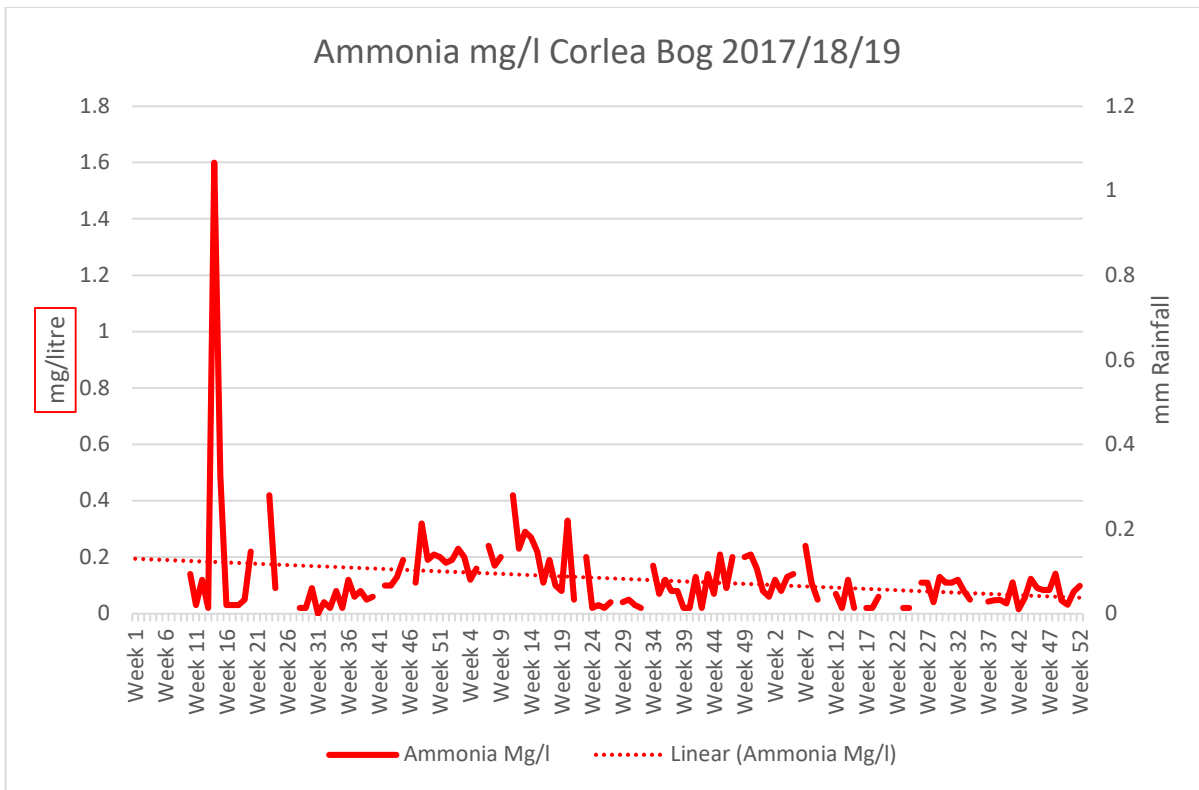


Figure 3.6 Ammonia emissions graph for Longfordpass Bog 2015 – 2019

As the monthly monitoring program at Edera continues in 2021 during the rehabilitation works, and data from the 2020 monitoring program is compiled, further trending will be produced to verify any ongoing trends.





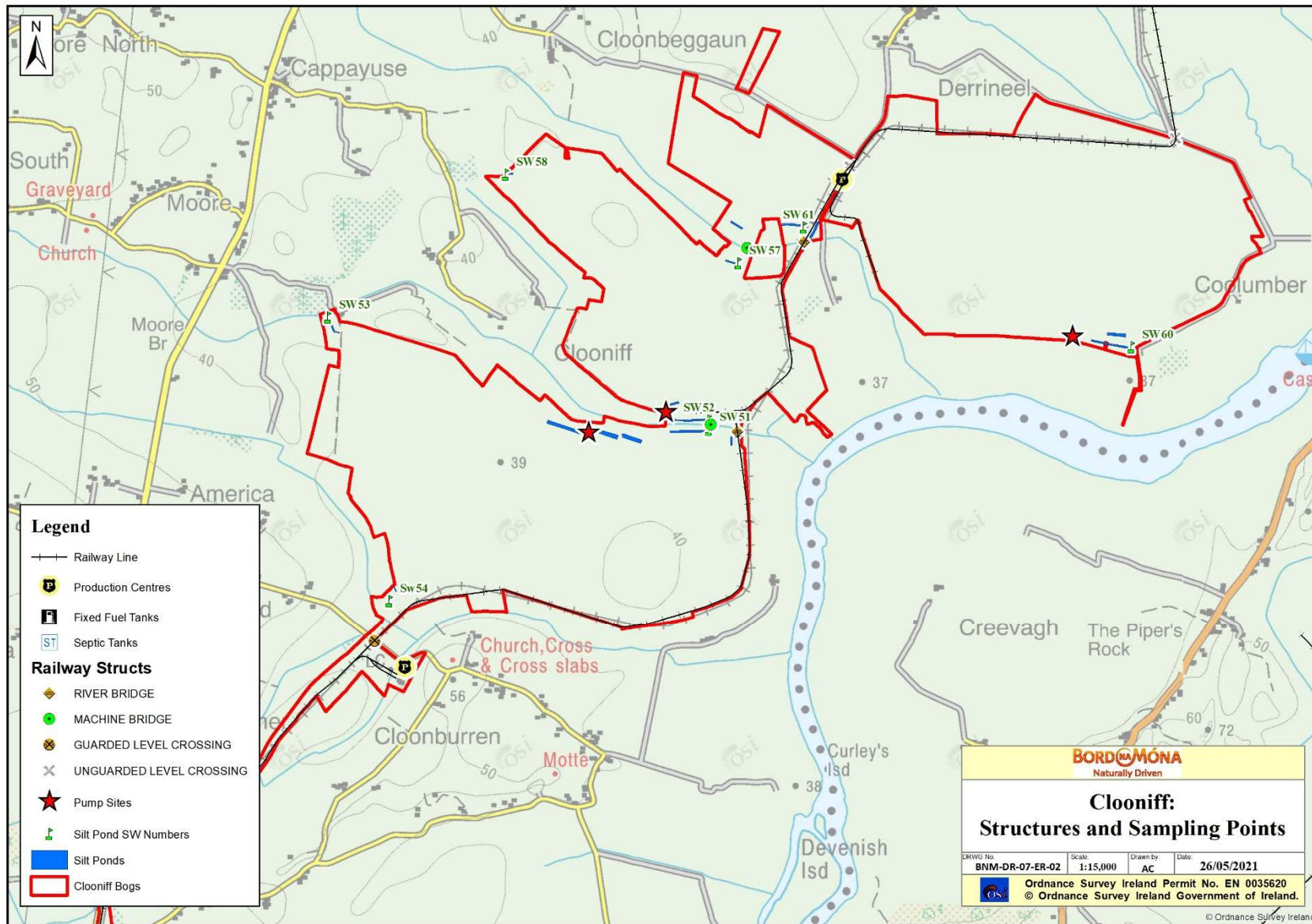


Figure 3.7 Map of Clooniff Bog showing structures and designated emission points

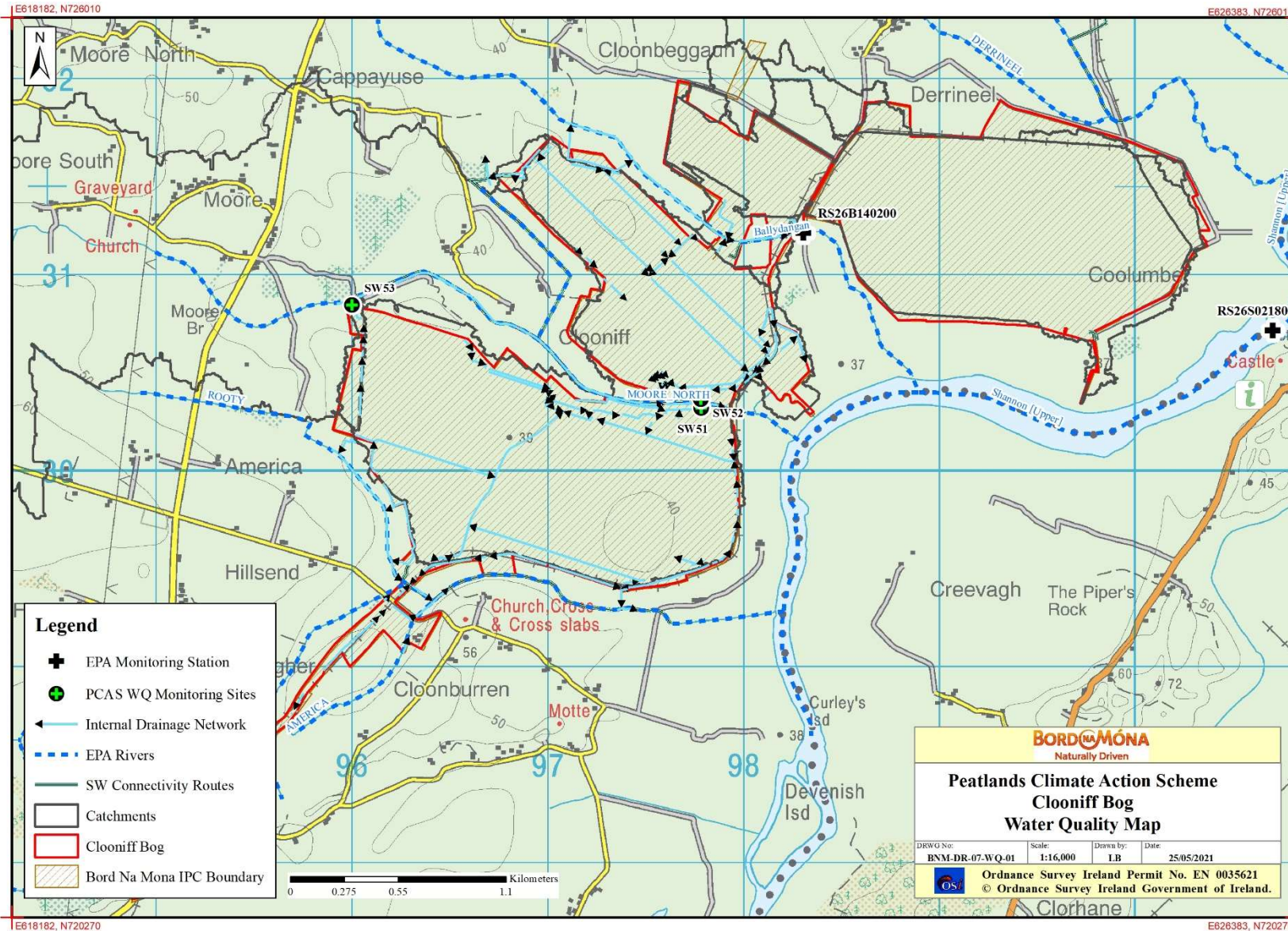


Figure 3.8a Map of Clooniff Bog showing water management features and water quality monitoring points.



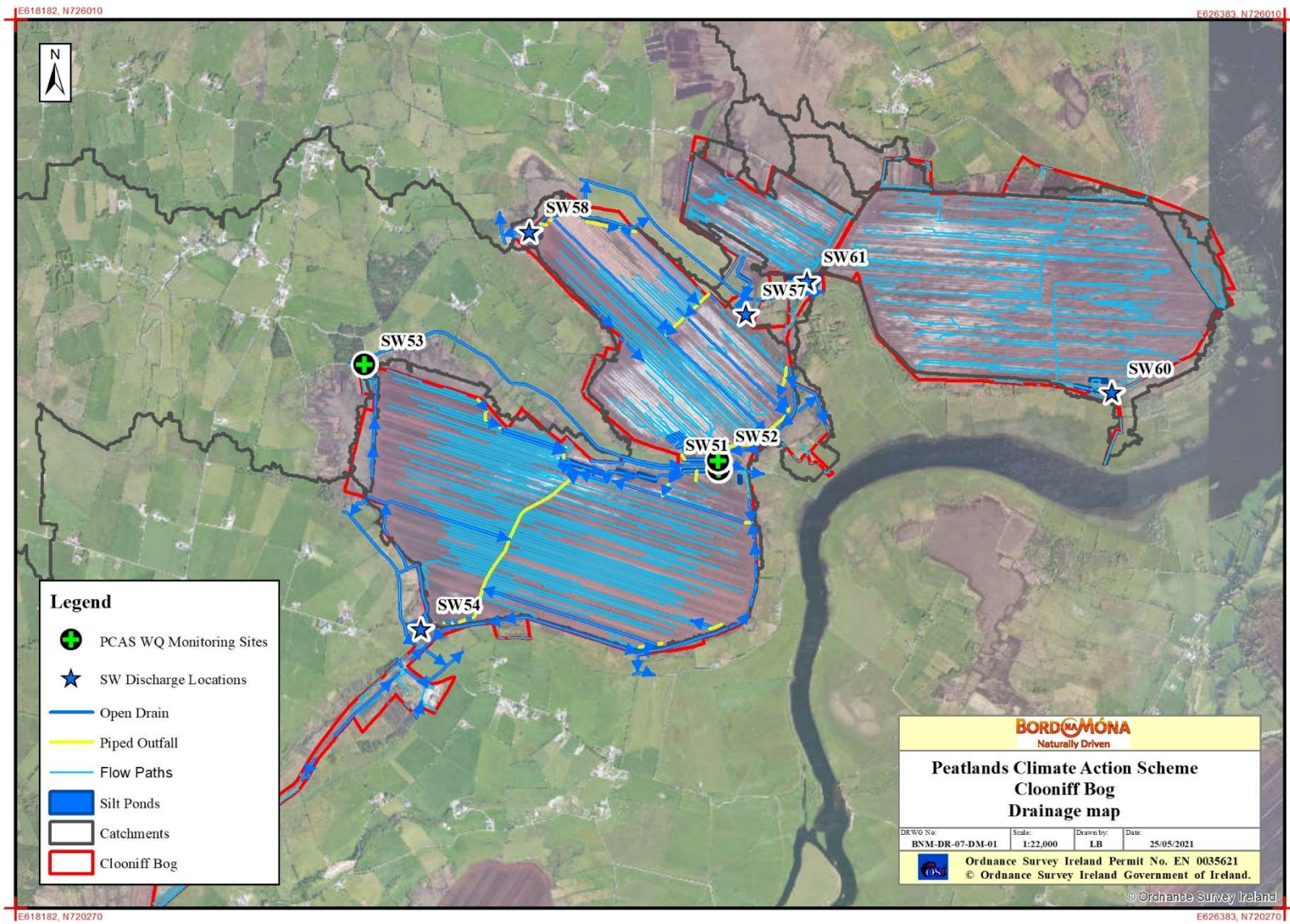


Figure 3.8b Map of Clooniff Bog showing general drainage

### 3.7 Fugitive Emissions to air

The bog is no longer in industrial peat production. Rehabilitation of the cutaway peatland will seek to re-wet the dry peat where possible, and re-vegetate all areas (whether wet or dry). Collectively, ceasing industrial peat production, re-wetting and re-vegetating will minimise any risk of emission to air from dust.

### 3.8 Carbon emissions

The bog is likely to be a carbon source as it is a drained (degraded) peatland with currently active drainage, which facilitates the oxidation of peat. Peat extraction generally transforms a natural raised bog which acts as a modest carbon sink into a cutaway ecosystem which is a large source of carbon dioxide (2–5 t C/ha/year) (Waddington & McNeil, 2002; Alm *et al.*, 2007; Wilson *et al.*, 2007, Wilson *et al.*, 2015). Furthermore, they are also a significant source of methane (Huttunen *et al.*, 2003; Laine *et al.*, 2007a) as a consequence of the conditions within the peat body that provide a suitable environment for the microbial breakdown of plant litter and root exudates. Degraded peatlands also release carbon/GHG emissions via the fluvial/aquatic pathway (Dissolved Organic Carbon – DOC, Suspended Solids/Particulate Matter, degassing of GHGs from water).

The EPA-funded CarbonRestore Project (Renou-Wilson *et al.* 2012) found that rewetting of drained peatlands can lead to restoration of functional peatland, such as the return of typical plant and animal species, which in turn may lead to the restoration of peat-formation and the carbon sink function. The EPA NEROS project carried out GHG flux research at Moyarwood Bog and found that Moyarwood Bog was overall a Carbon sink (sink for CO<sub>2</sub> and a source for Methane) 6 years after bog restoration was carried out (Renou-Wilson *et al.* 2018).

It is expected that Clooniff Bog can become a reduced carbon source with sections having potential to develop as a carbon sink (albeit in the longer term) following rehabilitation. The potential of any cutaway site to develop as a reduced carbon source/carbon sink in the longer-term depends on the success of the rehabilitation measures, the extent of development of *Sphagnum*-rich or other peat-forming habitats, the balance of carbon fluxes from different cutaway habitats and future climatic conditions. This site is expected to develop a mosaic of fen, Reed swamp, wet woodland, scrub. Birch woodland is expected to develop on the drier mounds and peripheral headlands.

### 3.9 Current ecological rating

(Following NRA (2009) Evaluation Criteria)

**Current ecological rating** ranges from **International** to **Local Importance (lower value)**. The site partially overlaps with the River Shannon Callows SAC & pNHA (NPWS site code: 000216) and the Middle Shannon Callows SPA (NPWS site code: 004096) and this area is deemed to be of **International Importance**.

The majority of the site is rated as **Local importance (lower value)** due to the dominance of bare peat associated with peat extraction operations. Cutaway habitats are generally poorly developed, as are marginal remnant habitats, which have a somewhat higher value and assigned a rating **Local importance (higher value)**. Coolumber Bog is rated as being of **county importance** due to the wetland habitats that have developed there and the species that have been recorded, including breeding waders.

It is expected that the overall ecological value of this site will increase in the future as the site re-vegetates, matures and forms semi-natural habitats such as fen and Reed swamp.

### 3.10 Clooniff Bog Characterisation Summary

Clooniff Bog is located approximately 4Km to the north of Shannonbridge in Co. Roscommon, on the western banks of the River Shannon. Peat production at Clooniff Bog commenced in the 1970's, with all commercial peat extraction ceasing in 2019. Peat depths vary across the site with part of the site is considered a deep residual peat (>2m depths).

The bog can be broadly divided into three main categories: (1) deep residual peat, (2) shallow cutaway bog prone to winter flooding, (3) marginal and other dry areas of the former production area. (The bog is developed into these three areas to assist rehab planning. In reality, there are natural transitions between these areas where there are ecological and environmental gradients in relation to residual peat, etc.). These are summarised further as follows.

- (1) A significant part of the former production area is residual deep peat. Ground-water is unlikely to have a significant influence on the development of vegetation. If this peat can be re-wetted, and a stable water level developed close to the peat surface, it is expected to develop an embryonic *Sphagnum*-rich vegetation. The topography of this area is variable. Some of this area is modelled as wet and should be relatively straight-forward to re-wet once drains are blocked. Some of this area is modelled as dry and more intensive deep peat measures with bunding, re-profiling and cell berms are proposed to optimise hydrological conditions for the development of embryonic *Sphagnum*-rich vegetation.
- (2) The cutaway bog prone to winter flooding is located on the eastern side of the bog, adjacent to the River Shannon. This area is expected to develop into wetland habitat. In some parts of the site, deeper water wetlands will develop due to local topography and hydrology. However, where possible Rehabilitation measures are proposed to block drains to manage summer water-levels and create a shallow wetland with emergent vegetation.
- (3) Some parts of the former production area will be relatively dry. This includes headlands and high fields. Some separate areas of higher ground have also been identified throughout the site, where there is limited potential to significantly re-wet residual peat. Drain-blocking and some fertiliser application is proposed. Birch woodland and other drier habitats are expected to develop.

## 4. CONSULTATION

### 4.1 Consultation to date

Consultation seeks to engage an audience of relevant stakeholders at both a national and local level. National stakeholders have been identified from varied bog restoration and rehabilitation efforts undertaken by Bord na Móna over the past 40 years, with particular emphasis on engagement with stakeholders during their Biodiversity Action Plan programme, since 2010. National Stakeholders includes relevant government departments and agencies, relevant semi-state bodies, NGOs and other environmentally-focused groups with a national remit.

There has been ongoing consultation about rehabilitation, biodiversity and other general issues over the years about Blackwater group bogs including Clooniff Bog with various stakeholders in relation to:

- Midlands & East Regional WFD Operational Committee (River Basin Management Plans).
- Archaeological Liaison Committee (National Museum of Ireland & Dept. of Culture Heritage and the Gaeltacht).
- There has been ongoing engagement with NPWS regarding issues at Cloonascragh Fen and Blackwood pNHA.
- The old Ballinasloe Canal is also being considered as one of the route options of the proposed Galway-Athlone greenway and Bord na Móna has been in high-level consultation with the relevant bodies regarding the potential development of a greenway on the existing track adjacent to the canal.
- Local community walking group in relation to the amenity use of the site.

To inform the current Plan, both national and local stakeholders, including neighbours whose land adjoins Clooniff Bog and local representatives of national bodies (such as Regional National Parks and Wildlife Service staff) and relevant offices in County Councils (such as the Heritage or Environmental Offices) have been contacted. Any identified local interest groups have been sought and informed of the opportunity to engage with this rehabilitation plan, and when identified have been invited to submit their comments or observations in relation to the proposed rehabilitation at Clooniff Bog (see Appendix XI).

In addition, provision for consultation with local residents and landowners in general (including any with turbary rights) has been facilitated by the distribution of letters to all houses within 1km of the boundary of Clooniff Bog. These letters included information about PCAS as well as contact details for further information. An advertisement about PCAS was also printed in the Connaught Tribune and Galway Advertiser in January 2021 (both area local newspapers that covers the Clooniff Bog area).

Further to the above, telephone correspondence was undertaken as either follow up to submissions received, or to instigate consultation. All correspondence received has been acknowledged and evaluated against the rehabilitation work proposed here; these are also summarised in Appendix XI.

### 4.2 Issues raised by Consultees

To date, a number of issues have been raised by consultees during the consultation process for the current draft of the rehabilitation plan for Clooniff Bog – these are summarised below.



#### *4.2.1 Assessments of rehabilitation*

Queries on rehabilitation assessments were raised by NPWS and the National Museum of Ireland in relation to Appropriate Assessment, Environmental Impact Assessment and Strategic Environmental Assessment. The various stakeholders were keen to see these documents were made available for public view.

#### *4.2.2 Restoration scope*

Stakeholders including; The Ballydangan Red Grouse Project, Moore Game and Conservation Club and IPCC were keen to see the rehabilitation plan aligned with amenity and after-use of the Clooniff Bog. Restoration/rehabilitation of marginal habitats was raised by BCI as worthy of consideration within the rehabilitation measures to support biodiversity objectives.

#### *4.2.3 Monitoring*

Further details on monitoring of ecological metrics, and how and where reporting on this monitoring would take place, was raised in the IPCC submission. Butterfly Conservation Ireland also suggested that monitoring of Large Heath butterfly be considered to assess the success of the proposed rehabilitation actions.

#### *4.2.4 Flooding*

Stakeholders such as the IFA, ICMSA and multiple residential neighbours queried likely impacts arising from the proposed re-wetting associated with the rehabilitation in relation to flooding on adjoining lands and, specifically, with regards to the maintenance of drains. The IFA also raised the issue of Health and Safety in relation to raising water levels as well as possible impacts on land and property prices.

#### *4.2.5 Turf cutting*

Butterfly Conservation Ireland commented that ongoing turf cutting on the margins of the bog (within and outside of the area owned by Bord na Móna) needed to be addressed to maximise the benefits of the rehabilitation work being proposed.

#### *4.2.6 Other issues*

Amenity interests and opportunities associated with Clooniff Bog were raised by a number of consultees, including IPCC, Ballydangan Red Grouse Project and Moore Game and Conservation Club.

Archaeological end of life survey of all the bogs were requested by National Museum of Ireland and National Monuments Unit.

For a complete summary of submissions received and replies, see Appendix XI

### **4.3 Bord na Móna response to issues raised during consultation**

#### *4.3.1 Assessments of rehabilitation*

Appropriate Assessment (AA) screening will be undertaken on all the bogs as part of PCAS and this is currently being undertaken by external consultants for Clooniff Bog. Where required, Natura Impact Statements shall be

completed and submitted to the Minister in accordance with 42(9) and 42(10) of the Habitats Regulation, noting that Bord na Móna is prescribed as a 'public authority' under this legislation. In relation to the SEA Directive and EIAR Directive, this has been considered and the legal advice to date is that the scheme does not come under these Directives.

An Archaeological Impact Assessment (AIA) is also being undertaken on all the bogs in PCAS. The aim for known archaeology on these bogs is to accomplish preservation in situ and we are taking steps to identify and avoid all known archaeology. We are doing this by including all known archaeology on our GIS from the AIA process, and either excluding or defining a buffer zone around these features, which will then be excluded from any ground works in these areas in the final plan. It is anticipated that any archaeology will benefit hugely from the ultimate remit of the rehabilitation, in that water tables will be raised thereby preserving in-situ. There is also an identified procedure for managing reports of stray finds that may arise during rehabilitation works.

An archaeological end of life survey of all the bogs as requested by National Museum of Ireland and National Monuments Unit is not part of the current scope of the scheme. Bord na Móna would be happy to assist such a survey, where possible.

#### 4.3.2 *Restoration scope*

As part of the PCAS, all restoration/rehabilitation options have been developed to support climate action and biodiversity objectives. The restoration at Clooniff Bog will enable and support any further amenity development by improving overall environmental and ecological conditions.

#### 4.3.3 *Monitoring*

As part of the PCAS, a monitoring and verification plan has been developed to support climate action and biodiversity objectives. This will include stratified monitoring of bog condition, habitats and biodiversity at several different scales. Some fauna monitoring (pollinator transect) is proposed as part of the monitoring and verification at Clooniff Bog during the period of the scheme (2021-2025). However, note that fauna typically take longer to respond to the changes in vegetation colonisation and habitats arising from the proposed rehabilitation measures identified for Clooniff Bog. Note that while Large Heath butterfly, a species of high ecological interest has not been recorded on site, there is a strong likelihood that this species is still present as it has been recorded on other Bord na Móna bogs in similar condition in the recent past.

#### 4.3.4 *Flooding*

It is the intention of Bord na Móna that the re-wetting of the bogs will be carried out in such a manner that does not impact on third party lands. Where it is deemed that blocking of a shared drain would cause any adjoining lands to flood, this will be avoided and alterations made to the rehabilitation plan. In general, drains around the margins of the bog will not be blocked.

External consultants have been appointed to carry a hydrological assessment to identify any potential impacts to neighbouring lands and to mitigate against any such impacts.

The rehabilitation measures proposed at Clooniff Bog will generally result in reduced runoff and drainage from the existing drains through drain blocking. It is intended that these measures will not significantly alter the existing topographical catchments and that the spine of the drainage networks, those which the upstream catchments

drain through, will be retained by Bord na Móna. Based on evidence from other bogs, rehabilitation measures will reduce the run-off from the bog by returning the peatlands towards its natural water retention function.

Bord na Móna will continue to manage their land bank into the future. As peat production has now ceased on Bord na Móna lands and rehabilitation measures will be carried out, a regular drainage maintenance programme will not be required or carried out as would have been the case in the past. However, if issues arise with the Bord na Móna internal drainage system that affects upstream or downstream landowners, then these issues will be addressed by Bord na Móna.

#### 4.3.5 *Turf cutting*

Those with existing, private turbary rights to cut turf for domestic fuel will be allowed to continue to cut turf as before. As noted above in relation to flooding, any re-wetting of Clooniff Bog will be designed to not impact on existing turf cutting.

#### 4.3.7 *Other issues (including amenity)*

Creating amenity such as walking tracks is not part of the direct scope of PCAS. However, PCAS will enable and support future amenity development.

Species specific conservation plans and habitat management, as suggested by some stakeholders e.g. IPCC and BRGP have the potential to play a valuable role in achieving important conservation goals. However, while it is envisioned that PCAS will promote biodiversity and conservation of some species through habitat generation, species specific conservation plans are beyond the scope of PCAS.

Amenity such as those suggested or proposed by several consultees can be positively aligned and integrated to after-use plans following the completion of the proposed rehabilitation at Clooniff Bog. Rehabilitation measures proposed for Clooniff Bog do not need to be amended to integrate any currently foreseeable future amenity proposal.

Given the proximity of our peatlands to the Shannon basin, Bord na Móna are positioned to make significant contributions to future amenity and associated green infrastructure initiatives, not least the proposed Dublin to Galway Greenway.

Other issues, including after-use and management issues outside the boundary of Clooniff Bog, are acknowledged but are specifically outside the scope of this rehabilitation plan.

#### 4.3.8 *Concluding statement.*

- No specific issues were raised during consultation that required significant changes to the substance of the rehabilitation plan.
- Issues raised by several consultees in relation to potential impacts on adjacent land had already been accounted for during the hydrological analysis.
- Several marginal drains will not be blocked to avoid impacts on adjacent lands, rights of way, or turf-banks.
- No changes were required to the rehabilitation plan to enable any potential future amenity.

## 5. REHABILITATION GOALS AND OUTCOMES

The rehabilitation goals and outcomes outline what Bord na Móna want to achieve by implementing the rehabilitation. These include:

- Meeting conditions of IPC Licence.
- Stabilisation or reduction in water quality parameters of water discharging from the site (e.g. suspended solids).
- Reducing pressure on receiving water-bodies that have been classified as At Risk from peatlands and from peat extraction, via stabilization or improving water-quality from this bog, and therefore, reducing pressures.
- Optimising hydrological conditions for **climate action benefits as part of PCAS**. Optimising hydrology for the development of embryonic *Sphagnum*-rich vegetation communities on deep peat, and eventually naturally functioning and peatland habitats.
- Optimising hydrological conditions for the development of Reed Swamp and fen on shallow more alkaline peat and other subsoils.
- Optimising hydrological conditions for the protection of exposed archaeological structures, their retention in situ and preservation into the future, where possible.
- The main goal and outcome of this plan is the successful rehabilitation (environmental stabilisation) of peatlands used for industrial peat production at the bog in a manner that is acceptable to both external stakeholders and to Bord na Móna and which optimise climate action and other ecosystem service benefits.

The rehabilitation goals and outcomes take account of the following issues.

- It will take some time for stable naturally functioning habitats to fully develop at Clooniff Bog. This will happen over a longer time-frame than the implementation of this rehabilitation plan
- Re-wetting residual peat will initially maintain and enhance the carbon storage capacity of the bog. There is scientific consensus that restoration of hydrology in damaged bog can improve carbon storage, water storage and attenuation and help support biodiversity both on the site and in the catchment (See Section 3.8). This will reduce carbon emissions from the site from a larger carbon source to a smaller carbon source. In time, the site has the capacity to develop in part as a carbon sink. PCAS is expected to deliver significant contributions to Ireland's climate action.
- It is not expected that the site has the potential to develop active raised bog (ARB) analogous to the priority EU Habitats Directive Annex I habitat within the foreseeable future (c.50 years). Furthermore, only a proportion of the bog has potential to develop *Sphagnum*-rich habitats in this timeframe. Nevertheless, re-wetting across the entire bog, as part of the Scheme, will improve habitat conditions of the whole bog, making the overall bog wetter. Other peatland habitats will develop in a wider mosaic that reflects underlying conditions.
- Rehabilitating former industrial peat production bog will also in the longer-term support other ecosystem services such as the development of new habitat to support biodiversity and local attenuation of water flows from the bog.
- WFD status in receiving water bodies can be affected by peatlands and peat extraction, but is also affected by other sources such as agriculture. In addition, receiving water bodies that are assessed as At Risk from peatlands and from peat extraction are likely to have several contributory sources of impacts

(private peat extraction and Bord na Mona). Reducing pressures due to former peat extraction activities at Clooniff will contribute to stabilising or improving water quality status of receiving water bodies in general. Ultimately, improving the WFD status of the receiving water-body will depend on reducing pressure from a range of different sources., including peatlands in general (private and Bord na Mona).

## 6. SCOPE OF REHABILITATION

The principal scope of this plan is to rehabilitate the bog. This is defined by:

- The area of Clooniff Bog (Figure 3.1).
- EPA IPC Licence - Ref. P0502-01. As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. Clooniff bog is part of the Blackwater Bog group.
- The proposed rehabilitation is designed to exceed the requirements as defined by the IPC Licence. PCAS is designed to enhance the ecosystem services of Clooniff Bog, in particular, optimising **climate action benefits**. The proposed improvements will mean that environmental stabilization is achieved (meaning IPC obligations are met) and, in addition, significant other ecosystem service benefits will be accrued.
- The local environmental conditions of Clooniff Bog identify wetland creation and deep peat re-wetting as the most suitable rehabilitation approach for this site.
- The key objective of rehabilitation, as defined by this licence, is **environmental stabilisation** of the bog. Bord na Móna have defined the key goal and outcome of rehabilitation at Clooniff Bog **environmental stabilisation and optimising deep peat re-wetting, and setting the site on a trajectory towards the development of embryonic peat-forming (*Sphagnum*-rich) vegetation communities on deep peat, and the development of Reed Swamp and fen on shallow more alkaline peat and other subsoils**.
- Rehabilitation of Clooniff Bog will support multiple national strategies of climate action, biodiversity action and other key environmental strategies such as the Water Framework Directive.
- **Time frame.** Rehabilitation measures will be carried out during the period of PCAS (2020-2025). The surrender of the licence is likely to extend beyond the PCAS timeframe.
- No direct rehabilitation measures will be carried out in the small proportion of the margin of Clooniff Bog that overlaps with the protected European sites.

### 6.1 Key constraints

- **Bog conditions.** Rehabilitation outcomes of sites are constrained by the environmental characteristics of these particular areas. For example, much of the peat mass has been removed at many sites, the environmental characteristics of these areas have therefore changed radically (peat depths, hydrology, water chemistry, substrate type, nutrient status, etc.) and there will therefore be different habitat outcomes (wetlands, fen, heathland, grassland and Birch woodland). At Clooniff Bog, only a certain proportion of peat has been removed leaving a largely un-vegetated surface over deep peat deposits. There are local factors that will influence the future trajectory of this site, which need to be considered as part of the wider rehabilitation.
- **Potential Future Land-use.** Potential future uses must undergo the appropriate consenting and development process as required. Any future use at Clooniff Bog would be considered by Bord na Móna in the context of the land bank status. In the event that Bord na Móna make the decision to support any proposed project, it is likely that the rehabilitation measures proposed in this plan will be compatible with the any potential future development of a peatlands park that has key objectives of amenity and biodiversity. Amenity could be integrated with the post-rehabilitated peatland landscape.
- **Surrounding landscape and neighbours.** Another key constraint is the interaction between the Bord na Móna sites and the surrounding landscape. Care will be taken that no active rehabilitation management



is carried out that could negatively and knowingly impact on surrounding land. This includes the hydrology of neighbouring farmland, neighbouring turbary, as well as potential changes to the hydrology of surrounding designed sites. It is anticipated that the work proposed here (blocking drains and re-wetting cutaway peatlands) will not have any flooding impacts on adjacent land. In general, marginal drains will **not be blocked**.

- **Public Rights of Way.** Where a public right of way or similar burden exists on Bord na Móna property, consideration will be given to ensuring that this remain intact, where possible. In some instances, depending upon previous land uses and management, alternative solutions may be required. These will be explored in consultation with local communities and statutory bodies.
- **Archaeology.** The discovery of monuments or archaeological objects during peatland rehabilitation may potentially constrain the rehabilitation measures proposed for a particular area. If this occurs, rehabilitation measures will be reviewed and adapted. An archaeological impact assessment of the proposed rehabilitation at Clooniff is being carried out. Rehabilitation around archaeology will be avoided, minimised or amended (peat barriers located to avoid damage to any archaeological features) in response to the AIA (Figure 8.5, Appendix XII).

## 6.2 Key Assumptions

- It is assumed that Bord na Móna will have all resources required to deliver this project.
- It is expected that weather conditions will be within normal limits over the rehabilitation plan timeframe. Long periods of wet weather have the capacity to significantly affect ground conditions and constrain drain blocking and other ground activities.

## 6.3 Key Exclusions

The scope of this rehabilitation plan does not cover:

- The longer-term development of stable naturally functioning habitats to fully develop at Clooniff Bog. The plan covers the short-term rehabilitation **actions** and **an additional monitoring and after-care programme** to monitor the rehabilitation and to respond to any needs.
- This plan is not intended to be an after-use or future land-use plan for Clooniff Bog.
- The longer-term management of this site, potentially as a nature conservation site, or for amenity, or for other uses in the future.

## 7. CRITERIA FOR SUCCESSFUL REHABILITATION

This section outlines what criteria will be used to indicate successful rehabilitation and what key criteria/targets will be used to mark the achievement of the rehabilitation goals and outcomes and validate the completion of the rehabilitation.

The key objective of this rehabilitation plan is **environmental stabilisation** and the stabilisation of any emissions from the site that related to the former industrial peat extraction activities.

Rehabilitation is generally defined by Bord na Móna as:

- stabilisation of bare peat areas via targeted active management (e.g. drain-blocking/re-wetting) slowing movement of water across the site and encouraging natural colonisation; and
- mitigation of potential emissions (e.g. silt).

In addition, Bord na Móna wish to optimise climate action and other ecosystem service benefits via enhanced rehabilitation measures. This will significantly go beyond what is required to meet rehabilitation and decommissioning obligations under existing EPA IPC licence conditions. The proposed interventions will mean that environmental stabilization is achieved (meaning IPC obligations are met) and, in addition, significant other benefits particularly for climate action will be accrued.

### 7.1. Criteria for successful rehabilitation to meet EPA IPC licence conditions:

- Rewetting of residual peat in the former area of industrial peat production to offset potential silt run off and to encourage development of vegetation cover via natural colonisation, and reducing the area of bare exposed peat. See Table 7.1 for a summary of the criteria for successful rehabilitation and associated monitoring. The target will be the delivery of measures and this will be measured by an aerial survey after rehabilitation is completed.
- That there is a stabilising/improving concentration of suspended solids and ammonia associated with the measures undertaken to stabilise the peat surface by the blocking of the internal drainage system and the maximised rewetting of the peat surface.
- Receiving water bodies have been classified under the River Basin Management Plan and this classification includes waters that are At Risk from peatlands and peat extraction. The success criteria will be that the “At Risk” classification will see improvements in the associated pressures from this peatland or if remaining At Risk, that there is an improving trajectory in the pressure from this peatland.

(See Table 7.1 for a summary of the criteria for successful rehabilitation and associated monitoring.)

### Additional criteria for successful rehabilitation to optimise climate action and other ecosystem service benefits:

- Optimising the extent of suitable hydrological conditions to optimise climate action and other ecosystem service benefits (optimising and maximising deep peat re-wetting). This will be measured by an aerial survey after rehabilitation has been completed.
- Accelerating the trajectory of the site towards becoming a reduced carbon source/carbon sink and eventually naturally functioning peatland habitats (heath, scrub, poor fen and embryonic *Sphagnum*-rich raised bog peatland communities, where conditions are suitable). These habitats will generally establish initially as pioneer vegetation. This will be measured through habitat mapping and the development of

cutaway bog condition assessment. This cutaway bog condition assessment will include assessment of environmental and ecological indicators such as vegetation cover, vegetation communities, presence of key species, *Sphagnum* cover, bare peat cover and water levels. Baseline monitoring will be carried after rehabilitation is completed (during the scheme). It is proposed that sites can be monitored against this baseline in the future.

- Reduction in carbon emissions. This will be estimated via a combination of habitat condition assessment and application of appropriate carbon emission factors derived from other sites. Baseline monitoring (habitat condition) will be carried after rehabilitation is completed (during the scheme). It is proposed that sites can be monitored against this baseline in the future.
- Improvement in biodiversity and ecosystem services. This will be demonstrated by metrics outlined in Section 9.1 that can be used to measure changes in ecosystem services (e.g. water quality parameters, development of pioneer habitats, breeding bird monitoring). This will be measured by collecting a range of scientific data that can then quickly be adapted and into metrics that can be used to measure changes in various ecosystem services. Baseline monitoring will be carried after rehabilitation is completed (during the scheme). It is proposed that sites can be monitored against this baseline in the future.

Table 7.1. Summary of Success criteria, targets, how various success criteria will be measured and expected time-frames.

Criteria type	Criteria	Target	Measured by	Expected Time-frame
IPC validation	Rewetting of the drained high bog area	Delivery of planned rehabilitation measures.  This will be a combination of drain blocking, bunding and re-profiling	Aerial photography after rehabilitation has been completed – to demonstrate measures (drain-blocking)	2021-2024
IPC validation	Key water quality parameters  Ammonia, Phosphorous, Suspended solids, pH and conductivity	Stabilization  Improvement of key water quality parameters	Water quality monitoring. Started in advance of the proposed rehabilitation.	2021-2023
IPC validation	Reducing pressure from peat production on the local water body catchment (WFD)	At Risk classification will see improvements in the associated pressures from this peatland or if remaining At Risk, that there is an improving	EPA WFD monitoring programme  Additional BnM water quality monitoring	WFD schedule

		trajectory in the pressure from this peatland		
Climate action verification	Optimising the extent of suitable hydrological conditions to optimise climate action and setting the site on a trajectory towards establishment of a mosaic of compatible peatland habitats	Optimal extent of suitable hydrological conditions  Indicators of establishment of compatible cutaway habitats	Aerial photography, Cutaway bog condition map and Habitat mapping to map extent of suitable hydrological conditions.  Baseline monitoring to be carried out during the scheme when rehabilitation is complete. Sites can be re-monitored in the future and compared against this baseline.	2021-2025
Climate action verification	Biodiversity and ecosystem services.  Habitat establishment  Presence of key species – Sphagnum  Breeding and wintering birds  Pollinators	Improvement in biodiversity and ecosystem services.	Metrics that relate to selected biodiversity and ecosystem services  Presence of key species – Sphagnum – Walkover survey  Breeding birds – Breeding bird survey  Pollinators – Pollinator walk  Baseline monitoring to be carried out during the scheme when rehabilitation is complete. Sites can be re-monitored in the future and compared against this baseline.	2021-2024

Meeting climate action verification criteria and monitoring of these criteria after the Scheme has been completed is dependent on support from the Climate Action Fund or other sources of funding. Note that monitoring and verification of the overall scheme will be stratified – not all these criteria will be measured at each individual site.

**7.2. Critical success factors needed to achieve successful rehabilitation as outlined in the plan**

The achievement of successful rehabilitation as outlined in the plan requires:

- **Funding to pay for resources required to deliver the planned rehabilitation (Bord na Móna and external).** Bord na Móna maintains a Provision on its balance sheet to pay for these future costs when industrial peat extraction ceases. Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence. It is expected that additional costs of enhanced rehabilitation will be supported by Government through the Climate Action Fund.
- **Bord na Móna to have sufficient resources (staff and training) to deliver the planned rehabilitation with required associated skills and competencies.**
- **Bord na Móna to have sufficient resources (suitable machinery) and staff to maintain this machinery.**
- **Weather conditions to be within normal limits over the rehabilitation plan timeframe.** Long periods of wet weather have the capacity to significantly affect ground conditions and constrain the delivery of rehabilitation. The potential impact of wet weather on ground conditions can be reduced by appropriate planning and management. Bord na Móna have significant experience of managing these issues through 70 years of working in these peatland environments.
- **Rehabilitation measures to be effective.** The rehabilitation measures proposed in this plan are based on 40 years of Bord na Móna experience of peatland management and best practise applied internationally in peatland management. Measures proposed in this plan have already been shown to be effective at other sites. Bord na Móna will apply a flexible and adaptable approach to the more innovative rehabilitation measures proposed in this plan. If measures are not initially effective, Bord na Móna will review any requirement for additional practical rehabilitation.
- **Natural colonisation of vegetation to develop semi-natural habitats at a rate within the normal limits.** The development of naturally functioning semi-natural habitats on cutaway peatland takes time. Pioneer vegetation can develop relatively quickly (3-10 years) and wetland habitats can develop relatively quickly. Birch woodland make take 20-30 years to develop. However, it may take 50 years for active raised bog vegetation to re-develop on ground that was previously cutaway. Different environmental conditions will have a significant impact on the rate of natural colonisation, and as a result of the combination of different environmental conditions and the application of different rehabilitation measures, there will be a variety of habitat outcomes.
- Rehabilitation measures have been designed to accelerate and work with natural colonisation and other natural processes. Bord na Móna experience of rehabilitation has shown that re-wetting improves conditions for natural colonisation and that natural colonisation is accelerated where the environmental conditions are most suitable. Rehabilitation measures have been designed to modify the conditions of areas within sites where conditions are less suitable for natural colonisation (modifying hydrology, topography, nutrient status or availability of potential seed sources).
- **Monitoring to be robust and effective.** Rehabilitation Monitoring will be established to validate the success of rehabilitation as required by Condition 10 of the IPC Licence and to verify the benefits of the proposed measures to optimise climate action. This will focus on a collecting a range of scientific data that can then quickly be adapted and into metrics that can be used to measure changes in various ecosystem services.

## 8. REHABILITATION ACTIONS AND TIME FRAME

Peatland rehabilitation requires detailed planning and the use of data from desktop surveys and field surveys. This data in association with topographical and hydrological modelling (Figure 8.3 & 8.4) will be important in planning the future peatland landscapes and planning the use of the most appropriate rehabilitation methodologies to maximise climate action benefits. Hydrological modelling (Figure 8.4) indicates those areas that are likely to re-wet when drains are blocked, based on the current topography, and areas where water levels may have to be modified, where needed. Enhanced rehabilitation measures will look to optimise hydrological conditions for re-wetting peat in other areas. This planning is also essential for matching the most sustainable rehabilitation methodology to the most suitable cutaway environment to maximise the benefits of the resource outlay (maximising cost/benefit).

The rehabilitation actions will be a combination of PCAS measures to re-wet peat. The distribution of these measures is provisionally outlined in Figure 8.5. (Note that the actual distribution of these measures may be subject to change in response to stakeholder consultation and refinement of the enhanced rehabilitation measures.)

These enhanced measures for Clooniff Bog will include:

- Re-wetting the deep peat areas of the bog using berms and field re-profiling. This enhanced measure seeks to create large (c. 45m x 60m) flat areas or cells of shallow (< 10 cm) water conditions on bare peat, across multiple fields that are enclosed by shallow berms to retain shallow surface water;
- In some areas, a cut-and-fill cell bunding technique is proposed. The cut and fill cell bunding approach aims to create 'saucers' or flat bunded areas (cells) on peat with berms to hold shallow water at appropriate levels;
- Re-wetting some deep peat areas of the bog through regular field drain blocking using a dozer to create three peat barriers every 100 m along each field drain;
- Re-assessment of the pumping regime and turning off pumps if this desired and has no significant external impact. Initial hydrological modelling indicates that a significant part of the site will develop a mosaic of wetland habitats with deeper water, when pumping is reduced or stopped. Additional hydrological modelling and hydrological management will look to optimise summer water levels to maximise the development of wetland vegetation (by looking to set water depths at < 0.5 m, where possible. It is inevitable that some sections will naturally have deeper water due to the variable topography). Water-levels will be adjusted at outfalls and by adjusting piped drainage. More sustainable permanent gravity drainage solutions will be examined. It is expected that a natural seasonal flooding regime will develop, with water-levels fluctuating in association with levels in the adjacent River Shannon and Callows.
- Re-alignment of piped drainage;
- Blocking drains in targeted marginal (degraded) high bog area and re-wetting, where possible, using an excavator to install peat barriers. Some bog remnants are too small to benefit from this approach;
- Targeted fertiliser applications to accelerate vegetation establishment on headlands and high fields. (It is noted that the application of fertiliser may need additional assessment and approval as per the IPC Licence),
- Seeding of vegetation and inoculation of *Sphagnum* in suitable areas; and
- Seeding of vegetation in Coolumber Bog is not required as this bog has already undergone significant natural colonisation and the development of pioneer habitats is already significantly progressed.
- Silt ponds will be retained and maintained during the rehabilitation phase. During the monitoring and verification phase silt ponds will be continually inspected and maintained, where appropriate. When it



is deemed that silt ponds are not required, as the bog has been successfully stabilised and there is no silt run-off, the condition of the silt ponds will be reviewed. Silt ponds will either be de-watered (water levels lowered to a level where the silt pond will naturally develop as a small wetland feature), left in situ, or infilled (where discharges do not require silt control).

**Table 8.1:** Types of and areas for enhanced rehabilitation measures at Clooniff Bog. Note that the types of rehab and areas of rehab may change in response to stakeholder consultation and refinement of the enhanced rehabilitation measures.

Type	Code	Enhanced Rehabilitation Measure	Extent (Ha)
Dry cutaway	DCT1	Blocking outfalls and managing water levels with overflow pipes	
Dry cutaway	DCT2	Regular drain blocking (max 3/100 m) + blocking outfalls and managing water levels with overflow pipes + targeted fertiliser treatment	46.74
Dry cutaway	DCT3	More intensive drain blocking (max 7/100 m) + blocking outfalls and managing overflows + targeted fertiliser treatment	
Deep peat cutaway	DPT2	More intensive drain blocking (max 7/100 m) + blocking outfalls and managing overflows	
Deep peat cutaway	DPT3	More intensive drain blocking (max 7/100 m), + field reprofiling + blocking outfalls and managing overflows	71.28
Deep peat cutaway	DPT4	Berms and field re-profiling (45m x 60m cell) + blocking outfalls and managing overflows + drainage channels for excess water + <i>Sphagnum</i> inoculation	33.31
Wetland	WLT1	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes	
Wetland	WLT2	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site	
Wetland	WLT3	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site + constructing larger berms to re-wet cutaway + transplanting Reeds and other rhizomes	209.26
Wetland	WLT4	More intensive drain blocking (max 7/100 m), + blocking outfalls and managing overflows + transplanting Reeds and other rhizomes	71.21
Marginal land	MLT1	No work required (Marginal land)	70.4
Marginal Land	MLT2	More Intensive drain blocking (max 7/100)	5.3
Constrained areas		Rehabilitation aligned to constraints	16.74
Silt ponds		Silt ponds	3.9
<b>Total</b>			<b>528.14</b>

### 8.1 Short-term planning actions (0-1 years)

- Seek formal approval of the enhanced plan, noting the alternative adapted standard plan should funding from the proposed Scheme not materialise, from the EPA;
- Agree an *ex ante* budget of eligible costs (based on the approved enhanced plan) with the Scheme regulator;

- Develop a detailed site plan with detailed site drawings outlining how the various rehabilitation methodologies (The proposed Scheme PCAS) will be applied to Clooniff Bog. This will take account of peat depths, topography, drainage and hydrological modelling. (See map for an indicative view of the application of different rehabilitation methodologies);
- Carry out a hydrology and drainage management appraisal of the proposed rehabilitation measures.
- Carry out a review of known archaeology and an archaeological impact appraisal of the proposed rehabilitation. Incorporate the results of this assessment into the rehabilitation plan to minimise known archaeological disturbance, where possible;
- Carry out a review of remaining milled peat stocks;
- Carry out a review of issues that may constrain rehabilitation such as known rights of way, turbary and existing land agreements. Several known rights of way are present along the Bord na Moña margins.
- Carry out an ecological appraisal of the potential impacts of the planned rehabilitation, if needed, such as the presence of sensitive ground-nesting bird breeding species (e.g. Curlew) or larval webs of Marsh Fritillary butterfly, etc. The scheduling of rehabilitation operations will be adapted, if needed, as mitigation; and
- Ensure all activities comply with the environmental protection requirements of the IPC Licence.

## 8.2 Short-term practical actions (0-2 years)

- Carry out proposed measures as per the detailed site plan. This will include a combination of drain blocking, peat field re-profiling and cell-bunding. All rehabilitation will be carried out with regard to best practice environmental control measures (Appendix IV);
- Monitor the success of rehabilitation measures in relation to developing suitable hydrological conditions;
- Carry out the proposed monitoring, as outlined.
- While natural colonisation is expected to commence almost immediately once peat production ceases, Phase 2 actions will be carried out in targeted areas to accelerate re-vegetation and colonisation of target species. Phase 2 actions may include seeding of targeted vegetation and inoculation of *Sphagnum*;
- Silt ponds will be monitored during this period and there will be continued maintenance and cleaning to prevent potential silt run-off from the site during the rehabilitation phase; and
- Submit an *ex post* report to the Scheme regulator to verify the eligible works to be carried out in year 1 of the Scheme, and an *ex ante* estimate for year 2 of the Scheme; and so on for each year of the proposed Scheme.

## 8.3 Long-term (>3 years)

- Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary;
- Delivery of a monitoring, aftercare and maintenance programme (See section 10.2 below);
- Decommissioning of silt-ponds will be assessed and carried out, where required; and
- Reporting to the EPA will continue until the IPC License is surrendered.

#### 8.4 Timeframe

- **2020-2021:** Short-term planning actions.
- **2021:** Short-term practical actions.
- **2021-2024:** Long term practical actions. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- **2024:** Decommission silt-ponds, if necessary.

#### 8.5 Budget and costing

Bord na Móna (BnM) appreciates the Minister's intention to support, via the Climate Action Fund, Bord na Móna in developing a package of measures, 'the proposed Scheme', for enhanced decommissioning, rehabilitation and restoration of cutaway peatlands referred to as, the Peatlands Climate Action Scheme'. *However, only the additional costs associated with the additional and enhanced rehabilitation, i.e, measures which go beyond the existing standard mandatory decommissioning and rehabilitation requirements arising from Condition 10 will be eligible for support.*

The enhanced decommissioning, rehabilitation and restoration of the peatlands funded by the proposed Scheme will deliver benefits across climate action (GHG mitigation through reduced carbon emissions and acceleration towards carbon sequestration), enrich the State's natural capital, increase eco-system services, strengthen biodiversity, improve water quality and storage attenuation as well as developing the amenity potential of the peatlands.

Bord na Móna maintains a provision on its balance sheet to pay for the future licence compliance costs of mandatory standard rehabilitation and decommissioning when industrial peat extraction ceases. This is updated every year - for more information see the Bord na Móna Annual Report (Bord na Móna 2020). Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence.

At this time, a 'mandatory' rehabilitation provision (sufficient to discharge the requirement of Condition 10 in the licence) has been allocated to the site based on the area of different types of cutaway across the site (See Appendix I).



Figure 8.1. Aerial photo of Clooniff Bog. The majority of the bog is bare peat. The northern bog (Coolumber) has already re-wetted and water levels reflect winter conditions.



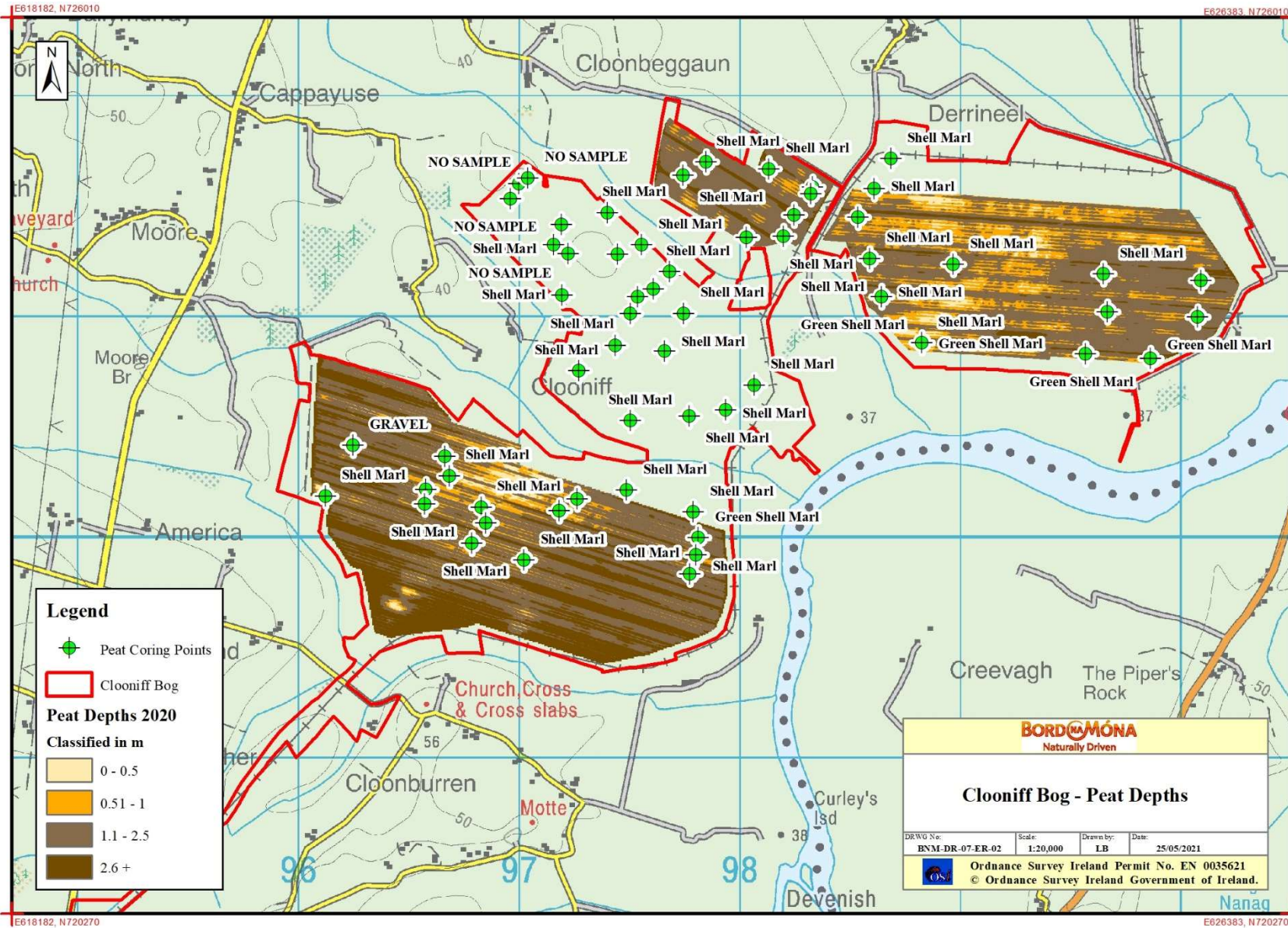


Figure 8.2. Peat depth map for Clooniff Bog. The bog has a mosaic of different peat depths. Peat depth data is not available for the central section.



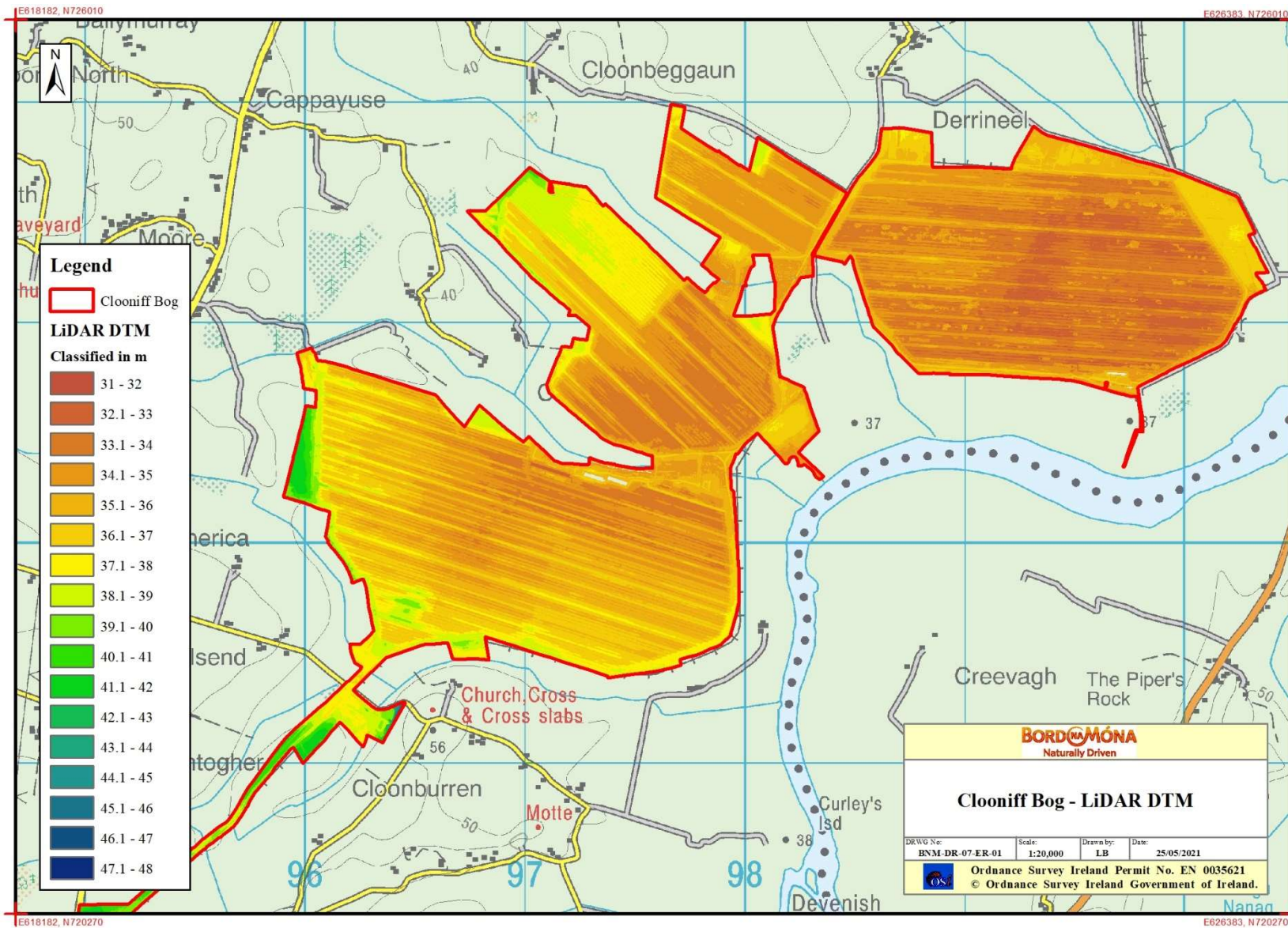


Figure 8.3. LIDAR topography map of Clooniff Bog. Low areas and basins are orange-yellow, more elevated areas are blue-green.



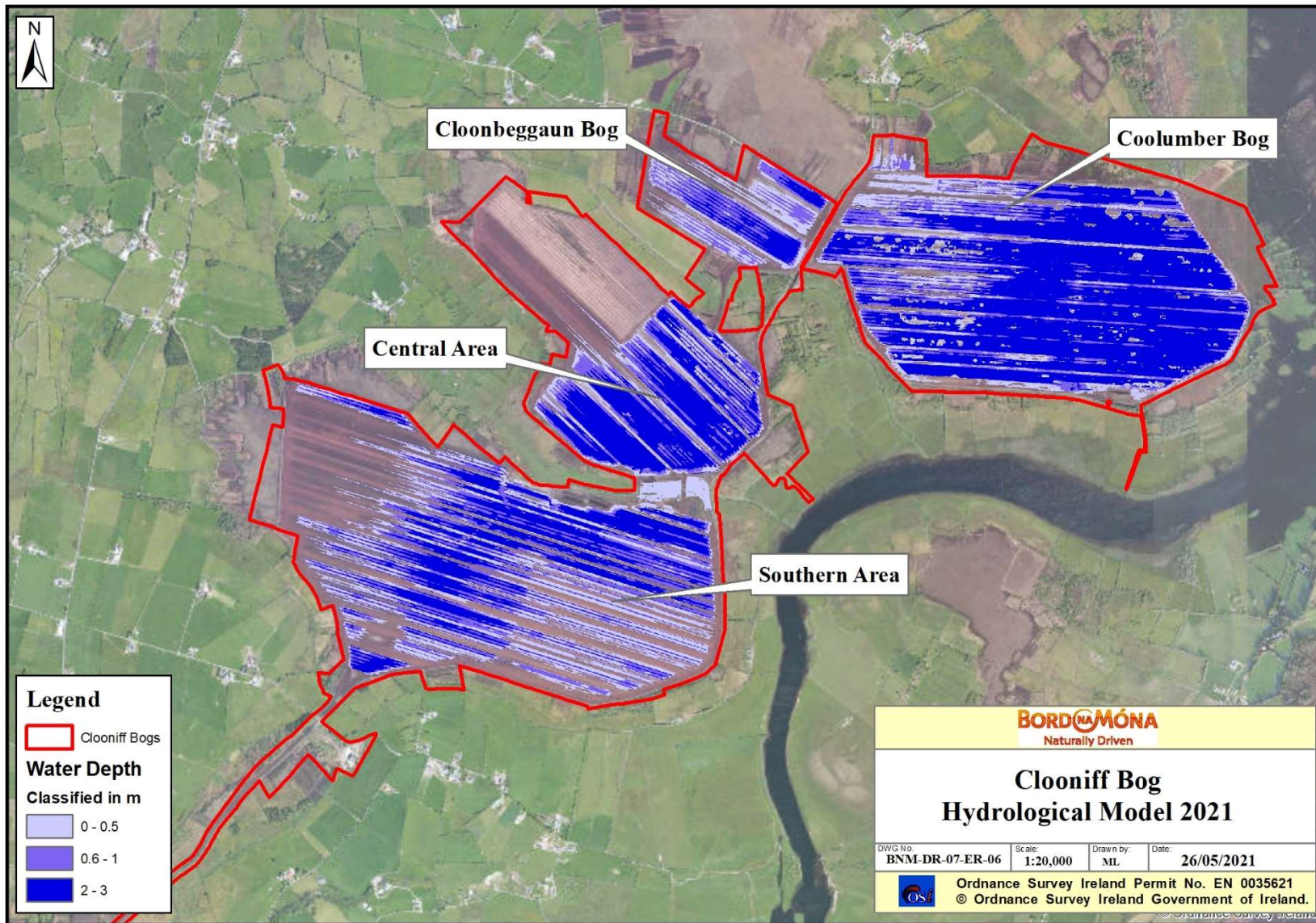


Figure 8.4. Hydrological modelling for Clooniff Bog showing range of expected water depths based on current topography and key flow-paths.



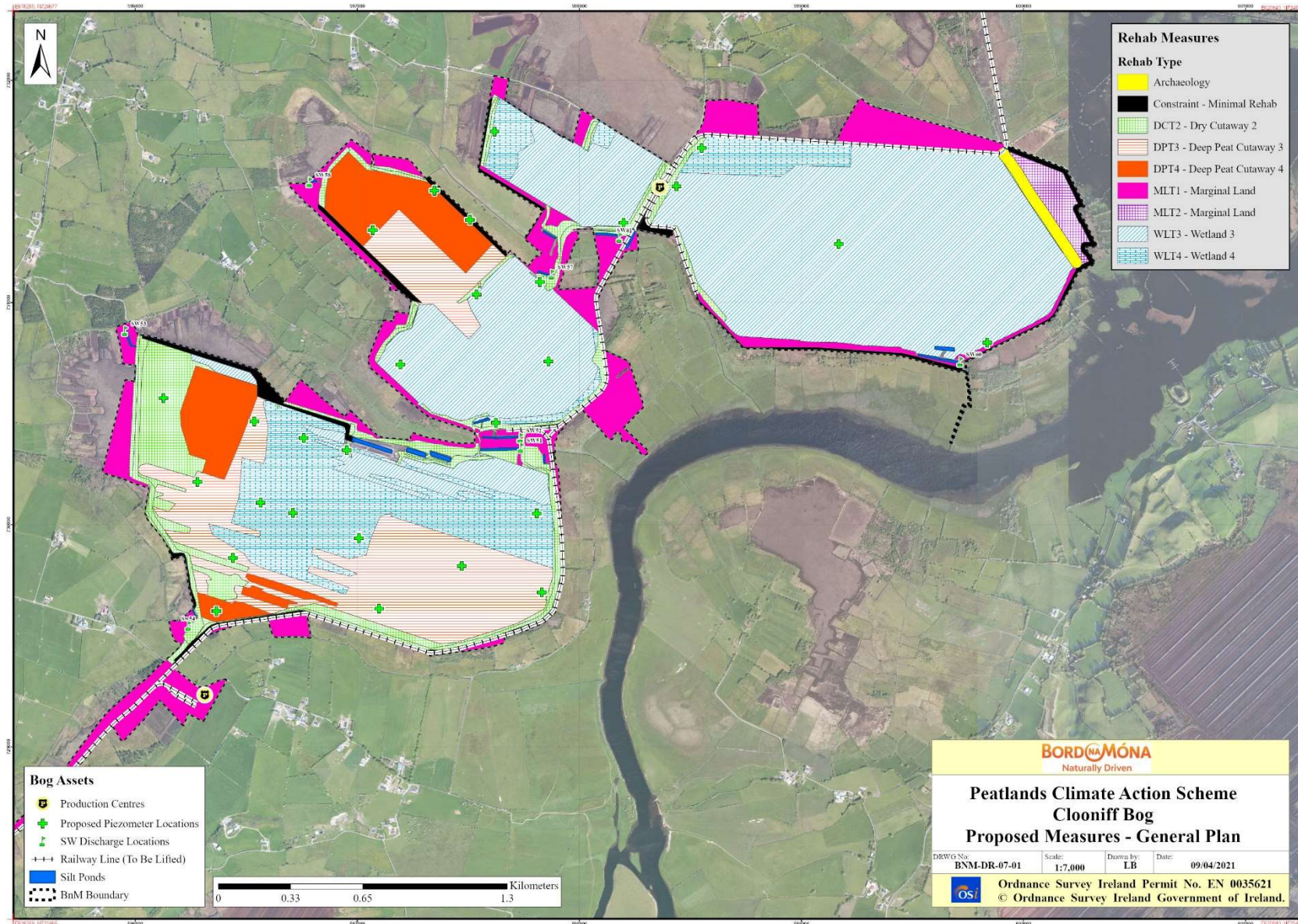


Figure 8.5. Indicative Enhanced Rehabilitation Plan for Clooniff Bog. *Note that the types of rehab and areas of rehab may change in response to stakeholder consultation and refinement of the enhanced rehabilitation measures.*

## 9. AFTERCARE AND MAINTENANCE

### 9.1 Programme for monitoring, aftercare and maintenance

This programme for monitoring, aftercare and maintenance has been designed to meet the Conditions of the IPC Licence. This is defined as:

- There will be **initial quarterly monitoring assessments** of the site to determine the general status of the site, the condition of the silt ponds, assess the condition of the rehabilitation work, monitoring of any potential impacts on neighbours land, general land security, boundary management, dumping and littering.
- The number of these site visits will reduce after 2 years to bi-annually and then after 5 years to annual visits.
- These monitoring visits will also consider any requirements, for further practical rehabilitation measures.
- The **baseline condition of the site will be established** post-rehabilitation implementation by using an aerial survey to take an up to date aerial photo, when rehabilitation is completed. The extent of bare peat will be assessed using this baseline data, and habitat maps will be updated.
- **Water quality monitoring** at the bog will be established. This will start in advance of the proposed rehabilitation. The main objective of this water quality monitoring will be to establish a baseline and then monitor the impact of peatland rehabilitation on water quality from the bog.
- In order to assist in monitoring surface water quality from this bog, it is planned to increase the existing licence monitoring requirements to sampling for the same parameters to every month during the scheduled activities and for a period up to two years. post rehabilitation, depending on the period required to confirm that the main two parameters, suspended solids and ammonia are remaining compliant with the licence emission and trigger limit values and there is an improving trajectory in these two parameters i.e. reduction in concentration.
- Enhanced water quality monitoring will aim to include up to 70% of a bogs drainage catchments.
- Monitoring results will be maintained, trended and reported on each year as part of the requirement to report on Condition 10.1 of the IPC Licence on Bog Rehabilitation in the Annual Environmental Report, which will be available in April each year at [www.epa.ie](http://www.epa.ie).
- The parameters to be included (as per condition 6.2 of the IPC Licence) include monthly monitoring for pH, Flow, Suspended Solids, Total Solids, Total Phosphorus, Total Ammonia, Colour, and COD.
- This monthly sampling regime on a selected number of silt ponds will be carried out over a two-year cycle. The original (licence) requirement was for a quarterly sampling regime but this has been increased to a monthly regime to appropriately track the changing water chemistry that will occur as part of this rehabilitation. In addition, DOC will be included as a parameter to try and identify any changes in carbon in the surface water.
- If, after two years, key targets for successful rehabilitation are being achieved and critical success factors are being met, then the water quality monitoring will be reviewed, with consideration of potential ongoing research on site. The water quality data, the aerial surveys and the habitat mapping will be collated and will be submitted to the EPA as part of the final validation report.
- If, after two years, key targets for successful rehabilitation have **not** been achieved and critical success factors have **not** been met, then the rehabilitation measures and status of the site will be evaluated and enhanced, where required. This evaluation may indicate no requirement for additional enhancement of rehabilitation measures, but may demonstrate that more time is required before key criteria for

rehabilitation has been achieved. Monitoring of water quality will then also continue for another period to be defined.

- Where other uses are proposed for the site, these will be assessed by Bord na Móna in consultation with interested parties. Other after-uses can be proposed for licensed areas and must go through the appropriate assessment process and planning procedures.

Additional monitoring measures are also proposed to monitor ecosystem service benefits that have been derived by rehabilitation. These proposed monitoring measures will be funded by the proposed Scheme or additional other funding. Monitoring of climate action and other ecosystem service benefits will be designed to take account of the requirements of monitoring benefits of the overall Scheme and will be stratified; that is not all monitoring will be carried out in each site. These are defined as:

- Vegetation and habitat monitoring after rehabilitation is completed using a cutaway bog condition assessment (Similar to ecotope mapping). This assessment will include assessment of on environmental and ecological indicators such as vegetation cover, vegetation communities, presence of key species, *Sphagnum* cover, bare peat cover and water levels.
- The condition of the bog can be assessed using the condition assessment and suitable Greenhouse Gas (GHG) emission factors can be assigned to different habitats. GHG emission factors have been determined for various peatland habitats in Ireland (Wilson *et al.*, 2015) and are constantly being refined with more and more research. BnM is actively supporting research into GHG fluxes in different rehabilitated peatland habitats. This means that potential GHG emissions can be estimated from the site, as the site continues along its trajectory towards a naturally functioning peatland ecosystem.
- It is proposed to monitor the improvement of some biodiversity ecosystem services. A breeding bird and Pollinator monitoring programme will be established. Specific pollinator indicators will be monitored (Bee and Butterfly). To be defined in relation to monitoring of the overall proposed Scheme and after consultation with stakeholders.

## 9.2 Rehabilitation plan validation and licence surrender – report as required under condition 10.4

**IPC License Condition 10.4.** *A final validation report to include a certificate of completion for the Rehabilitation Plan, for all or part of the site as necessary, shall be submitted to the Agency within six months of execution of the plan. The licensee shall carry out such tests, investigations or submit certification, as requested by the Agency, to confirm that there is no continuing risk to the environment.*

Reporting to the EPA will continue until the IPC License is surrendered. The bog will be included in the full licence surrender process as per the Guidance to Licensees on Surrender, Cessation and Closure of Licensed Sites EPA, 2012, when:

- The planned rehabilitation has been completed;
- The key criteria for successful rehabilitation has been achieved and critical success factors have been met;
- Water quality monitoring demonstrates that water quality of discharge is stabilising or improving; and;
- The site has been environmentally stabilised.



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## APPENDIX I: A STANDARD PEATLAND REHABILITATION PLAN TO MEET CONDITIONS OF THE IPC LICENCE

In the event that the proposed Scheme (PCAS) is not supported by additional funding, Bord na Móna is still obligated to carry out peatland rehabilitation to meet the conditions of the IPC Licence. Under its EPA licences and following cessation of peat extraction, BnM is mandated to ‘decommission’ its operations by removing materials ‘that may result in environmental pollution’ and establish that ‘rehabilitation’ measures have environmentally stabilised peat production areas.

This proposed standard peatland rehabilitation plan is outlined here to **estimate potential costs**. Bord na Móna will still be expected to cover the costs that would have accrued from standard decommissioning and rehabilitation activities, as part of its original obligations. The existing costs associated with both the removal of potentially polluting materials and the environmental stabilisation of the peatlands resides with Bord na Móna. However, the expenditure necessary to deliver the additional and enhanced decommissioning, rehabilitation and restoration and the benefits that flow from these measures and interventions/improvements will be eligible for funding by government through the Climate Action Fund.

The same process as outlined in Section 2 will be followed.

### Scope of rehabilitation

The principal scope of this rehabilitation plan is to rehabilitate the bog. This is defined by:

- The area of Clooniff Bog (Figure 3.1).
- EPA IPC Licence - Ref. Ref. P0502-01. As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. Clooniff bog is part of the Blackwater Bog group.
- The key objective of rehabilitation, as defined by this licence, is **environmental stabilisation** of the bog.
- To minimise potential impacts on neighbouring land. Some boundary drains around Clooniff Bog will be left unblocked as blocking boundary drains could affect adjacent land.

### Rehabilitation goals and outcomes

The key rehabilitation goal and outcome for Clooniff Bog is environmental stabilisation of the site via wetland creation and deep peat re-wetting. This is defined as:

- Carrying out drain blocking to re-wet peat and slow runoff.
- Stabilising potential emissions from the site (e.g. suspended solids).
- Environmental stabilisation.

The outcome is setting the site on a trajectory towards establishment of natural habitats.

### Criteria for successful rehabilitation:

- Rewetting of deep peat and shallow cutaway in the former area of industrial peat production to offset potential silt run off and to encourage development of vegetation cover via natural colonisation, and reducing the area of bare exposed peat.
- That there is a stabilising/improving concentration of suspended solids and ammonia associated with the measures undertaken to stabilise the peat surface by the blocking of the internal drainage system and

the maximised rewetting of the peat surface. This will be demonstrated by developing a stable or downward trajectory of water quality indicators (suspended solids and ammonia) towards what would be typical of a re-wetted cutaway bog. This will be measured via water quality monitoring (suspended solids and ammonia).

- That the main water body associated with surface water from this bog continues to be excluded in the EPA's list of peat pressure water bodies as reported in the River Basin Management Plans. Where the water body has been identified as under pressure from peat extraction, that the intervening EPA monitoring programme associated with its Programme of Measures for this water body shows positive improvements in water quality impacts that were attributable to the original peat extraction activity.

### **Rehabilitation targets**

- Demonstrating the delivery of the rehabilitation through site visits and through updated aerial photography (indicating presence of peat blockages and re-wetting). This will be demonstrated by a post rehab aerial survey.
- Stabilising potential emissions from the site (silt run-off). The key target will be developing a stable or downward trajectory of water quality indicators (suspended solids and ammonia) towards what would be typical of a re-wetted cutaway bog. This will be demonstrated by water quality monitoring results.

### **Rehabilitation measures: (see Figure Ap-1)**

- Blocking field drains in the former industrial production area using a dozer to create regular peat blockages (three barriers per 100 m) along each field drain;
- Re-alignment of piped drainage.
- Realignment of gravity outfalls.
- Fertiliser treatment of high fields and headlands (typically slow to naturally re-colonise) to encourage natural colonisation.
- No measures are planned for the surrounding marginal peatland habitats.
- Silt ponds will continue to be maintained during rehabilitation and decommissioning.
- Evaluate success of short-term rehabilitation measures and enhance where necessary.
- Decommissioning of silt-ponds will be assessed and carried out, where required.

### **Timeframe:**

- 2021. 1<sup>st</sup> phase of rehabilitation. Field drain blocking.
- 2021. 2<sup>nd</sup> phase. Further realignment of piped drainage and other re-wetting measures dependent on success of 1<sup>st</sup> phase re-wetting, as determined by ongoing monitoring of water levels and re-vegetation.
- Other enhancement measures such as fertiliser treatment will be carried out, if needed. These will be determined by ongoing monitoring.
- 2023-2024. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- 2023-2024. Decommission silt-ponds, if necessary.

Table AP-1. Rehabilitation measures and target area.

Type	Code	Description	Area (Ha)
Deep peat cutaway	DPT1	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes	104.59
Dry Cutaway	DCT1	Limited drain blocking, blocking outfalls and managing water levels with overflow pipes	46.74
Wetland	WLT1	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes	280.47
Marginal land	MLT1	No work required	75.7
Silt ponds		Silt-ponds	3.9
Constraint		Constrained areas	16.74
<b>Total</b>			<b>528.14</b>

### Monitoring, after-care and maintenance

- There will be initial quarterly monitoring assessments of the site to determine the general status of the site, the condition of the silt-ponds, assess the condition of the rehabilitation work, assess the progress of natural colonisation, monitoring of any potential impacts on neighbouring land and general land security. The number of site visits will reduce after 2 years to bi-annually. These site visits will assess the need to additional rehabilitation.
- Water quality monitoring will be established.
- Monitoring results will be maintained, trended and reported on each year as part of the requirement to report on Condition 10.1 of the IPC Licence on Bog Rehabilitation in the Annual Environmental Report, which will be available in April each year at [www.epa.ie](http://www.epa.ie).
- The parameters to be included (as per condition 6.2 of the IPC Licence) include monthly monitoring for pH, Flow, Suspended Solids, Total Solids, Total Phosphorus, Total Ammonia, Colour, and COD.
- This sampling regime on a selected number of silt ponds will be carried out over a two year cycle. The original (licence) requirement was for a quarterly sampling regime.
- Where other uses are proposed for the site, these will be assessed by Bord na Móna in consultation with interested parties. Other after-uses can be proposed for licensed areas and must go through the appropriate assessment and planning procedures.

### Validation and IPC Licence surrender

Reporting to the EPA will continue until the IPC License is surrendered. The bog will be included in the full licence surrender process as per the Guidance to Licensees on Surrender, Cessation and Closure of Licensed Sites (EPA, 2012) when:

- The planned rehabilitation has been completed;
- Water quality monitoring demonstrates that water quality of discharge is stabilising or improving; and
- The site has been environmentally stabilised.



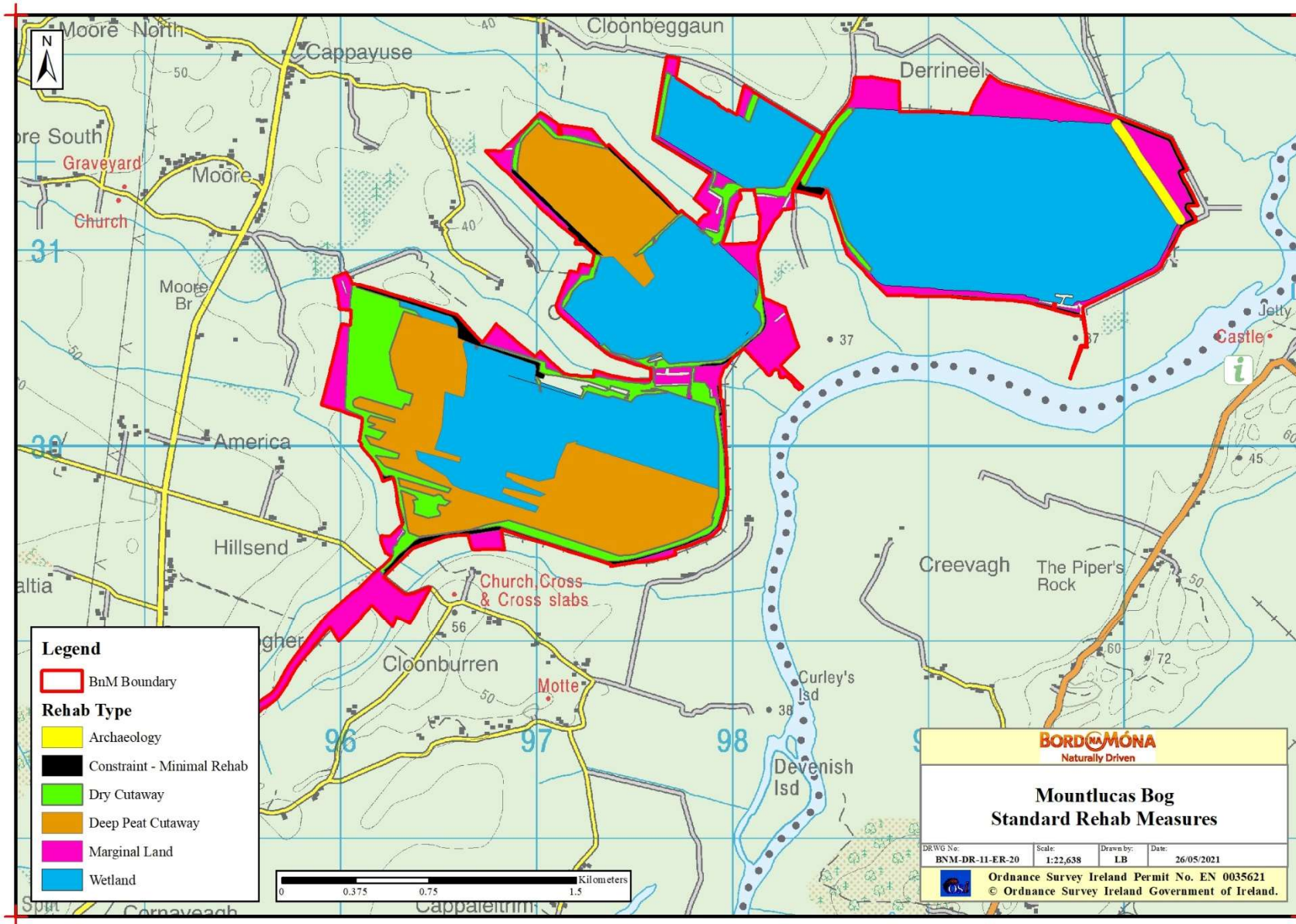


Figure Ap-1. Indicative adapted standard rehabilitation plan for Clooniff Bog.

## APPENDIX II: BOG GROUP CONTEXT

The Blackwater Bog Group IPC Licensed area is made up of three sub-groups (Attymon, Blackwater and Derryfadda) and have been in industrial peat production for several decades. The majority of sites are situated alongside the Shannon and Suck Rivers within counties Roscommon, Galway, Westmeath and Offaly and cover an overall area of 15,515 ha. Each bog area further comprises a range of habitats from bare milled peat production areas to re-colonising cutaway to workshops areas and transport infrastructure. Industrial peat extraction from these sites mainly supplied ESB power stations at Shannonbridge (WOP) and Lanesborough (LRP).

Industrial peat extraction in the Blackwater Bog Group has permanently ceased on the majority of sites. It is planned to supply remaining milled peat stocks to Shannonbridge (WOP) and Lanesborough (LRP) during 2020. Both power stations will cease using peat by the end of 2020. Decommissioning and rehabilitation for the Blackwater Bog Group is expected to start in 2020/2021.

A number (6) of bogs were initially drained but have never been used for industrial peat production (three former development bogs (Kellysgrove, Tirrur-Derrymore and Newtown-Loughgore), Clonboley, Killeglan and Derrydoo-Woodlough). The latter three bogs are classed as restored raised bogs, still contain active bog habitat (that qualifies as the Annex I EU Habitats Directive habitat) and now form the core of the Bord na Móna Raised Bog Restoration Project due to their high biodiversity value and bog restoration potential. NPWS have identified the Clonboley bog cluster as having high ecological value within the recent assessment of raised bog SACs, NHAs and non-designated sites (NPWS 2014<sup>2</sup>).

Several sections of Tirrur-Derrymore bog have been leased to NPWS for domestic turf cutting as part of the SAC turf-cutting compensation scheme. Turf-cutters from neighbouring SACs have been relocated to this site by NPWS. Several other bogs are being assessed for similar use.

The depth of remnant peat within Blackwater bog units will have a very significant impact on the development of these sites, with deeper peat (Derryfadda milled peat production bogs) having potential for the establishment of embryonic peat-forming (*Sphagnum*-rich) vegetation communities. Milled peat cutaway (such as at Blackwater) develops in a somewhat different way as in places the underlying gravel is exposed, there is significant alkaline influence on the water chemistry and in many of these cutaway bogs will develop fen and wetlands due to the local topography, hydrology and water chemistry.

A breakdown of the component bog areas for the Blackwater Bog Group IPC License Ref. PO502-01 is outlined in Table Ap-2.

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<sup>2</sup> <http://www.npws.ie/peatlandsturf-cutting/nationalraisedbogsacmanagementplan/>

Table Ap-2a: Blackwater Bog Group names, area and indicative status (Attymon sub-group)

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Attymon	336	Cutover Bog Industrial peat production commenced at Attymon Bog in 1941 and ceased in 2019. Attymon is a deep peat cutover bog.	Attymon Bog formerly supplied fuel sod peat. Coillte have developed a portion of the former production area for conifer forestry. Some rehabilitation was carried out in 2019/2020.	2109	Finalised 2018
Cloonkeen	252	Cutover Bog Industrial peat production commenced at Cloonkeen Bog in 1953 and ceased in 2019. Cloonkeen Bog is a deep peat cutover bog.	Cloonkeen Bog formerly supplied fuel sod peat. Coillte have developed a portion of the former production area for conifer forestry. Some rehabilitation was carried out in 2019/2020.	2019	Finalised 2018
Derrydoo-Woodlough	452	Development Bog Derrydoo-Woodlough Bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place.	Bog restoration was carried out in 2013-2014 Rehabilitation (bog restoration) now complete.	N/A	Finalised 2012
Tirrur-Derrymore	422	Development Bog This bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place.	This bog has significant raised bog restoration potential. Section leased to NPWS as a SAC turf-cutting relocation site.	N/A	Updated 2020
Newtown-Loughgore	448	Development Bog This bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place.	Some sod turf production Bog restoration was carried out in 2019-2020 Rehabilitation (bog restoration) nearly complete.	2020	Finalised 2012
Killeglan	581	Development Bog This bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place.	Bog restoration was carried out in 2013-2014 Rehabilitation (raised bog restoration) complete	N/A	Finalised 2016
Cloonboley 1	675	Development Bog This bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place on the main section.	A small sub-section has been used for sod turf production. Bog restoration was carried out in 2013-2014 Rehabilitation (raised bog restoration) complete	2020	Finalised 2014
Cloonboley2	203	Development Bog This bog was drained in the 1980s in anticipation of industrial peat production. No industrial peat harvesting ever took place.	Bog restoration was carried out in 2013-2014 Rehabilitation (raised bog restoration) complete	N/A	Finalised 2016

Table Ap-2b: *Blackwater Bog Group names, area and indicative status (Blackwater sub-group)*

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Ballaghurt	597	Cutaway Bog  Industrial peat production commenced at Ballaghurt Bog in 1981. The majority of the site is cutaway with some residual deeper peat	Ballaghurt Bog formerly supplied a range of commercial functions including horticultural peat and fuel peat.  Pioneer cutaway vegetation communities are naturally developing on some cutaway areas.	2020	Draft 2017
Belmont	316	Cutaway Bog  Industrial peat production commenced at Belmont Bog during the 1950's. The majority of the site is cutaway.	There are some areas of pioneer cutaway vegetation communities naturally colonising cutaway sections.  Coilte have developed a portion of the bog for forestry.	2020	Draft 2021
Blackwater	2,303	Cutaway Bog  Industrial peat production commenced at Blackwater Bog during the 1950's. The majority of the site is cutaway.	Bloomhill Bog formerly supplied milled horticultural peat and fuel peat.  There is extensive development of emergent cutaway vegetation communities across the former production area.  The site has been used for experimental forestry (BOGFOR) and other conifer plantations.  Part of the site was rehabilitated with lake and wetland creation.  An ash facility took ash from Shannonbridge Power station	2020	Draft 2017
Bloomhill	883	Cutover Bog  Industrial peat production commenced at Bloomhill Bog during 1981. The majority of the site still has relatively deep residual peat.	Bloomhill Bog formerly supplied milled horticultural peat and fuel peat.  Much of the former peat production area is bare peat.	2020	Draft 2017
Bunahinly-Kilgarvan	389	Cutover Bog  Industrial peat production commenced at Bunahinly-Kilgarvan Bog during the 1990's. Residual Deep peat remains on these bogs.	Bunahinly-Kilgarvan formerly supplied milled horticultural peat and fuel peat.  Much of the former production area is bare peat.  Part of Bunihinly has been re-wetted.	2020	Draft 2017
Glebe	132	Cutover Bog  Industrial peat production commenced at Glebe Bog during the 1990's. Residual deep peat remains on these bogs.	Glebe Bog formerly supplied milled; horticultural peat and fuel peat.  Glebe bog is still listed as a pNHA.  Much of the former production area is bare peat.	2020	Draft 2017
Clooniff	523	Cutover & cutaway Bog  Industrial peat production commenced at Clooniff Bog during the 1970's. A mosaic of variable peat depths remains on this bog.	Clooniff Bog formerly milled fuel peat.  Much of the former production area is bare peat or wetland.  Some emergent vegetation communities are naturally colonising cutaway areas. Reduced pumping has created a large wetland in one area.	2020	Draft 2021

Cornafulla	460	Cutover Bog Industrial peat production commenced at Cornafulla Bog in 1987. This bog still retains relatively deep residual peat.	Cornafulla Bog formerly supplied milled horticultural peat and fuel peat. Much of the former production area or cutaway is bare peat.	2020	Draft 2017
Cornaveagh	492	Cutover Bog Industrial peat production commenced at Cornaveagh Bog in 1970's and ceased in 2020. This bog still retains relatively deep residual peat.	Cornaveagh Bog formerly supplied milled horticultural peat and fuel peat. Much of the former production area footprint or cutaway is bare peat.	2020	Draft 2017
Cullaghmore	442	Cutover Bog Industrial peat production commenced at Cullaghmore Bog in 1960's and ceased in 2020. Much of this bog is cutaway, with some pockets of deeper residual peat.	Cullaghmore Bog formerly supplied milled horticultural peat and fuel peat. Much of the former production area footprint or cutaway is bare peat. Some pioneer cutaway vegetation communities are naturally colonising cutaway areas.	2020	Draft 2017
Garryduff	970	Cutaway Bog Industrial peat production commenced at Garryduff Bog in 1960's. The majority of this bog is cutaway.	Much of the former production area footprint or cutaway is bare peat. Extensive natural development of pioneer cutaway vegetation communities is present on cutaway areas.	2020	Draft 2021
Kellysgrove	201	Development Bog Kellysgrove Bog was drained in the 1980s in anticipation of industrial peat production. No peat harvesting ever took place.	The site retains degraded raised bog vegetation. Kellysgrove Bog retains significant raised bog restoration potential. A way-marked walking trail is positioned along the old Ballinasloe Canal.	2020	Draft 2021
Kilmacshane	1,294	Cutaway Bog Industrial peat production commenced at Kilmacshane Bog in 1960's. The majority of this bog is cutaway with some pockets of deeper peat remaining.	Kilmacshane Bog formerly supplied milled horticultural peat and fuel peat. Some pioneer cutaway vegetation communities are naturally colonising cutaway areas and water levels have risen as pumping reduced, creating wetlands.	2014	Draft 2021
Lismanny	449	Cutaway Bog Industrial peat production commenced at Lismanny Bog in 1960's. The majority of this bog is cutaway with some pockets of deeper peat remaining.	Lismanny Bog formerly supplied milled horticultural peat and fuel peat. Much of the former production area footprint is bare peat. Some pioneer cutaway vegetation communities are naturally colonising cutaway areas.	2020	Draft 2021

Table Ap-2c: *Blackwater Bog Group names, area and indicative status (Derryfadda sub-group)*

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Derryfadda	610	Cutover bog Industrial peat production commenced at Derryfadda Bog in 1980's. This bog still retains residual deep peat.	Derryfadda Bog formerly supplied milled horticultural peat and fuel peat.  Much of the former production area is bare peat.  Some pioneer cutaway vegetation communities are naturally colonising cutaway areas.	2020	Draft 2017
Boughill	415	Cutover bog Industrial peat production commenced at Boughill Bog in 2008. This bog still retains residual deep peat.	Boughill Bog formerly supplied milled horticultural peat and fuel peat.  Much of the former production area footprint or cutaway is bare peat.	2020	Draft 2017
Castlegar	517	Cutover bog Industrial peat production commenced at Castlegar Bog in 2001. This bog still retains residual deep peat.	Castlegar Bog formerly supplied milled horticultural peat and fuel peat.  Much of the former production area is bare peat.  The adjacent Annaghbeg Bog NHA is an intact undrained raised bog	2019	Draft 2021
Gowla	650	Cutover bog Industrial peat production by BnM commenced at Gowla Bog in 1970's. Development for sugar production was in place at Gowla since the 1950's. This bog still retains residual deep peat.	Gowla Bog formerly supplied milled horticultural peat and fuel peat.  Much of the former production area footprint is bare peat.	2020	Draft 2017



## APPENDIX III: ECOLOGICAL SURVEY REPORT

<b>Ecological Survey Report</b>			
<i>Note: This report outlines an ecological survey of the bog. This report should not be taken as a management plan for the site as other land-uses may still be considered. Information within this report may inform the development of other land-uses and identify areas with particular biodiversity value.</i>			
<b>Bog Name:</b>	<b>Clooniff</b>	<b>Area (ha):</b>	532ha
<b>Works Name:</b>	Blackwater	<b>County:</b>	Roscommon
<b>Recorder(s):</b>	DF	<b>Survey Date(s):</b>	16 <sup>th</sup> & 20 <sup>th</sup> March 2012 & November 2016.
<b>Habitats present (in order of dominance)</b>			
The most common habitats present at this site include:			
<ul style="list-style-type: none"> <li>• Bare peat (BP) (Codes refer BnM classification of pioneer habitats of production bog. See Appendix II).</li> <li>• Pioneer poor fen communities dominated by Soft Rush (pJeff)</li> <li>• Pioneer dry heath communities (dHeath)</li> <li>• Emerging Birch scrub (eBir)</li> <li>• Silt Ponds (Silt) with associated habitats such as scrub, Bracken, rank grassland (GS2), dry calcareous grassland (gCal) and typical pioneer communities of disturbed areas (disTuss).</li> </ul>			
The most common habitats present around the margins at this site include:			
<ul style="list-style-type: none"> <li>• Birch woodland (WN7) (Codes refer to Heritage Council habitat classification, Fossitt 2000), See Appendix II)</li> <li>• Scrub (WS1) (Gorse scrub and Birch scrub developing of dry high bog around margins)</li> <li>• Raised bog (PB1)</li> <li>• Cutover bog (PB4) (several small fragments)</li> <li>• Wet grassland (GS4) along the edges of the site.</li> </ul>			
<b>Description of site</b>			
<p>Clooniff Bog is located approximately 6km to the north of Shannonbridge in Co Roscommon. The bog is divided into four individual units with a long rail link that connects it with Cornaveagh Bog located ca. 1km to the south. Access to Clooniff Bog can be gained from public roads located to the north and to the south of the site respectively.</p> <p>The majority of Clooniff contains in excess of 2m of peat remaining on the site. The north western corner of the site contains an area of high bog that has recently been re-developed for milled peat production. This area was previously in milled peat production for a short period and it had re-vegetated with Heather.</p> <p>Clooniff is mainly composed of bare peat as the entire bog was in active peat production until recently. Marginal habitats include Birch woodland (WN7), remnant sections of raised bog (PB1), scrub (WS1) and cutaway bog (PB4). The remnant sections are generally small and are dry with a dominance of Ling Heather.</p> <p>The River Shannon flows within close proximity to the eastern boundary of the site and two narrow strips of land (under BnM ownership) extend from the site to the River Shannon. A number of long peat berms have been constructed on the site between 2010 and 2012. These berms have an average height of 0.6 m and are designed</p>			

to prevent flooding from the Shannon and other smaller streams that flow through the site. A water pump is operational close to the centre of the site.

Two small streams flow through the site with a third stream flowing along the southern boundary of the site. These streams have been canalised and supports a small number of aquatic plant species. Riparian vegetation was mainly composed of Willow (*Salix* sp.), Common Reed (*Phragmites australis*) and Reed Canary Grass (*Phalaris arundinacea*). A number of silt ponds, some of which were newly constructed, are located adjacent to the streams. Otter activity is high along these streams and there is frequent evidence of Otter tracks, spraint and fish remains. It is likely that an Otter “couch” is situated on the site. Coarse fish including Bream and Roach were also observed in these streams.

There are records of Rhododendron (*Rhododendron ponticom*) present in amongst the marginal habitats of the site. This invasive species has the potential to colonise portions of the site once production ceases and outcompete native plant species.

Although the majority of the site is classified as bare peat, many of the field drains support wetland plants such as Common Reed (as the dominant vegetation type). The presence of a drainage ditch that runs along most northerly section of the site supports Black Bog Rush (*Schoenus nigricans*), a species found on cutaway when the peat layer (acid base) meets the marl layer (base rich).

A rehabilitation trial was carried out in November 2016 on a small section of the cutaway (ca. 1.5 ha) concentrated in the northern part of the site at the location of the main outfall. The trial involved re-profiling and landscaping of berms, drain blocking and sourcing donor plant material from a donor site to enhance the establishment of wetland vegetation. Following reconfiguration of the constructed wetland, Common Reed (*Phragmites australis*) was sourced locally from within Clooniff and stands were translocated and planted within the rehab area. Drainage from the production bog was directed towards the main outfall location at the constructed wetland rehabilitation area. In addition to the silt ponds present at the main outfall location, the constructed wetland will serve to alleviate and attenuate suspended solids and ammonia concentrations from industrial peat production areas and provide a wetland refuge for species of wild flora and fauna.

#### **Designated areas on site (cSAC, NHA, pNHA, SPA other)**

A small section of the site partially overlaps with the the River Shannon SAC & pNHA (000216) and the Middle Shannon Callows SPA (004096)

#### **Adjacent habitats and land-use**

Adjacent habitats include lowland depositing river (FW2), wet grassland (GS4), improved agricultural grassland (GA1), cutaway bog (PB4) and raised bog (PB1).

#### **Watercourses (major water features on/off site)**

- The River Shannon flows along the eastern edge of the site.
- Two streams flow through the site, with a third stream flowing along the southern boundary of the site. These streams flow into the River Shannon.

#### **Peat type and sub-soils**

The depth of peat remaining in Clooniff ranges in depth between 1m to over 2.6m. The majority of the peat remaining on the site is fen peat. The peat is underlain with gravel.

**Fauna biodiversity****Birds**

Several bird species were noted on the site during the survey.

- Mallard
- Teal
- Snipe
- Other more common species include Heron, Blackbird, Robin, Wren, Blue Tit and Wood Pigeon.

**Mammals**

Signs of several mammal species were noted on the site during the survey.

- Otter
- Badger
- Pine Marten
- Fox
- Mink

**Other species**

- Frog
- Roach
- Bream

**References**

Cross, J.R. 2006. The Potential Natural Vegetation of Ireland. Biology and Environment: Proceeding of the Royal Irish Academy, Vol. 106B, No. 2, 65-116 (2006).

European Commission (2013). Interpretation manual of European Union Habitats. European Commission DG Environment Nature ENV B.3.

Fossitt, J. (2000). A guide to habitats in Ireland. Kilkenny. The Heritage Council.

NRA (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes (Revision 2). National Roads Authority.

## APPENDIX IV. - ENVIRONMENTAL CONTROL MEASURES TO BE APPLIED TO BOG REHABILITATION

- Bog restoration/rehabilitation measures will be restricted to within the footprint of the proposed rehabilitation area.
- The proposed rehabilitation will have due regard to noise limits and hours of operation (i.e. dusk and dawn) to minimise any potential disturbance on resident and local fauna that utilise the site and immediate environs.
- All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (SI 359/1996).
- The proposed activities will be restricted to daylight hours and there will be no requirement for artificial lighting.
- Silt ponds will be inspected and maintained as per the IPC Licence.
- During periods of heavy precipitation and run-off increasing risks of siltation, activities will be halted.
- Measures will be carried out using a suitably sized machine and in all circumstances, excavation depths and volumes will be minimised where possible.
- All machines will be regularly checked and maintained prior to arrival at the site to prevent hydrocarbon leakage.
- Hoses and valves will be checked regularly for signs of wear and will be closed and securely locked when not in use.
- Fuelling and lubrication of equipment shall only be carried out in designated areas away from surface water drainage features and ecologically sensitive areas.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.
- Vehicles will never be left unattended during refuelling.
- No direct discharges to waters will be made. No washings from vehicles, plant or equipment will be carried out on site.
- All plant refuelling will take place using mobile fuel bowsers. Only dedicated trained and competent personnel will carry out refuelling operations.
- Mobile storage such as fuel bowsers will be bunded to 110% capacity to prevent spills. Tanks for bowsers and generators shall be double skinned. When not in use, all valves and fuel trigger guns from fuel storage containers will be locked. All pumps using fuel or containing oil will be locally and securely bunded where there is the possibility of discharge to waters.
- Potential impacts caused by spillages etc. during rehabilitation will be reduced by keeping spill kits and other appropriate equipment on-site.
- Site activities will be carried out in accordance with 'best practice'. In order to ensure compliance and implementation of 'best practice', these measures will be communicated to relevant Bord na Móna staff and updated as required.

## APPENDIX V. BIOSECURITY

There are records of Rhododendron (*Rhododendron ponticom*) present in amongst the marginal habitats of the site. This species is listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011). Rhododendron has the potential to colonise portions of the cutaway following the cessation of peat harvesting activities.

The potential for importation or introduction of non-native plant species (such as Japanese Knotweed, Himalayan Balsam, etc.) during future rehabilitation management, such as drain-blocking using excavators, has the potential to result in the establishment of invasive species within the site. Section 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 prohibits the introduction and dispersal of invasive alien species (particularly plant species) listed on Part 1 (third column) of the 'Third Schedule'.

This section aims to reduce the risk from, and impacts of, invasive species and protecting biodiversity on lands under Bord na Móna ownership. Rehabilitation and decommissioning in the bog will have due regard to the relevant biosecurity measures outlined below:

- Records of problematic invasive species within the various bog units will be marked out with signs to highlight areas of infestation to personnel.
- All plant machinery will be restricted from disturbing known colonies of invasive species.
- All plant machinery will avoid unnecessary crossings to adjoining lands.
- Good site hygiene will be employed to prevent the introduction and spread of problematic invasive alien plant species (i.e. Japanese Knotweed (*Fallopia japonica*), Himalayan Balsam (*Impatiens glandulifera*), Himalayan Knotweed (*Persicaria wallichii*), etc.) by thoroughly washing vehicles prior to entering the site.

The biosecurity measures outlined above are in line with best practice guidelines issued by the National Roads Authority (NRA, 2010) – The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads and broadly based on the Environment Agency's (2013) – The Knotweed Code of Practice: Managing Japanese Knotweed on Development Sites (Version 3, amended in 2013, accessed on the Environment Agency's website on the 11th of July 2016).

In addition to the above, Best Practise measures around the prevention and spread of Crayfish plague<sup>3</sup> and Zebra Mussel will be adhered with throughout all rehabilitation measures and activities.

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<sup>3</sup> <https://www.biodiversityireland.ie/projects/invasive-species/crayfish-plague/>

## APPENDIX VI: POLICY AND REGULATORY FRAMEWORK

Bord na Móna Plc is a publicly owned company, originally established in 1934 to develop some of Ireland's extensive peat resources for the purposes of economic development and to support energy security. In the decades since its establishment the company has employed tens of thousands of people in its fuel, energy, and horticultural growing media businesses. For much of its history the company's support of important national policy aims has been enabled and encouraged in a variety of ways by Government.

Today, Bord na Móna is undertaking a number of highly significant actions in support of climate policy. These actions involve a radical transformation and decarbonisation of nearly the entire Bord na Móna business. This transformation will be driven by unlocking the full potential of our land and creating significant value for Ireland and the Midlands in particular. Bord na Móna have now announced the complete cessation of industrial peat production across its estate (January 2021).

Bord na Móna is an integral part of the economic, social, and environmental fabric of Ireland and Irish life. As a key employer in the Midlands, the company is conscious that its obligations go beyond purely commercial and environmental – there is also a social responsibility to employees and the communities served by Bord na Móna. It is the company's role and absolute priority to ensure that its long-term strategy delivers on all of these important areas in a robust and balanced way.

There are a wide range of policies, plans, legislation and land designations that inform the development of this Bord na Móna peatland rehabilitation plan. Bord na Móna have also developed and operate various policies and strategies that also inform the development of this rehabilitation plan.

### 1 EPA IPC Licence

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Blackwater Bog Group (Ref. P0502-01). As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The bog is part of the Mount Dillon Bog group. This regulatory requirement is the main driver of the development of this rehabilitation plan.

### 2 The Peatlands Climate Action Scheme (PCAS)

Bord na Móna (BnM) appreciates the Minister's intention to support, via the Climate Action Fund, Bord na Móna in developing a package of measures, 'the proposed Scheme', for the enhanced decommissioning, rehabilitation and restoration of cutaway peatlands, referred to as the 'Peatlands Climate Action Scheme'. The proposed Scheme includes lands previously used to supply peat for electricity generation within the State. The enhanced decommissioning, rehabilitation and restoration of the peatlands funded by the proposed Scheme will deliver benefits across climate action (GHG mitigation through reduced carbon emissions and acceleration towards carbon sequestration), enrich the State's natural capital, increase eco-system services, strengthen biodiversity, improve water quality and storage attenuation as well as developing the amenity potential of the peatlands.

It is envisaged that Bord na Móna carry out an enhanced decommissioning, rehabilitation and restoration scheme, (PCAS), across a footprint of 33,000 ha. This proposed scheme will significantly go beyond what is required to meet rehabilitation and decommissioning obligations under existing EPA IPC licence conditions. Interventions and measures supported by the Scheme will ensure that environmental stabilisation is achieved (meaning IPC obligations are met), and importantly, significant additional benefits, particularly relating to climate action and



other ecosystem services, will also be delivered. *However, only the costs associated with the additional and enhanced measures, i.e., those which go beyond the existing decommissioning and rehabilitation requirements arising from Condition 10, will be eligible for support under the proposed Scheme.*

The proposed enhanced rehabilitation measures detailed in this document, are predicated on the understanding that the element of the rehabilitation, over and above the ‘standard’ measures necessary to comply with pre-existing Condition 10 IPC Licence requirements, will be deemed eligible costs for the Scheme regulator.

### **3 National Climate Policy**

The National Policy Position establishes the fundamental national objective of achieving a transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050. It sets out:

- the context for the objective;
- clarifies the level of GHG mitigation ambition envisaged; and
- establishes the process to pursue and achieve the overall objective.

The evolution of climate policy in Ireland will be an iterative process based on the adoption by government of a series of national plans over the period to 2050. GHG mitigation and adaptation to the impacts of climate change are to be addressed in parallel national plans – respectively through the National Climate Action Plan. The plans will be continually updated, as well as being reviewed on a structured basis at appropriate intervals and, at a minimum, every five years. This will include early identification and ongoing updating of possible transition pathways to 2050 to inform sectoral strategic choices.

Bord na Móna is following a decarbonisation programme aimed at reducing the carbon emissions from its activities. The company aims to further develop renewable energy and resource recovery markets with a key objective of reducing the carbon intensity of all products. In addition, the carbon emission mitigation benefits associated with the post-peat extraction rehabilitated peatland following re-wetting, revegetation and colonisation of significant areas with native woodland will make a significant contribution to achieving the State’s carbon emission reduction targets.

### **4 National Peatlands Strategy**

The National Peatlands Strategy (2015) contains a comprehensive list of actions, necessary to ensure that Ireland’s peatlands are preserved, nurtured and become living assets within the communities that live beside them. It sets out a cross-governmental approach to managing issues that relate to peatlands, including compliance with EU environmental law, climate change, forestry, flood control, energy, nature conservation, planning, and agriculture. The Strategy has been developed in partnership between relevant Government Departments/State bodies and key stakeholders through the Peatlands Council.

The strategy recognises that Ireland’s peatlands will continue to contribute to a wide variety of human needs and to be put to many uses. It aims to ensure that Ireland’s peatlands are sustainably managed so that their benefits can be enjoyed responsibly. It aims to inform appropriate regulatory systems to facilitate good decision making in support of responsible use. It also aims to inform the provision of appropriate incentives, financial supports and disincentives where required. The strategy attempts to strike an appropriate balance between different needs, including local stakeholders like turf-cutters and semi-state bodies such as Bord na Móna.

In line with a National Peatlands Strategy recommendation, a Peatlands Strategy Implementation Group (PSIG), was established, assisted in the finalisation of the Strategy, is overseeing subsequent implementation and will report to Government on an annual basis on the implementation of the actions and principles contained within the Strategy.

Bord na Móna is a key stakeholder in the National Peatlands Strategy and the Peatlands Strategy Implementation Group. The strategy recognises the potential for some Bord na Móna sites to be restored and to contribute to the national SAC and NHA network of protected raised bog sites. The strategy also recognises the various different values of cutaway bog and developed six key principles (with Bord na Móna) for the after-use of cutaway bog.

- Bord na Móna will continue to assess and evaluate the potential of the company's land bank, using a land use review system. The assessment will help prepare a set of evidence-based management plans for the various areas of peatland. These plans will also inform its cutaway bog rehabilitation.
- The policy of Bord na Móna is not to open up any undrained new bogs for peat production.
- Lands identified by Bord na Móna as having high biodiversity value and/or priority habitats will be reserved for these purposes as the principal future land use.
- Generally, Bord na Móna cutaway bogs that flood naturally will be permitted to flood unless there is a clear environmental and/or economic case to maintain pumped drainage.
- In deciding on the most appropriate afteruse of cutaway peatlands, consideration shall be given to encouraging, where possible, the return to a natural functioning peatland ecosystem.
- This will require re-wetting of the cutaway peatlands which may lead in time to the restoration of the peatland ecosystem.
- Environmentally, socially and economically viable options should be analysed to plan the future use of industrial cutaway peatlands, in conjunction with limiting factors as outlined in Bord na Móna's Strategic Framework for the Future Use of Peatlands.

The National Peatlands Strategy highlights the importance and value of developing peatland rehabilitation plans for Bord na Móna cutaway sites and implementing this peatland rehabilitation.

## **5 National River Basin Management Plan 2018-2021 (Water Framework Directive)**

The National River Basin Management Plan (2018-2021) (Department of Housing, Planning, Community and Local Government 2017) is the key national plan for Ireland to achieve the objectives of the Water Framework Directive (WFD). In broad terms, the objectives of the WFD are (1) to prevent the deterioration of water bodies and to protect, enhance and restore them with the aim of achieving at least good status and (2) to achieve compliance with the requirements for designated protected areas.

The NRBMP outlines how peat extraction can be a potentially significant pressure on various water quality parameters. Peatland rehabilitation of Bord na Móna cutaway (in addition to other measures) is part of the WFD (2018-2021) programme of measures. The NRBMP takes account of the fact that Bord na Móna is in the process of phasing out the extraction of peat for energy production, that it set a target to rehabilitate 9,000 ha of cutaway bogs (covering 25 peatlands) by 2021 (in 2018) and will look to implement best-available mitigation measures to further reduce water quality impacts caused by peat extraction while the phasing-out process is taking place. This NRBMP rehabilitation target is set to be superseded by the acceleration of the Bord na Móna de-carbonisation programme and PCAS.

The development of site rehabilitation plans and the delivery of peatland rehabilitation by Bord na Móna is expected to have a positive impact on water quality and will help the NWBMP deliver its objectives in relation to the Water Framework Directive and is one of the five key principle actions.

## **6 National Biodiversity Action Plan 2016-2021**

The National Biodiversity Action Plan 2016-2022 has a vision that biodiversity and ecosystems in Ireland are conserved and restored, delivering benefits essential for all sectors of society and that Ireland contributes to efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally. Ireland's 2<sup>nd</sup> National Biodiversity Action Plan outlines the main policies, strategies, actions and targets in relation to biodiversity. This plan has several Bord na Móna specific objectives and actions including implementing the BnM Biodiversity Action Plan 2016-2021 and overlaps with both the National Peatlands Strategy and the National Raised Bog Special Areas of Conservation Management Plan 2017-2022.

## **7 National conservation designations**

Bord na Móna operates in a wider landscape that also includes a network of European and National nature conservation sites (Special Areas of Conservation (SACs), Special Protection Areas (SPAs), National Heritage Areas (NHAs, cNHAs) and National Nature Reserves). Bord na Móna will take account of this network of conservation objectives and their conservation objectives when developing these rehabilitation plans. It is expected that peatland rehabilitation will, in general, benefit the conservation objectives of this network of nature conservation sites.

Clooniff Bog is situated in close proximity to, or overlaps a number of lands designated for conservation. Clooniff Bog partially overlaps with the River Shannon Callows SAC and pNHA (NPWS Site Code: 000216) and Middle Shannon Callows SPA (NPWS Site Code: 004096) on the western periphery of the site as a whole and along the southern edge of Coolumber Bog (Figure 3.5). The River Shannon Callows SAC (and pNHA) is designated for grasslands (Molinia and Lowland Hay Meadows) as well as alluvial woodland and Otter. The Middle Shannon Callows SPA is designated for the assemblage of wintering wildfowl, many species of which occur in internationally and nationally important numbers as well, in addition to breeding Corncrake. It is also noted as being important for breeding waders and a range of other nationally scarce species such as breeding Shoveler, Quail and Whinchat.

## **8 National Raised Bog Special Area of Conservation Management Plan 2017-2022.**

The National Raised Bog Special Area of Conservation Management Plan 2017-2022 sets out a roadmap for the long-term management, restoration and conservation of protected raised bogs in Ireland. The Plan strikes an appropriate balance between the need to conserve and restore Ireland's raised bog network as part of Ireland's commitments towards the EU Habitats Directive, and the needs of stakeholders and gives recognition to the important role that communities have to play in the conservation and restoration of raised bogs. The National Raised Bog Special Areas of Conservation (SACs) Management Plan 2017-2022 is part of the measures being implemented in response to the on-going infringement action against Ireland in relation to the implementation of the EU Habitats Directive, with regard to the regulation of turf cutting on the Special Areas of Conservation

(SACs). The then Minister for Arts, Heritage and the Gaeltacht, also published a **Review of Raised Bog Natural Heritage Area Network** in 2014.

Bord na Móna has played a key role in the development of the National Raised Bog Special Area of Conservation Management Plan 2017-2022 and the Review of the Raised Bog Natural Heritage Area Network. Several Bord na Móna sites were assessed by the National Parks and Wildlife Service as part of the above Plan and Review and there is an expectation that several Bord na Móna sites will be designated as SACs and NHAs in the future. This will reinforce the network of protected raised bog sites and replace in part sites that will be de-designated as they have been deemed to be significantly damaged and are deemed to have no raised bog restoration prospects.

Bord na Móna has also responded to the needs of the NRBMP and provided several sites to the government for the relocation of turf-cutters from SACs. This is part of a suite of ongoing bog conservation measures in the NRBMP to manage turf-cutting in protected sites. Bord na Móna and the National Parks and Wildlife Service continues to engage regarding the ongoing relocation of turf-cutters from protected raised bog sites.

## **9 All-Ireland Pollinator Plan 2015-2020**

The All-Ireland Pollinator Plan 2015-2020 outlines key objectives and actions to protect and support pollinating insects and the habitats they rely on. There are several Bord na Móna specific actions in this plan including the adoption of pollinator-friendly management within the Bord na Móna network of sites. One action to help achieve this objective is habitat rehabilitation and restoration, where possible, of pollinator-friendly habitats, including peatland habitats.

## **10 Land-use planning policies**

As Bord na Móna operates in many counties across Ireland, it is important to note the respective development plans in these counties. Many of the existing development plans recognise the potential that exists in the after-use of cutover/cutaway peatlands. Bord na Móna seeks to work with all of the relevant local authorities to ensure that the most appropriate after-uses are reflected in local planning policy. The following areas of consistent importance are of both direct and indirect relevance to Bord na Móna: heritage, tourism, biodiversity/conservation, landscape, wind energy, and economy/enterprise.

Clooniff Bog is located in an area zoned by Roscommon County Council as open countryside.

## **11 National Archaeology Code of Practise**

Bord na Móna operates under an agreed Code of Practice regarding archaeology with the Department of Arts, Heritage and the Gaeltacht and the National Museum of Ireland which provides a framework to enable the Company to progress peat extraction whilst carrying out archaeological mitigation. The Code replaced a set of Principles agreed with the Department of Arts, Heritage and the Gaeltacht in the 1990s. Under the Code Bord na Móna, the Minister and Director work together to ensure that appropriate archaeological mitigation is carried out in advance of peat extraction.

- BNM must ensure that any monuments or archaeological objects discovered during peat extraction are protected in an appropriate manner by following the Archaeological Protection Procedures.
- BNM must ensure that any newly discovered monuments on Bord na Móna lands are reported in a timely manner to the National Monuments Service of the Department of Arts, Heritage and the Gaeltacht.

- BNM must ensure that any archaeological objects discovered on Bord na Móna lands are reported immediately to the Duty Officer of the National Museum of Ireland.
- Bord na Móna will endeavour to adhere to this code of practise during the peatland rehabilitation phase and appropriate archaeology mitigation is carried out before and during cutaway peatland rehabilitation. An Archaeological Impact Assessment is being carried out for the proposed rehabilitation at this site (Appendix XII). The recommendations of this assessment will be incorporated into the rehabilitation plan to minimise impacts on known archaeology. In addition, Bord na Móna will adhere to the Archaeology Code of Practise relating to management of stray archaeological finds that may arise during cutaway peatland rehabilitation and decommissioning.

## 12 Bord na Móna Biodiversity Action Plan 2016-2021

Rehabilitation of industrial peatlands is a key objective of the Bord na Móna Biodiversity Action Plan 2016-2021. This action plan outlines the main objectives and actions around biodiversity on Bord na Móna lands. The Bord na Móna Biodiversity Action Plan also outlines key International and European policy in relation to biodiversity. This includes the **United Nations Convention on Biodiversity 2011-2020 (CBD)** and **European Biodiversity Strategy to 2020**. Further details of these policies and Bord na Móna's responses can be found in the Bord na Móna Biodiversity Action Plan (Bord na Móna 2016). Both policy documents highlight targets such as reducing pressure on biodiversity, promoting sustainability, habitat restoration and benefits of ecosystem services.

One example of a key CBD target is:

- *“Restore at least 15% of degraded areas through conservation and restoration activities.”*

The EUs headline target for progress by 2020 is to:

- *“halt the loss of biodiversity and the degradation of ecosystems in the EU by 2020, restore them as far as feasible, while stepping up the EU contribution to averting global biodiversity loss.”*

The Clooniff Bog Rehabilitation Plan is aligned to the CBD target and the EU Biodiversity Strategy target and will help Ireland meet its commitment to these international Biodiversity polices.

## 13 Bord na Móna commitments

Bord na Móna made the commitment in 2009 not to develop any new peatland sites for industrial peat production. The company has continued to work with different stakeholders.

The company announced that peat production would be cut by over 50 percent in 2019 and would entirely cease over most of its lands by the mid-2020s. Bord na Móna have now announced the complete cessation of industrial peat production across its estate (January 2021). Rehabilitation measures will continue to be carried out with the focus on re-wetting and rehabilitation of cutover and cutaway areas in line with national policies (such as the National Peatland Strategy, the National Biodiversity Action Plan, the Climate Action Plan 2019, the Water Framework Directive, etc.) and rehabilitation guidelines set down by the Environmental Protection Agency. To date, 15,000 hectares of cutaway and cutover bog have been rehabilitated using this approach with 5,000 hectares in active rehabilitation.

In line with Bord na Móna's accelerated decarbonisation programme, the company has also committed to a significantly larger rehabilitation target. This is reflected in our plans to rehabilitate a further 20,000 hectares of cutaway and cutover bog to wetland and woodland mosaics by 2025. In addition, we plan to restore a further

1,000 hectares of raised bog habitat by 2025. These targets are significant in both timing and scale and are indicative of Bord na Móna's increased new ambition in this area.

These commitments outline the importance of peatland rehabilitation to Bord na Móna. The company will continue to demonstrate environmental responsibility and continue to deliver on these commitments in relation to peatland rehabilitation and in relation to the future management of these lands to maximise their benefits, particularly their ecosystem service benefits, along with the sustainable development of a portion of the land bank for other uses.

#### **14 Bord na Móna Strategic Framework for the future use of cutaway peatlands 2020**

The general after-use strategy of Bord na Móna is outlined in the Bord na Móna Strategic Framework for Future-Use of Cutaway Bogs 2020. This document outlines how Bord na Móna's cutover peatland estate is complex in nature with great variability in terms of peat depths, peat types, drainage, subsoil condition and environmental value. Thus, future options require consideration on a site-specific basis, also bearing in mind the considerable internal variation within bogs. The development of the land-bank will also take account of national needs, while also taking account of the various national legislation, policies and plans related to the management of peatlands. In general, Bord na Móna will seek to balance and optimise commercial, social, and environmental value of these sites, while taking account of the need for sustainability and their biodiversity value.

Any consideration of other future after-uses for Bord na Móna land such as development or other mixed uses will be conducted following the relevant planning guidelines and consultation with relevant authorities and will be considered within the framework of this peatland rehabilitation plan.



## APPENDIX VII. DECOMMISSIONING

### Condition 10 Decommissioning

This is a requirement of the applicable Integrated Pollution Control Licence issued by the Environmental Protection Agency. This condition 10.1 requires the following:

*10.1 Following termination of use or involvement of all or part of the site in the licensed activity, the licensee shall:*

*10.1.1 Decommission, render safe or remove for disposal/recovery, any soil, subsoils, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.*

The main success criteria pertaining to successfully complying with this condition is ensuring that no environmental liability remains from this infrastructure and material and that the bog can be deemed suitable for surrender of the licence under section 95 of the EPA Acts. This is achieved by Bord na Móna identifying and quantifying any mechanical and infrastructural resources that were installed in the bog to enable the development and production operation at the site. This list is then refined to identify any items that would be deemed as possibly resulting in environmental pollution, should they not be removed.

Typically, these items/infrastructures would be any remaining, unconsolidated plant, equipment and attachments, waste materials, unused raw materials such as land drainage pipes, remaining peat stockpiles, stock pile covering, pumps, septic tanks and fuel tanks.

In relation to this bog, the list and tasks would be as follows:

Item	Description	Clooniff Decommissioning Plan
1	Clean-up of remaining or unconsolidated waste or materials located in Bogs, Yards, Buildings and Offices	Clean-up of Bog
2	Cleaning Silt Ponds	Cleaning Silt Ponds
3	Decommissioning Peat Stockpiles	Peat Stockpile Management via Levelling
4	Decommissioning or Removal of Buildings and Compounds	Not relevant
5	Decommissioning Fuel Tanks and associated facilities	Decommissioning and De-Gassing Mobile Fuel Tanks
6	Decommissioning and Removal of Bog Pump Sites	Not Applicable
7	Decommissioning or Removal of Septic Tanks	De-sludge Septic Tank

In addition, condition 7 of the licence requires these now defined waste items to be disposed of or recovered as follows:

7.1 Disposal or recovery of waste shall take place only as specified in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* of this licence and in accordance with the appropriate National and European legislation and protocols. No other waste shall be disposed of/recovered either on-site or off-site without prior notice to, and prior written agreement of, the Agency.

7.2 Waste sent off-site for recovery or disposal shall only be conveyed to a waste contractor, as agreed by the Agency, and only transported from the site of the activity to the site of recovery/disposal in a manner which will not adversely affect the environment.

7.3 A full record, which shall be open to inspection by authorized persons of the Agency at all times, shall be kept by the licensee on matters relating to the waste management operations and practices at this site. This record shall as a minimum contain details of the following:

7.3.1 The names of the agent and transporter of the waste.

7.3.2 The name of the persons responsible for the ultimate disposal/recovery of the waste.

7.3.3 The ultimate destination of the waste.

7.3.4 Written confirmation of the acceptance and disposal/recovery of any hazardous waste consignments sent off-site.

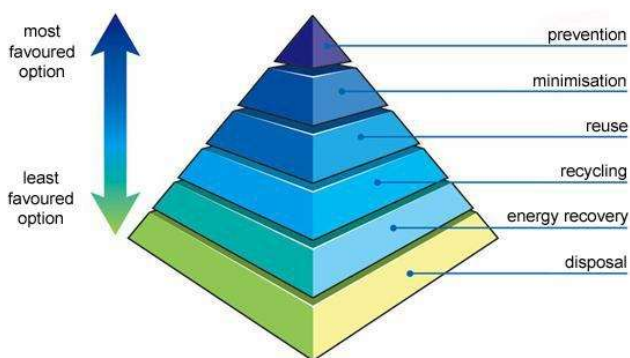
7.3.5 The tonnages and EWC Code for the waste materials listed in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* sent off-site for disposal/recovery.

7.3.6 Details of any rejected consignments.

A copy of this Waste Management record shall be submitted to the Agency as part of the AER for the site.

As required by the licence, these waste items will be removed for recycling or disposal, using external contractors with the required waste collection permits, approved under 7.2, with waste records maintained as required under 7.3.

Where possible, Bord na Móna will utilize the appropriate waste hierarchy to identify waste that can reused or recycled ahead of disposal.



The validation of the success of condition 10.1 is carried out through an Independent Closure Audit (ICA), followed by an EPA Exit Audit (EA) and the eventual partial or full surrender of the licence.

## 2. Enhanced Decommissioning.

The remaining infrastructure does not constitute a risk to the environment and would not be a requirement of condition 10 of the licence. The removal of these are deemed as enhanced measures. These may enhance the future afteruse of the bog for amenity value, security against access for illegal and unsocial activities and general State and community benefit. In relation to this bog, this would include the infrastructure defined below:

Item	Enhanced Decommissioning Type	Clooniff Decommissioning Plan
1	Removal of Railway Lines	Removal of Railway Lines
2	Decommissioning Bridges and Underpasses	Not Applicable
3	Decommissioning Railway Level Crossing	Decommissioning Railway Level Crossing
4	Restricting Access (bogs and silt ponds)	Restricting Access to Bog.
5	Removal of High Voltage Power Lines	Not Applicable

## APPENDIX VIII. GLOSSARY

**Cutaway Bog:** A Bord na Móna site generally becomes cutaway when it is economically unviable to continue industrial peat extraction or when the majority of peat has been removed.

**Deep peat cutover bog.** Deep peat cutaway bog is defined as former raised bogs that have been in industrial peat production, where production has ceased but the residual peat depth is typically in excess of 2m. *Sphagnum* mosses are key species of raised bogs and the majority of the peat mass is formed from these mosses. *Sphagnum* species and other raised bog species are a key part of raised bog habitat function and prefer more acidic, nutrient poor, water-logged conditions. Typical raised bog *Sphagnum* mosses and other bog species do not thrive with the more typical alkaline water chemistry of cutaway bog but do grow well in these more acidic conditions where peat has been re-wetted. There is potential to re-develop *Sphagnum*-rich plant communities in these conditions if the peat can be re-wetted. This brings the opportunity of re-developing *Sphagnum*-rich vegetation communities that are considered Carbon sinks or peat-forming habitats and restoring the carbon sequestration function of these sites.

**Dry cutaway bog:** Cutaway bog is categorised as dry cutaway where it is not practical or feasible to re-wet these areas completely. It is inevitable that some areas of cutaway will remain relatively dry due to the heterogenous topography of the cutaway, as well as requirements for continued drainage on site for identified after-uses, or off site in relation to neighbouring lands or other infrastructure. Ridges and mounds of glacial deposits can become exposed during peat extraction and form a heterogenous topographical mosaic separated by basins. Dry cutaway may have very thin or no residual peat where ridges and mounds have been exposed. The exposed sub-soils are a mix of glacial gravels, muds and tills that can be quite free-draining. Dry cutaway may also have deeper residual peat but in a location (ie. at the margin) where the peat can not be re-wetted due to boundary constraints. Dry cutaway may also develop in situations where there a relatively steep slope that inhibits re-wetting. The majority of dry cutaway will develop towards grassland, heath, scrub and dry woodland habitats.

**Enhanced decommissioning:** This is defined as decommissioning carried out under proposed Scheme, which is proposed to externally funded.

**Enhanced rehabilitation:** This is defined as rehabilitation carried out under proposed Scheme, which is proposed to be externally funded. It is proposed by Government that Bord na Móna be obligated to carry out enhanced decommissioning, rehabilitation and restoration on peatlands. This proposed Scheme will significantly go beyond what is required to meet rehabilitation and decommissioning obligations under existing EPA IPC licence conditions. Interventions and activities supported by the Scheme will ensure that environmental stabilisation is achieved (meaning IPC obligations are met), and importantly, significant additional benefits, particularly relating to climate action and other ecosystem services, will also be delivered. *However, only the costs associated with the additional, enhanced and accelerated measures, i.e., those interventions which go beyond the existing decommissioning and rehabilitation requirements arising from Condition 10 will be eligible for support under the proposed Scheme.*

**Environmental stabilisation:** The key objective of peatland rehabilitation is **environmental stabilisation** of the former industrial peat production areas and the stabilisation of any potential emissions from the bog that related to the former industrial peat extraction activities.

Environmental stabilisation is defined as:

- Carrying out planned peatland rehabilitation.

- Setting former bare peat industrial peat production areas on a trajectory towards naturally functioning peatland habitats, via planned peatland rehabilitation, the restoration of wetter hydrological conditions and encouragement of natural colonisation.
- Stabilisation or downward trajectory of key water quality parameters (e.g. suspended solids, ammonia),
- Meeting IPC Licence conditions.

**Marginal land.** Marginal land is defined as land around the margin of the industrial peat production area. This margin generally contains a range of habitats including scrub, Birch woodland, cutover bog and raised bog remnants. It has a variety of land-uses including turf-cutting (private turbary). The Scheme will consider potential rehabilitation and restoration actions (e.g. drain blocking) within marginal land zones, where appropriate.

**Rehabilitation:** Rehabilitation is defined in general by Bord na Móna as environmental stabilisation of the former cutaway. This is generally achieved via re-wetting, where possible, and natural colonisation of the former cutaway, with or without intervention. It is not possible to restore raised bog habitats on BnM cutaway in general in the short-term. In general, most of the peat mass has been removed from many BnM cutaway sites and the environmental characteristics of these areas have therefore changed radically (peat depths, hydrology, water chemistry, substrate type, nutrient status. This means there will therefore be different habitat outcomes (wetlands, fen, heathland, grassland and Birch woodland). Other after-use development may also serve to act as rehabilitation.

**Restoration:** Ecological restoration is defined as the process of re-establishing to the extent possible the structure, function and integrity of indigenous ecosystems and the sustaining habitats they provide” (SER 2004). Defined in this way, restoration encompasses the repair of ecosystems (Whisenant 1999) and the **improvement of ecological conditions in damaged wildlands** through the **reinstatement of ecological processes**. In general, Bord na Móna cutaway peatlands cannot be restored back to raised bog in a reasonable timeframe as their environmental conditions has changed so radically (with the removal of the acrotelem – the living layer and much of the peat mass). However, they can be returned to a **trajectory** towards a naturally functioning peatland system (Renou-Wilson 2012). **Raised bog restoration** is an objective of some BnM sites where there is residual natural raised bog vegetation and where the majority of the peat is still intact.

**Standard rehabilitation:** This is defined as rehabilitation that is designed to meet the conditions of the EPA IPC Licence. The key objective of rehabilitation is environmental stabilisation. This is achieved by a combination of re-wetting, where possible, and natural colonisation of the former cutaway, with or without intervention. Other after-use development may also serve to act as rehabilitation.

**Standard decommissioning:** This is defined as decommissioning that is designed to meet the conditions of the EPA IPC Licence. This is defined as to render safe or remove for disposal/recovery, any soil, subsoils, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.

**Wetland cutaway bog.** Wetland cutaway bog is defined as former raised bogs that have been in industrial peat production, where production has ceased and the majority of peat has been cutaway, and where this cutaway has the potential to be re-wetted. A significant number of Bord na Móna sites have pumped drainage and these sites are likely to develop a mosaic of wetland habitats when pumping is reduced or stopped. The water chemistry of wetland cutaway frequently is strongly influenced by the more alkaline sub-soils that have been exposed during peat production. This means that pioneer vegetation is more typical of fen and wetland, rather than raised bog. Wetland cutaway will have a broad range of hydrological conditions depending on the local

topography. In some cases, these wetlands may form deep water (> 0.5 m) whilst other areas may have the water table at or just below the surface of the ground.



## APPENDIX IX. EXTRACTIVE WASTE MANAGEMENT PLAN

### (Minimisation, treatment, recovery and disposal)

#### Objective:

The objective of this generic plan is to comply with the requirements of regulation 5 of the Waste Management (Management of Waste from Extractive Industries) Regulations, and to prevent or reduce waste production and its harmfulness.

#### Scope:

This plan covers IPPC Licence's P0502-01, Blackwater Group of Bogs in Counties Roscommon, Galway, Offaly and Westmeath,

#### 1.0 Extractive Waste:

Waste classified as extractive waste from peat extraction operations arise from three operations associated with this activity.

##### 1.1 Silt Pond excavations and maintenance.

All peat extraction activities in Blackwater serviced by a silt lagoons/ponds. During the excavation of these silt ponds, pre IPPC Licensing in 1999 and since licensing, the excavated material is stored adjacent to the silt pond, where it either remains in situ or levelled out. As required by condition 6.6, these silt lagoons are cleaned twice per annum or more often if inspections dictate. These silt cleanings are also deposited on the same location, adjacent to the silt pond, where they may be levelled periodically to allow room for subsequent cleanings. These mounds of silt pond excavation material and cleanings are generally no higher than 2-3 metres.

##### 1.2 Power Station screenings:

Lough Ree Power Ltd screens the peat from the bogs prior to processing. This screening removes oversized peat, stones and bog timbers. Schedule 3 (ii) of the IPPC licence permits disposal of these peat screenings back to the bog, where it is levelled and graded into the surrounding peat landscape. These locations have been agreed with the Agency as per condition 7.4 of the IPPC Licence, and as per the attached locations.

##### 1.3 Bog Timbers:

During peat extraction operations, bog timbers often arise in the bog surface and are required to be cleared. These timbers consist of bog pine, oak and some yew. Some of these timbers, such as the oak and yew are removed for use in the wood craft industry, with the remaining bog pine stockpiled in locations at the opposite end of each bog, where it generally becomes a habitat for flora and fauna. These piles of timber are generally no higher than 1-2 metres.

### 2.0 P0502-01 IPPC Licence Extractive Waste Conditions

#### 2.1 Condition 7.5 Extractive Waste Management

The licensee shall draw up a Waste Management Plan (to be known as an Extractive Waste Management Plan) for the minimisation, treatment, recovery and disposal of extractive waste. This Plan shall meet the requirements of regulation 5 of the Waste Management (Management of Waste from the Extractive Industries) Regulations, 2009. The Plan shall be submitted for agreement by the Agency by the 31<sup>st</sup> December 2012. The Plan shall be reviewed at least once every five years thereafter in a manner agreeable to the Agency and amended in the event of substantial changes to the operation of a waste facility or to the waste deposited. Any amendments shall be notified to the Agency.

All extractive waste shall be managed in accordance with the Extractive Waste Management Plan. A report on the implementation of the Extractive Waste Management Plan shall be provided in the AER.

#### 2.2 Condition 7.6 Waste Facility

- (i) No new waste facility may be developed or an existing waste facility modified unless agreed by the Agency.
- (ii) The licensee shall ensure that all existing waste facilities are managed and maintained to ensure their physical stability and to prevent pollution or contamination of soil, air, surface water or groundwater.
- (iii) The licensee shall ensure that all new waste facilities are constructed, managed and maintained to ensure their physical stability and to prevent pollution or contamination of soil, air, surface water or groundwater.
- (iv) Operational measures shall be continuously employed to prevent damage to waste facilities from personnel, plant or equipment.
- (v) The licensee shall establish and maintain a system for regular monitoring and inspection of waste facilities.
- (vi) All records of monitoring and inspection of waste facilities, as required under the licence, shall be maintained on-site in order to ensure the appropriate handover of information in the event of a change of operator or relevant personnel.

#### 2.3 Condition 7.7 Excavation Voids

7.7.1 Unless otherwise agreed by the Agency, only extractive waste shall be placed in excavation voids.

7.7.2 When placing extractive waste into excavation voids for rehabilitation and construction purposes, the licensee shall, in accordance with regulation 10 of the Waste Management (Management of Waste from the Extractive Industries) Regulations, 2009, and the Extractive Waste Management Plan:

- Secure the stability of the waste
- Put in place measures to prevent pollution of soil, surface water and ground water.
- Carry out monitoring of the extractive waste and excavation void.

### Condition 7.5. Extractive Waste Management Plan. 5 (1)

#### 3.0 Minimisation.

##### 3.1 Silt pond excavation material and cleanings.

IPPC Licence conditions require all production areas to be serviced by an appropriately designed silt pond based on storage volume and retention time. Condition 6.6 requires all ponds to be cleaned bi-annually and more often if inspections dictate, so the only opportunity for minimisation of same is through Standard Operating Procedures. These are required under condition 2.2.2 (i) regarding minimisation of suspended solids, and are in-place to minimise the generation of silt, which in-turn will minimise the generation of silt pond waste.

### **3.2 Power Station Screenings.**

These screenings cannot be minimised as they are a consequence of peat production, stones, timbers and oversize peat materials are naturally occurring on the bog, and are required to be removed prior to processing.

### **3.3 Bog Timbers.**

Bog timbers are also naturally occurring materials within a bog and are required to be removed prior for production. The volume of these bog timbers varies from bog to bog and as such their minimisation is not controllable or quantifiable.

## **4.0 Treatment**

### **4.1 Silt pond excavation material and cleanings.**

The silt pond excavation material and silt cleanings do not require any treatment for its end use which will be either backfilling these silt pond voids as per condition 7.7.1 above as part of the Bog Rehabilitation Plan, or reincorporated into the surrounding peatlands.

### **4.2 Power Station Screenings.**

The factory screenings are permitted to be returned to the bog as they were naturally occurring materials from the bog, and as such do not require any treatment to serve this purpose.

### **4.3 Bog Timbers**

As per 1.3 above, these timbers are stockpiled at two locations in each bog, as per the attached list of sites and become habitats for various flora and fauna.

## **5.0 Recovery**

### **5.1 Silt pond excavation material and cleanings.**

Condition 2.2.2 (vi) requires the reuse of silt pond waste to be examined. This was undertaken in 2006, the outcome of which was that this waste peat silt material, as a fuel, was contaminated with sub-soils, rendering it unsuitable for combustion. In addition, volumes are small compared to overall peat production volumes.

### **5.2 Power Station Screenings.**

Given the nature of these screenings as outlined in 1.2 above, there is no further use identified and they are permitted to be disposed of back to the bog.

### **5.3 Bog Timbers**

Investigations into processing these materials into smaller fractions for potential heating purposes did not yield any viable results. In addition, these older stockpiles are now classified as habitats and as such would not be considered for reuse as a fuel.

## **6.0 Disposal**

### **6.1 Silt pond excavation material and cleanings.**

Schedule 3 (ii) permits the disposal of silt pond cleanings (Lagoon Sediments) to the bog and these locations, adjacent to the silt pond site, are presented in the attached spreadsheet, with associated grid coordinates.

### **6.2 Power Station Screenings.**

Schedule 3 (ii) permits the disposal of screenings (Peat Screenings) to the bog at designated locations agreed under Condition 7.4, and these locations, are presented in the attached spreadsheet, with associated grid coordinates.

### **6.3 Bog Timbers**

These naturally occurring bog timbers are stockpiled at locations in each bog, grid coordinates attached.

## **7.0 Extractive Waste Management Plan**

### **5 (2a)(i)**

The vast majority of peat extraction bogs were all designed and drained for production prior to the 1960's and as such the production fields layout cannot be altered. Under our Cleaner Reduction Procedures, various design changes have been implemented to the production machines and process to reduce lost peat which eventually is captured in the silt ponds and requires removal as waste peat silt. This along with training and ongoing research and development will continuously reduce waste peat and subsequently waste silt pond cleanings. Bog timbers are present naturally in various volumes and quantities in different bogs and as peat production involves stripping peat in layers, the exposure, generation and removal of these timbers is unavoidable. Work has been undertaken recently into project looking at grinding of these bog timbers in situ using a timber miller, and if this project becomes viable it will contribute to the reduction of bog timbers.

### **5 (2a)(ii)**

Given the nature and expanse of peat bogs, the stockpiling and storage of these waste materials do not present a visual, storage or stability problem. As required under Condition 10 of the IPPC Licence, the silt pond excavations and screenings will be utilised to backfill the silt pond voids once the bogs have finished and stabilised in accordance with our Bog Rehabilitation Plan. Storage of these wastes in the interim, open to the elements does not present a change on the nature of these wastes that will threaten the environment or prevent their reuse during the bog rehabilitation process.

### **5 (2a)(iii)**

Under Condition 10 of the IPPC Licence, all silt ponds will be decommissioned once the bog surface has stabilised, in agreement with the Agency. This will involve the removal of weirs and flow controls, returning the silt pond back to its original drain or removing the silt pond from the drainage system. Both of these activities will involve placing the silt pond extraction and cleaning material back into the excavation void.

### **5 (2a)(iv)**

The peat bogs do not contain any topsoil, so this is not required.

**5 (2a)(v)**

Peat mineral resources do not undergo any treatment.

**5 (2b)**

These three extractive waste are all being reused and recovered back to their original extraction points and have not undergone any physical, chemical, or biological change.

**5 (2c)(i, ii & iii)**

These three extractive wastes, stored on the bog for reuse or recovery during the bog rehabilitation phase, do not require any management or monitoring during the operation of these bogs. Silt pond excavations and cleanings are stored adjacent to the silt pond and quickly revegetated and stabilise, the screenings are graded back into the bog at the agreed locations upon disposal and the bog timbers do not prevent any water or airborne danger to the environment.

**5 (3)**

The three extractive wastes arising from peat extraction operations at this site are classified wastes from mineral non-metalliferous excavation, with an EWC code of 0101 02. The materials are not classified as hazardous under Directive 91/689/EEC20, and do not contain substances or preparations classified as dangerous under Directives 67/548/EEC5 or 1999/45/EC6 above a certain threshold.

The peat excavations and cleanings are stored in locations and in a manner that they could not collapse, and are remote in their nature. The stockpiles are located adjacent to silt ponds that are cleaned regularly and as such these stockpiles are managed and levelled to facilitate further cleanings.

Therefore the material stored at these waste facilities would not be considered to be a Category A waste facility.

**Classification in accordance Annex II.**

Waste Material	Description	Classification	Chemical Process treatment	Deposition description	Transport System
Silt Pond Excavations and cleanings	Peat and mineral soils associated with peatlands. Stored for reuse during bog rehabilitation, with no displacement of overburden	01 01 02	None	Excavated from silt ponds by excavator and deposited adjacent to the silt pond.	Excavator
Peat Screenings	Stones, timbers and oversized peat particles, reincorporated into low areas, agreed with the Agency, and stabilized under normal natural bog conditions	01 01 02	None	Removed by screen at the factory and transported by tractor and trailer to the designated and agreed locations	Tractor and trailer.
Bog Timbers	Pine, Oak and Yew species, stored at locations in each bog. Not subject to any stability issues due to exposure to atmospheric/meteorological conditions.	01 01 02	None	Removed from the bog surface by excavator and transported by tractor and trailer to the agreed locations	Tractor and Trailer

**Description of operations.**

Silt pond excavations arise from the requirement to have silt ponds treating all peat extraction sites. Silt pond cleanings arise from the removal of peat silt from silt ponds as required under IPPC Licence. Bog timbers arise from preparation of the bogs surface for peat production. Estimated quantities of materials are below:

**Closure plan. (Bog Rehabilitation Plan).**

Condition 10.1 – 10.3 of the IPPC Licence requires the following:

- 10.1 Following termination of use or involvement of all or part of the site in the licensed activity, the licensee shall:
  - 10.1.1 Decommission, render safe or remove for disposal/recovery, any soil, subsoils, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.
  - 10.1.2 Implement the agreed cutaway bog rehabilitation plan (refer Condition 10.2).

**10.2 Cutaway Bog Rehabilitation Plan:**

- 10.2.1 The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for permanent rehabilitation of the cutaway boglands within the licensed area. This plan shall be submitted to the Agency for agreement within eighteen months of the date of grant of this licence.
- 10.2.2 The plan shall be reviewed every two years and proposed amendments thereto notified to the Agency for agreement as part of the AER. No amendments may be implemented without the written agreement of the Agency.

10.3 The Rehabilitation Plan shall include as a minimum, the following:

- 10.3.1 A scope statement for the plan; to include outcome of consultations with relevant Agencies, Authorities and affected parties (to be identified by the licensee).
- 10.3.2 The criteria which define the successful rehabilitation of the activity or part thereof, which ensures minimum impact to the environment.
- 10.3.3 A programme to achieve the stated criteria.
- 10.3.4 Where relevant, a test programme to demonstrate the successful implementation of the rehabilitation plan.
- 10.3.5 A programme for aftercare and maintenance.

10.4 A final validation report to include a certificate of completion for the Rehabilitation Plan, for all or part of the site as necessary, shall be submitted to the Agency within six months of execution of the plan. The licensee shall carry out such tests, investigations or submit certification, as requested by the Agency, to confirm that there is no continuing risk to the environment. This plan including maps and ecological classifications are available on file at the Mountdillon IPPC Licence Coordinators office.

The location in relation to the silt pond excavations and cleanings are adjacent to the silt ponds, which are considered under the Shannon River Basin Management Plan in accordance with the requirements of Directive 2000/60/EC.

Screenings and bog timbers are all naturally occurring elements of peatland and their placement back to the bog in smaller concentrated designated waste facilities does not constitute a risk to the prevention of water compliance.

The lands under where these materials are deposited are peatlands and are un-effected by the placing of this material.

**Review.**

This plan will be reviewed every five years, the first review to take place in September 2017. This review will entail an inspection of these waste facilities to ensure their placing, management, maintenance and stability comply with the requirements of the Extractive Waste Management requirements and condition 7.5, 7.6 and 7.7 of the Blackwater IPPC Licence P0502-01.

## APPENDIX X. MITIGATION MEASURES FOR THE APPLICATION OF FERTILISER

- Any fertiliser used will be Rock Phosphate and will not be applied in the following conditions:
  1. The land is waterlogged;
  2. The land is flooded, or it is likely to flood;
  3. The land is frozen, or covered with snow;
  4. Heavy rain is forecast within 48 hours (forecasts will be checked from Met Éireann).
  5. The ground slopes steeply and there is a risk of water pollution, when factors such as surface run-off pathways, the presence of land drains, the absence of hedgerows to mitigate surface flow, soil condition and ground cover are taken into account.
- No fertiliser will be spread on land within 2 metres of a surface watercourse.
- Buffer zones in respect of waterbodies, as specified on <https://www.epa.ie/about/faq/name,57156,en.html>, will be adhered with at all times with regard to fertiliser application. Reproduced as follows:

Water body / Feature	Buffer zone
Any water supply source providing 100m <sup>3</sup> or more of water per day, or serving 500 or more people	200 metres (or as little as 30 metres where a local authority allows)
Any water supply source providing 10m <sup>3</sup> or more of water per day, or serving 50 or more people	100 metres (or as little as 30 metres where a local authority allows)
Any other water supply for human consumption	25 metres (or as little as 30 metres where a local authority allows)
Lake shoreline	20 metres
Exposed cavernous or karstified limestone features (such as swallow holes or collapse features)	15 metres
Any surface watercourse where the slope towards the watercourse exceeds 10%	10 metres
Any other surface waters	5 metres*

**APPENDIX XI. CONSULTATION SUMMARIES****Table APXI -1 Consultees contacted**

<b>Bog Name</b>	<b>Contact Organisation</b>	<b>Contact Name</b>	<b>Date of Issue</b>	<b>Communication Format</b>	<b>Date Response Received</b>	<b>Response format</b>
Clooniff	Roscommon County Council - Director of Services (Planning, Environment and Emergency Services)	Liam Bergin	04/01/2021	E-mail		
Clooniff	Roscommon County Council - Heritage Officer	Nollaig Feeney	04/01/2021	E-mail		
Clooniff	Northern and Western Regional Assembly	info@nwra.ie	04/01/2021	E-mail		
Clooniff	Chairperson of Roscommon County Council	Laurence Fallon	04/01/2021	E-mail		
Clooniff	Roscommon County Councillors - Athlone Electoral Area	Cllr. Donal Kilduff	04/01/2021	E-mail		
Clooniff	Roscommon County Councillors - Athlone Electoral Area	Cllr. Ivan Connaughton	04/01/2021	E-mail		
Clooniff	Roscommon County Councillors - Athlone Electoral Area	Cllr. John Naughton	04/01/2021	E-mail		
Clooniff	Roscommon County Councillors - Athlone Electoral Area	Cllr. John Keogh	04/01/2021	E-mail		
Clooniff	Roscommon County Councillors - Athlone Electoral Area	Cllr. Tony Ward	04/01/2021	E-mail		



Clooniff	TD Roscommon - Galway	Michael Fitzmaurice	04/01/2021	E-mail		
Clooniff	TD Roscommon - Galway	Claire Kerrane	04/01/2021	E-mail		
Clooniff	TD Roscommon - Galway	Denis Naughten	04/01/2021	E-mail		
Clooniff	Senator Roscommon Mayo	Aisling Dolan	04/01/2021	E-mail		
Clooniff	Environmental Protection Agency	Brian Meeney	04/01/2021	E-mail		
Clooniff	National Parks and Wildlife Service	Brian Lucas, Deirdre Lynn, Ciaran O Keefe and Adele Shelton	04/01/2021	E-mail		
Clooniff	NPWS Regional Network	District Conservation Officer (Galway East)	12/01/2021	E-mail	03-07/12/2020	E-mail
Clooniff	Dept of the Housing Local Government and Heritage	Malcom Noonan (Minister of State at the Department of Housing, Local Government and Heritage)	06/02/2021	E-mail		
Clooniff	National Monuments Service	Margaret Keane	04/01/2021	E-mail		
Clooniff	National Museum of Ireland (Irish Antiquities Division)	Isabella Mulhall	04/01/2021	E-mail	28/12/2020	E-mail
Clooniff	Minister for Environment, Climate and Communications	Minister - Eamon Ryan	06/01/2021	E-mail		
Clooniff	Dept of Environment, Climate and Communications	noel.regan@decc.gov.ie	04/01/2021	E-mail		
Clooniff	Minister for Rural and Community Development	Minister - Heather Humpreys	<b>06/01/2021</b>	E-mail		
Clooniff	Minister - Office of Public Works	Minister of State - Patrick O Donovan	<b>06/01/2021</b>	E-mail		
Clooniff	Office of Public Works	General e-mail contact	12/01/2021	E-mail	11/12/2020	E-mail
Clooniff	Minister of state for Agriculture with responsibility for Land use and Biodiversity	Pippa Hackett Minister of State for Land Use and Biodiversity)	<b>06/01/2021</b>	E-mail		
Clooniff	Inland Fisheries Ireland	General E-mail contact	04/01/2021	E-mail		

Clooniff	Waterways Ireland	head office - info email	04/01/2021	E-mail		
Clooniff	The Heritage Council	Lorcan Scott	04/01/2021	E-mail		
Clooniff	Western Development Commission	<a href="mailto:info@wdc.ie">info@wdc.ie</a>	04/01/2021	E-mail		
Clooniff	An Forum Uisce (The Water Forum)	General e-mail contact	04/01/2021	E-mail		
Clooniff	Local Authority Waters Programme Clár Uiscí na nÚdarás Áitiúil Mayo County Council, Aras an Chontae, The Mall, Castlebar, Co. Mayo	Noreen Shryane   Catchment Scientist Western Region	04/01/2021	E-mail		
Clooniff	An Taisce	General e-mail contact	04/01/2021	E-mail		
Clooniff	Friends of the Earth	Oisin Coughlan	04/01/2021	E-mail		
Clooniff	Friends of the Irish Environment		04/01/2021	E-mail		
Clooniff	Birdwatch Ireland	General e-mail contact	04/01/2021	E-mail		
Clooniff	Irish Peatlands Conservation Council	General e-mail contact	04/01/2021	E-mail	21/01/2021	E-mail
Clooniff	Irish Wildlife Trust	General e-mail contact	04/01/2021	E-mail		
Clooniff	Bat Conservation Ireland	General e-mail contact	04/01/2021	E-mail		
Clooniff	Woodlands of Ireland	General e-mail contact	04/01/2021	E-mail		
Clooniff	Butterfly Conservation Ireland	Jesmond Harding/info email	04/01/2021	E-mail	13/01/2021	E-mail
Clooniff	Community Wetlands Forum (part of Irish Rurallink)	General e-mail contact	04/01/2021	E-mail		
Clooniff	Turf Cutters and Contractors Association		10/12/2020	Post		
Clooniff	Roscommon Public Participation Network (PPN)	General e-mail contact	04/01/2021	E-mail		

Clooniff	Sustainable Water Action Network (SWAN)	<a href="http://www.swanireland.ie/">http://www.swanireland.ie/</a>	04/01/2021	E-mail		
Clooniff	Irish Farmers Association (Leitrim, Logford, Roscommon, Sligo)	John O Hanlon	04/01/2021	E-mail	25/01/2021	E-mail
Clooniff	Irish Farmers Association (Head Office)	Tim Cullinan (President)	04/01/2021	E-mail		
Clooniff	National Association of Regional Game Councils	Email - <a href="mailto:nargc@nargc.ie">nargc@nargc.ie</a>	04/01/2021	E-mail		
Clooniff	ICMSA (Irish Creamery Milk Suppliers Association)	General e-mail contact	04/01/2021	E-mail		
Clooniff	ICSA (Irish Cattle and Sheep Farmers Association)	General e-mail contact	04/01/2021	E-mail		
Clooniff	Midlands & East Regional WFD Operational Committee	Ray Spain Co-ordinator Local Authority Water Programme	04/01/2021	E-mail		
Clooniff	Shannon Flood Risk State Agency Co-ordination Working Group	Jackie Stewart - Flood Risk Management Policy	04/01/2021	E-mail		
Clooniff	CARO (Climate Action Regional Office) Atlantic and Seaboard North	David Mellet	04/01/2021	E-mail		
Clooniff	Galway Athlone Cycleway Project team	<a href="mailto:info@galwaytoathlonecycleway.com">info@galwaytoathlonecycleway.com</a>	04/01/2021	E-mail		
Clooniff	Moore Game and Conservation Club	Patrick Kelly			09/02/2021	E-mail
Clooniff	Ballydangan Red Grouse Project	Patrick Dunning				E-mail

**Table APXI -2 Response summary from Consultees contacted**

Organisation	Summary of Response by Stakeholder	BnM Response
NPWS Regional Network	Responded through e-mail thread on the 02, 03,07,09/12/2020. Points discussed were; 1) To advise of the requirement to investigate if assessment under the SEA and birds directives for each site.	BnM acknowledged via e-mail; Also, phone conversation with local NPWS Conservation Ranger Laura Connolly.
National Museum of Ireland (Irish Antiquities Division)	Responded through e-mail 28/12/2020, Issues raised were; 1) The request that due diligence be taken during works to protect any archaeologically significant findings or areas 2) The NMI reiterated the importance of peatlands for the preservation of archaeology and requested they be consulted as part of any EIA undertaken	BnM acknowledged and will give due cognisance to all points within the rehabilitation plan for A virtual meeting/PCAS presentation was held for NMI on 18/01/2021
Office of Public Works	Responded via e-mail 01/12/2020 querying the reason for inclusion of OPW in the stakeholders list.	BnM responded with and explanation via e-mail on 01/12/2020.
Dept. of Agriculture, Food & the Marine (DAFM)	Submission by e-mail to express support for PCAS. Recommended; 1) That local landowners and stakeholders be considered as part of the consultation process. 2) EIA assessment be carried out prior to PCAS works. 3) Hydrological assessments are carried out with a view to protecting adjoining lands from adverse impacts.	BnM acknowledged and responded via e-mail to assure BnM will give due cognisance to all points within the rehabilitation plan for Clooniff Bog. A virtual meeting/PCAS presentation was held for DAFM on 11/12/2020

Irish Peatlands Conservation Council	<p>Responded to consultation through e-mail on 21/01/2021. Among issues raised were;</p> <ol style="list-style-type: none"> <li>1. Water quality issues including dissolved organic content and the monitoring of water quality measures post PCAS works.</li> <li>2. Request for species specific conservation initiatives to be considered as part of PCAS.</li> <li>3. Encouraged the integration of local stakeholders into the consultation process.</li> </ol>	BnM acknowledged and will give due cognisance to all points within the rehabilitation plan for Clooniff Bog. BnM raised responded via e-mail.
Butterfly Conservation Ireland	<p>Responded to consultation via e-mail with submission on Clooniff. Concerns raised were:</p> <ol style="list-style-type: none"> <li>1) Alterations to the text of the rehab plan.</li> <li>2) Request for all turf cutting on BnM land to end.</li> <li>4) Suggest monitoring for Large Heath Butterfly or food plant Hare’s-tail Cottongrass.</li> <li>5) Suggested alterations to habitat design in rehab plan to further connect regional high bog habitats.</li> <li>6) Advised BnM to ensure that quality habitats already found on site are not damaged by PCAs activities.</li> </ol>	BnM acknowledged via e-mail; Phone conversation with Jesmond Harding 19/01/2021.
Irish Farmers Association	<p>Responded to consultation regarding Clooniff and the PCAS project at large on multiple dates throughout ongoing discourse. Concerns raised were:</p> <ol style="list-style-type: none"> <li>1) Potential for flooding on adjacent lands.</li> <li>2) Health and Safety</li> <li>3) Perceived potentially detrimental impact of PCAS on property value</li> <li>4) Reiterated the desire of the IFA that people who have been cutting turf on bogs should retain this right.</li> </ol>	A meeting was held by BnM on 18/02/2021 the to present details on PCAS to the IFA and members. Dialogue is ongoing.
ICMSA (Irish Creamery Milk Suppliers Association)	Virtual meeting/PCAS presentation organised for 03/03/2021.	A meeting was held by BnM on 03/03/2021 to present details on PCAS to the ICMSA and members. Dialogue is ongoing.

<p>Moore Game and Conservation Club</p>	<p>Submission on PCAS from Moore Game and Conservation Club. A summary of concerns raised in the submission includes;</p> <ol style="list-style-type: none"> <li>1) A list of activities carried out by the club members on the club lands adjoining Clooniff Bog was provided.</li> <li>2) A request to include rear and release pens for game in the PCAS project works at Clooniff Bog.</li> <li>3) Suggestion as to how best to promote biodiversity on bogs through PCAS.</li> <li>4) A request for consultation to involve local stakeholders.</li> <li>5) A request that predator control be considered as a measure to promote biodiversity across the PCAS bogs.</li> <li>6) Suggested BnM utilise PCAS as an opportunity to engage in conservation projects at Clooniff Bog.</li> </ol>	<p>BnM acknowledged and will give due cognisance to all points within the rehabilitation plan for Clooniff Bog. BnM raised responded via e-mail.</p> <p>BnM responded via phone call on 21/01/2021. Advised that conservation projects were outside the scope of PCAS.</p>
<p>Ballydangan Red Grouse Project</p>	<p>Concerns raised were;</p> <ol style="list-style-type: none"> <li>1) Any loose peat removal from site must ensure that local water bodies are not contaminated.</li> <li>2) Trout and native crayfish species use the river between Coolumper and Clooniff.</li> <li>3) Archaeological interests on site.</li> <li>4) Encouraged the planting of heath species</li> <li>5) Red grouse and Curlew habitat management is encouraged.</li> <li>6) Water body management where appropriate is encouraged.</li> <li>7) A list of breeding bird species that use the water bodies was provided.</li> <li>8) Suggested BnM utilise PCAS as an opportunity to engage in conservation projects at Clooniff Bog.</li> </ol>	<p>BnM acknowledged and will give due cognisance to all points within the rehabilitation plan for Clooniff Bog. BnM raised responded via e-mail.</p> <p>BnM responded via phone call on 21/01/2021. Advised that conservation projects were outside the scope of PCAS.</p>



## **APPENDIX IX. ARCHAEOLOGY**

**Archaeological Impact Assessment of Proposed Bog Rehabilitation at Clooniff Bog, Co. Offaly. Dr. Charles Mount. Nov 2020.**



**Archaeological Impact Assessment of Proposed Bog  
Decommissioning and Rehabilitation at Clooniff Bog, Co.  
Roscommon**

**Report For**

**Bord Na Móna Energy Ltd.**

**Author**

**Dr. Charles Mount**

**Bord Na Móna Project Archaeologist**



## Introduction

The EPA (2002) *Guidance on the process of preparing and implementing a bog rehabilitation plan* notes that the licensee should characterise the bog prior to embarking on detailed planning and implementation. This characterisation should detail how the land is classified in terms of statutory protections, e.g. as European sites, world heritage sites, RAMSAR sites, National Heritage Areas, national monuments, archaeological heritage, etc. This archaeological impact assessment report was prepared by Dr. Charles Mount for Bord na Móna Energy Ltd to fulfil this characterisation in relation to archaeological heritage. It represents the results of a desk-based assessment of the impact of proposed bog rehabilitation on c.531 hectares at Clooniff, Co. Roscommon on the known archaeological heritage of the bog. The proposed rehabilitation actions will be a combination of measures to create wetlands and re-wet deep peat as outlined in the draft Methodology Paper for the proposed Bord na Móna Decommissioning, Rehabilitation and Restoration Scheme. These enhanced measures for Clooniff Bog will include:

- Blocking field drains in the former industrial production area using a dozer to create regular peat blockages (three barriers per 100 m) along each field drain;
- Re-alignment of piped drainage.
- Re-alignment of gravity outfalls.
- Fertiliser treatment of high fields and headlands (typically slow to naturally re-colonise) to encourage natural colonisation.
- No measures are planned for the surrounding marginal peatland habitats.
- Silt ponds will continue to be maintained during rehabilitation and decommissioning.
- Evaluate success of short-term rehabilitation measures and enhance where necessary.
- Decommissioning of silt-ponds will be assessed and carried out, where required.

Clooniff Bog is located c.2.9km south-east of Ballydangan and east of the L2039 road. The bog occupies the townlands of America, Cappayuse, Clooniff, Cloonbeggau, Cloonburren, Coolumber, Derrineel and Moore South, on OS 6 inch sheets Roscommon 54, 55 and 56.

## Methodology

This is a desk-based archaeological assessment that includes a collation of existing written and graphic information to identify the likely archaeological potential of Clooniff Bog. The extent of the rehabilitation area is indicated in Fig. 1. This area was examined using information from:

- The IAWU Peatland Survey
- Re-assessment Peatland Survey 2009
- The Bord na Móna excavation programme
- The Sites and Monuments Record that is maintained by the Dept of Housing, Local Government and Heritage
- The Excavations Database
- Previous assessments

An impact assessment has been prepared and recommendations have been made.



## Desktop assessment

### Recorded Monuments

The Record of Monuments and Places (RMP) for Co. Roscommon which was established under Section 12 of the National Monuments (Amendment) Act, 1994 was examined as part of the assessment (DAHGI 1998). This record was published by the Minister in 1998 and includes sites and monuments that were known in Clooniff Bog before that date. This review established that there is one RMP situated in the proposed rehabilitation area, a gravel road RO055-005---- that extends through the bog in Coolumber townland for a distance of c.1km along the line of the early medieval bridge that crosses the River Shannon at Clonmacnoise (see Table 1 and Fig. 1). The road was briefly uncovered in two places by Bord na Mona staff in 1983 and subsequently inspected by National Monuments Staff and then recovered. This is described in the RMP as:

*RO055-005---- Coolumber Road - gravel/stone trackway – peatland*

*In a low-lying bog running NW from the River Shannon. A section of road (L c. 1 km; Wth 2.5-3m; T 0.3m) just opposite the bridge of Clonmacnoise (RO055-008----) was revealed in 1983 at two points as a layer of gravel (Wth 2.5-3m; T. 0.3m) at a depth of 0.6-1m in the bog. The modern NNW-SSE road (L c. 3km) through Nure village continues along the line of the routeway and may have been built on the gravel road. Part of the road is preserved in a section of uncut peat.*

RMP_NO	Site type	Townland	N.G.R. E	N.G.R. N
RO055-005---	Road - gravel/stone trackway - peatland	Coolumber	20018	23140

Table 1. List of RMP sites in Clooniff Bog.

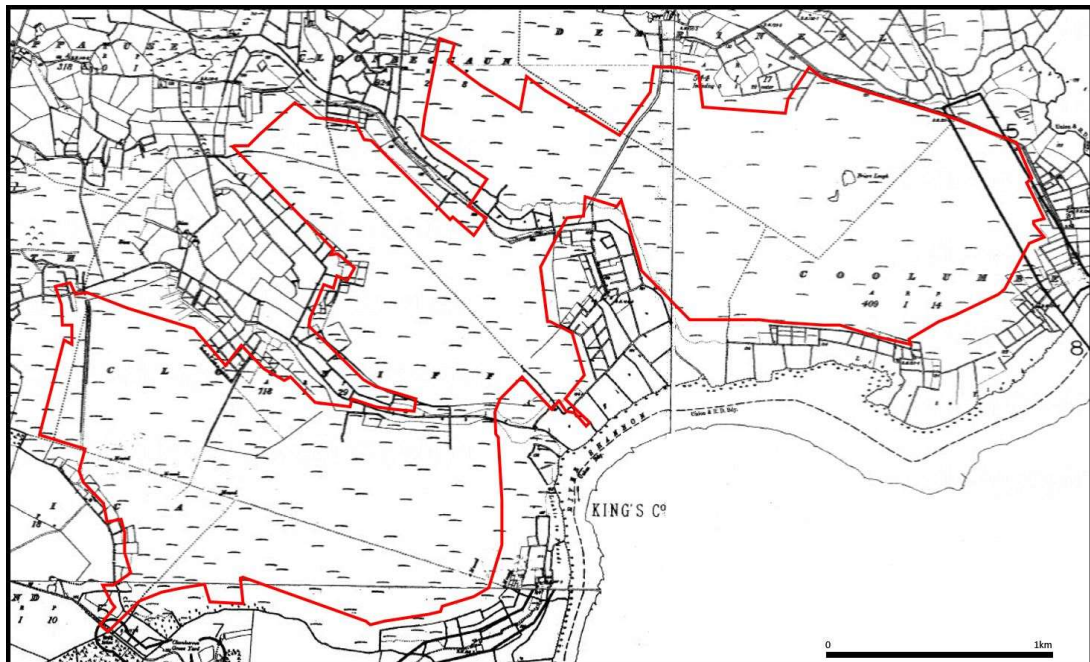


Fig. 1. Clooniff Bog, Co. Roscommon, detail of the Record of Monuments and Places map sheet Nos. 54, 55 and 56. The proposed rehabilitation area is outlined with the red line. There is one Recorded Monument in the area.



### Peatland survey

Clooniff Bog was surveyed by the Irish Archaeological Wetland Unit in 1992 as part of the Archaeological Survey of Ireland Peatland Survey (unlicensed). A total of 10 sightings were identified and recorded and subsequently lodged in the records of the Archaeological Survey of Ireland (see Table 1). These consisted of six sightings of toghers and 4 sightings of worked and unworked wood. The sightings were mainly concentrated in one group in Clooniff townland.

Catalogue Code	Townland	Site Type	D below surface	N.G.R. E	N.G.R. N	Status 2012
RO-CIF 0001	Clooniff	Togher	0.35	197330	230260	Gone
RO-CIF 0002	Clooniff	Togher	0.60	197345	230300	Gone
RO-CIF 0003	Clooniff	Togher	0.60	197359	230300	Gone
RO-CIF 0004	Clooniff	Togher	0.50	197375	230291	Gone
RO-CIF 0005	Clooniff	Togher	0.71	197385	230275	Gone
RO-CIF 0006	Clooniff	Togher	0.69	197378	230280	Gone
RO-CIF 0007	Clooniff	Worked wood	0.00	197341	230275	Gone
RO-CIF 0008	Clooniff	Worked wood	0.10	197900	230340	Gone
RO-CIF 0009	Clooniff	Unworked wood	0.60	197351	230300	Gone
RO-CIF 0010	Clooniff	Unworked wood	0.60	197375	230262	Gone
RO-CLN 0001	Cloonburren	Togher	-	196990	229030	Survives

Table 1. List of sites recorded by the IAWU in Clooniff Bog.

### Sites and Monuments Record

The Sites and Monuments Record (SMR) which is maintained by the Department of Housing, Local Government and Heritage was examined as part of the assessment on the 11th of March 2021. The SMR consists of records included in the RMP and sites and monuments notified to the Dept. since the publication of the RMP. This review established that there are 14 monuments entered in the SMR in the proposed rehabilitation area. The monuments are indicated in Table 2 and Fig. 2 below. These include the sightings identified by the Irish Archaeological Wetland Unit survey in 1992 that were notified to the Archaeological Survey of Ireland (without any concordance) with the addition of four boundary mounds.

SMR No.	Townland	Site Type	N.G.R. E	N.G.R. N	Status
RO054-045----	Clooniff	Boundary mound	596113	730169	Gone
RO054-046----	Clooniff	Boundary mound	596348	730089	Gone
RO054-047----	Clooniff	Boundary mound	596605	730010	Gone
RO054-047----	Clooniff	Boundary mound	597733	729662	Gone
RO054-051----	Clooniff	Road - unclassified togher	597282	730295	Gone
RO054-052----	Clooniff	Road - unclassified togher	597295	730339	Gone
RO054-053----	Clooniff	Road - unclassified togher	597309	730331	Gone
RO054-054----	Clooniff	Road - unclassified togher	596979	730212	Gone
RO055-055----	Coolumber	Road - gravel/stone trackway - peatland	600091	731417	Survives
RO054-056----	Clooniff	Road - unclassified togher	597324	730310	Gone
RO054-057----	Clooniff	Redundant Record	597219	730302	Gone
RO054-058----	Clooniff	Structure - peatland	596926	731335	Gone
RO054-059----	Clooniff	Structure - peatland	597302	730330	Gone
RO054-060----	Clooniff	Structure - peatland	597326	730290	Gone

Table 2. List of SMRs in Clooniff Bog.

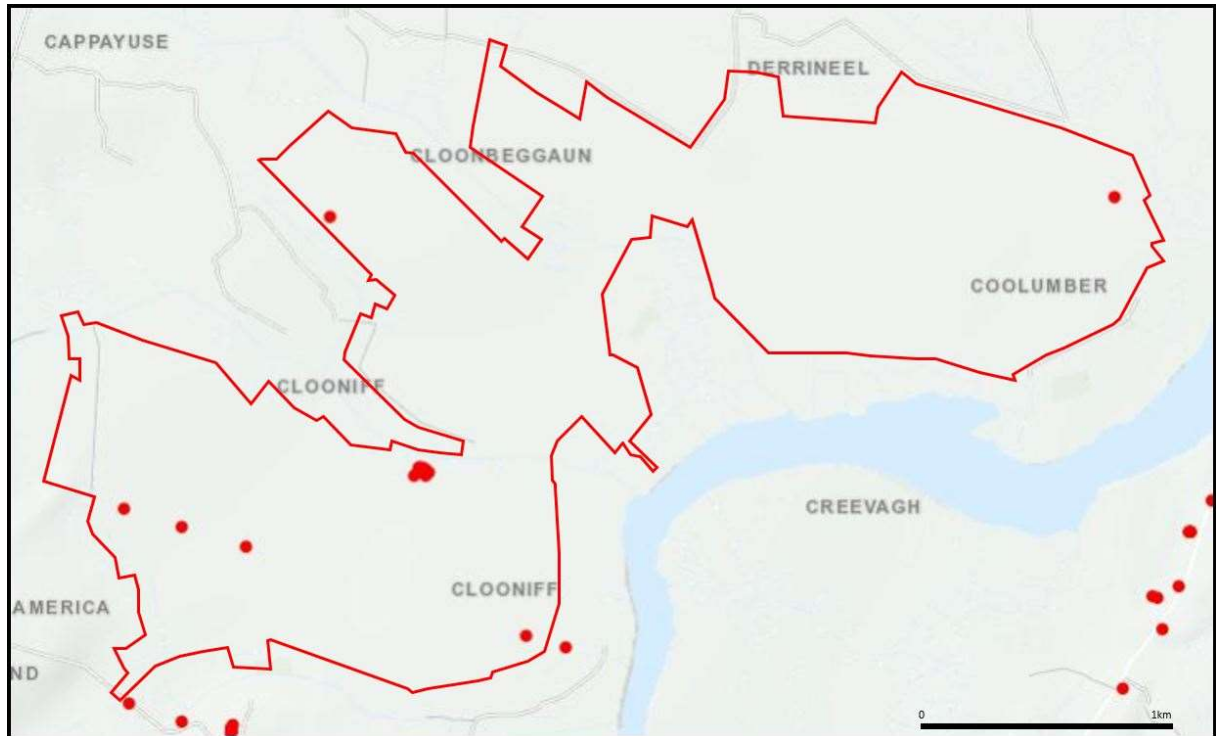


Fig. 2. Clooniff Bog, Co. Roscommon, detail of the Sites and Monuments Record. The proposed rehabilitation area is outlined with the red line. There are a 14 SMRs in the area.

#### **Re-assessment Peatland Survey 2009**

The Re-assessment Survey of Clooniff Bog was carried out in 2009 under licence No. 09E0405 (Rohan 2009). All of the sighting reported by the IAWU in 1992 and all the remaining sightings included in the SMR in the rehabilitation area, except RO055-005----, were found to have been removed. There were no new sightings of archaeological material.

#### **Archaeological investigations**

Reports of archaeological excavations and licensed monitoring in the study area listed in the excavations database at [excavations.ie](http://excavations.ie) were examined as part of the assessment. There have been no licensed archaeological excavations carried out in Clooniff Bog.

#### **Reported finds**

There is one reported find recorded in the Topographical Files of the National Museum that can be attributed to Clooniff Bog, a mudstone axehead (2004:1) recovered from the surface of the bog in Clooniff townland. There are three iron finds from Cloonburren townland; an iron tool (1955:90), an iron hook (1955:91) and a second iron tool (1955:92) with a recorded find spot of 'Castle Acre' which is to the east of the bog.

#### **Previous assessments**

Clooniff Bog has been the subject of an Environmental Impact Assessment Report carried out by Irish Archaeological Consultancy LTD in 2018 for Bord na Móna Energy Limited in relation to IPC Licence P0500-01. The assessment noted the monuments identified in the IAWU 1992 survey and the Re-assessment





Peatland 2009 and noted that there was a moderate potential for archaeological features to be uncovered during the course of any future development works in Clooniff Bog.

### Impact assessment

There are 14 known sightings of archaeology in the rehabilitation area. The Re-assessment Survey of Clooniff Bog carried out in 2009 found that 13 of the sightings had been removed. One site survives RO055-005---- a gravel road in Coolumber townland (see Table 3).

SMR No.	Townland	Catalogue Code	Site Type	N.G.R. E	N.G.R. N	Status
RO055-005----	Coolumber	-	Road - gravel/stone trackway - peatland	600091	731417	Survives

Table 3. All surviving sightings in the rehabilitation area.

### Recommendations

There is one surviving archaeological site in Clooniff Bog RMP RO055-005---- which should be avoided by the rehabilitation works (see Table 3). A complete set of grid references for the monument are not available so the whole zone of notification (indicated in Fig 1 with a dark black outline and numbered 5) should be avoided. Should any previously unknown archaeological material be uncovered during the rehabilitation works, it should also be avoided and reported to the Bord na Móna Archaeological Liaison Officer and the National Museum of Ireland.

### Conclusion

This is a desk-based archaeological assessment and includes a collation of existing written and graphic information to identify the likely archaeological potential of the proposed rehabilitation area. There are 14 known known sightings of archaeological heritage in the rehabilitation area of which one RMP RO055-005---- survives and should be avoided by the rehabilitation works. Should any previously unknown archaeological material be uncovered during the rehabilitation works, it should be avoided and reported to the Bord na Móna Archaeological Liaison Officer and the National Museum of Ireland.

### References

DAHGI 1998. Recorded Monuments Protected under Section 12 of the National Monuments (Amendment) Act, 1994. County Roscommon.

EPA 2020. Guidance on the process of preparing and implementing a bog rehabilitation plan.

Rohan, N. 2009. Report on 2009 Re-assessment Field Survey 2013. Blackwater and Boora Group of Bogs Counties Offaly, Galway, Westmeath and Roscommon. Unpublished report commissioned Bord na Móna.

Dr. Charles Mount  
15 March 2021

### Role of the Archaeological Liaison Officer

1. To communicate this Code of Practice and the *Archaeological Protection Procedures* (Appendix IV) to all personnel operating on the bog.
2. To ensure that all notices relating to the *Archaeological Protection Procedures* are posted and maintained at appropriate locations on the bog.
3. To report any stray finds, presented to the Liaison Officer from his/her group of bogs, to the Duty Officer of the National Museum of Ireland.
4. To provide for the appropriate protection of the stray find, whether in-situ or removed from the bog, as directed by the Duty Officer of the National Museum of Ireland.



# Code of Practice

22

# Code of Practice

5. To arrange for the delivery or collection of the stray find, as directed by the Duty Officer of the National Museum of Ireland.
6. To complete the Report of Discovery of Archaeological Object(s) in Bogs (Appendix V), as directed by the Duty Officer of the National Museum of Ireland.
7. To maintain a file of all stray finds and associated documentation and provide copies to the Project Archaeologist.
8. To provide assistance, where required, to the Department during archaeological surveys.
9. To provide assistance, where required, to Bord na Móna's Consultant Archaeologists, during investigation and mitigation of monuments.
10. To report to the Bord na Móna members on the Archaeology Management Liaison Committee any planned developments or new activities on cutaway peatland areas within his/her group of bogs.



	<b>Procedure: ENV017</b>	<b>Rev: 1</b>
<b>Title: Archaeological Findings</b>	<b>Approved: EM</b>	<b>Date: 13/10/2020</b>

**1) Purpose**

The purpose of this procedure is to describe the arrangements in Bord na Móna for findings of Archaeological material (Stray Finds).

**All objects, sites or monuments, no matter how fragmentary, are important elements of our heritage.**

**2) Procedure**

1. Check whether there are any known archaeological monuments in your area.
2. Be vigilant at all times - objects or traces of structures can be found on the field surfaces, in the drain faces, on the bog margins or caught within the mechanics of machinery.
3. If an object is found leave it in place, if it is safe to do so, note its position and immediately contact your Archaeological Liaison Officer who will assess the situation and contact the Duty Officer of the National Museum of Ireland.
4. Resist the temptation to investigate the find spot as this may disturb fragile archaeological deposits.
5. If the object is already dislodged or is in imminent danger, remove it carefully, mark its find spot and report it immediately to your Archaeological Liaison Officer.
6. Objects made of wood, leather or textile, which are removed from peat should be kept in conditions similar to those in which they are found. This can be done by packing them in peat or, if waterlogged, placing them in a clean basin of water and sealing the container. Resist the temptation to clean or remove peat from the object.
7. If timbers or other materials, such as gravel or stones, which could be part of a man-made structure are noted on the bog, mark the location and report it immediately to your Archaeological Liaison Officer. If you suspect the find is of archaeological importance, resist the temptation to expose it any further as this could result in damage to the structure.
8. Report anything that looks unnatural in the bog – your Archaeological Liaison Officer will decide whether it should be referred to the appropriate authorities.

**NOTE:** Our archaeological heritage is a finite, non-renewable resource. Once a site is destroyed its information is lost forever and we have lost the chance to understand a little more about our past, where we have come from and perhaps the opportunity to learn for the future.

Your Archaeological Liaison Officer is .....

**3) Records**

Revision Index			
Revision	Date	Description of change	Approved

1	13/09/2020	First release	EMcD
2			

## **Appendix C Site Synopses**



## **SITE SYNOPSIS**

**SITE NAME: MIDDLE SHANNON CALLOWS SPA**

**SITE CODE: 004096**

The Middle Shannon Callows SPA is a long and diverse site which extends for approximately 50 km from the town of Athlone to the town of Portumna; it lies within Counties Galway, Roscommon, Westmeath, Offaly and Tipperary. The site averages about 0.75 km in width though in places is up to 1.5 km wide. Water levels on the site are greatly influenced by the very small fall between Athlone and Portumna and by the weir at Meelick. The site has extensive areas of callow, or seasonally flooded, semi-natural, lowland wet grassland, along both sides of the river. The callows are mainly too soft for intensive farming but are used for hay or silage or for summer grazing. Other habitats of smaller area which occur alongside the river include lowland dry grassland, freshwater marshes, reedbeds and wet woodland. The diversity of semi-natural habitats present and the sheer size of the site attract an excellent diversity of bird species, including significant populations of several.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Whooper Swan, Wigeon, Corncrake, Golden Plover, Lapwing, Black-tailed Godwit and Black-Headed Gull. It is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The Middle Shannon Callows qualifies as a site of international importance as it regularly supports in excess of 20,000 wintering waterbirds (23,656 – four year mean peak for four of the winters between 1995/96 and 1999/2000). The site also supports internationally important populations of Whooper Swan (305 – five year mean peak for the period 1995/96 to 1999/2000) and Black-tailed Godwit (485 – four year mean peak for four of the winters between 1995/96 and 1999/2000). Four further species of wintering waterbird occur in numbers of national importance, i.e. Wigeon (3,059), Golden Plover (4,133), Lapwing (13,240) and Black-headed Gull (1,209) – all figures are four year mean peaks for four of the winters between 1995/96 and 1999/2000.

The Shannon Callows is the largest site monitored as part of I-WeBS and many parts of it are inaccessible on the ground. Annual monitoring of the wintering waterbirds of the Shannon Callows is undertaken by aerial surveys in January/February with some areas also covered by ground counts. The importance of the site for some species may have been underestimated if count coverage missed the brief spring peaks for these species, e.g. peak counts of Lapwing (23,409) and Black-tailed Godwit (1,096) recorded in the baseline period (1995/96 to 1999/2000) have been considerably higher than the four year means. A wide range of other species occurs within the site, including Mute Swan (407), Teal (88), Tufted Duck (41), Dunlin

(335), Curlew (162) and Redshank (39). Small numbers of Greenland White-fronted Goose use the Shannon Callows (peak 55 in 1998/99) and these are generally associated with larger flocks which occur on the adjacent Little Brosna Callows and River Suck Callows. The callow grasslands provide optimum feeding grounds for these various species of waterfowl, while many of the birds also roost or rest within the site.

The Shannon Callows is also an important site for breeding waders with the total population on the Shannon and Little Brosna Callows being one of three major concentrations in Ireland and Britain in 1987. Numbers of some species have declined since then but a survey of the Shannon Callows in 2002 recorded the following breeding waders - Lapwing (63 pairs), Redshank (116 pairs), Snipe (139 drumming birds) and Curlew (8 pairs). Black-tailed Godwit, a very rare breeding species in Ireland, nests or attempts to nest in small numbers each year within the site. A further scarce breeding species, Shoveler, also nests in small numbers each year (an estimated 12 pairs in 1987).

The Middle Shannon Callows SPA supports a breeding population of Corncrake (19 pairs - five year mean peak between 2003 and 2007, based on records of calling males).

Corncrake winter in southern and eastern Africa, migrating northwards to arrive on their breeding grounds from early April onwards, departing again in August and September. They require the cover of tall vegetation throughout their breeding cycle and are strongly associated with meadows which are harvested annually, where they nest and feed. Annual cutting of these meadows creates a sward which is easy for the birds to move through. Other habitats, which can provide cover for Corncrake in the early and late stages of the breeding season, are also important for this species.

Corncrake is listed on the 2010 International Union for Conservation of Nature (IUCN) Red List of Threatened Species. This is due to population and range declines of more than 50% in the last 25 years across significant parts of its range.

Quail, a related, scarce species, is also known to breed within the callow grasslands.

A good variety of other bird species are attracted to the site. Birds of prey, including scarce species such as Merlin and wintering Hen Harrier have been recorded hunting over the callows. A range of passerine species associated with grassland and swamp vegetation breed, including Sedge Warbler, Grasshopper Warbler, Skylark and Reed Bunting. Kingfisher is also known to occur within the site. Whinchat, an uncommon breeding species, occurs in small numbers.

The Middle Shannon Callows SPA is an internationally important site that supports an assemblage of over 20,000 wintering waterbirds. It holds internationally important populations of two species - Whooper Swan and Black-tailed Godwit. In addition, there are four species that have wintering populations of national importance. The site also supports a nationally important breeding population of Corncrake. Of particular note is that several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Corncrake and Golden Plover.

10.1.2012

## **SITE SYNOPSIS**

**SITE NAME: RIVER SUCK CALLOWS SPA**

**SITE CODE: 004097**

The River Suck Callows SPA is a linear, sinuous site comprising a section of the River Suck from Castlecoote, Co. Roscommon to its confluence with the River Shannon close to Shannonbridge, a distance of approximately 70 km along the course of the river. The river forms part of the boundary between Counties Galway and Roscommon. The site includes the River Suck itself and the adjacent areas of seasonally-flooded semi-natural lowland wet callow grassland. The River Suck is the largest tributary of the River Shannon.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Whooper Swan, Greenland White-fronted Goose, Wigeon, Golden Plover and Lapwing. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The River Suck Callows SPA is an important site for wintering waterfowl. Of particular note is the nationally important Greenland White-fronted Goose flock (293 – five year mean peak for the period 1994/95 to 1998/99) which congregates mainly in the middle reaches of the river. Four other species occur in populations of national importance, i.e. Whooper Swan (164), Wigeon (3,232), Golden Plover (2,241) and Lapwing (3,906) – all figures are five year mean peaks from aerial surveys between 2001/02 and 2005/06. Other species present include Mute Swan (122), Teal (402), Mallard (70), Black-tailed Godwit (24), Curlew (22) and Black-headed Gull (86).

The River Suck Callows SPA is of considerable ornithological importance, in particular for the presence of nationally important populations of five species. Of note is that three of the species that occur regularly, i.e. Whooper Swan, Greenland White-fronted Goose and Golden Plover, are listed on Annex I of the E.U. Birds Directive. Part of the River Suck Callows SPA is a Wildfowl Sanctuary.



### Site Name: River Shannon Callows SAC

### Site Code: 000216

The River Shannon Callows is a long and diverse site which consists of seasonally flooded, semi-natural, lowland wet grassland, along and beside the river between the towns of Athlone and Portumna. It is approximately 50 km long and averages about 0.75 km wide (reaching 1.5 km wide in places). Along much of its length the site is bordered by raised bogs (many, but not all, of which are subject to large-scale harvesting), esker ridges and limestone-bedrock hills. The soils grade from silty-alluvial to peat. This site has a common boundary, and is closely associated, with two other sites with similar habitats, River Suck Callows and Little Brosna Callows.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (\* = priority; numbers in brackets are Natura 2000 codes):

[6410] <i>Molinia</i> Meadows
[6510] Lowland Hay Meadows
[7230] Alkaline Fens
[8240] Limestone Pavement*
[91E0] Alluvial Forests*
[1355] Otter ( <i>Lutra lutra</i> )

The River Shannon Callows is mainly composed of lowland wet grassland. Different plant communities occur, depending on elevation, and therefore flooding patterns. Two habitats listed on Annex I of the E.U. Habitats Directive are well-represented within the site – *Molinia* meadows and lowland hay meadows. The former is characterised by the presence of the Meadow Thistle (*Cirsium dissectum*) and Purple Moor-grass (*Molinia caerulea*), while typical species in the latter include Meadow Fescue (*Festuca pratensis*), Rough Meadow-grass (*Poa trivialis*), Downy Oat-grass (*Avenula pubescens*), Common Knapweed (*Centaurea nigra*), Ribwort Plantain (*Plantago lanceolata*) and Common Sorrel (*Rumex acetosa*). In places these two habitats grade into one another.

Low-lying areas of the callows with more prolonged flooding are characterised by Floating Sweet-grass (*Glyceria fluitans*), Marsh Foxtail (*Alopecurus geniculatus*) and wetland herbs such as Yellow-cress (*Rorippa* spp.), Water Forget-me-not (*Myosotis scorpioides*) and Common Spike-rush (*Eleocharis palustris*). Most of the callows consist of a plant community characterised by Creeping Bent (*Agrostis stolonifera*), Brown Sedge (*Carex disticha*), Common Sedge (*Carex nigra*), and herbs such as Marsh-marigold (*Caltha palustris*) and Marsh Bedstraw (*Galium palustre*), while the more

elevated and peaty areas are characterised by low-growing sedges, particularly Yellow Sedge (*Carex flava* agg.) and Star Sedge (*Carex echinata*). All these communities are very diverse in their total number of plant species, and include the scarce species Meadow-rue (*Thalictrum flavum*), Summer Snowflake (*Leucojum aestivum*) and Marsh Stitchwort (*Stellaria palustris*).

A further two Annex I habitats, both listed with priority status, have a minor though important presence within the site. Alluvial forest occurs on a series of alluvial islands just below the ESB weir near Meelick. Several of the islands are dominated by well-grown woodland consisting mainly of Ash (*Fraxinus excelsior*) and Willows (*Salix* spp.). The islands are prone to regular flooding from the river.

At Clorhane, an area of limestone pavement represents the only known example in Co. Offaly. It is predominantly colonised by mature Hazel (*Corylus avellana*) woodland, with areas of open limestone and calcareous grassland interspersed. The open limestone pavement comprises bare or moss-covered rock, or rock with a very thin calcareous soil cover supporting a short grassy turf. The most notable plant in the grassy area is a substantial population of Green-winged Orchid (*Orchis morio*), which occurs with such species as Sweet Vernal-grass (*Anthoxanthum odoratum*), Quaking-grass (*Briza media*), sedges (*Carex caryophyllea*, *C. flacca*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Common Knapweed (*Centaurea nigra*), and Ribwort Plantain (*Plantago lanceolata*). Ferns associated with the cracks in the pavement include *Asplenium trichomanes*, *A. ruta-muraria*, *A. adiantum-nigrum* and *Polypodium australe*. Bryophytes include *Grimmia apocarpa* and *Orthotrichum* cf. *anomalum*. Anthills are common within the open grassland. The Hazel wood is well-developed and has herbaceous species such as Primrose (*Primula vulgaris*), Common Dog-violet (*Viola riviniana*), Wood-sorrel (*Oxalis acetosella*) and Herb-Robert (*Geranium robertianum*). The wood is noted for its luxuriant growth of epiphytic mosses and liverworts, with such species as *Neckera crispa* and *Hylocomium brevirostre*. Yew (*Taxus baccata*) occurs in one area.

Other habitats of smaller area but also of importance within the site are lowland dry grassland, drainage ditches, freshwater marshes and reedbeds. The dry grassland areas, especially where they exist within hay meadows, are species-rich, and of two main types: calcareous grassland on glacial material, and dry grassland on levees of river alluvium. The former can contain many orchid species, Cowslip (*Primula veris*), abundant Adder's-tongue (*Ophioglossum vulgatum*) and Spring-sedge (*Carex caryophyllea*), and both contain an unusually wide variety of grasses, including False Oat-grass (*Arrhenatherum elatius*), Yellow Oat-grass (*Trisetum flavescens*), Meadow Foxtail (*Alopecurus pratense*), and Meadow Brome (*Bromus commutatus*). In places Summer Snowflake also occurs.

Good quality habitats on the edge of the callows included in the site are wet broadleaved semi-natural woodland dominated by both Downy Birch (*Betula pubescens*) and Alder (*Alnus glutinosa*), and dry broadleaved woodland dominated by Hazel. There are also areas of raised bog, fen on old cut-away bog with Black Bog-rush (*Schoenus nigricans*), and a 'petrifying stream' with associated species-rich



calcareous flush which supports Yellow Sedge (*Carex lepidocarpa*), Blunt-flowered Rush (*Juncus subnodulosus*) and Stoneworts (*Chara* spp.).

Immediately south of Portumna Bridge and south east of the town of Portumna the area of low-lying terrestrial land west of the river comprises a large area of the Annex I habitat alkaline fen. The fen comprises a complex of rich-fen plant communities. Sedges (*Carex lasiocarpa*, *Carex acutiformis*) and Bogbean (*Menyanthes trifoliata*) dominate parts of the fens while other small sedges are common throughout. The orchids Early Marsh Orchid (*Dactylorhiza incarnata*), Western Marsh Orchid (*D. majalis*) and Marsh Helleborine (*Epipactis palustris*) and the red-listed plant species Marsh Pea (*Lathyrus palustris*) have been recorded within the fen.

Two species which are legally protected under the Flora (Protection) Order, 2015, occur in the site - Opposite-leaved Pondweed (*Groenlandia densa*) in drainage ditches, and Meadow Barley (*Hordeum secalinum*) on dry alluvial grassland. This is one of only two known inland sites for Meadow Barley in Ireland. The Red Data Book plant Green-winged Orchid is known from dry calcareous grasslands within the site.

The site is of international importance for wintering waterfowl as numbers regularly exceed the 20,000 threshold (mean of 34,985 for five winters 1994/94-1998/99). Of particular note is an internationally important population of Whooper Swans (287). A further five species have populations of national importance (all figures are means for five winters 1995/96-1999/00): Mute Swan (349), Wigeon (2972), Golden Plover (4254), Lapwing (11578) and Black-tailed Godwit (388). Species which occur in numbers of regional or local importance include Bewick's Swan, Tufted Duck, Dunlin, Curlew and Redshank. The population of Dunlin is notable as it is one of the few regular inland flocks in Ireland. Small flocks of Greenland White-fronted Goose use the Shannon Callows; these are generally associated with larger flocks which occur on the adjacent Little Brosna Callows and River Suck Callows.

Shoveler (an estimated 12 pairs in 1987) and Black-tailed Godwit (Icelandic race) (one or two pairs in 1987) breed within this site. These species are listed in the Red Data Book as being threatened in Ireland. The scarce bird Quail is also known to breed within the area. The callows has at times held over 40% of the Irish population of the globally endangered Corncrake, although numbers have declined in recent years. A total of 66 calling birds were recorded in 1999, but numbers have dropped significantly since then. The total population of breeding waders (Lapwing, Redshank, Snipe and Curlew) in 1987 was one of three major concentrations in Ireland and Britain. The population of breeding Redshank in the site was estimated to be 10% of the Irish population, making it nationally significant. Also, the Annex I species Merlin and Hen Harrier are regularly reported hunting over the callows during the breeding season and in autumn and winter.

This site holds a population of Otter, a species listed on Annex II of the E.U. Habitats Directive, while the Irish Hare, which is listed in the Irish Red Data Book, is a common sight on the callows.

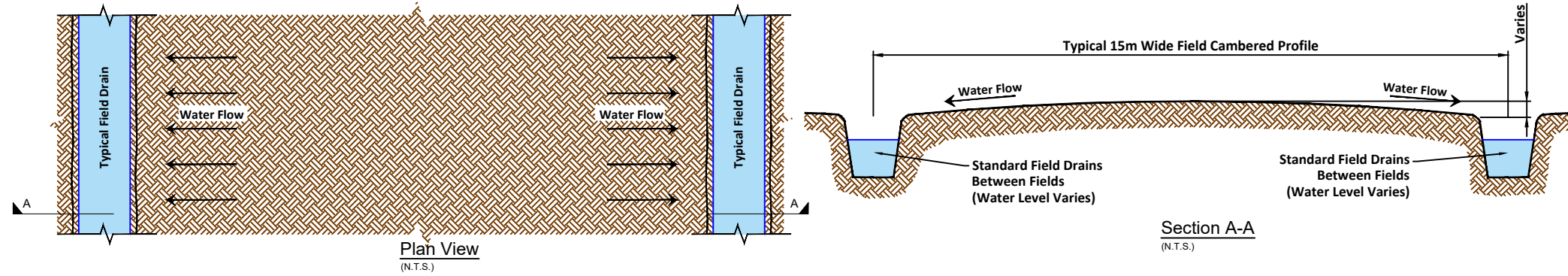
The Shannon Callows are used for summer dry-stock grazing (mostly cattle, with some sheep and a few horses), and permanent hay meadow. About 30 ha is a nature reserve owned by voluntary conservation bodies. The River Shannon is used increasingly for recreational purposes with coarse angling and boating accounting for much of the visitor numbers. Intermittent and scattered damage to the habitats has occurred due to over-deepening of drains and peat silt deposition, water-skiing, ploughing and neglect of hay meadow (or reversion to pasture). However, none of these damaging activities can yet be said to be having a serious impact. Threats to the quality of the site may come from the siting of boating marinas in areas away from centres of population, fertilising of botanically-rich fields, the use of herbicides, reversion of hay meadow to pasture, neglect of pasture and hay meadow, disturbance of birds by boaters, anglers, birdwatchers and the general tourist. The maintenance of generally high water levels in winter and spring benefits all aspects of the flora and fauna, but in this regard, summer flooding is a threat to breeding birds, and may cause neglect of farming.

The Shannon Callows has by far the largest area of lowland semi-natural grassland and associated aquatic habitats in Ireland, and one in which there is least disturbance of natural wetland processes. Botanically, it is extremely diverse with two legally protected species of plants and many scarce species. Excellent examples of two habitats listed on Annex I of the E.U. Habitats Directive occur within the site – *Molinia* meadows and lowland hay meadows with good examples of a further three Annex habitats (two with priority status). In winter the site is internationally important for numbers and species of waterfowl. In spring it feeds large numbers of birds on migration, and in summer it holds very large numbers of breeding waders, rare breeding birds and the endangered Corncrake, as well as a very wide variety of more common grassland and wetland birds. The presence of Otter, an Annex II species, adds further importance to the site.

## **Appendix D Drawings of Proposed Rehabilitation Methodologies**

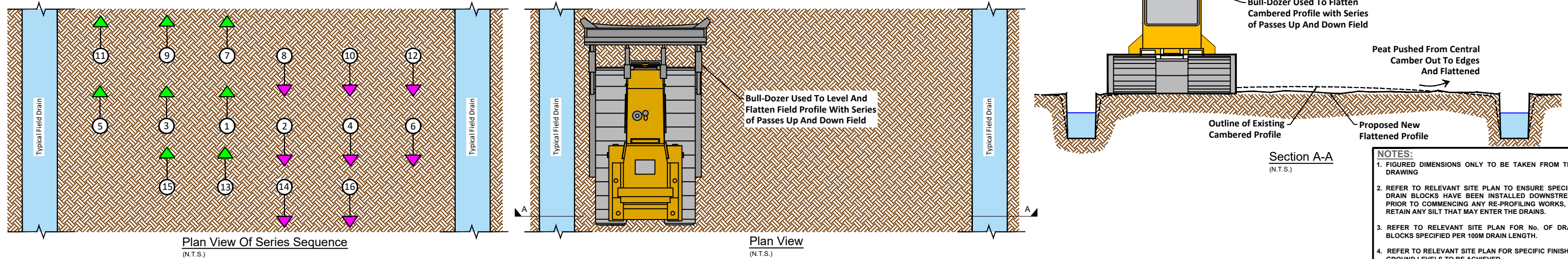
**Existing Layout:**

Typical existing bare peat fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area. The concept of field re-profiling is to level the surface of the individual peat production fields to retain surface water at the required depth.



**Phase 1  
Re-Profiling of Field Surface**

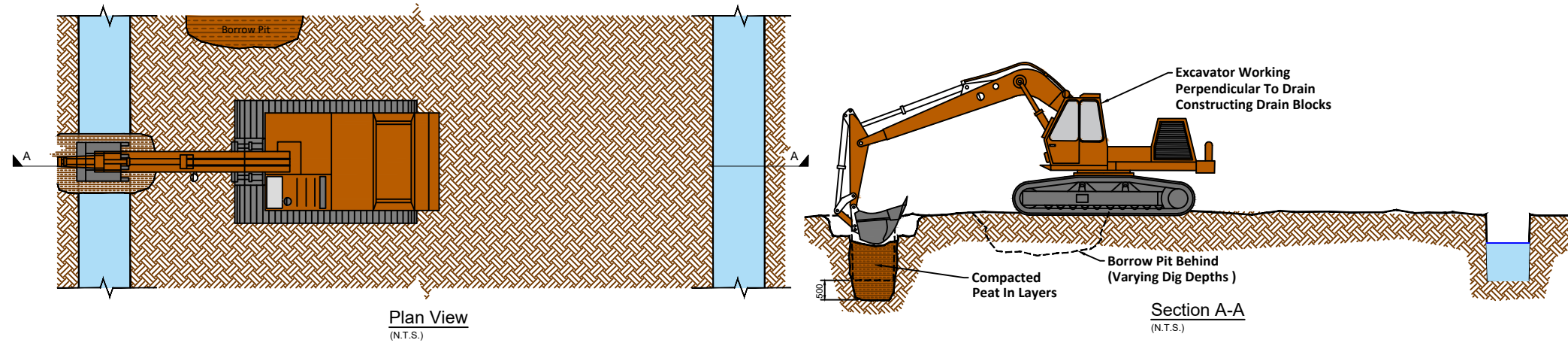
Field to be re-profiled using bull-dozer making a total of 16 passes, 8 passes up and 8 passes down, flattening the camber on the production field. (Sequence of runs shown below)



- NOTES:**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
  2. REFER TO RELEVANT SITE PLAN TO ENSURE SPECIFIC DRAIN BLOCKS HAVE BEEN INSTALLED DOWNSTREAM PRIOR TO COMMENCING ANY RE-PROFILING WORKS, TO RETAIN ANY SILT THAT MAY ENTER THE DRAINS.
  3. REFER TO RELEVANT SITE PLAN FOR No. OF DRAIN BLOCKS SPECIFIED PER 100M DRAIN LENGTH.
  4. REFER TO RELEVANT SITE PLAN FOR SPECIFIC FINISHED GROUND LEVELS TO BE ACHIEVED.
  5. ALL DETAILS TO BE AGREED WITH BORD NA MONA OPERATIONS PRIOR TO CONSTRUCTION.
  6. OPERATORS TO CONFORM WITH ALL STANDARD OPERATING PROCEDURES.
  7. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATION FOR THE PARTICULAR BOG AND WITH THE REQUIREMENTS OF THE REHABILITATION PLAN, ANY NATURA IMPACT STATEMENT RECOMMENDED MEASURES IF APPLICABLE, ARCHAEOLOGY REPORTS AND ANY OTHER SPECIFIC ECOLOGICAL MEASURES OR ENVIRONMENTAL REPORTS FOR THIS BOG.

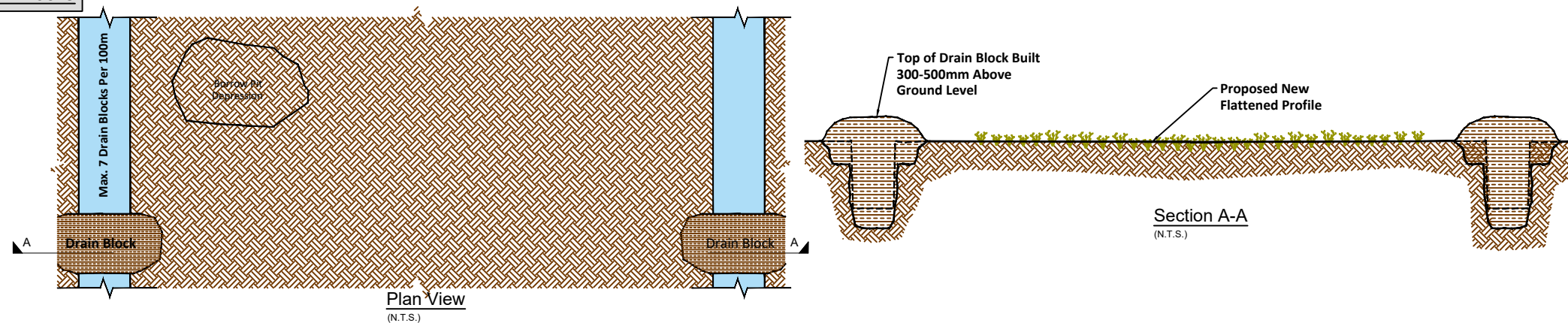
**Phase 2  
Peat Drain Blocking**

Drain blocks are constructed using an excavator operating at a perpendicular direction to the field drains. Key is cut in the drain approximately 500mm deep, and ensuring that it is wider than the actual drain. 500mm of peat is removed from bottom of drain also and placed behind the machine for replacement later. Area behind the machine is to be used as a borrow pit. Remove turf and degraded peat. Place this material close by to be used as cover later. 'Clay' like peat is extracted from pit and compacted in 300mm layers using the excavator bucket. The peat is firmly compacted using the machine bucket before laying more peat from the borrow pit. The drain block is built up at least 300-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries. The borrow pit is back filled with the peat extracted from the bottom of pit. The sides of the borrow pit are to be pressed down and graded with the excavator bucket. (NOTE: If any vegetation present, it should be carefully removed at the start and left aside for replacement at the end of the process, to help bind and stabilise the top of the drain block.)



**Complete Shallow Field Profile with Regular Drain Blocks**

Field re-profiling is developed as a technique to slow the surface water loss from the bog and to retain as much water as possible on the bog, at the required depth.



**STATUS**

Rev	Description	Issued By	Date
b	Issued For Approval	P.K.	25/02/21
a	Issued For Information	P.K.	29/01/21

**BORD NA MÓNA**  
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Bord Na Móna Engineering Department  
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Fax. 057 9345160

PROJECT:  
Peatland Climate Action Scheme  
PCAS

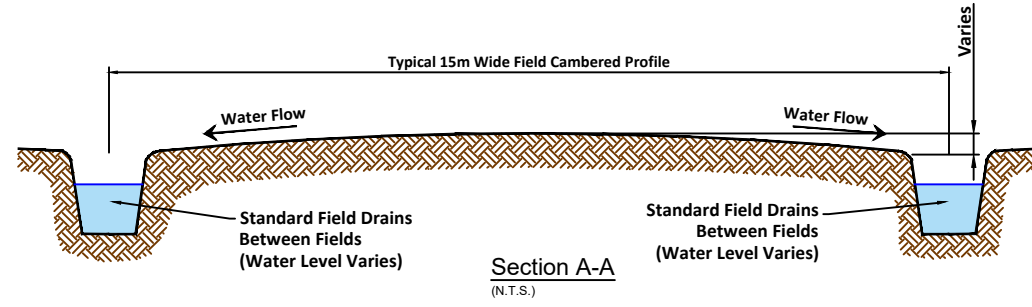
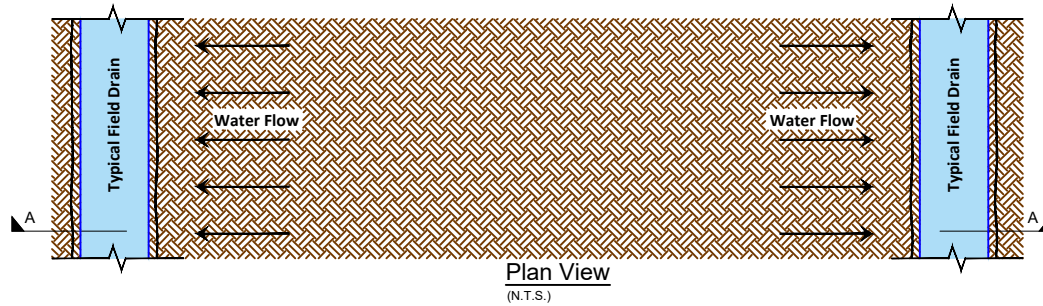
TITLE:  
Rehabilitation Method DPT 3A  
Field Re-profiling

Drawn By:	Checked By:	Approved:
CAD Designer	Discip. Lead	Design Manager
P.K.	D.K.	P.N.
Date: 18/12/20	Scale: Not to Scale	A3
Drawing No.: PCAS-0100-003	Stage: For Approval	Rev: b



**Existing Typical Field Layout:**

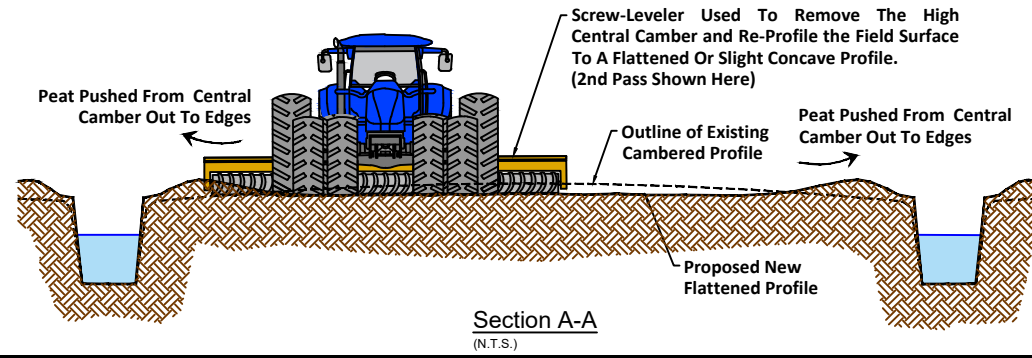
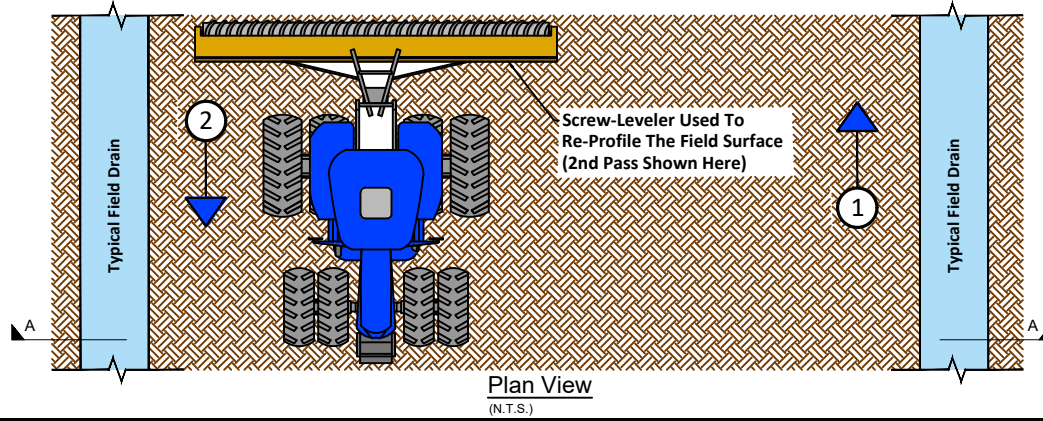
Typical existing bare peat fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area. The concept of field re-profiling is to level the surface of the individual peat production fields to retain surface water at the required depth.



- NOTES:**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
  2. REFER TO RELEVANT SITE PLAN TO ENSURE SPECIFIC DRAIN BLOCKS HAVE BEEN INSTALLED DOWNSTREAM PRIOR TO COMMENCING ANY RE-PROFILING WORKS, TO RETAIN ANY SILT THAT MAY ENTER THE DRAINS.
  3. REFER TO RELEVANT SITE PLAN FOR No. OF DRAIN BLOCKS SPECIFIED PER 100M DRAIN LENGTH.
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  5. ALL DETAILS TO BE AGREED WITH BORD NA MONA OPERATIONS PRIOR TO CONSTRUCTION.
  6. OPERATORS TO CONFORM WITH ALL STANDARD OPERATING PROCEDURES.
  7. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATION FOR THE PARTICULAR BOG AND WITH THE REQUIREMENTS OF THE REHABILITATION PLAN, ANY NATURA IMPACT STATEMENT RECOMMENDED MEASURES IF APPLICABLE, ARCHAEOLOGY REPORTS AND ANY OTHER SPECIFIC ECOLOGICAL MEASURES OR ENVIRONMENTAL REPORTS FOR THIS BOG.

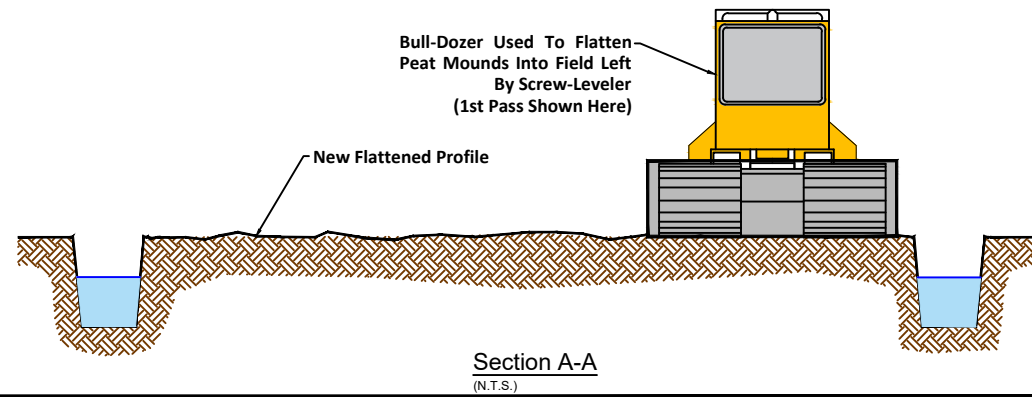
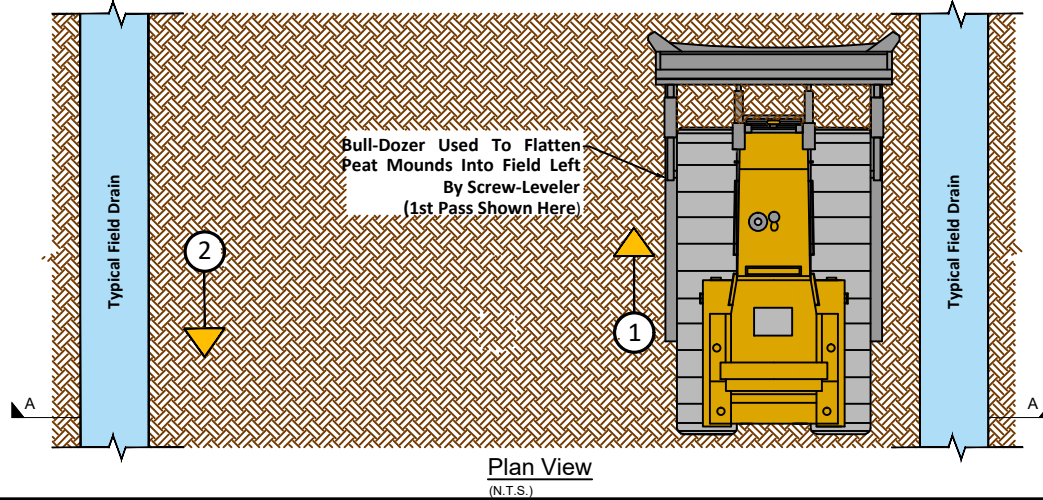
**Phase 1  
Re-Profiling of Field Surface**

The production field is re-profiled using a screw-leveler to remove the high central camber from individual production fields and deposit the peat on the lower-lying edges of the same production field. The Screw-Leveler is towed using a tractor, with a level axis, will run up one side ① of the production field and down the other side ②, sufficiently offset from drain to ensure the peat does not enter the drain but forms a mound beside the drain.



**Phase 2  
Leveling of Loose Peat**

Next the Bull-dozer will run up one edge side ① of the production field and down the other side ② flattening the loose peat mounds, ensuring a minimal amount of peat enters the drains.

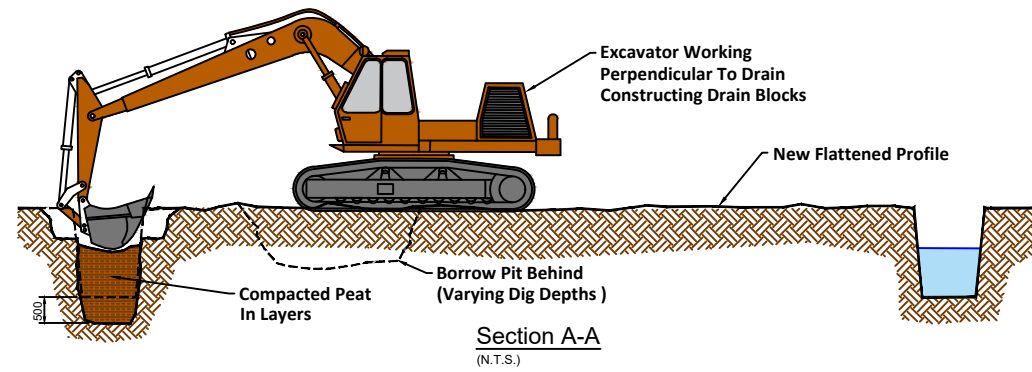
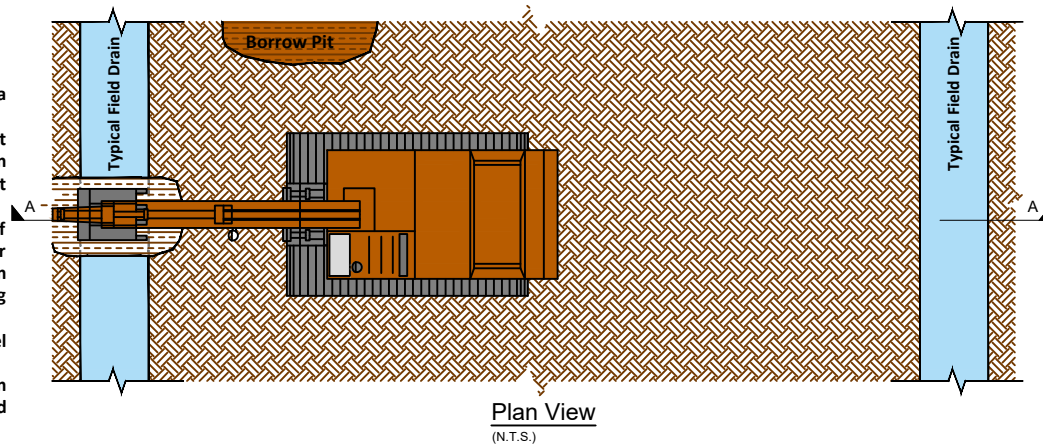


**Phase 3  
Peat Drain Blocking**

Drain blocks are constructed using an Excavator operating at a perpendicular direction to the field drains. Key is cut in the drain approximately 500mm deep, and ensuring that it is wider than the actual drain. 500mm of peat is removed from bottom of drain also and placed behind the machine for replacement later.

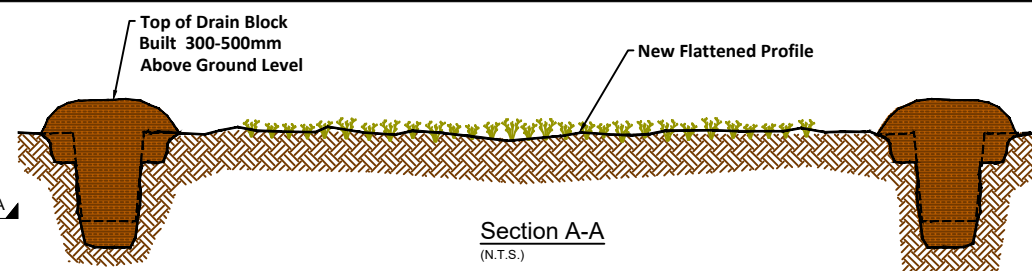
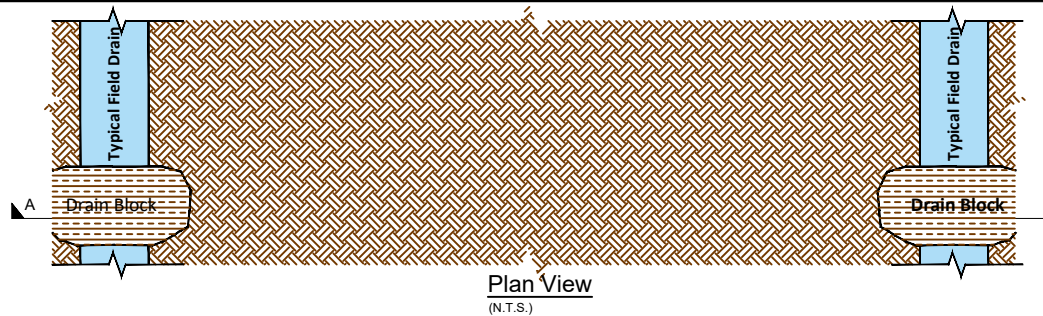
Area behind the machine is to be used as a borrow pit. Remove turf and degraded peat. Place this material close by to be used as cover later. 'Clay' like peat is extracted from pit and compacted in 300mm layers using the excavator bucket. The peat is firmly compacted using the machine bucket before laying more peat from the borrow pit. The drain block is built up at least 300-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries. The borrow pit is back filled with the peat extracted from the bottom of drain. The sides of the borrow pit are to be pressed down and graded with the excavator bucket.

(NOTE: If any vegetation present, it should be carefully removed at the start and left aside for replacement at the end of the process, to help bind and stabilise the top of the drain block.)



**Complete Flattened Field Profile**

Field re-profiling is developed as a technique to slow the surface water loss from the bog and to retain as much water as possible on the site. Each re-profiled field will hold a shallow layer of water. In time, these shallows have been shown to quickly infill with peatland vegetation.



**STATUS**

Rev	Description	Issued By	Date
b	For Approval	P.K.	03/03/21
a	Issued For Information	P.K.	07/01/21

**BORD NA MONA**  
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PROJECT:  
Peatland Climate Action Scheme  
PCAS

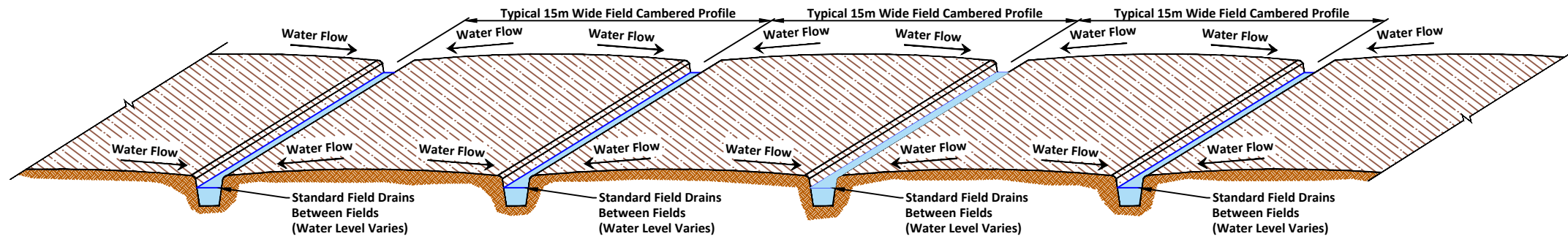
TITLE:  
Rehabilitation Method DPT 3B  
Field Re-profiling

Drawn By:	Checked By:	Approved:
CAD Designer	Discp. Lead	Design Manager
P.K.	D.K.	P.N.
Date: 18/12/20	Scale: Not to Scale	A3
Drawing No.:		Stage: For Approval
PCAS-0100-004		Rev:
		b



**Existing Layout:**

Typical existing bare peat fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area.



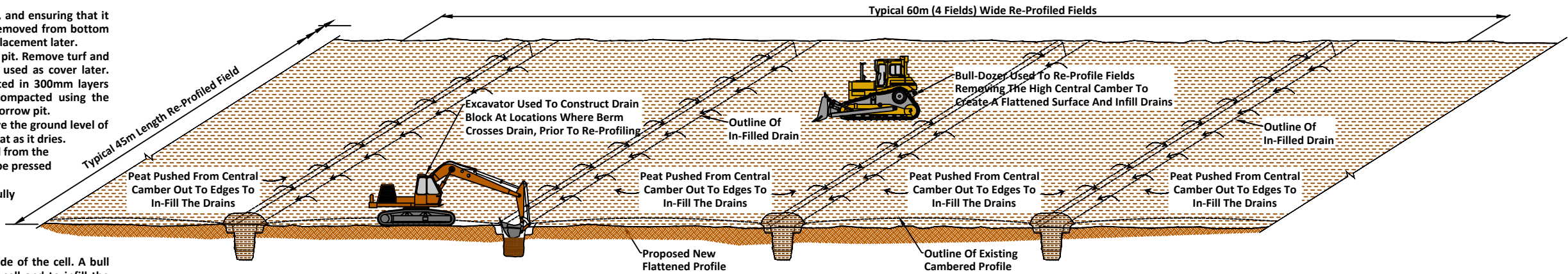
**NOTES:**

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. REFER TO RELEVANT SITE PLAN TO ENSURE SPECIFIC DRAIN BLOCKS HAVE BEEN INSTALLED DOWNSTREAM PRIOR TO COMMENCING ANY RE-PROFILING WORKS, TO RETAIN ANY SILT THAT MAY ENTER THE DRAINS.
3. REFER TO RELEVANT SITE PLAN FOR NO. OF DRAIN BLOCKS SPECIFIED PER 100M DRAIN LENGTH.
4. REFER TO RELEVANT SITE PLAN FOR SPECIFIC FINISHED GROUND LEVELS TO BE ACHIEVED.
5. ALL DETAILS TO BE AGREED WITH BORD NA MONA OPERATIONS PRIOR TO CONSTRUCTION.
6. OPERATORS TO CONFORM WITH ALL STANDARD OPERATING PROCEDURES.
7. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATION FOR THE PARTICULAR BOG AND WITH THE REQUIREMENTS OF THE REHABILITATION PLAN, ANY NATURA IMPACT STATEMENT RECOMMENDED MEASURES IF APPLICABLE, ARCHAEOLOGY REPORTS AND ANY OTHER SPECIFIC ECOLOGICAL MEASURES OR ENVIRONMENTAL REPORTS FOR THIS BOG.

**Phase 1**  
Drain Blocking And Re-Profiling of Fields Surface

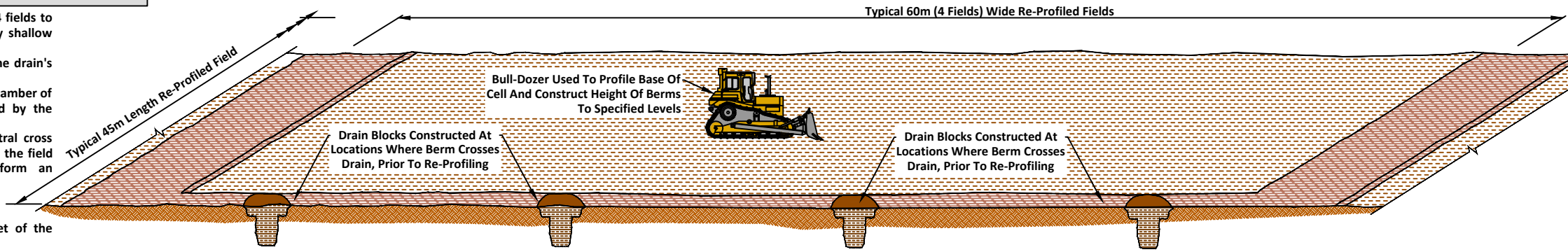
Drain blocks are constructed using an Excavator operating at a perpendicular direction to the field drains. Key is cut in the drain approximately 500mm deep, and ensuring that it is wider than the actual drain. 500mm of peat is removed from bottom of drain also and placed behind the machine for replacement later. Area behind the machine is to be used as a borrow pit. Remove turf and degraded peat. Place this material close by to be used as cover later. 'Clay' like peat is extracted from pit and compacted in 300mm layers using the excavator bucket. The peat is firmly compacted using the machine bucket before laying more peat from the borrow pit. The drain block is built up at least 300-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries. The borrow pit is back filled with the peat extracted from the bottom of drain. The sides of the borrow pit are to be pressed down and graded with the excavator bucket. (NOTE: If any vegetation present, it should be carefully removed at the start and left side for replacement at the end of the process, to help bind and stabilise the top of the drain block.)

The centre of the cambered field is used as one side of the cell. A bull dozer is used to level and flatten the base of the cell and to infill the drains by removing the camber from the fields. Laser levels are mounted on bull-dozers to allow the machine drivers to move peat and create flat surfaces to the appropriate levels.



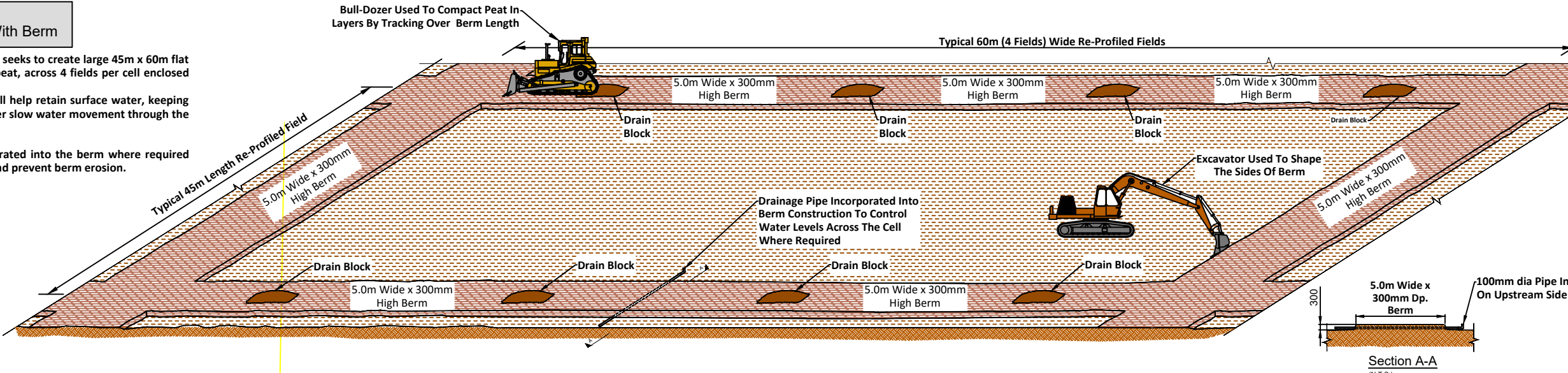
**Phase 2**  
Formation of Surface Berms And Levelling Base of Cells

Berms are formed 45m in length and 60m across 4 fields to create an enclosed cell. The berms are relatively shallow (300mm high) and are 5.0m wide. An Excavator is used to form a key(5m long) in the drain's edges where the berm crosses. A strip of peat(5m wide) is taken from the central camber of the field, pushed into the drain and compacted by the bull-dozer tracking over the drain block. Next the bull-dozer is used to complete the central cross section of Berm by taking peat from the centre of the field and pushing it in line with the field to form an approximately 5m Wide x 300mm High Cross Berm. The peat material in the berm is compacted in layers by the dozer tracking over it. Berm edge profile is shaped by using the bucket of the excavator.



**Final Profile:**  
45m x 60m Cell With Berm

This enhanced measure seeks to create large 45m x 60m flat areas or cells on bare peat, across 4 fields per cell enclosed by shallow berms. The creation of cells will help retain surface water, keeping peat wet and will further slow water movement through the bog. Drainage pipes incorporated into the berm where required to manage overflows and prevent berm erosion.



STATUS			
Rev	Description	Issued By	Date
c	For Approval	P.K.	24/02/21
b	Cell Size Text Amended	P.K.	28/01/21
a	Issued For Information	P.K.	07/01/21

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PROJECT:  
Peatland Climate Action Scheme (PCAS)

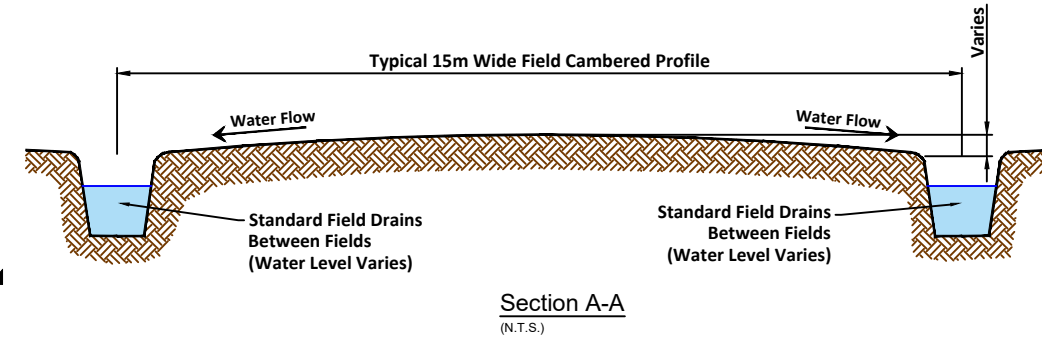
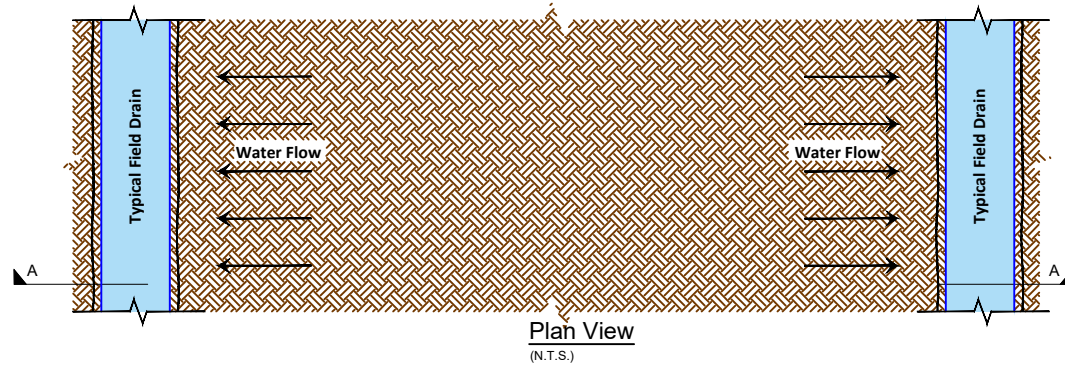
TITLE:  
Rehabilitation Method DPT 4  
45m x 60m Cell With Berms

Drawn By:	Checked By:	Approved:
CAD Designer	Discp. Lead	Design Lead
P.K.	D.K.	P.N.
Date: 22/12/20	Scale: Not to Scale	A3
Drawing No.: PCAS-0100-006	Stage: For Approval	Rev: c



**Existing Layout:**

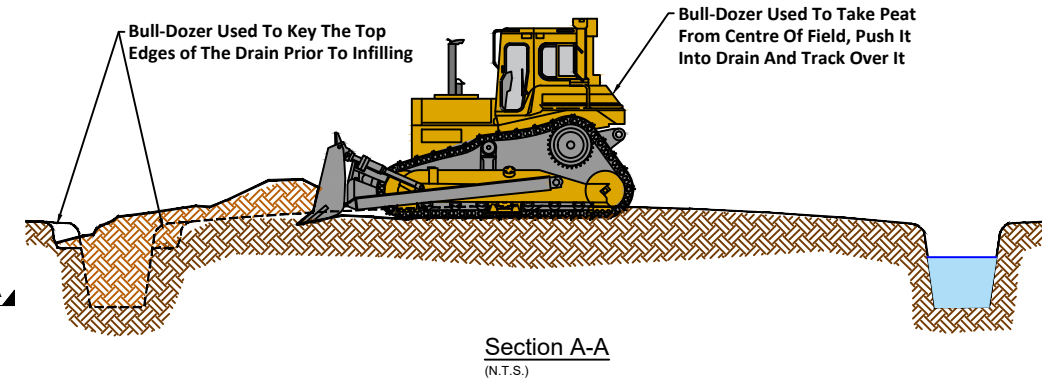
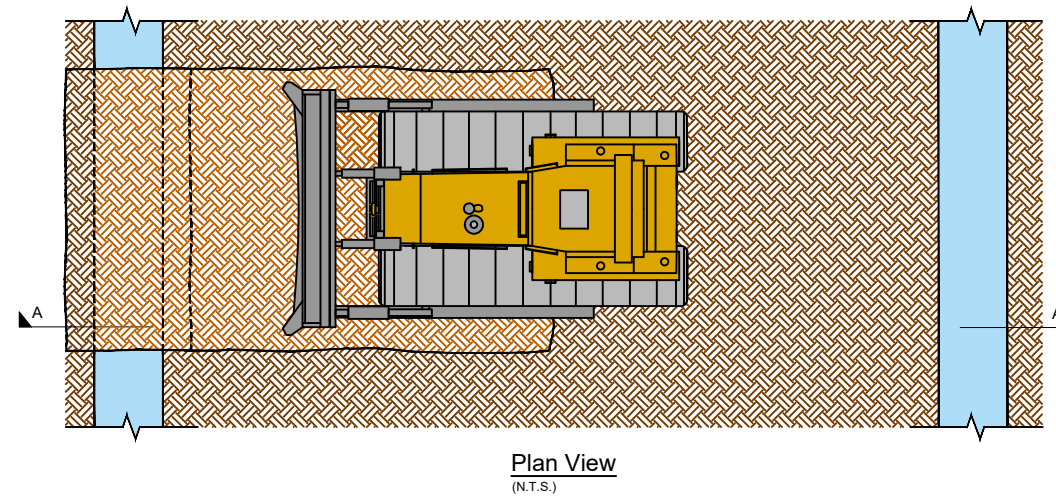
Typical existing bare peat fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area. The concept of drain blocking is to raise the water levels in the drains to re-wet the cutaway and slow the water movement through the bog.



- NOTES:**
- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
  - REFER TO RELEVANT SITE PLAN TO ENSURE SPECIFIC DRAIN BLOCKS HAVE BEEN INSTALLED DOWNSTREAM PRIOR TO COMMENCING ANY RE-PROFILING WORKS, TO RETAIN ANY SILT THAT MAY ENTER THE DRAINS.
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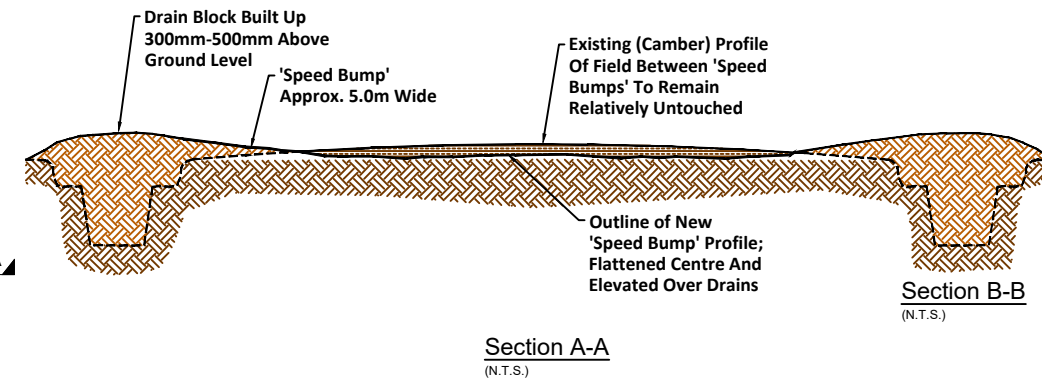
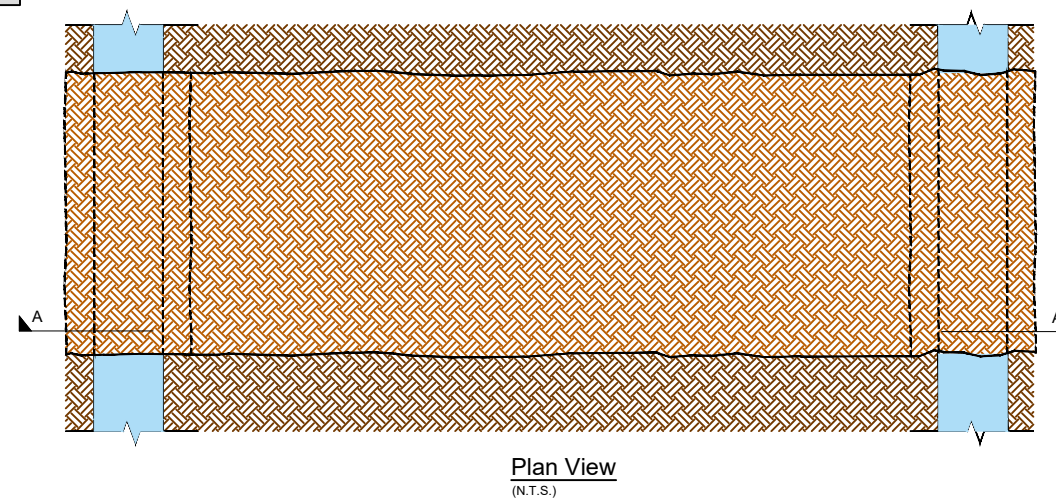
**Phase 1  
Forming 'Speed Bump'**

The Bull-dozer is used to create a 5m Length key along both edges of the drain, approximately 500mm Wide x 500mm Deep. Next a strip of peat is taken from the central camber of the field, pushed into the drain and compacted by the bull-dozer tracking over the drain block, to form an approximately 5m Wide 'Speed Bump'.



**Complete Fields With Speed Bump (3 Per 100m)**

Drain Blocks are built up at least 300mm-500mm above the existing ground level to allow for peat subsidence and to prevent water from flowing over the drain block and eroding it before it becomes stabilised.



Rev	Description	Issued By	Date
c	For Approval	P.K.	03/03/21
b	'Key' Added To Top Edges Of Drain At Drain Block Locations	P.K.	08/02/21
a	Issued For Information	P.K.	29/01/21

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PROJECT:  
Peatland Climate Action Scheme  
PCAS

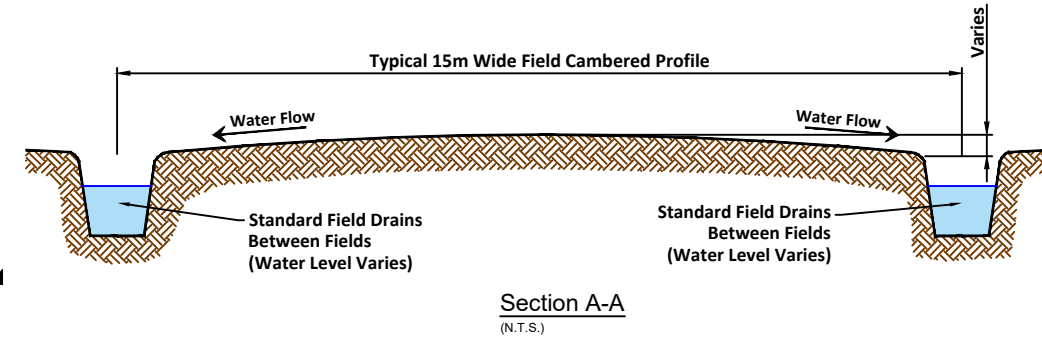
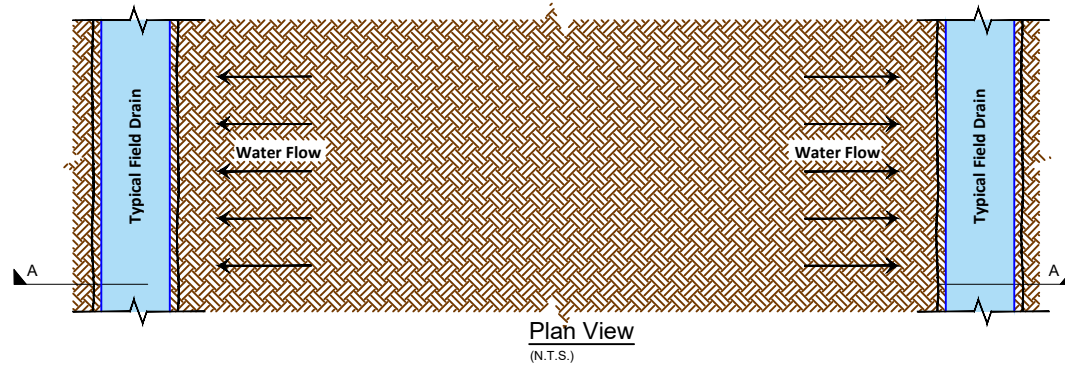
TITLE:  
Rehabilitation Method DCT 2  
'Speed Bump' Peat Drain Block

Drawn By:	Checked By:	Approved:
CAD Designer	Discip. Lead	Design Lead
P.K.	D.K.	P.N.
Date: 13/01/21	Scale: Not to Scale	A3
Drawing No.: PCAS-0100-008	Stage: For Approval	Rev: c



**Existing Layout:**

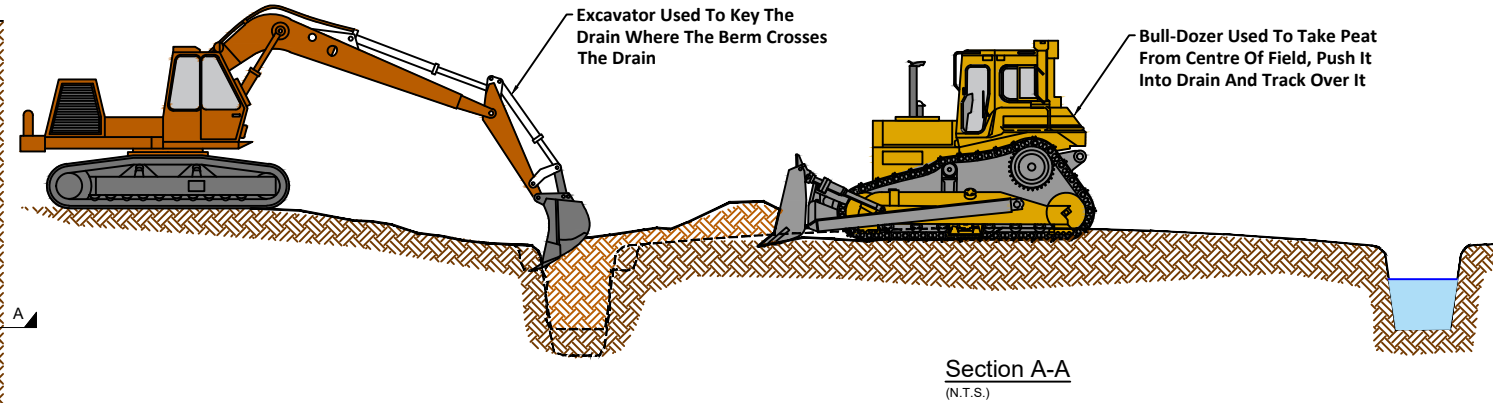
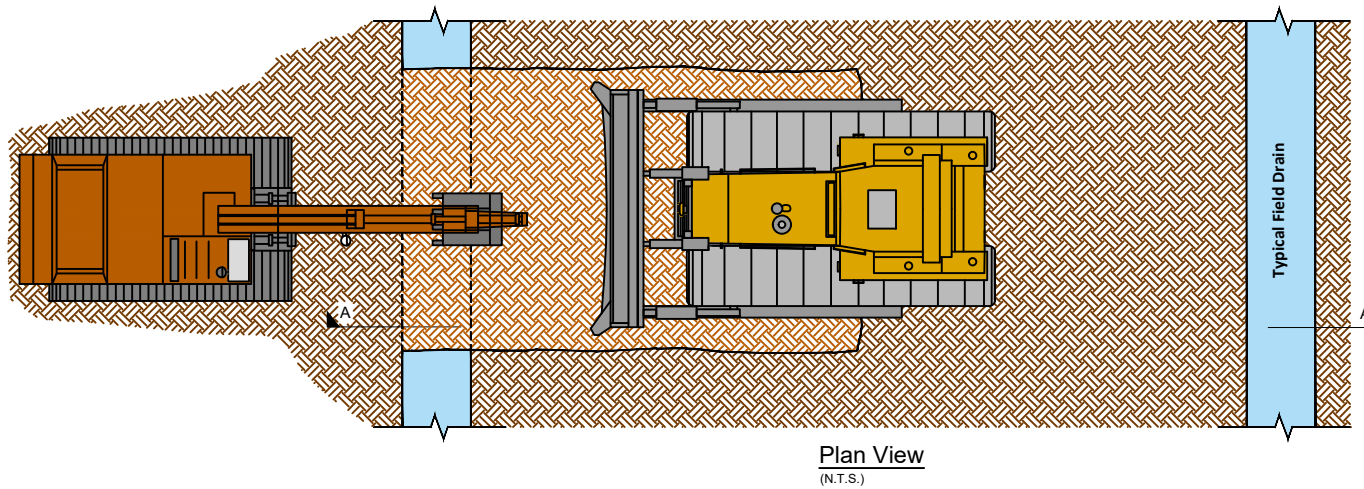
Typical existing bare peat fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area. The concept of Cross berms is to slow the water movement through the bog.



- NOTES:**
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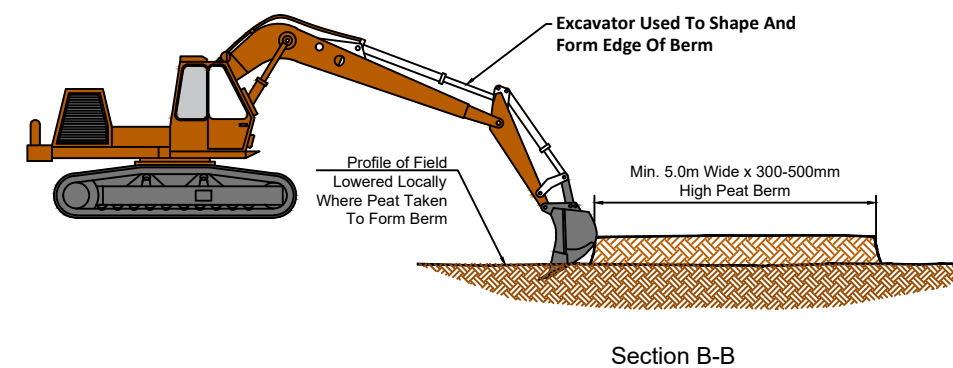
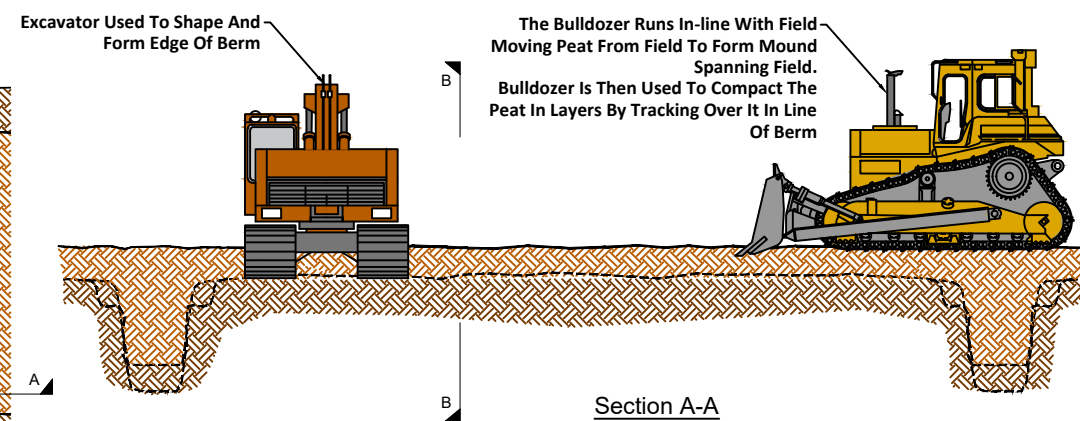
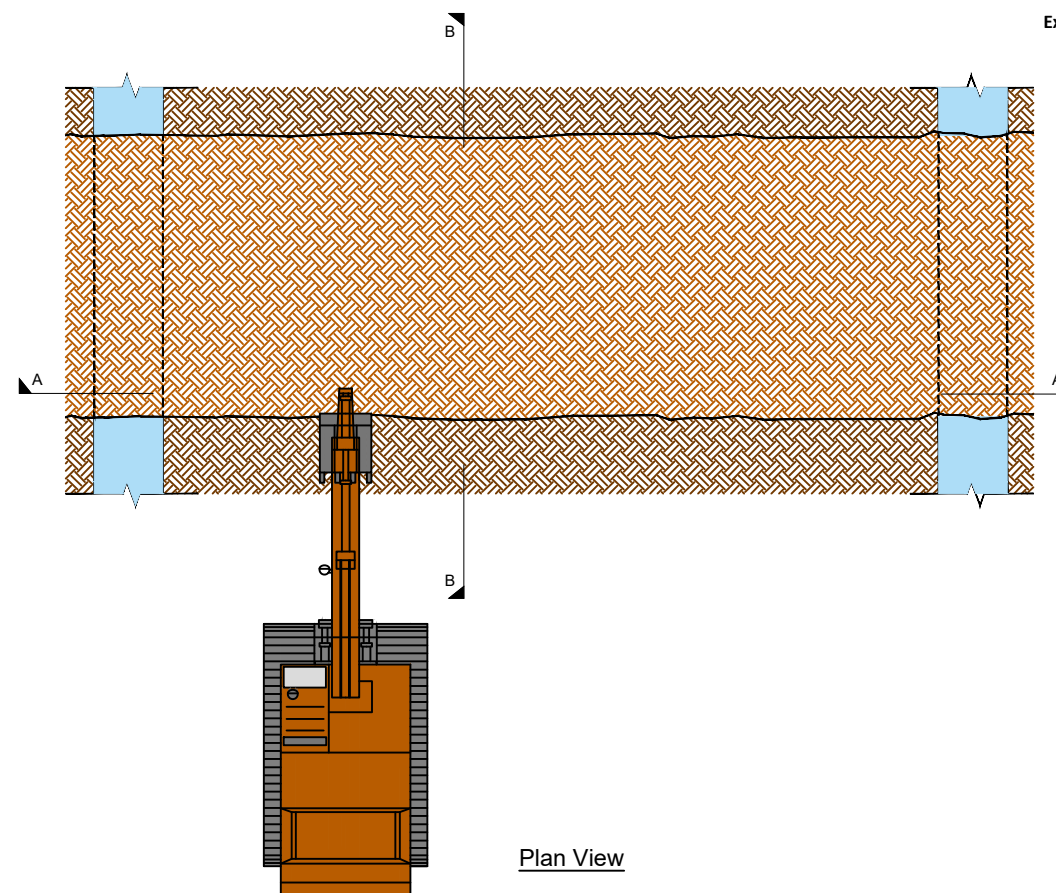
**Phase 1  
Forming Peat Berm**

An Excavator is used to form a key in the drain where the berm crosses. A strip of peat is taken from the central camber of the field, pushed into the drain and compacted by the bull-dozer tracking over the drain block.



**Phase 2  
Forming Peat Berm**

Next the bull-dozer is used to complete the central cross section of Berm by taking peat from the centre of the field and pushing it in line with the field to form a minimum 5m Wide x 300-500mm High Cross Berm. The peat material in the berm is compacted in layers by the dozer tracking over it. The excavator bucket is used to form and shape the edges of the compacted berm.



STATUS			
Rev	Description	Issued By	Date
c	Berm Dimensions And Details Revised	P.K.	11/03/21
b	Berm Height Increased And Trench Detail Added	P.K.	25/02/21
a	Issued For Information	P.K.	29/01/21

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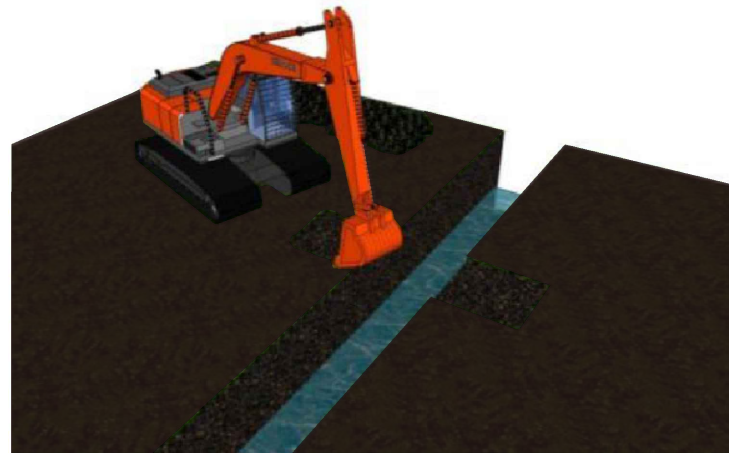
PROJECT:  
Peatland Climate Action Scheme  
PCAS

TITLE:  
Rehabilitation Method WLT 3  
Peat Berm

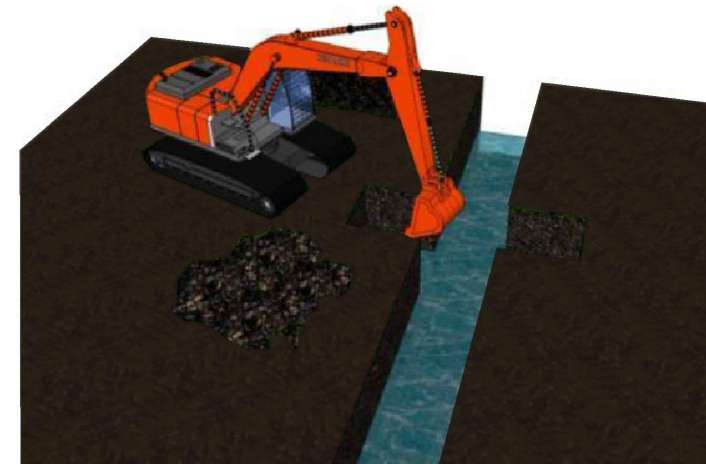
Drawn By:	Checked By:	Approved:
CAD Designer	Discip. Lead	Design Lead
P.K.	D.K.	P.N.
Date: 28/01/21	Scale: Not to Scale	A3
Drawing No.: PCAS-0100-010	Stage: Information	Rev: c



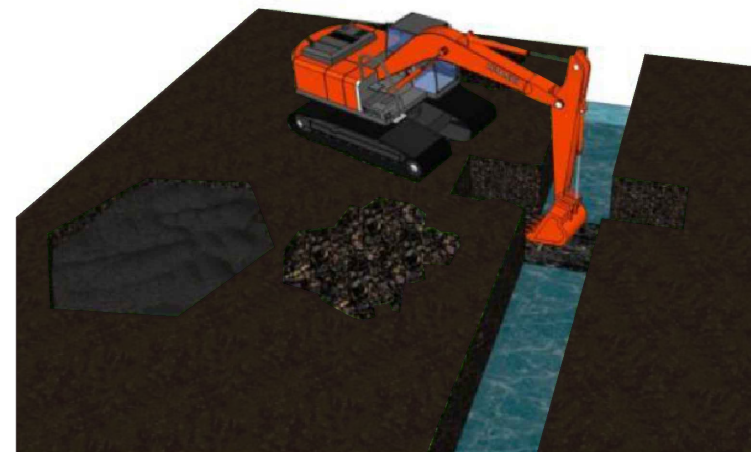
1. Before building of drain blocks, the sides and bottom of the ditch is cleaned using the excavator to remove dry degraded peat, to ensure a good peat-to-peat contact.  
( If any vegetation present, it should be carefully removed and left aside for replacement at the end of the process. )



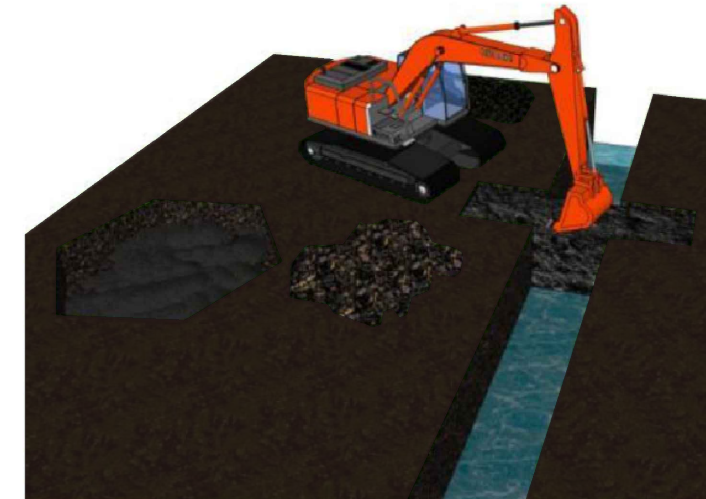
2. Cut key in either side of the drain approximately 500mm deep, and ensure that it is wider than the actual drain. Remove 500mm of peat from bottom of the drain also and place behind the machine for replacement later.



3. Open an area behind machine to be used as a borrow pit. Avoid using the surface layer of peat (top 100-200mm) which is likely to be very permeable. Only use the deeper, more compacted peat to build the drain block.  
( If any vegetation present, it should be carefully removed and left aside for replacement at the end of the process. )



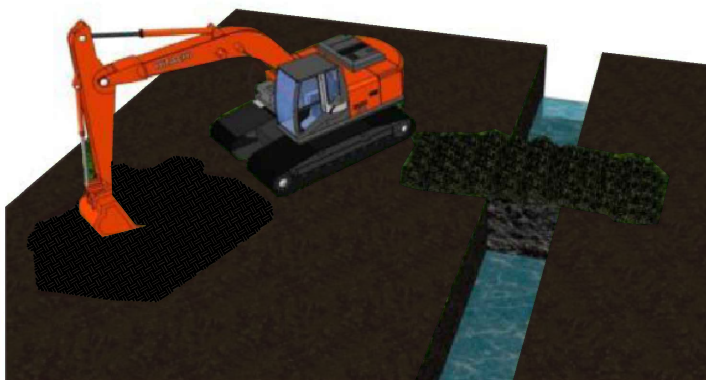
4. Dig out peat from the borrow pit and place into the drain compacting in 300mm layers. Compact the peat firmly using the excavator bucket before laying more peat from the borrow pit.



5. Build the drain block up at least 300mm-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries.  
( Take any vegetation removed in step 1 and step 3 and place on the top of the drain block, to help bind and stabilise the drain block. )



6. Backfill the borrow pit with the peat extracted from the bottom of the drain in step 2. Press down on the sides of the peat borrow hole with the excavator bucket to grade the sides of the borrow pit.



This enhanced measure's main objective is to block drains with peat drain blocks to raise water levels, re-wetting peat and slowing water movements through the bog.

NOTES:			
1. FIGURED DIMS ONLY TO BE TAKEN FROM THIS DRAWING.	2. REFER TO RELEVANT SITE PLAN TO ENSURE SPECIFIC DRAIN BLOCKS HAVE BEEN INSTALLED DOWNSTREAM PRIOR TO COMMENCING ANY RE-PROFILING WORKS, TO RETAIN ANY SILT THAT MAY ENTER THE DRAINS.	3. REFER TO RELEVANT SITE PLAN FOR No. OF DRAIN BLOCKS SPECIFIED PER 100M DRAIN LENGTH.	4. REFER TO RELEVANT SITE PLAN FOR SPECIFIC FINISHED GROUND LEVELS TO BE ACHIEVED.
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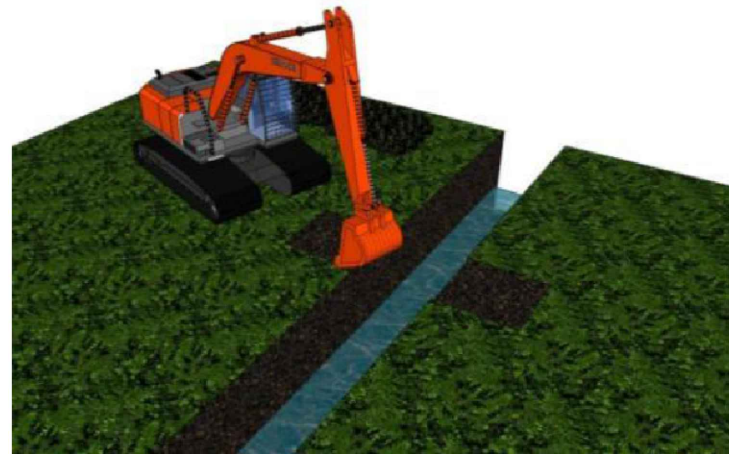
STATUS			
Rev	Description	Issued By	Date
b	For Approval	P.K.	25/02/21
a	Issued for Information	P.K.	29/01/21

PROJECT: Peatland Climate Action Scheme PCAS				
TITLE: Rehabilitation Method WLT 4 Peat Drain Blocking				
Drawn By:	Checked By:	Approved:		
CAD	Designer	Discip. Lead	Design Lead	Design Manager
P.K.		D.K.	P.N.	P.N.
Date:	13/01/21	Scale:	N.T.S.	A3
Stage:	For Approval			
Drawing No.:	PCAS-0100-011			Rev:
				b

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1. Before building of drain blocks, the sides and bottom of the ditch is cleaned using the excavator to remove dry degraded peat, to ensure a good peat-to-peat contact. Any vegetation should be carefully removed and left aside for replacement at the end of the process.



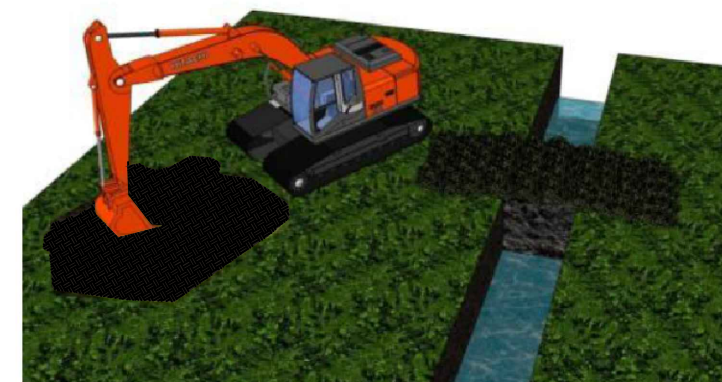
2. Cut key in either side of the drain approximately 500mm deep, and ensure that it is wider than the actual drain. Remove 500mm of peat from bottom of the drain also and place behind the machine for replacement later.

3. Open an area behind machine to be used as a borrow pit. Avoid using the surface layer of peat (top 100-200mm) which is likely to be very permeable. Only use the deeper, more compacted peat to build the drain block. Any vegetation should be carefully removed and left aside for replacement at the end of the process.



4. Dig out peat from the borrow pit and place into the drain compacting in 300mm layers. Compact the peat firmly using the excavator bucket before laying more peat from the borrow pit.

5. Build the drain block up at least 300mm-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries. Take any vegetation removed in step 1 and step 3 and place on the top of the drain block, to help bind and stabilise the drain block.



6. Backfill the borrow pit with the peat extracted from the bottom of the drain in step 2. Press down on the sides of the peat borrow hole with the excavator bucket to grade the sides of the borrow pit.

This enhanced measure's main objective is to block drains with peat to raise water levels, re-wetting peat and slowing water movements through the bog.

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PROJECT: Peatland Climate Action Scheme PCAS

TITLE: Rehabilitation Method MLT 2 Peat Drain Blocking

STATUS			
b	For Approval	P.K.	25/02/21
a	Issued for Information	P.K.	29/01/21
Rev	Description	Issued By	Date

Drawn By:	Checked By:	Approved:
CAD	Designer	Discip. Lead
P.K.	D.K.	P.N.
Date: 28/01/21	Scale: N.T.S.	A3
Stage: For Approval		
Drawing No.: PCAS-0100-013		Rev: b

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## **Appendix E Engineering and Rehabilitation Design Specification**



PCAS Project

Ummeras Bog Rehabilitation Measures

Engineering and Rehabilitation Design Specification





# DOCUMENT CONTROL SHEET

Client	Bord na Móna					
Project Title	Ummeras Bog Rehabilitation Measures					
Document Title	Engineering and Rehabilitation Design Specification					
Document No.	PCAS-0-UM-01-SP01					
This Document Comprises	DCS	TOC	Text	No. of Tables	No. of Figures	No. of Appendices
	1	1	34	1	11	2

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
0	TE	PK / LH /GD	DK	PN	BnM CIVIL ENG DEPARTMENT	12/03/2021

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APPENDICES

## 1. Introduction

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within Kilberry Bog Group under IPC Licence (Ref. P0506-01). As part of Condition 10.2 of this licence, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area.

This document – *Ummeras Bog Engineering and Rehabilitation Design Specification* – should be read in association with both the *Ummeras Bog Site Characterisation and Monitoring 2021* and the *Ummeras Drainage Management Plan 2021*. These three reports should be read in association with **Ummeras Cutaway Bog Decommissioning and Rehabilitation Plan 2021**, which addresses **all** of the requirements of Condition 10.2 of IPC Licence Ref. P0506-01.

The – *Ummeras Bog Rehabilitation Measures Engineering and Rehabilitation Design Specification* – specifically focuses on the design specification of the peatland rehabilitation measures proposed for Ummeras Bog and includes the following:

- Description of the proposed rehabilitation measures.
- Identification of the location of the proposed rehabilitation measure.
- Description of the site-specific parameters that resulted in the selection of the proposed rehabilitation measures.
- Description of the method of implementation for each rehabilitation measure.
- Assessment of the likelihood of failure for each rehabilitation measure
- Description of the method of setting out and verification of completion of rehabilitation measures.
- An Emergency Response Plan is outlined in the event of failure of a rehabilitation element.

## 2. Site Location

Ummeras Bog is located approximately 2.5km south-west of Rathangan, 3km north of Mónasterevin and c.4.5km south-west of Rathangan. It straddles the border between Co. Offaly to the north and Co. Kildare to the south. The surrounding landscape is dominated by farmland, largely consisting of improved grassland. There is some conifer plantation on older cutover bog and other peatlands in the local area. The Grand Canal is located to the east of the site. The Slate River flows to the north of the site and meets the Figile, where it then flows south to the west of Ummeras Bog to meet the Barrow.

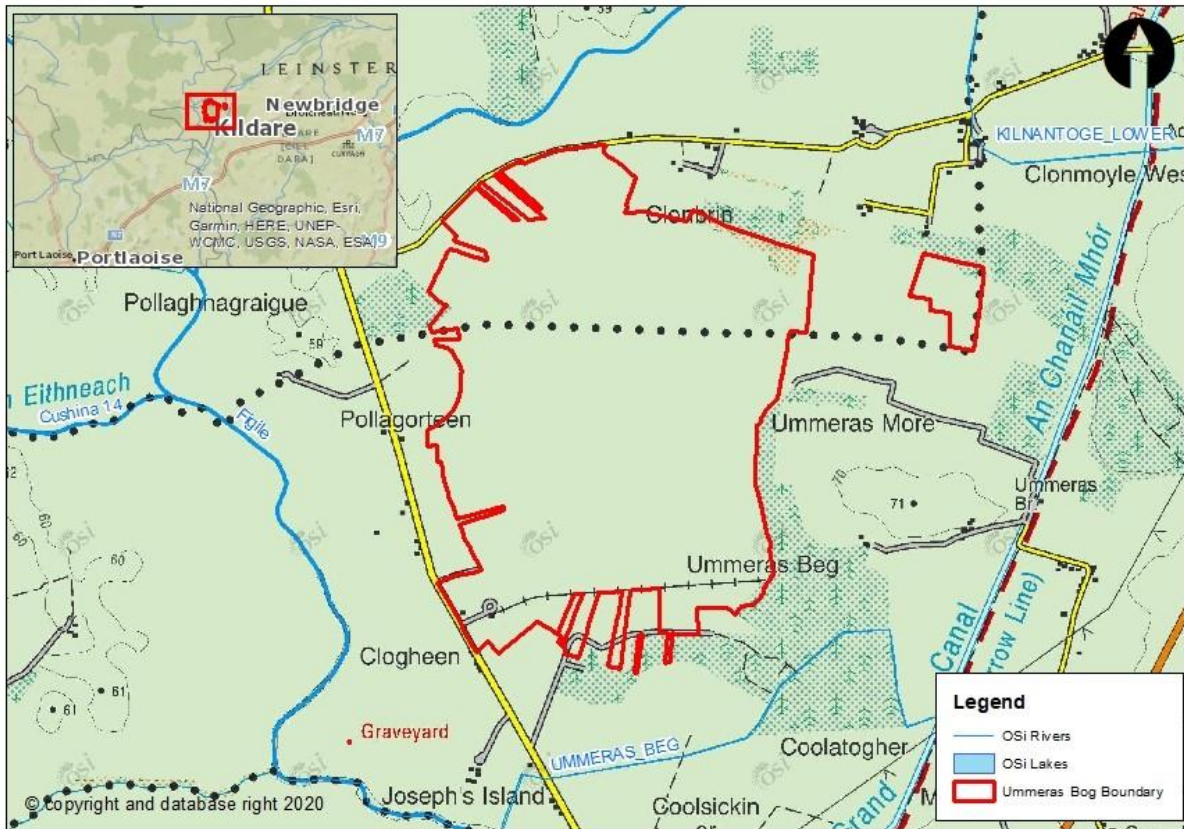


Figure 2.1 Ummeras Location Map

### 3. Scope of Works

The area of proposed rehabilitation measures for Ummeras Bog is approximately 283.7a. The rehabilitation measures can be summarised as follows:

- Provision of peat drain blocks within existing drains.
- Provision of berms.
- Field re-profiling.
- Provision of re-profiled field cells.
- Provision of control measures.
- Modifying outfalls.
- Managing water levels.

Pertinent rehabilitation methods are detailed in the following drawings, also provided as part of the PCAS package:

- PCAS-0100-001 Rehab Method DPT 1 – Speed Bump Peat Drain Block

- PCAS-0100-002            Rehab Method DPT 2 – Peat Drain Block
- PCAS-0100-006            Rehab Method DPT 4 – 45m x 60m Cell with Berms
- PCAS-0100-007            Rehab Method DPT 5 – 30m x 30m Cell with Berms
- PCAS-0100-008            Rehab Method DCT 2 – Speed Bump Peat Drain Block
- PCAS-0100-010            Rehab Method WLT3 – 300 to 500mm high Berm
- PCAS-0100-011            Rehab Method WLT4 – Peat Drain Block
- PCAS-0100-014            Rehab Method            – Modifying Outfalls - Managing Water Levels

#### 4. Proposed Rehabilitation Measures

The location of the Proposed rehabilitation measures within Ummeras Bog are identified in Figure 4.1 below. A description of each rehabilitation measure and the target area within Ummeras bog is outlined in Table 4.1

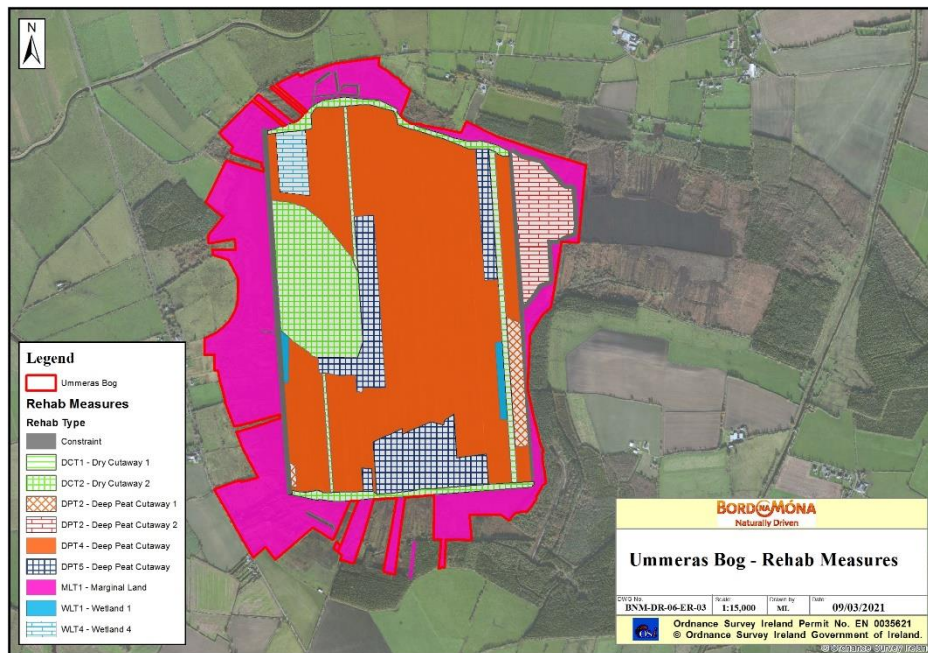


Figure 4.1 Proposed Enhanced Rehabilitation Plan for Ummeras Bog



Type	Code	Description	Area (Ha)
Deep peat cutover bog	DPT1	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes	4.0
	DPT2	More intensive drain blocking (max 7/100 m) + blocking outfalls and managing overflows	11.4
	DPT3	More intensive drain blocking (max 7/100 m), + field reprofiling + blocking outfalls and managing overflows	
	DPT4	Berms and field re-profiling (45m x 60m cell) + blocking outfalls and managing overflows + drainage channels for excess water + Sphagnum inoculation	120.8
	DPT5	Cut and Fill cell bunding (30m x 30m cell) + blocking outfalls and managing overflows + drainage channels for excess water + Sphagnum inoculation	26.6
Dry cutaway	DCT1	Blocking outfalls and managing water levels with overflow pipes	6.4
	DCT2	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes + targeted fertiliser treatment	28.7
	DCT3	More intensive drain blocking (max 7/100 m) + blocking outfalls and managing overflows + targeted fertiliser treatment	
Wetland cutaway	WLT1	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes	1.8
	WLT2	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site	
	WLT3	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site + constructing larger berms to re-wet cutaway + transplanting Reeds and other rhizomes	1.1
	WLT4	More intensive drain blocking (max 7/100 m), + blocking outfalls and managing overflows + transplanting Reeds and other rhizomes	4.0
	WLT5	More intensive drain blocking (max 7/100 m), + field reprofiling + blocking outfalls and managing overflows + transplanting Reeds and other rhizomes	
Marginal land	MLT1	No work required	79.0
	MLT2	More intensive drain blocking (max 7/100 m)	
	MLT3	More intensive drain blocking (max 7/100 m) + blocking outfalls and managing overflows with + boundary berm	
Other		Silt-ponds	
		Constraints	8.7
		Archaeology constraints	
		Riparian	
Total			292.5

**Table 4.1 Rehabilitation measures and the proposed target area for Ummeras bog**

The rehabilitation measures have been selected based on a number of site-specific measures below and the basis for the selection of the main rehabilitation types is outlined in the *Ummeras Site Categorisation and Monitoring 2021 Report*.

- Bog type, and peat depth;
- Drainage type, gravity or pumped;
- Hydrological and Topographical modelling;
- Type of surface (vegetated or not);
- Slope/topography;
- Hydrology and piezometer baseline data (where available).

The above criteria feeds into a rehabilitation decision matrix contained in Appendix A which provides a general basis for selecting a particular rehabilitation measure on a specific bog, in combination with site specific issues outlined in the *Ummeras Site Categorisation and Monitoring 2021 Report*, Table 4.1 outlines the particular rehabilitation measures for Ummeras Bog with a detailed description below.

#### **4.1. Rehabilitation measures proposed at Ummeras Bog**

The following are the proposed rehabilitation measures at Ummeras Bog outlining the process in general and the key criteria necessary to apply the measures to particular areas of the bog

##### **4.1.1. DPT1 – Speed Bump Peat Drain Block**

DPT1- Regular drain blocking (3/100 m) - blocking outfalls and managing water levels with overflow pipes are the elements within the DPT1 rehabilitation measure which are elaborated upon within Chapter 5

- This measure is proposed where the peat depth is generally in excess of 2 metres and the topography is relatively flat.
- DPT1 is adopted in sections of Ummeras bog as per Figure 4.1 The key criteria used to adopt the DPT1 approach in these areas is a deep peat profile in excess of 2 metres along with a relatively level topography.

##### **4.1.2. DPT2- Peat Drain Blocks**

DPT2 - More intensive drain blocking (Up to 7 drain blocks per 100 m), blocking of outfalls and managing overflows are the elements within the DPT2 rehabilitation measure which are elaborated upon within Chapter 5.

- DPT2- This measure is proposed where the peat depth is generally in excess of 2 metres and the topography is relatively flat and is considered an appropriate measure to align with bog best practice restoration.
- DPT2 is adopted within Ummeras bog as per Figure 4.1 The key criteria used to adopt the DPT2 approach in Ummeras bog is the presence of a deep peat profile in excess of 2 metres along with a relatively level topography. It is also considered that the DPT2 measure will not significantly alter the topography of the sub-catchments that they are located within.

#### 4.1.3. DPT4 - 45m x 60m Cell with Berms - Drain Blocks

**DPT4-** Berms and field re-profiling (45m x 60m cell), blocking outfalls, managing overflows and drainage channels for excess water and *Sphagnum* inoculation are the elements within the DPT4 rehabilitation measure which are elaborated upon within Chapter 5.

The creation of cells will help retain shallow surface water, keeping peat wet while further slowing water movement through the bog.

The centre of the cambered field is used as one side of the cell. A bulldozer is used to level and flatten the base of the cell and to infill the drains by removing the camber from the fields.

- DPT4 is adopted in sections of Ummeras bog as per Figure 4.1. The key criteria used to adopt the DPT4 approach is a deep peat profile generally in excess of 2 metres and areas that have gentle slopes that require bunding to maintain optimum hydrological conditions.
- **DPT4 A** is an alternative means of achieving a similar outcome to DPT4 and although DPT4A has been implemented and planned for other areas of Ummeras bog, there is a potential to substitute DP4A for DP4 in other areas. The DPT4A methodology is detailed in section 4.3 below. Rehabilitation Method DPT 4A Field Re-profiling with Cells and Berms.

**DPT4A-** Drain blocking at pre-determined intervals, field reprofiling, filling in of drains, Cross berms, blocking outfalls and managing overflows are the elements within the DPT4A rehabilitation measure which are elaborated upon within Chapter 5.

As part of the ongoing rehabilitation measures trials at Ummeras Bog, a variation to DPT4 evolved. This option of using a screw leveller as well as a dozer to re profile the production fields was identified during the trials. The screw levelling apparatus that was originally used to provide the convex camber on the field when peat harvesting was taking place is inverted which allows the screw leveller to now create a concave camber to the production field and thus reducing significantly the number of passes by the bulldozer to create the desired profile. In addition, the bulldozer places the loose peat within the drains removing their original function and increasing the area to be rehabilitated. The provision of the drain blocks and cross berms are still necessary to ensure there are no preferential flow paths through the drains path. The cross berms which run between high fields control wave action and sheet flow and depending on the intervals between the high fields,

longitudinal berms can also be provided to create cells, this approach is seen as a viable alternative to DPT4 Cells due to the following points:

- Simpler construction process to DPT4;
- Broader range of time in which it is expected to be able to carry out the measure (not as sensitive to bad weather as DPT4);
- Equal to or better rehabilitation impacts expected compared to DPT4;
- Increase in extent of re-wetted peat and target water-levels;
- Improvement in health and safety as drains are infilled;
- Potential for improved operator productivity.

The following phases outline the processes of DPT4A which has the capacity replace DPT4 measures in areas of Ummeras Bog, further detail in relation to the measures below are outlined in Section 5.

**Phase 1: Re-Profiling of Field Surface**

The first operation in the re-profiling process begins with using a Screw-Leveller to remove the high central camber from individual production fields and deposit the peat on the lower-lying edges of the same production field.

**Phase 2: Infilling of Drains**

Next the Bull-dozer will run up one side of the production field and down the other side with the front blade at an angle placing the peat in the drain.

**Phase 3: Final Levelling of Drains & Field**

The Bull-dozer will track over the first of the infilled drains and then back down the other drain compacting and levelling the peat. It will also make a pass down the middle of field flattening any peat mounds left between Screw Leveller and Bulldozer runs.

**Phase 4: Drain Blocking**

Drain blocks are constructed using an Excavator operating at a perpendicular direction to the field drains. Key drain blocks will be located downstream of the measures prior to infilling of the drains to ensure no release of silt occurs during the activities.

**Phase 5: Cross berms**

Cross berms will be placed at regular centres essentially creating large cells across the production fields which will control unfavourable wave action and sheet flow where the measure is located in level areas.

#### 4.1.4. **DPT5 – 30m x 30m Cell with Berms with Drain Blocks**

DPT5 Cut and Fill cell bunding (30m x 30m cell), blocking outfalls and managing overflows, drainage channels for excess water, *Sphagnum* inoculation are the elements within the DPT5 rehabilitation measure which are elaborated upon within Chapter 5.

The creation of cells will help retain surface water, keeping peat wet further slowing water movement through the bog.

- DPT5 is adopted in sections of Ummeras bog as per Figure 4.1. The key criteria used to adopt the DPT4 approach in these areas is a deep peat profile generally in excess of 2 metres and areas that have gentle slopes that require bunding to maintain optimum hydrological conditions.
- DPT5 is adopted rather than DPT4 within areas where it is positioned higher along the hydrology gradient and in areas where it is anticipated to be slightly more difficult to wet.

#### 4.1.5. **DCT1- Blocking outfalls and managing water levels with overflow pipes**

Blocking outfalls and managing water levels with overflow pipes

DCT1- Blocking outfalls and managing water levels with overflow pipes

- DCT1 is adopted in sections of Ummeras bog as per Figure 4.1. The key criteria used to adopt the DCT1 approach in these areas is a dry cutaway condition.

#### 4.1.6. **DCT2 – Regular Drain blocking**

DCT2- Regular drain blocking (3/100 m) blocking outfalls and managing water levels with overflow pipes and targeted fertiliser treatment

- DCT2 is adopted in sections of Ummeras bog as per Figure 4.1. The key criteria used to adopt the DCT2 approach in these areas is a dry cutaway condition.

#### 4.1.7. **WLT1– Designated Wetland Areas**

WLT1- Turn off or reduce pumping to re-wet cutaway, blocking of outfalls and managing water levels with overflow pipes, are the elements within the WLT1 rehabilitation measures which are elaborated upon within Chapter 5.

Areas prone to seasonal winter inundation are designated for wetland creation. Standing water will be allowed to occur resulting in increased water storage. Areas of Ummeras as shown as WLT1 in Figure 4.1 match this criterion.

- WLT1 is adopted in sections of Ummeras bog as per Figure 4.1, The key criteria used to adopt the WLT1 Areas that are likely to develop into wetlands which can largely be determined from a combination of LIDAR images, supplemented by flood mapping and surveys of levels (with the latter referencing existing water levels such as silt ponds or other outfalls from the site). Wetland cutaway has a broad range of hydrological conditions depending on the local topography. In some cases, these wetlands may form deep water (> 0.5 m) whilst other areas may have the water table at or just below the surface of the ground. Optimal peatland rehabilitation seeks to maintain a water table just above the ground level (circa. 100mm ± 50mm) during the summer.

#### 4.1.8. **WLT3 – Designated Wetland Areas**

WLT3- Turn off or reduce pumping to re-wet cutaway, blocking of outfalls and managing water levels with overflow pipes, Targeted blocking of outfalls within a site, provision of larger berms to re-wet cutaway and transplanting Reeds and other rhizomes are the elements within the WLT3 rehabilitation measures which are elaborated upon within Chapter 5.

Areas prone to seasonal winter inundation are designated for wetland creation. Standing water will be allowed to occur resulting in increased water storage. Areas of Ummeras as shown as WLT3 in Figure 4.1 match this criteria.

- WLT3 is adopted in sections of Ummeras bog as per Figure 4.1, The key criteria used to adopt the WLT3 Areas that are likely to develop into wetlands can largely be determined from a combination of LIDAR images, supplemented by flood mapping and surveys of levels (with the latter referencing existing water levels such as silt ponds or other outfalls from the site). Wetland cutaway has a broad range of hydrological conditions depending on the local topography. In some cases, these wetlands may form deep water (> 0.5 m) whilst other areas may have the water table at or just below the surface of the ground. Optimal peatland rehabilitation seeks to maintain a water table just above the ground level (circa. 100mm ± 50mm) during the summer.

#### 4.1.9. **WLT4 – Peat Drain Block**

WLT4 More intensive drain blocking (Up to 7 drain blocks per 100 m), blocking outfalls and managing overflows and transplanting Reeds and other rhizomes are the elements within the WLT4 rehabilitation measure which are elaborated upon within Chapter 5.

This measure's main objective is to block drains with drain blocks to raise water levels, re-wet peat and slow water movements through the bog.



This method is similar as that described under Deep Peat methodologies as Dry Cutaway methodology 'DCT3', but is provided in areas more prone to flooding

- WLT4 is adopted in sections of Ummeras bog as per Figure 4.1. The key criteria to adopt the WLT4 approach includes areas that are subject to seasonal winter inundation but generally dry out during the summer with the drainage in place. The objective of the measures to eliminate the drainage functionality and to maintain summer water levels close to the ground surface. Areas that are likely to develop into wetlands in a similar manner to that outlined in WLT4.

#### 4.1.10. **MLT1 – Marginal Lands**

Lands around the margin of the former peat production area

Marginal lands are defined as those areas (generally around the margins but can also be located on islands within sites) where industrial peat production has not taken place. These can be identified from habitat maps coupled with aerial images of the sites.

The habitat present on these sites can vary substantially, from near-intact raised bog remnants to cutover bog associated with domestic turf-cutting and the varied habitats such activities create (potentially including grasslands, wetlands and woodlands, as well as dry heath or peatland habitats).

It will be dependent upon the habitats and management objectives for the bog as a whole and in particular, adjacent areas of peatland where rehabilitation is being undertaken.

No rehabilitation measures are proposed in the MLT1 areas.

#### 4.1.11. **Sphagnum Inoculation**

The main objective of *Sphagnum* inoculation is to accelerate the rate of natural colonisation of *Sphagnum* moss at suitable sites by introducing donor material. The presence of *Sphagnum*-rich vegetation on peatlands brings significant benefits as this is considered a potential carbon sink.

It is proposed to use locally sourced *Sphagnum* and procured donor material, sourced from older established Bord na Móna cutover bog sites where possible, to inoculate Bord na Móna deep peat cutover bogs. Small amounts (handfuls) will be distributed into the newly created cells on deep peat cutover bog and this can be scattered by hand or planted into the peat substrate. The use of significant volumes of *Sphagnum* donor material is constrained by the small amount of suitable donor material and donor sites. It is therefore proposed to use *Sphagnum* donor material developed in greenhouses (e.g. Beadaplugs), where suitable donor material can be made available. These *Sphagnum* plugs will then be planted into each cell (c. 1-5m<sup>2</sup> is suggested per cell for planting plugs).

#### 4.1.12. Fertiliser application

In some instances, cutaway bog areas are very slow to colonise naturally. Areas where vegetation is slower to naturally colonise tend to be drier areas such as headlands and high fields that dry out in the summer.

It is proposed to use fertiliser to help accelerate natural colonisation on headlands (the area around the edges of the production bogs) and on high fields (former stockpile fields). Both areas are prone to drying in the summer, inhibiting vegetation establishment and growth. This enhanced measure will be combined with other measures to optimize ecosystem service benefits. Fertiliser will be applied during the August-September period to encourage seedling establishment towards the end of the growing season. Seedlings that establish in the spring tend to suffer greater rates of mortality as the peat dries out in the summer and this factor is significantly reduced in the later summer-autumn period.

Where applied, it is proposed to use a slow-release, Phosphorous-rich fertiliser (such as Rock Phosphate) to accelerate natural colonisation and the development of pioneer vegetation cover. Low application rates (aligned to 50% of the recommended rate provided by the Forest Service Guidelines for fertilisation of forestry on peat) will be used. Furthermore, due to Bord na Móna's organic certification status on its landholding, any fertilisers applied will need to conform to these standards.

## 5. Methods of Site Construction (Elements of various rehabilitation measures)

This Section covers the design and construction approach to the elements which make up the enhanced rehabilitation measures described in section 4 above which includes site clearance; peat drain blocking, berm construction, field re-profiling, provision of re-profiled field cells and managing water levels where required.

### 5.1. Peat Drain block

#### **Basis for design:**

Peat drain blocking is a common proven rehabilitation measure on many bogs in Ireland, resulting in a successful re-wetting of peat through the reduction of water flowing off the bog. This measure is used in the DPT2 and the WLT4 rehabilitation methodologies.

#### **Description of process:**

Drain blocks are formed using a tracked excavator operating at a perpendicular direction to the field drains. The method used follows the approach outlined by McDonagh (1996) in accordance with the **Best Practise in Raised Bog Rehabilitation in Ireland (2017)**.

- A key is cut in the drain approximately 500mm deep ensuring that it is wider than the actual drain. A 500mm depth of peat is removed from bottom of drain also and placed behind the

machine for replacement later. (If any vegetation present, it is carefully removed at the start and left aside for replacement at the end of the process, to help bind and stabilise the top of the drain block.)

- An area behind the machine, within reach of the excavator arm, is used as a borrow pit. Degraded peat is removed from the surface. This material is placed close by to be used as cover later.
- 'Clay' like peat is extracted from pit and compacted in 300mm layers using the excavator bucket, to form the drain block. The peat is firmly compacted using the machine bucket before laying more peat from the borrow pit.
- The drain block is built up at least 300-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries.
- The borrow pit is then back filled with the peat extracted from the bottom of the drain. The sides of the borrow pit are pressed down and graded with the excavator bucket.

**Risks identified:**

- Erosion of the drain block particularly in steeply sloping sections.
- Failure of drain block resulting in localised negative impact on rehabilitation measure (excessive ponding etc.).
- Failure of drain block resulting in localised escape of silt/sediment.
- Failure of drain block resulting in localised increase in hydrostatic pressures to adjacent drain blocks.
- Failure of drain block resulting in localised increase in hydrostatic pressure to berms enclosing different rehabilitation measure types.
- Failure of drain block resulting in an increase in water flow to hydraulic breaks protecting adjoining lands.
- **Mitigation through design:**
  - The selection of an appropriate drain block spacing.
  - Drain blocks are formed at a minimum of 300mm higher than the adjacent ground level and are relatively wide to create a relatively strong structure out of peat that will mitigate water flow eroding the drain block construction.
  - The provision of a key in the drain coupled with the compaction of peat in layers (max depth 300mm), ensures a tight seal is maintained and a strong structure is developed to mitigate the formation of preferential flow paths around the edges of the drain block. Design follows best practise.

- Operators assigned to this work element are familiar with the technique and process and provide effective robust drain blocks. The operators are experienced and capable of adapting to the particular conditions encountered within the bog.
- Qualified, experienced Engineers overseeing the works during the installation phase ensure that quality procedures of the various elements are implemented and effectively meet the standards for quality service and performance.
- **Mitigation through maintenance and avoidance:**
  - Ongoing monitoring of completed peat drain blocks in the weeks after formation will ensure they have consolidated.
  - The risk associated with peat drain block failure from an environmental and rehabilitation measures impact is generally categorised as low as a peat drain block failure will result in an impact that is localised and silt control measures are provided upstream of all discharge points. There is an allowance for a reactive approach to remediation measures where required.
  - A post rehabilitation Lidar and imagery survey will take place which will capture any areas where failures occurred resulting in remediation measures in a particular area if required. The Lidar survey will be implemented when the rehabilitation measures have been in place for a reasonable period of time allowing areas of weakness or potential concern to become apparent.
  - In the event of a peat drain block failure, the adjacent peat drain blocks will generally have sufficient capacity to accommodate any additional hydrostatic pressures generated ensuring the negative impact is localised.
  - If, after heavy rainfall, significant water flows in the drains cause localised drain block failure, the regular and frequent placing of drain blocks along the drain further downstream will mitigate the impact to the immediate area.
  - Peat drain blocks are designed to retain water on the cutover resulting in a reduction in discharge into the boundary drains, preventing any negative impacts on adjacent agricultural land. (See chapter 7 below 'Emergency Failure Response' outlining mitigation measures to be put in place should any risks of unexpected hydrological impacts occur).



Figure 5.1.1 Peat drain block trials at Castlegar bog

## 5.2. 'Speed-Bump' Drain Block

### Basis for design:

Peat drain blocking is a common proven rehabilitation measure on many bogs in Ireland, resulting in a successful re-wetting of peat through the reduction of water flowing off the bog. This measure is particularly effective for bare peat areas that are not prone to flooding and is used in the DPT1 and the DCT2 rehabilitation methodologies.

### Description of process:

- Drain blocks are formed using a bulldozer operating at a perpendicular direction to the field drains. First a key is cut from both edges of the drain using the bulldozer, approximately 500mm deep ensuring that it is wider than the actual drain.
- A strip of peat is taken from the central camber of the field, pushed into the drain and compacted by the bull-dozer tracking over the drain block, to form an approximately 5m Wide 'Speed Bump'.
- Fields are then completed with Speed Bumps (at an approximate ratio of 3 Per 100m). Speed bumps are profiled to ensure that the overall field profile is lower in the centre and higher over the drain blocks. The drain block is built up and compacted by the bull-dozer tracking over it to at least 300-500mm above the ground level of the bog, to allow for subsequent shrinkage of the peat as it dries.

### Risks identified:

- Erosion of the drain block particularly in steeply sloping sections.
- Failure of drain block resulting in localised negative impact on rehabilitation measure (excessive ponding etc.).

- Failure of drain block resulting in localised escape of silt/sediment.
- Failure of drain block resulting in localised increase in hydrostatic pressures to adjacent drain blocks.
- Failure of drain block resulting in localised increase in hydrostatic pressure to berms enclosing different rehabilitation measure types.
- Failure of drain block resulting in an increase in water flow to hydraulic breaks protecting adjoining lands.
- **Mitigation through design:**
  - The selection of an appropriate drain block spacing.
  - Drain blocks are formed at a minimum of 300mm higher than the adjacent ground level and are relatively wide to create a relatively strong structure out of peat that will mitigate water flow eroding the drain block construction.
  - The provision of a key in the drain ensures a tight seal is maintained and a strong structure is developed to mitigate the formation of preferential flow paths around the edges of the drain block.
  - Operators assigned to this work element are familiar with the technique and process and provide effective robust drain blocks. The operators are experienced and capable of adapting to the particular conditions encountered within the bog.
  - Qualified, experienced Engineers overseeing the works during the installation phase ensure that quality procedures of the various elements are implemented and effectively meet the standards for quality service and performance.
- **Mitigation through maintenance and avoidance:**
  - Ongoing monitoring of completed peat drain blocks in the weeks after formation will ensure they have consolidated.
  - The risk associated with peat drain block failure from an environmental and rehabilitation measures impact is generally categorised as low as a peat drain block failure will result in an impact that is localised and silt control measures are provided upstream of all discharge points. There is an allowance for a reactive approach to remediation measures where required.
  - A post rehabilitation Lidar and imagery survey will take place which will capture any areas where failures occurred resulting in remediation measures in a particular area if required. The Lidar survey will be implemented when the rehabilitation measures have been in place for a reasonable period of time allowing areas of weakness or potential concern to become apparent.



- In the event of a peat drain block failure, the adjacent peat drain blocks will generally have sufficient capacity to accommodate any additional hydrostatic pressures generated ensuring the negative impact is localised.
- If, after heavy rainfall, significant water flows in the drains cause localised drain block failure, the regular and frequent placing of drain blocks along the drain further downstream will mitigate the impact to the immediate area.
- As peat drain blocks are designed to retain water on the cutover resulting in a reduction in discharge into the boundary drains, preventing any negative impacts on adjacent agricultural land. (See chapter 7 below 'Emergency Failure Response' outlining mitigation measures to be put in place should any risks of unexpected hydrological impacts occur).



Figure 5.2.1 'Speed-Bump' Peat Drain Block at Carrickhill Bog

### 5.3. Berm (300-500mm high)

#### Basis for Design:

The concept of cross berms is to optimise the extent of re-wetted peat and target water levels, create enclosed areas of peat with shallow water levels and slow the water movement through the bog. These berms are used in the DPT4, DPT5 and WLT3 methodologies.

The berm design adopts an empirical design approach. It is proposed to apply proven sizes, proportions, materials, and assemblies from existing successful rehabilitation measures and flood defense berm features carried out in the past by Bord na Móna. The proposed berms are relatively shallow, circa 300mm high (minimum) and are constructed across or perpendicular to the fields acting to enclose an area to retain a shallow layer of surface water (circa 100mm).

**Description of process:**

- A tracked excavator working perpendicular to the drain is used to form a 500mm deep key in the drain edges where the berm crosses.
- A strip of peat 5m in width is taken from the central camber of the field, pushed into the drain, using the bucket of a tracked bulldozer. The peat is compacted by the bulldozer tracking over the drain block to ensure the peat forms a tight seal in the drain.
- A key is also formed similarly in the drain on the opposite side of the production field at the end of the proposed berm and the drain infilled and compacted as above.
- Next the bulldozer is used to complete the central cross section of berm by taking peat from the centre of the field and pushing it in line with the field to form a minimum 5m Wide x 300 / 500mm high cross berm. Consistency of peat is important, which should be firm enough to be shaped and compacted. The peat berm is compacted using the dozer and when this complete the excavator trims and shapes the completed berm. The berm is circa 5m (minimum) in width.

**Risks identified:**

- Peat berm failure resulting in localised negative impact on rehabilitation measure (excessive ponding etc.)
- Peat berm failure resulting in localised escape of silt/sediment.
- Increase in hydrostatic pressures to adjacent restoration methods leading to berm failure.
- Increase in hydrostatic pressure to berms enclosing different rehabilitation measure types leading to berm failure.
- Overtopping of berm resulting in an uncontrolled escape of silt/sediment.
- Subsidence of berm.
- **Mitigation through design:**
  - Peat Berms are not proposed for use in areas subject to seasonal winter inundation.
  - It is recognized that consistency of peat is important, in that it should be firm enough to be shaped and compacted.
  - Peat Berms are constructed circa 300mm (min.) higher than the adjacent ground level to create targeted hydrological conditions. The berms are built to a minimum width of 5m to create a low wide strong structure that is capable of maintaining these suitable hydrological conditions.
  - The berm installation process includes a key formation in the drains. A 500mm deep key is formed by taking a strip of peat from the field and pushing it in to the drain where

it is compacted by the bulldozer ensuring a tight seal. The excavator trims and shapes the completed berm.

- The low and robust design of the peat berms means that overflow pipes are not required for all berms and it is expected that in flatter ground, water will overflow over the berms with minimal risk of erosion. Where necessary they will be incorporated to ensure water levels are controlled, do not rise over top of the berm and mitigate against the erosion of the berm while ensuring water level control.
  - Operators assigned to this work element are familiar with the technique and process and provide effective robust berms. The operators are experienced and capable of adapting to the particular conditions encountered within the bog.
  - Qualified, experienced Engineers overseeing the works during the installation phase ensure that quality procedures of the various elements are implemented and effectively meet the standards for quality service and performance.
- **Mitigation through maintenance and avoidance:**
    - Avoidance of berms in areas subject to seasonal winter inundation.
    - A post construction lidar and imagery survey will capture the impact of the completed rehabilitation measures indicating if any appropriate remedial action is required or deemed necessary.
    - As peat berms are designed to retain a shallow level of water on the cutover there will be no increase in water discharging into the boundary drains preventing any negative impacts on adjacent agricultural land. (See chapter 7 below 'Emergency Failure Response' outlining mitigation measures to be put in place should any risks of undesirable hydrological impacts occur).



Figure 5.3.1 Peat Berm at Castlegar Bog

#### 5.4. Screw levelling/In-filling of Production field drains

##### **Basis for Design:**

This concept of field re-profiling is to level the surface of the individual peat production fields to retain surface water at the required depth. From previous Bord na Móna experience and in similar environments in Castlegar bog, the geometry and process as set out above has proven effective by creating a suitable flat profile where water is held at suitable levels by edge berms forming a cell. The basis of empirical design is previous experience. This measure which includes a screw leveller combined with a dozer is used in the DPT4A methodology.

##### **Description of process:**

- The first operation in the re-profiling process requires the blocking of the downstream field drains to mitigate silt run-off.
- The Screw-Leveller will remove the high central camber from individual production fields and deposit the peat on the lower-lying edges of the same production field. The Screw-Leveller, with a level axis, will run up the first side of the production field and down the other side close to the edge of the drain, resulting in some of the peat being tipped into the drain.

- Next the Bulldozer will run up the first side of the production field and down the other side with the front blade at an angle placing the peat in the drain.
- The Bulldozer will then track over the first of the infilled drains and then back down the other drain compacting and levelling the peat. It will also make a pass down the middle of field flattening any peat mounds left between Screw Leveller and Bulldozer runs.
- The original channels will be carefully filled in with suitable material as specified on the drawings. The materials shall be compacted in accordance with the requirements on drawings.

**Risks identified:**

- Uncontrolled escape of silt/sediment into adjacent drains and downstream during rainfall events.
- Excess surface water flow leading to 'Sheet flow' and erosion of silt and emerging vegetation from surface of the bog.
- **Mitigation through design:**
  - Risk of additional silt created by peat disturbance. Field drains upstream and downstream will be blocked to mitigate water flow in the drain minimising silt run-off. (See chapter 7 below 'Emergency Failure Response' outlining mitigation measures to be put in place should any risks of undesirable increased movement of peat occur during construction stage).
  - Peat drain blocks to be provided immediately after field reprofiling to prevent preferential flow paths in infilled drains.
  - Operators assigned to this work element are familiar with the technique and process. The operators are experienced and capable of adapting to the particular conditions encountered within the bog.
  - Qualified, experienced Engineers overseeing the works during the installation phase ensure that quality procedures of the various elements are implemented and effectively meet the standards for quality service and performance.
- **Mitigation through maintenance and avoidance:**
  - A post construction lidar and imagery survey will capture the impact of the completed rehabilitation measures highlighting if any appropriate remedial action is required or deemed necessary.





Figure 5.4.1 Field re-profiling using Screw-Leveller

## 5.5. Modifying Outfalls and Controlling Water Levels

A description of several techniques in respect of outfall modification and management of water levels follows.

Some, such as blocking of outfalls, are applicable across multiple rehabilitation prescriptions, whilst techniques such as the cutting of ‘taps’ through high production fields are more applicable to those bogs which are subject to periodic inundation. This inundation may be due to rainfall or flooding or where water needs to be diverted from one part of the bog to another by way of management, or to create wetland areas. Both measures are essential to the management of water levels.

### 5.5.1. 'V' Tap Across High Field to Control Water Levels

#### **Basis for Design:**

This is effectively a method for diverting surface water from one side of a high field to another, to manage the water level in both fields and eventually direct excess surface water towards an outfall.



This approach has been implemented across various Bord na Móna bogs to manage water levels and an example of this is Baunmore Bog in Littleton Bog Group.

**Description of process:**

- An excavator is used to Create a 'V'-Shaped Tap across a high field to allow water pass from a field with water to a field with little or none.
- The excavator approaches the proposed 'tap' location along the surface of the high field. It then proceeds to excavate a V-shaped trench or drain to the desired depth to permit water to flow between the fields to either side.

**Risk and Proposed Mitigation Measures:**

- The analysis of Lidar maps and topography in conjunction with the Drainage Management Plan will be elemental to targeting the most appropriate locations for the "tap".



Figure 5.5.1.1 'V' Tap across a high field at Baunmore to control water levels

## 5.5.2. Blocking of Outfall

**Basis for Design:**

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The blocking of outfalls drains on the cutaway is a measure that is only carried out in a limited number of circumstances where it is essential to manage hydrology by raising water levels in a particular area and controlling the overflow via a new channel or pipe at an appropriate level.

It is an effective method of controlling water loss from the bog and is proven in its effectiveness in Littleton Bog. This measure is used in the DPT1, DPT2, DPT3A, DPT3B, DPT4A, DPT4, DPT5 and MLT2 rehabilitation methodologies.

**Description of process:**

- An Excavator is used to form a key on either side of the drain which forms the outfall from the bog or field. A 500mm depth of peat is removed from bottom of drain also and placed behind the machine for replacement later. (If any vegetation present, it is carefully removed at the start and left aside for replacement at the end of the process, to help bind and stabilise the top of the drain block.)
- A strip of peat is taken from the centre of the adjacent field, pushed into the drain, and compacted by the bull-dozer tracking over the drain block from the opposite side of the drain to the excavator. For a deep drain the peat will be compacted in layers of 300mm using the bucket of the excavator. The approximate width of the block is 3-5 times the width of the drain.
- The block drain block is built up at least 300mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries and it will be wide enough to prevent water moving around the blockage, to prevent further leakage when the block subsides.

Where possible and available, vegetation is used to cover the peat forming the outfall blockage. This measure is strongly linked with the next in respect of water level management.

**Risk and Proposed Mitigation Measures:**

- Complete filling of drains should require little ongoing maintenance if carried out to a high standard.
- Prior to infilling, any loose or dried out peat in the base or sides of drain should be removed.
- Blocking of outfalls will be planned so that it will be fully completed in one day and will be carried out in suitable weather conditions.
- Adequate compaction of the peat will be ensured.
- Water level management will be considered and an overflow channel or pipe will be constructed at an appropriate level.

Periodic inspections will be conducted to ensure they remain robust and are working effectively.

### 5.5.3. Raise Piped Culverts to control water levels

**Basis for Design:**

This measure is particularly effective for cutaway bogs with relatively flat basins where raising of pipes produces water flow at a higher invert level, within specified areas of the pre-existing drainage network. This measure is utilised in methodologies DPT1, DCT2, WLT1, WLT2, WLT3 and WLT4. It may also be used in place of a controlled weir where required for other rehab methodologies.

**Description of process:**

- The drain shall be temporarily blocked upstream of the existing outfall pipe or diverted if blocking of drain is not feasible. Water will still exit at the designated emission points via the silt ponds.
- A new transverse field drain, and pipe is then placed at a higher specified invert level than the existing outfall.
- The pipe shall be placed and covered in accordance with manufacturers specifications and adequate cover shall be provided to protect the pipe integrity.

**Risk and Proposed Mitigation Measures:**

- Blocking of the outfalls upstream of existing silt ponds will prevent increased silt run-off. The drain will be temporarily blocked upstream or diverted.
- Works will only be carried out in suitable weather conditions.



Figure 5.5.3.1 Raised water outlet at Cavemount

## 5.6. Post-Rehabilitation Bog drainage to external network

The following section sets out the drainage paths for the proposed rehabilitation measures at Ummeras Bog to ensure a defined route for water to discharge back to the external network remains post rehabilitation measures.

### 5.6.1. DPT4 & DPT5 Cell drainage to external network

DPT4 & DPT5 measures make up the majority of the area within Ummeras bog that is undergoing rehabilitation measures. Within these areas of Ummeras bog where The DPT4 & DPT5 cells are located there is a risk of the water levels increasing to excessive depths, particularly in winter months and during large flood events should there not be a defined route for the water to discharge back to the external drainage network.

In Ummeras Bog where catchments flow into the areas that DPT4, or DPT5 measures are proposed, as the contributing catchment area increases through subsequent cells there will be greater potential for the cells downstream to be overtopped, increasing risk of erosion of the bunds and generating excessive water depths. To mitigate against this, it is proposed to interconnect the cells with overflow pipes and direct the water flow towards the outfalls. It will not be necessary in all instances to pipe the cells such as where smaller catchments upstream or no localised depressions exist as infrequent

overtopping of these cells is not considered a significant risk given the robust design of the cells. However, in line with a precautionary approach it is proposed to include overflow pipes in any cells with a minimum contributing catchment area of 2 hectares. This area is taken from previous experience of drainage within Ummeras bog and can be adjusted with the provision of further pipes in the relevant cells to reduce the catchment area if required. Indicative overflow locations are shown in Figure 5.6.2.1 and thus creating a flow path through the cells to the outfalls.

The two hectare area threshold is an initial threshold adopted based on previous experience within Ummeras and other Bord na Móna Bogs. However, this threshold is subject to change from bog to bog depending on a number of factors such as rate of effective rainfall, rate of infiltration etc. However, it is anticipated that the area adopted will enable an assessment of the approach and inform an adjustment of the threshold should it be required.

It should be noted in some instances where catchments are located in depressions and cannot be drained without the use of overflow pipes, then these will also be proposed regardless of whether the cells have a contributing catchment area of <2 hectares or not.

Within the DPT4, DPT4A & DPT5 measures there is an ability to come back on site and install additional pipes to cells and additional taps, where deemed necessary as hydrological conditions begin to stabilise.

As can be seen in Figure 5.6.2.1, DPT4 & Cell drainage it is proposed to have overflow pipes from cell to cell in the direction of flow. The flow paths throughout the site following the rehabilitation measures have been considered based on current and anticipated topography. The cells have been designed to drain towards a specific discharge point or open drain which will extend to the outfall. The overall drainage routes and how they connect into the river channels is shown within Figure 5.6.4.1

These main drainage routes will consist of a series of open drains and culverts through the high fields where required (taps) and will align with existing discharge outfall points. Some minor modifications may be required based on final surface levels across the site to ensure gravity flow can be maintained. Based on the overall catchment size draining to the outfalls in Ummeras Bog it is proposed to tap the high fields with 450mm pipes, which will have an estimated capacity of 0.68 m<sup>3</sup>/s assuming free flowing and a gradient of 0.05. This is considered conservative in the context of the contributing catchment area and calculated flows for a 1% AEP event. Furthermore, this size of pipe (450mm) is a typical size utilized within BnM bogs to drain similar or greater catchments areas. Any open drains connecting to the taps will have equal to or greater capacity than the 450mm Pipe.

Due to the nature of the measures it is not possible to specify specific levels prior to the rehabilitation measures as the level will depend on amendments to topography through field reprofiling and other measures which will manipulate the ground profile locally. However, an assessment of current and anticipated surface levels along with levels of the current piped outfall indicates that an adequate fall can be achieved (at a higher elevation than the current piped outfall).

Figure 5.6.2.1 Demonstrates the general direction of flow of water through the cells towards the main drainage routes and outfalls.

### 5.6.2. Rehabilitation Measures - Drainage to external network

The other measures such as DPT 2, DCT1, DCT2, Wetland measures etc. do not alter the topography of the sub-catchment in which they are contained or do not create berms which enclose the measures and therefore it is anticipated that the pre-rehabilitation flow path to the discharge location will be retained. This is because topographical flow paths for surface water out of the bog (by gravity) will be retained in these areas and the bog is not dependent on a pumping regime to ensure ponding does not occur.

The potential for increased groundwater levels, and to a lesser extent, marginal alteration of the topographical catchments has been assessed within the Ummeras Drainage management plan in line with a precautionary approach. With gravity drainage routes retained it is anticipated that groundwater levels will reach the surface of the peat fields but no higher than this. This is also relevant to the area of high bog to the North West where DPT2 is proposed where the pre-rehabilitation flow paths will be retained.

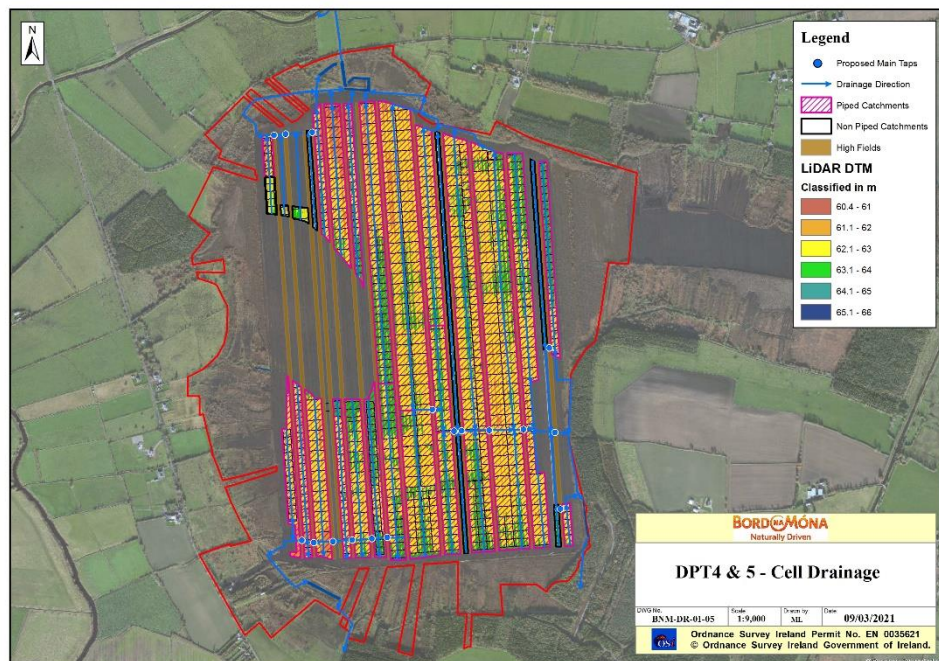


Figure 5.6.26.2.1 Post – rehabilitation Drainage to external network



## 6. Setting Out and Archaeology Buffer Zones

### 6.1. Setting Out Locations of Rehabilitation Measures

The following outlines the procedure for the setting out of locations of rehabilitation measures:

- Prior to commencement on site, co-ordinates of all drain blocks berm locations will be published onto the Bord na Móna ArcGIS Online Cloud.
- Operations staff will access that data using the ESRI Fields Maps application, on high accuracy GPS tablets.
- Locations of these drain blocks and berms will be presented to the machine drivers via the built-in GPS tablet and ESRI application and the machine drivers will use this technology to locate the position of the measures.
- In areas where additional clarity is required as in the case where rehabilitation measures are located in proximity to a designated or a protected site, then the location of the proposed boundary or restricted area will be set out and marked on site by Bord na Móna surveyors.

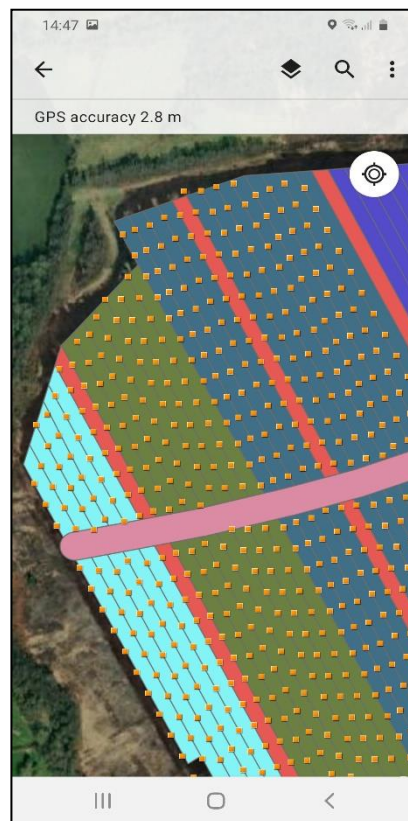


Figure 6.1.1 An example of the onscreen setting out interface

- Engineering staff will use the same ArcGIS cloud technology to verify the rehabilitation measures being carried out. This will enable weekly GIS status maps of works being carried out on a site.



Figure 6.1.2 An example of a site verification survey

#### 6.1.1. Archaeology Buffer Zone

- There are currently no archaeology areas identified in Ummeras Bog.

#### 6.1.2. Ecological Restriction Zone

- There is currently no Ecological Restriction Zone proposed for Ummeras Bog however this may change prior to commencement of the measures. and if so a buffer zone will be provided.
- As referred to in Section 6.1 the location of the proposed boundary to this buffer zone will be set out and marked on site by Bord na Móna surveyors prior to measures commencing in that location, at the appropriate time prior to the commencement of activities.

## 7. Emergency Response Plan

The Emergency Response Procedure is included in Appendix B and outlines the procedures to be implemented in the event of a Peat Spillage as follows:

- Isolate the source of peat spillage the source of which could include a silt pond failed berm or failed drain block.

- Assess the extent of the peat spill and follow to bog outfall.
- Switch off any associate bog pumps.
- Construct dry peat berms around extent of peat flow and monitor.
- If the peat spillage is assessed to have the potential to extend to a receiving water deploy a silt curtain on the receiving water.
- Continue clean as instructed by/under direction of Local Authority/ Inland Fisheries Ireland / EPA.

# **Appendix A**

## **Decision Matrix**

# **Appendix B**

## **Emergency Response Plan**

## **Appendix F Environmental Management Plan**





# **Peatland Climate Action Scheme**

## **Environmental Management Plan**

Prepared by  
Bord na Móna, Civil Engineering Office



## DOCUMENT CONTROL SHEET

Client	Bord na Móna					
Project Title	Peatland Climate Action Scheme					
Document Title	Environmental Management Plan					
Document No.	PCAS-RP-01-EMP					
This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
	1	1	19	4	0	2

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
-	Draft	DM	EMcD/MMcC/ DK/CC	PN	BnM Engineering Dept.	28-04-2021
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## 1.0 Introduction

Bord na Móna have identified a footprint of 33,000 ha of their estate as peatlands suitable for enhanced rehabilitation. This proposed Peatlands Climate Action Scheme (PCAS) will significantly exceed the requirements of the rehabilitation and decommissioning obligations under existing Environmental Protection Agency (EPA) Integrated Pollution Control (IPC) Licence Conditions. Improvements supported by PCAS will ensure that environmental stabilisation is achieved, and significant additional benefits are realised through optimising climate action benefits. This decommissioning, rehabilitation and restoration process will be referred to in subsequent sections of this report as ‘the works’.

The objectives of the Environmental Management Plan (EMP) are to:

- a) Identify management responsibilities and reporting requirements for environmental management;
- b) Identify the relevant Environmental Commitments;
- c) Set out the environmental protection measures to be implemented;
- d) Outline how compliance with the EMP will be achieved; and
- e) Promote best environmental practices for the duration of the development.

This Environmental Management Plan should be read in conjunction with the following site-specific documents for the relevant bog where works are taking place:

- Rehabilitation Plan,
- Preliminary Health & Safety Plan,
- Engineering Construction Package,
- Environmental File,
- Ecology File,
- Associated IPC Licence,
- Training Pack,

The Rehabilitation Plan gives details on the proposed works and outlines control measures and associated monitoring in order to mitigate against any detrimental impacts that may arise on site during the works. It also outlines Bord na Móna’s responsibilities under the existing IPC Licence Conditions with respect to peatland rehabilitation.

## 2.0 Proposed Rehabilitation Works

The enhanced rehabilitation measures are outlined and detailed in the site-specific Rehabilitation Plan, Engineering Construction Package, Environmental File & Ecology File. These measures are grouped into rehabilitation packages and their suitability for the deployment in different 'high level' categories of land types are outlined in Table 2-1. The Standard Rehab Methodology Drawings in Table 2-2 should be followed with respect to the execution of the various methodologies on site.

Table 2-1 Rehabilitation Packages

Code	Description
<b>Deep Peat Cutover Bog</b>	
DPT1	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes
DPT2	More intensive drain blocking (7/100 m) + blocking outfalls and managing overflows with a controlled weir outfall + Sphagnum inoculation
DPT3	More intensive drain blocking (7/100 m), + field reprofiling + blocking outfalls and managing overflows with a controlled weir outfall + Sphagnum inoculation
DPT4	Berms and field re-profiling (45m x 60m cell) + blocking outfalls and managing overflows with a controlled weir outfall + drainage channels for excess water + Sphagnum inoculation
DPT5	Cut and Fill cell bunding (30m x 30m cell) + blocking outfalls and managing overflows with a controlled weir outfall + drainage channels for excess water + Sphagnum inoculation
<b>Dry Cutaway</b>	
DCT1	Blocking outfalls and managing water levels with overflow pipes
DCT2	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes + targeted fertiliser treatment
DCT3	More intensive drain blocking (7/100 m) + blocking outfalls and managing overflows with a controlled weir outfall + targeted fertiliser treatment
<b>Wetland</b>	
WLT1	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes
WLT2	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site
WLT3	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site + constructing larger berms to re-wet cutaway + transplanting Reeds and other rhizomes
WLT4	More intensive drain blocking (7/100 m), + blocking outfalls and managing overflows with a controlled weir outfall + transplanting Reeds and other rhizomes
WLT5	More intensive drain blocking (7/100 m), + field reprofiling + blocking outfalls and managing overflows with a controlled weir outfall + transplanting Reeds and other rhizomes
<b>Marginal Land</b>	
MLT1	No work required
MLT2	More intensive drain blocking (7/100 m)

Table 2-2 – Schedule of Standard Rehab Methodology Drawings

Drawing No.	Drawing Title
PCAS-0100-001	Rehabilitation Method DPT1
PCAS-0100-002	Rehabilitation Method DPT2
PCAS-0100-003	Rehabilitation Method DPT3A
PCAS-0100-004	Rehabilitation Method DPT3B
PCAS-0100-005	Rehabilitation Method DPT4A
PCAS-0100-006	Rehabilitation Method DPT4
PCAS-0100-007	Rehabilitation Method DPT5
PCAS-0100-008	Rehabilitation Method DCT2
PCAS-0100-009	Rehabilitation Method DCT3
PCAS-0100-010	Rehabilitation Method WLT3
PCAS-0100-011	Rehabilitation Method WLT4
PCAS-0100-012	Rehabilitation Method WLT5
PCAS-0100-013	Rehabilitation Method MLT2
PCAS-0100-014	Modifying of Outfalls & Managing Water Levels
PCAS-0100-015	Field Re-profiling
PCAS-0100-016	Boundary Berm

### 3.0 Envisaged Sequence of Works

This section provides an outline of the envisaged sequence of works associated with the project. Bord na Móna Operations Risk Assessment Method Statements (RAMS) should include a detailed description of the works, particularly those works which have the potential to impact public spaces. Mitigation measures for these impacts should also be proposed within the RAMS.

#### 3.1 Site Preparation Works

Bord na Móna Operations will be responsible for security of the site and as such, will be required to carry out, among others, the following tasks:

- Ensure that a relevant and robust site induction process is in place for all site personnel.
- Ensure that all site personnel have valid Safe Pass card, and valid CSCS card where applicable.
- Ensure that access to the site by unauthorised persons is restricted, by appropriate means.

The site compound may be used as a storage area for various materials throughout the course of the works. Typical materials to be stored include fuels, plant and equipment. Temporary water supply, electricity and sewerage to be satisfied by Bord na Móna Operations as required.

#### 3.2 General Description of Works

The works involves the construction of peat dams, berms and the adoption of various peat bunding techniques in addition to monitoring activities as per the IPC Licence requirements.

The scope of works is described as, but are not limited to, the following:

- Silt pond inspections fortnightly and cleaning bi-annually.
- Sampling of the silt pond outlet every month.
- Refuelling of machines.
- Unloading of fuel from supplier into a double skinned tank onsite.
- Unloading of oil barrels from a pick-up and depositing into the oils store.
- Other materials being delivered to site by BNM and third parties.
- Idle travel out the bog bringing operators to machines to facilitate welfare breaks.
- Collection of loose polythene out the bog and stockpile at the centre.
- Collection of old unused concrete pipes and transport back to centre.



- Remove old machines from bogs, returning to the centre for cutting and collection by a scrap contractor.
- Lifting and collecting unused sections of rail line along mainline.
- Lifting laid permanent rail line and polythene.
- Decommissioning works including, but not limited to plastic clean up, lifting of rail lines etc.
- Provision of temporary welfare facilities for the Bord na Móna staff.
- Construction of peat dams within existing drains.
- Construction of peat bunds and berms.

## **4.0 Management & Mitigation Measures**

### **4.1 Site Management**

The works shall be managed and supervised by competent and qualified personnel and all works shall be carried out under appropriate supervision, best practice, current health and safety measures and also suitable quality control. Facilities for site employees shall be provided within the site compound.

Implementation of the mitigation measures for the works will be the responsibility of Bord na Móna Operations and supervision of the works will be carried out by this Bord na Móna Department incorporating Site Supervisors and the Project Supervisor Construction Stage (PSCS).

In addition, implementation of the mitigation measures will be monitored and inspected by Bord na Móna Environmental, Ecology and Engineering Departments, who are independent of Bord Na Móna Operations. Project Ecologists, Engineers and Environmental Compliance Officers are appointed for each bog and they will ensure that measures are carried out in accordance with this Environmental Management Plan. The Project Ecologist, Environmental Compliance Officer, Engineer, H & S Manager, Site Supervisor and PSCS will have a 'stop works' authority.

### **4.2 Health & Safety**

All works shall be carried out so as to comply with all the requirements of the Safety and Health at Work Act 2005 and any subsequent regulations or amendments and with the requirements of the Health and Welfare at Work (Construction) Regulations, (SI 291 of 2013), any subsequent amendments and any other relevant Health and Safety legislation. All construction staff on site shall have a current Safe Pass card and relevant CSCS card. All works shall be carried out in a safe manner and in accordance with the above legislation and any other guidance notes issued by the Health and Safety Authority. In particular, all excavation works shall be carried out in accordance with the *HSA Publication: A Guide to Safety in Excavations*.

The PSCS will provide a site-specific Construction Stage Safety and Health Plan and will provide risk assessments and method statements for the works. On completion of the works the PSCS shall prepare a detailed safety file.

All site personnel/site visitors will be required to wear Personal Protective Equipment (PPE) and undergo the established site induction process prior to entering the site.

Bord Na Móna Operations should ensure that regular audits are carried out at the site, to ensure that measures and process outlined in the site health and safety plan are adhered to. Dangerous occurrences, incidents, near misses and unsafe acts should be recorded, with recorded action taken to prevent all further occurrences.

### **4.3 Restricted Activities**

Species-specific seasonal restrictions on the proposed activities may be required in line with elements highlighted in the site-specific Rehabilitation Measures & Ecology File.

Regarding vegetation clearance, should it be required, all works will comply with Section 40 of the Wildlife Act. Please refer to Vegetation Clearance SOP ECO-004 for specific guidance. For the avoidance of doubt – no felling works will be carried out as part of the proposed works.

There may also be a requirement to protect other ecological receptors such as colonies of breeding Marsh Fritillary ( a butterfly species), the breeding or resting places of Otter and possibly amphibians or reptiles which utilise locations such as drains or other water features.

Where clearance is required during the restricted period, the Department of Agriculture, Food and Marine advise that under Section 37 of the Forestry Act, 1946:

*It is illegal to uproot any tree over ten years old or to cut down any tress of any age (including trees which form part of a hedgerow) unless a Felling Notice has been lodged at the Garda Station nearest to the trees at least 21 days before felling commences.*

The Closed Period “40(1) (a) it shall be an offence for a person to cut, grub, burn or otherwise destroy during the period beginning on the 1<sup>st</sup> day of March and ending on the 31<sup>st</sup> day of August in any year, any vegetation growing on any land not then cultivated. (b) it shall be an offence for a person to cut, grub, burn or otherwise destroy any vegetation growing in any hedge or ditch during the period mentioned in paragraph (a) of this subsection”

As per guidance from Inland Fisheries Ireland, any instream works proposed to be undertaken in any rivers streams and watercourses should be undertaken between July and September and in all cases must be agreed in advance with Inland Fisheries Ireland.

Measures to avoid the inadvertent transfer of alien invasive species (aquatic or terrestrial) will be required.

The Project Ecologist or Environmental Manager will advise Bord na Móna Operations on site-specific application of these restrictions to individual sites.

### **4.4 Archaeology**

The discovery of monuments or archaeological objects during the works can constrain the rehabilitation measures proposed for a particular area. If this occurs, rehabilitation measures will be reviewed and adapted where required. An archaeological impact assessment for the site has been carried out and is included in the site-specific Rehabilitation Plan. The recommendations of this assessment have been incorporated into the site-specific Rehabilitation Plan, Engineering Construction Package, Environmental File & Ecology File to minimise impacts on known archaeology.

In addition, Bord na Móna Operations will adhere to the Archaeology Code of Practise relating to management of stray archaeological finds that may arise during the works.

### **4.5 Ground Water & Surface Water Management**

A key component of the works is the potential hydrological impact rehabilitation may have on the bog, surrounding lands and lands downstream which may be hydrologically linked to the bog.

Measures should be taken to protect groundwater and surface water at the site during the works. Drip trays, spill kits and mobile bund systems should be used where required to prevent loss of chemicals/fuels to ground. Plant and equipment should be refilled in a bunded or hardstand area using a drip tray or mobile bund.

Damaged containers should be removed from site and disposed of appropriately to avoid further use. Fuels and oils on site should be stored securely to avoid damage. Relevant staff have received emergency response training for pollution events and be trained in the use of spill kits and handling and refuelling.

Management Activities will comply with Condition 6 of the IPC Licence as follows:

- Intensive sampling of 70% of our bog catchments
- Monthly sampling silt pond outlets
- Fortnightly silt pond inspections
- Bi-annual silt pond maintenance as per procedure

All works should be carried out in line with the site-specific Engineering Construction Package, Environmental File & Ecology File in addition to the *Inland Fisheries "Guidelines on protection of fisheries during construction works in and adjacent to waters"*.

#### **4.6 Drainage Management Plan Measures**

Drainage Management Plans (DMP) have been developed for each bog to establish the baseline hydrological performance of the bog and the surrounding drainage network. The plan sets out the characterisation of the bog and surrounding lands, the existing performance of the drainage network and the level of flood risk. The plan identifies the potential hydrological zone of influence of the bog and the objectives, risks and opportunities associated with the rehabilitation of the bog.

The plan assesses the potential impact of the various rehabilitation measures which are proposed on the local drainage network and flood risk. It sets out, where necessary, mitigation measures required to reduce impacts to an acceptable level. The plan sets out the measures which are required to be delivered in parallel with the rehabilitation plan as well as the long-term operation and retention of the drainage network and associated infrastructure. The plan assesses the level of residual risk, the potential impact due to climate change and the adaptability of measures in response to these climate change impacts.

The DMP forms the basis of the detailed design drawings, included in the Engineering Construction Package, and should be read in conjunction with this report.

#### **4.7 Traffic & Transport Management**

All machines will be regularly checked and maintained prior to arrival at the site to prevent hydrocarbon leakage. No direct discharges to waters will be made.

#### **4.8 Noise Management**

Notwithstanding that there is little likelihood of a significant adverse impact, noise generation is expected as part of the works. It is envisaged that the main noise sources at the site will include earthworks plant and equipment and associated traffic.

Management Activities will comply with Condition 8 of the IPC Licence as follows:

- Activities on-site shall not give rise to noise levels off site at any noise sensitive location which exceed the following sound pressure limits ( $L_{eq,30min}$ ):
  - Day-time: 55 dB(A)
  - Night-time: 45 dB(A)
- There shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise sensitive location.

The works will be restricted to within the footprint of the proposed rehabilitation area. The works will have due regard to noise limits and hours of operation (i.e. dusk and dawn) to minimise any potential disturbance on resident and local fauna that utilise the site and immediate environs. The proposed measures will be restricted to daylight hours and there will be no requirement for artificial lighting.

Bord na Móna Operations will be obliged to take specific noise abatement measures as part of the works and in line with the recommendations of BS5228-1 2009. These measures will typically include:

- No plant used on site will be permitted to cause an ongoing public nuisance due to noise
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations.

#### **4.9 Dust Management**

Dust generation is not expected as part of the works. The nature of the proposed works will naturally reduce the production of dust on site, as reprofiling site levels encourages settlement of water on the surface of the bog.

Activities that could give rise dust will be managed under the relevant conditions under Condition 5 of the IPC licence as follows:

- The licensee shall ensure that all operations on-site shall be carried out in a manner such that air emissions and/or dust do not result in significant impairment of, or significant interference with amenities or the environment beyond the site boundary.
- Activities on-site shall not give rise to dust levels off site at any Dust Sensitive Location which exceed an emission limit of 350 mg/m<sup>2</sup>/day. [The sampling method to be in accordance with German TA Luft Immission Standards for Particle Deposition (IW1)].

#### **4.10 Fuel Management**

Fuels and oils used for plant and equipment on the site shall be stored in a bunded area within the site compound as required. This area shall be inspected regularly, and the bund shall be adequate to contain a minimum of 110% of the volume of the largest container of oil and fuel stored. Spill protection equipment such as absorbent mats, shall be available on site to contain any oil spill that may occur, and procedures shall be in place to deal with any such spillage. All plant shall be provided with drip trays and spill kits. Plant operators shall carry out a visual inspection of their vehicle daily and shall be trained in how to deal with any uncontrolled spillage of oil.

All plant refuelling will take place using mobile fuel bowsers or fixed bunded tanks. Only dedicated trained and competent personnel will carry out refuelling operations. Fuelling and lubrication of equipment shall only be carried out in designated areas away from surface water drainage features and ecologically sensitive areas. Hoses and valves will be checked regularly for signs of wear and will be closed and securely locked when not in use.

Fuel management to ensure no impact on the environment will be managed in accordance with Condition 9 of the IPC Licence as follows:

- No potentially polluting substance or matter shall be permitted to discharge to off-site surface waters, off site storm drains or groundwaters.
- The loading and unloading of fuel oils shall be carried out in designated areas protected against spillage and leachate run-off. While awaiting disposal, all materials shall be collected and stored in designated areas protected against spillage and leachate run-off.
- The licensee shall have in storage an adequate supply of containment booms and/or suitable absorbent material to contain and absorb any spillage.

- The licensee shall maintain a log of bi-annual inspections of all rail and tractor transported fuelling units. These inspections as a minimum should record any damage or leaks or flaws in rolling stock that could result in accidental spillage.

#### **4.11 Waste Management**

All waste arising from the works shall be managed and disposed of in a way that ensures the provisions of the Waste Management Act 1996 and associated amendments and regulations are applied.

Waste Management will be conducted in accordance with Condition 7 of the IPC Licence as follows:

- Disposal or recovery of waste shall take place only as specified in Schedule 2(i) Hazardous Wastes for Disposal/Recovery and Schedule 2(ii) Other Wastes for Disposal/Recovery of this licence and in accordance with the appropriate National and European legislation and protocols. No other waste shall be disposed of/recovered either on-site or off-site without prior notice to, and prior written agreement of, the Agency.
- Waste sent off-site for recovery or disposal shall only be conveyed to a waste contractor, as agreed by the Agency, and only transported from the site of the activity to the site of recovery/disposal in a manner which will not adversely affect the environment.
- A full record, which shall be open to inspection by authorised persons of the Agency at all times, shall be kept by the licensee on matters relating to the waste management operations and practices at this site. This record shall as a minimum contain details of the following.
  - The names of the agent and transporter of the waste.
  - The name of the persons responsible for the ultimate disposal/recovery of the waste.
  - The ultimate destination of the waste.
  - Written confirmation of the acceptance and disposal/recovery of any hazardous waste consignments sent off-site.
  - The tonnages and EWC Code for the waste materials listed in Schedule 2(i), Hazardous Wastes for Disposal/Recovery and Schedule 2(ii) Other Wastes for Disposal/Recovery sent off-site for disposal/recovery.
  - Details of any rejected consignments.

#### **4.12 Soil Management**

If soil contamination is encountered during the works arising from an accidental fuel spillage, this should be managed in accordance with Conditions 4, 7 & 9 of the IPC Licence as follows:

- The licensee shall notify the Agency by both telephone and email to the Agency's Headquarters, or to such other Agency office as may be specified by the Agency, as soon as practicable after the occurrence of any of the following:
  - Any release to atmosphere resulting in significant impairment of, or significant interference with amenities or the environment.
  - Any emission which does not comply with the requirements of this licence.
  - Any incident with the potential for environmental contamination of surface water or groundwater, or posing an environmental threat to air or land, or requiring an emergency response by a Local Authority.
  - The licensee shall include as part of the notification, date and time of the incident, details of the occurrence, and the steps taken to minimise the emissions and avoid recurrence.
- The licensee shall make a record of any incident as set out in above. The notification given to the Agency shall include details of the circumstances giving rise to the incident and all actions taken to minimise the effect on the environment and minimise wastes generated.

- A summary report of reported incidents shall be submitted to the Agency as part of the AER. The information contained in this report shall be prepared in accordance with any relevant guidelines issued by the Agency.
- In the case of any incident as set out above which relates to discharges to water, the licensee shall notify the appropriate Regional Fisheries Board, as soon as practicable after such an incident.
- In the event of any incident, as set out above having taken place, the licensee shall notify the appropriate Local Authority as soon as practicable, after such an incident.
- In the case of any incident, as set out above, which has the potential to impact the conservation objectives of the Special Areas of Conservation and Natural Heritage Areas identified in Attachment 10.1 of the IPC application having taken place, the licensee shall notify Dúchas of the Department of Arts, Heritage, Gaeltacht and the Islands as soon as practicable after such an incident.
- The licensee shall as part of their AER, or more frequently as may be necessary, notify and supply maps to the Agency of boglands, and discharges from same, intended to be included in the subsequent years' development and operational programmes.

#### **4.13 Fire Safety**

The ***Bord na Móna Fire Prevention & Fire Fighting Procedures*** in addition to the ***Bord na Móna Fire and Environmental Plan*** outline requirements for fire prevention and fighting in peat bogs and works locations.

It is the intention of Bord na Móna to identify the potential for and take all practicable measures to prevent the outbreak of fire by means of ensuring:

- Implementation of the above policy and procedures.
- Activities are risk assessed to identify potential fire hazards and allow for implementation of suitable control measures to eliminate or reduce to a minimum associated risk.
- Selection of suitable equipment and machinery which is used appropriately and adequately inspected and maintained by competent personnel.
- Installation, where appropriate, of fire-fighting equipment.
- Proper use, storage, and disposal of flammable materials.
- Use of permit to work system, as appropriate, where hot works are to be undertaken.

Bord na Móna Operations must ensure that all fire egress and access points are kept clear and free from obstruction. Emergency access to the various works zones shall be provided and maintained for the duration of the project.

- Unobstructed fire egress during the project.
- Adequate fire safety procedures.
- Access/egress for emergency vehicles.



## **5.0 Maintenance Access Requirements**

The site-specific Drainage Management Plan (DMP) indicates that the effectiveness of a hydraulic break depends upon the drain's ability to convey water away.

The hydraulic breaks identified in the site-specific Engineering Construction Package will require routine monitoring by Bord na Móna, following the works, to ensure the drain is functioning as intended.

## **6.0 Protection of Existing Vegetation**

Where peat extraction has ceased on a site several years ago it is typical for pioneer vegetation to have established on site via natural colonisation, which was encouraged by the cessation of disturbance from peat extraction activity. During this period, the field drainage system naturally breaks down in certain areas, accelerating natural colonisation. The development of pioneer habitats reflects the underlying environmental conditions with the key factor being topography and hydrology.

Regarding vegetation clearance, should it be required, all works will comply with Section 40 of the Wildlife Act. Please refer to Vegetation Clearance SOP ECO-004 for specific guidance. For the avoidance of doubt – no felling works will be carried out as part of the proposed works.

The Closed Period “40(1) (a) it shall be an offence for a person to cut, grub, burn or otherwise destroy during the period beginning on the 1<sup>st</sup> day of March and ending on the 31<sup>st</sup> day of August in any year, any vegetation growing on any land not then cultivated. (b) it shall be an offence for a person to cut, grub, burn or otherwise destroy any vegetation growing in any hedge or ditch during the period mentioned in paragraph (a) of this subsection”

The site-specific Ecology File will detail the application of these restrictions to individual sites where required.

## **7.0 Protected Habitats**

Bord na Móna is committed to protecting the diverse habitats in proximity to our estate on which a wide range of Ireland's native animals and plants depend. Sites in proximity to SACs and NHAs have been identified in the site-specific Rehabilitation Plan, Engineering Construction Package, Environmental File & Ecology File for the relevant bog where works are taking place.

Bord na Móna Operations shall incorporate appropriate mitigation measures from the NIS into the CEMP as required to mitigate against adverse impacts on these protected habitats where required, in particular any measures stipulated in Appropriate Assessment reporting.

## 8.0 Ecology

Measures should be taken by Bord na Móna Operations to protect flora and fauna during the works are outlined in the site-specific Ecology File. The works should be limited to daylight hours, in proximity to watercourses, to allow otters, foxes and other wildlife to forage along the watercourses at dawn, dusk and during the night.

Works will take cognisance of any identified Ecological Restriction Zones (ERZ's) to protect sensitive ecological receptors such as birds (breeding or non-breeding), amphibians or reptiles, invertebrates (e.g. Marsh Fritillary) or mammals (such as Otter) and any particularly sensitive habitats.

In advance of works, all site personnel will receive a toolbox talk with regards to the protection of sensitive receptors onsite, and the prevention of the spread of invasive species.

In addition, implementation of the mitigation measures will be monitored and inspected by Bord na Móna Environmental, Ecology and Engineering Departments, who are independent of Bord Na Móna Operations. Project Ecologists, Engineers and Environmental Officers will be appointed for each bog and they will ensure that measures are carried out in accordance with this Environmental Management Plan. The Ecologist, Environmental Compliance Officer, Engineer, H & S Manager, Site Supervisor and PSCS will have a 'stop works' authority

In addition, it is the responsibility of Bord na Móna to undertake any or all measures stipulated in Appropriate Assessment Reporting where required. Refer to the site-specific Environmental and/or Ecology File for specific guidance.

## 9.0 Peat Dam and Peat Berm Construction

Refer to ***Engineering Methods for Peatland Rehabilitation*** in the Engineering Construction Package for specific guidance on Peat Dam and Peat Berm Construction. The main objective of peat dam construction, as a rehabilitation measure, is to block drains with peat to raise water levels, re-wetting peat and slowing water movements through the site. Peat berm construction follows a similar principle to create large (e.g. 45m x 60m) cells to retain shallow surface water. The creation of cells helps retain surface water, keeping peat wet and slows water movement through the bog.

Geotechnical failures of peat embankments and dams can occur by the lateral displacement of an intact block of peat material due to reductions in the embankment self-weight following partial drying of the crest material and an increase in the active hydrostatic pressures following an increase in the depth of retained water after an intense rainfall event. These factors must be considered when carrying out horizontal and vertical stability calculations for peat embankments and dams.

It is important to create a 'key' for the dam / berm to mitigate against local failures of the peat material used in the construction when subject to associated hydraulic forces from the water being retained. This technique also improves the overall strength of the dam by creating a foundation and reduces sub-surface flows through the area.

Risk mitigation against dam and berm failure will be employed initially via design, whereby maximum water levels for each site will be specified in the site-specific Engineering Construction Package. Following construction, regular inspections of berms will be carried out.

If a local failure to a peat dam or berm occurs, the water will follow a pathway towards the nearest silt pond allowing any peat sediment from the local failure to be captured in the silt pond prior to discharging from the bog.

Where the risk cannot be mitigated against (in the case where the bog sits on an existing flood plain for example) emergency measures will be outlined in the Bord na Móna Emergency Response Procedure document.

## 10.0 Biosecurity

The potential for importation or introduction of non-native plant species (such as Japanese Knotweed, Himalayan Balsam, etc.) during the works has the potential to result in the establishment of invasive species within the site.

Section 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 prohibits the introduction and dispersal of invasive alien species (particularly plant species) listed on Part 1 (third column) of the 'Third Schedule'.

This section aims to reduce the risk from, and impacts of, invasive species and protecting biodiversity on bogs identified under PCAS. The works will have due regard to the relevant biosecurity measures as follows:

- Records of problematic invasive species identified within the bog units will be marked out with signs to highlight areas of infestation to personnel, including a buffer.
- All plant machinery will be restricted from disturbing known colonies of invasive species.
- All plant machinery will avoid unnecessary crossings to adjoining lands.
- Good site hygiene will be employed to prevent the introduction and spread of problematic invasive alien plant species (i.e. Japanese Knotweed (*Fallopia japonica*), Himalayan Balsam (*Impatiens glandulifera*), Himalayan Knotweed (*Persicaria wallichii*), etc.) by thoroughly inspecting and/or washing vehicles prior to entering the work area.
- Plant shall be inspected upon arrival and departure from site.
- All site users shall be made aware of these procedures and appropriate treatment methodologies.

The biosecurity measures outlined above are in line with best practice guidelines issued by the National Roads Authority (NRA, 2010) – The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads and broadly based on the Environment Agency's (2013) – The Knotweed Code of Practice: Managing Japanese Knotweed on Development Sites (Version 3, amended in 2013, accessed on the Environment Agency's website on the 11th of July 2016).

In order to prevent the introduction and spread of aquatic invasive species, biosecurity will be required for all PPE, equipment, plant and machinery components before entering (or which are likely to enter) drains and watercourses on the site and again before leaving the site:

- Protective gloves should be worn when using any disinfectant solution in any of the procedures listed below.
- Visually inspect all equipment that has come into contact with the water for evidence of attached plant or animal material, or adherent mud or debris. This should be done before leaving the site.

- Remove any attached or adherent material (vegetation and debris) before leaving the site of operation.
- Ensure that all water is drained from any live wells and other water retaining compartments, tanks and other equipment before transportation elsewhere.
- It is recommended to apply disinfectant to the undercarriage and wheels of the vehicle/machine after steam cleaning or power hosing.
- Wet or live wells and other water retaining compartments in survey boats must be cleaned, rinsed or flushed with a 1% solution of Virkon Aquatic or another proprietary disinfection product. Alternatively, a 5% solution (100 ml / 20 litre solution) of chlorine bleach should be used. Rinse thoroughly with clean water.
- Footwear should be dipped in or scrubbed with a disinfectant solution (e.g. 1% solution of Virkon Aquatic or another proprietary disinfection product) and thoroughly dried afterwards.
- All PPE should be visually inspected and any attached vegetation or debris removed. Where appropriate, the gear should be wiped down with a cloth soaked in 1% solution of Virkon Aquatic or another proprietary disinfection product. Alternatively, a 5% solution (100 ml / 20 litre solution) of chlorine bleach should be used. Rubber gloves must be worn when undertaking this procedure.
- Survey equipment should also be sprayed with 1% solution of Virkon Aquatic.

### **11.0 Emergency Response Procedures**

It is the intention of Bord na Móna to identify the potential for and take all practicable measures to prevent the occurrence of an emergency situation. However, in preparation for this possible occurrence, an Emergency Response Procedure will be prepared, implemented, maintained, and periodically reviewed by Bord na Móna Operations to minimise the potential for injury and ensure safe evacuation of persons.

Emergency Response Procedures are outlined for each location Appendix A

### **12.0 Reporting**

Bord na Móna have a defined methodology for delivering the Peatland Climate Action Scheme. This is facilitated via adherence to our robust quality systems and project execution plans that have been developed to apply LEAN project management processes to our design and documentation. Bord na Móna teams adopt these key tools to the benefit of all projects and will adopt a formal reporting mechanism in line with the requirements of the IPC Licence. These reporting mechanisms are outlined in the site-specific Engineering Construction Package, Environmental File & Ecology File.

It is Bord na Móna policy to report, and where necessary, investigate any environmental incidents.

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**APPENDIX A – STANDARD OPERATING PROCEDURES (SOPs)**


Bord na Móna Standard Operating Procedures with respect to Environmental & Biodiversity activities should be followed including, but not limited to, the documents listed in Table B-1 and Table B-2.

*Table A-1 – Schedule of Biodiversity Standard Operating Procedures (SOP)*

<b>Code</b>	<b>Description</b>
ECO 0001	Protection of Otter
ECO 0002	Prevention of disturbance (Birds)
ECO 0003	Protection of Marsh Fritillary
ECO 0004	Vegetation Clearance
ECO 0005	Protection of Amphibians and Reptiles
ECO 0006	Invasive Species

*Table A-2 – Schedule of Environmental Standard Operating Procedures (SOP)*

<b>Code</b>	<b>Description</b>
ENV017	Archaeological Findings
EP 5.0	General Emergency Preparedness & Response
SPIP	Silt Pond Inspection Procedure
SPMP	Silt Pond Maintenance Procedure
	Waste Management Procedure
	Gas Oil Loading Procedure

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<b>Title: Protection of Otter</b>	<b>Approved:</b>	<b>Date: 16/03/21</b>

### 1) Purpose

To describe the environmental measures required to protect Otter across the Peatlands Climate Action Scheme (PCAS).

### 2) Scope

To avoid likely significant effects of disturbance, displacement or physical injury to Otter which occur or are likely to occur at any locations where Bord na Móna may be carrying out PCAS activities with the potential for effects.

The potential for negative effects will be avoided through adherence to Best Practice measures and the use of confirmatory surveys to establish any requirements such as derogations and/or restriction zones around confirmed breeding or resting sites as appropriate.

This Procedure should be read in association with any other pertinent procedures, in particular around vegetation clearance and working near water.

### 3) Related Documents

Bord na Mona Silt Pond Maintenance Procedure

Bord na Mona Silt Pond Inspection Procedure

National Roads Authority (2006). Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes. The National Roads Authority, Dublin.

National Roads Authority (2008.) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. The National Roads Authority, Dublin.


Highways Agency (1999). Design Manual for Roads and Bridges - Nature Conservation Advice in Relation to Otters HA81/99. The Highways Agency, London.

### 4) Procedure

#### Environmental Controls

1. The PCAS project team will liaise with the Bord na Móna Ecology Team who will approve and provide guidance on all on site activities which could have an ecological impact.
2. All PCAS staff will receive environmental training and/or an Environmental site induction/Toolbox talk before being allowed to work on a Bord na Móna bog.
3. Work will only be able to take place once the Bord na Móna Ecology Team has signed off on the installation of any required mitigation measures.
4. Adherence to any specified mitigation measures are to be subject to audit by the Bord na Móna Ecology Team and/or Site Supervisor/Environmental Officer or PSCS as appropriate.
5. Implementation of the mitigation measures for the works will be the responsibility of Bord na Móna Operations and supervision of the works will be carried out by this Bord na Móna Department incorporating Site Supervisors and the Project Supervisor Construction Stage (PSCS).



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6. In addition, implementation of the mitigation measures will be monitored and inspected by Bord na Móna Environmental, Ecology and Engineering Departments, who are independent of Bord Na Móna Operations. Project Ecologists, Engineers and Environmental Compliance Officers will be appointed for each bog and they will ensure that measures are carried out in accordance with this Environmental Management Plan. The Project Ecologist, Environmental Compliance Officer, Engineer, H & S Manager, Site Supervisor and PSCS will have a ‘stop works’ authority.

7. Where non-compliance is detected, a system of follow up and corrective action will be implemented.

### Preparation

1. Confirmatory surveys will be carried out 150m upstream and downstream of suitable Otter habitat where relevant activities are programmed to occur. This will include silt ponds (cleaning and maintenance), channelized sections of watercourses and bog drainage channels with connectivity to suitable habitat. These confirmatory Otter surveys will be undertaken no more than 12 months in advance of proposed activities, during the period November and April when vegetation cover is reduced. For silt ponds surveys will include an area comprising the pond plus a 50m buffer.
2. Confirmatory surveys will be undertaken by a suitably qualified ecologist.
3. The results of surveys will be communicated to the site manager responsible for scheduling activities on a need to know basis.
4. Zones or locations containing confirmed breeding or resting locations (holts/couches) are to be delineated with signage at an appropriate distance (150m) to prevent disturbance.
5. In addition, any restriction zones are to be digitised and provided in shapefile format for upload to machine/site supervisor PDA’s where this facility is available.
6. These Ecological Restriction Zones (ERZs) will be marked out at regular intervals using a combination of appropriate signage or visual markers as appropriate, prior to works or activities commencing during the identified sensitive period.
7. The above will be carried out by a suitably qualified Ecologist/ Bord na Móna Ecology Team.
8. Surveys results will be confirmed no less than 3 days prior to scheduled activities commencing.
9. If required any derogation applications will be made by the Bord na Móna Ecology Team/designated project manager.

### Operator Training

1. All PCAS operators will receive a toolbox talk by a suitably qualified Ecologist/ Bord na Móna Ecology Team, to educate them on any relevant restrictions prior to the commencement of activities.
2. This will include any restricted areas, the requirement for same, the location of reference documentation such as the schedule of mitigation measures, and the procedure to follow if in doubt as to the locations of activities in respect of any restricted areas.
3. A copy or map illustrating the restriction zones per bog, and periods wherein activities can be undertaken will be available at all times at the site office.

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4. Where pertinent, a schedule of Mitigation Measures per bog will also be available at all times in the site office.

#### Responsibilities

1. The appointed PCAS Site Supervisor/PSCS as appropriate will be responsible for recording attendance at toolbox talks and making sure all operators have access to the required reference material, including drawings of restricted areas/ ERZ's.
2. The appointed PCAS Site Supervisor /PSCS as appropriate as will be responsible for the scheduling of activities
3. The appointed PCAS Site Supervisor /PSCS as appropriate must be aware of any other site-specific <sup>1</sup>mitigation around Otter
4. The Bord na Móna Ecology Team or Project Ecologist is responsible for conformance auditing.
5. If a derogation is required, any activities under same will be overseen by the Bord na Móna Ecology Team or appointed Project Ecologist.
6. Local NPWS will be made aware of any derogated works/activities before commencement.

#### Carrying out Activities


1. No works or activities are to be carried out in restricted areas or identified ERZ's during the relevant period as specified by the project ecologist. No works will be carried out within 150m of an active holt.
2. NPWS will be notified of any confirmed active holts.
3. As per NRA (2006) guidelines, following consultation with NPWS, works or activities closer to such breeding holts may take place – provided appropriate mitigation measures are in place, e.g. screening and/or restricted working hours on site;
4. No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance will not take place within 15m of such holts, except under licence (NRA, 2006);
5. Where holts are present in close proximity to invasive activities, but are determined not to require destruction, such activities may commence once recommended alternative mitigation measures to address otters have been complied with (NRA, 2006);
6. Only operators who have received the required training and toolbox talks are to be assigned duties within the above period.
7. Conformance will be audited through compliance checks by the Bord na Móna Ecology Team /Project Ecologist with 'stop-works' authority.
8. Activities will only be carried out between 08.00 and 17.30 to minimise the potential for disturbance.

## **5) Records**

Evidence of approval (electronic)  
Archive files

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<sup>1</sup> F

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Revision Index			
Revision	Date	Description of change	Approved

DRAFT

<b>BORD NA MÓNA</b> Naturally Driven	<b>Procedure: ECO-002</b>	<b>Rev:</b> <b>1</b>
<b>Title: Disturbance to Birds of Conservation Concern</b>	<b>Approved:</b>	<b>Date: 06/04/21</b>

### 1) Purpose

To describe the environmental measures required to avoid significant disturbance to bird species of conservation concern during the PCAS scheme.

### 2) Scope

To avoid likely significant effects of disturbance or displacement at a scale likely to result in significant effects to breeding or wintering bird species of conservation concern, which occur or are likely to occur at any locations where Bord na Móna may be carrying out PCAS activities.

The potential for negative effects will be avoided through adherence to Best Practice measures and the use of confirmatory surveys to establish any requirements such as restricted areas and/or restriction zones around confirmed breeding or roosting sites as appropriate. Suitable restriction buffers have been derived from a review of Best Practice and is provided as an Appendix to this document.

This Procedure should be read in association with any other pertinent procedures, in particular around vegetation clearance and working near water.

### 3) Related Documents

Bord na Mona Silt Pond Maintenance Procedure

Bord na Mona Silt Pond Inspection Procedure

National Roads Authority (2008.) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. The National Roads Authority, Dublin.

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Scottish National Heritage (2016) *Dealing with Construction and birds*. Guidance Version 3. SNH, Battleby, Scotland.

### 4) Procedure

#### Environmental Controls

1. The PCAS project team will liaise with the Bord na Móna Ecology Team who will approve and provide guidance on all on site activities which could have an ecological impact.
2. All PCAS staff will receive environmental training and/or an Environmental site induction/Toolbox talk before being allowed to work on a Bord na Móna bog.

	<b>Procedure: ECO-002</b>	<b>Rev: 1</b>
<b>Title: Disturbance to Birds of Conservation Concern</b>	<b>Approved:</b>	<b>Date: 06/04/21</b>

3. Work will only be able to take place once the Bord na Móna Ecology Team has signed off on the installation of any required mitigation measures.
4. Adherence to any specified mitigation measures are to be subject to audit by the Bord na Móna Ecology Team and/or PCAS Site Supervisor/Environmental Officer or PSCS as appropriate.
5. Where non-compliance is detected, a system of follow up and corrective action will be implemented.

### Preparation

1. Desktop review to check available baseline data to identify potential disturbance risks from proposed PCAS activities to breeding or wintering birds. If there is potential for disturbance risks, then confirmatory surveys are required.
2. Confirmatory surveys will be undertaken by a suitably qualified ecologist to identify the presence of any bird species of conservation concern which may potentially be disturbed. The survey will typically include habitats suitable for ground nesting birds, in particular sensitive species (e.g. Lapwing/Ringed Plover/Curlew/Red Grouse) but also buildings scheduled for decommissioning, potential winter period feeding or roosting areas for Wildfowl, roosting areas for Hen Harrier etc.
3. All surveys will take place prior to the commencement of any scheduled activities, and will follow Best Practice survey techniques.
4. The results of surveys will be communicated to the PCAS PSCS/ Site Supervisor/Environmental Officer (as appropriate) responsible for scheduling activities. For highly sensitive species such as nesting Curlew or roosting Hen Harrier precise locations of nesting or roosting will not be disseminated.
5. Zones or locations containing confirmed nesting attempts by species including but not limited to Lapwing, Ringed Plover, Black-headed Gull, Common Sandpiper, Curlew, Merlin are to be delineated at an appropriate distance to prevent disturbance.
6. Alternatively, the extent of any zones may be provided by the Ecology Team via ArcGis online Cloud for use on tablets by PCAS operators/Site Supervisor as appropriate.
7. These Ecological Restriction Zones (ERZs) (e.g. 800m around identified Curlew nests) will be marked out at regular intervals using a combination of appropriate signage or visual markers as appropriate, prior to works commencing during the identified sensitive period.
8. Any buildings will similarly be identified.
9. The above will be carried out by a suitably qualified Ecologist and/or under supervision by a suitably qualified ecologist.
10. Surveys results will be confirmed where appropriate prior to scheduled activities commencing.

### Operator Training

1. All PCAS operators will receive a toolbox talk by a suitably qualified Ecologist/ Bord na Móna Ecology Team, to educate them on any relevant restrictions prior to the commencement of activities.

<b>BORD NA MÓNA</b> Naturally Driven	<b>Procedure: ECO-002</b>	<b>Rev:</b> <b>1</b>
<b>Title: Disturbance to Birds of Conservation Concern</b>	<b>Approved:</b>	<b>Date: 06/04/21</b>

2. This will include any restricted areas, the requirement for same, the location of reference documentation such as the schedule of mitigation measures, and the procedure to follow if in doubt as to the locations of activities in respect of any restricted areas.
3. A copy or map illustrating the restriction zones per bog, and periods wherein activities can be undertaken will be available at all times at the site office.
4. Where pertinent, a schedule of Mitigation Measures per bog will also be available at all times in the site office.

#### Responsibilities

1. The appointed PCAS Site Supervisor/PSCS as appropriate will be responsible for recording attendance at toolbox talks and making sure all operators have access to the required reference material, including drawings of restricted areas/ ERZ's.
2. The appointed PCAS Site Supervisor /PSCS as appropriate as will be responsible for the scheduling of activities.
3. The appointed PCAS Site Supervisor PSCS as appropriate must be aware of any other site specific mitigation around disturbance to birds.
4. The Bord na Móna Ecology Team or Project Ecologist is responsible for conformance auditing.
5. If a derogation is required, any activities under same will be overseen by the Bord na Móna Ecology Team or appointed Project Ecologist.
6. Local NPWS will be made aware of any derogated or licensed works/activities before commencement.

#### Carrying out Activities


1. No PCAS works or activities are to be carried out in restricted areas or identified ERZ's during the relevant period as specified by the project ecologist.
2. Only operators who have received the required training and toolbox talks are to be assigned duties within the above period.
3. Conformance will be audited through compliance checks by the Project Ecologist/ PSCS/Environmental Officer as appropriate (with 'stop-works' authority).
4. Certain Activities may occur in ERZ's in instances where breeding attempts have finished/birds are no longer present – this can only occur following confirmation from the Project Ecologist that it is OK for activities to proceed. In general the use of headlands for travel through, and /or rail lines will be permitted within ERZ's where it is considered birds may be habituated to such regular movements.
5. Activities will only be carried out between 08.00 and 17.30 to minimise the potential for disturbance.

### 5) Records


Evidence of approval (electronic)  
Archive files

Revision Index			
Revision	Date	Description of change	Approved



	<b>Procedure: ECO-002</b>	<b>Rev: 1</b>
<b>Title: Disturbance to Birds of Conservation Concern</b>	<b>Approved:</b>	<b>Date: 06/04/21</b>


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 <p><b>BORD NA MÓNA</b> Naturally Driven</p>	<b>Procedure: ECO-003</b>	<b>Rev:</b> <b>1</b>
<b>Title: Protection of Marsh Fritillary</b>	<b>Approved:</b>	<b>Date: 22/04/21</b>

### 1) Purpose

To describe the environmental measures required to protect Marsh Fritillary during PCAS activities.

### 2) Scope

To avoid effects of disturbance/physical injury to and secondary habitat loss in respect of Marsh Fritillary which occur or are likely to occur at PCAS decommissioning and rehabilitation locations. This includes in situ larvae and adults, in known or previously identified colony locations.

The potential for negative effects will be avoided through adherence to Best Practice measures and the use of confirmatory surveys pre-commencement of PCAS activities to establish any requirements such as restriction zones around colonies/areas of suitable habitat containing larval webs etc.

This SOP should be read in association with other sheets, in particular around vegetation clearance.

### 3) Related Documents

SOP for vegetation clearance – ECO-004

National Roads Authority (2008.) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. The National Roads Authority, Dublin.

Fowles & Smith, (2006) Mapping the habitat quality of patch networks for the marsh fritillary *Euphydryas aurinia* (Rottemburg, 1775) (Lepidoptera, Nymphalidae) in Wales, *Journal of Insect Conservation* 10:161-177.


Warren, M.S (1994) The UK status and suspected metapopulation structure of a threatened European butterfly, the marsh fritillary *Eurodryas aurinia*. *Biological Conservation* 67, 239-249.

Harding, J.M. (2008). *Discovering Irish Butterflies & their Habitats*. Published by Jesmond Harding.

### 4) Procedure

#### Environmental Controls

1. The PCAS project team will liaise with the Bord na Móna Ecology Team who will approve and provide guidance on all on site activities which could have an ecological impact.
2. All PCAS staff will receive environmental training and/or an Environmental site induction/Toolbox talk before being allowed to work on a Bord na Móna bog.
3. PCAS work will only be able to take place once the Bord na Móna Ecology Team has signed off on the installation of any required mitigation measures.
4. Adherence to any specified mitigation measures are to be subject to audit by the Bord na Móna Ecology Team and/or PCAS Site Supervisor/Environmental Officer or PSCS as appropriate.

	<b>Procedure: ECO-003</b>	<b>Rev: 1</b>
<b>Title: Protection of Marsh Fritillary</b>	<b>Approved:</b>	<b>Date: 22/04/21</b>

- Where non-compliance is detected, a system of follow up and corrective action will be implemented.

### Preparation

- Desktop review to check available baseline data to identify potential disturbance risks from proposed PCAS activities to Marsh Fritillary. If there is potential for disturbance risks, then confirmatory surveys are required before any activities are carried out.
- Confirmatory surveys will be undertaken by a suitably qualified ecologist to confirm the presence of any previously identified Marsh Fritillary colonies.
- All surveys will take place prior to the commencement of any scheduled PCAS activities and will follow Best Practice survey techniques.
- The results of surveys will be communicated to the PCAS PSCS/ Site Supervisor/Environmental Officer (as appropriate) responsible for scheduling activities.
- Zones or locations containing confirmed Marsh Fritillary Colonies are to be delineated with signage at an appropriate distance to prevent disturbance.
- Alternatively, the extent of any zones may be provided by the Ecology Team via ArcGis online Cloud for use on tablets by PCAS operators/Site Supervisors.
- These Ecological Restriction Zones (e.g. 50m around identified colonies will be marked out at regular intervals using a combination of appropriate signage or visual markers as appropriate, prior to works commencing during the identified sensitive period.
- The above will be carried out by a suitably qualified Ecologist and/or under supervision by a suitably qualified ecologist.
- Surveys results will be confirmed where appropriate prior to scheduled activities commencing.

### Operator Training

- All PCAS operators will receive a toolbox talk by a suitably qualified Ecologist/ Bord na Móna Ecology Team, to educate them on any relevant restrictions prior to the commencement of activities.
- This will include any restricted areas, the requirement for same, the location of reference documentation such as the schedule of mitigation measures, and the procedure to follow if in doubt as to the locations of activities in respect of any restricted areas.
- A copy or map illustrating the restriction zones per bog, and periods wherein activities can be undertaken will be available at all times at the site office.
- Where pertinent, a schedule of Mitigation Measures per bog will also be available at all times in the site office.

### Responsibilities

- The appointed PCAS site supervisor/PSCS as appropriate will be responsible for recording attendance at toolbox talks and making sure all operators have access to the required reference material, including drawings of restricted areas/ ERZ's.
- The appointed PCAS site supervisor/PSCS as appropriate as will be responsible for the scheduling of activities
- The appointed PCAS site supervisor/PSCS as appropriate must be aware of any other site specific mitigation around disturbance to invertebrates.

<b>BORD NA MÓNA</b> Naturally Driven	<b>Procedure: ECO-003</b>	<b>Rev:</b> <b>1</b>
<b>Title: Protection of Marsh Fritillary</b>	<b>Approved:</b>	<b>Date: 22/04/21</b>

4. The Bord na Móna Ecology Team or Project Ecologist is responsible for conformance auditing
5. If a derogation/license is required, any activities under same will be overseen by the Bord na Móna Ecology Team or appointed Project Ecologist.
6. Local NPWS will be made aware of any derogated or licensed works/activities before commencement.


#### Carrying out Activities

1. No PCAS works or activities are to be carried out in restricted areas or identified ERZ's during the relevant period as specified by the project ecologist.
2. Only PCAS operators who have received the required training and toolbox talks are to be assigned duties within the above period.
3. Conformance will be audited through compliance checks by the Project Ecologist/ PSCS/Environmental Officer as appropriate (with 'stop-works' authority).
4. Activities may occur in ERZ's in instances where breeding has finished or larvae are confirmed by the Project Ecologist as not present – this can only occur following confirmation from the Project Ecologist that it is OK for activities to proceed.
5. Certain activities may be permitted once no usage of vehicles with the potential for trampling ground areas are being used i.e. activities by hand, carried out on foot etc, or activities of a H&S nature.

#### **5) Records**

Evidence of approval (electronic)  
Archive files

Revision Index			
Revision	Date	Description of change	Approved

	<b>Procedure: ECO-004</b>	<b>Rev: 1</b>
<b>Title: Vegetation Clearance</b>	<b>Approved:</b>	<b>Date: 04/05/21</b>

### 1) Purpose

To describe the environmental measures required for vegetation clearance during PCAS activities.

### 2) Scope

Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000, restricts the cutting, grubbing, burning or destruction by other means of vegetation growing on uncultivated land or in hedges or ditches during the nesting and breeding season for birds and wildlife, from 1st March to 31st August, inclusive.

The scope of this SOP is to ensure the protection of bird species using scrub, hedgerow or ground vegetation during PCAS activities.

The potential for negative effects will be avoided through adherence to Best Practice measures.

Typical exemptions will still apply for example, for health and safety reasons, the destruction of noxious weeds, during works permitted under statute etc.

This SOP should be read in association with other sheets, in particular around Marsh Fritillary, Birds and invasive species.

### 3) Related Documents

SOP for protection of Marsh Fritillary – ECO-003

SOP for Protection of Birds – ECO-002

SOP for treatment of Invasive Species – ECO-005


National Roads Authority (2008.) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. The National Roads Authority, Dublin.

Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000,

### 4) Procedure

#### Environmental Controls

1. The PCAS project team will liaise with the Bord na Móna Ecology Team who will approve and provide guidance on all on site activities which could have an ecological impact.
2. All PCAS staff will receive environmental training and/or an Environmental site induction/Toolbox talk before being allowed to work on a Bord na Móna bog.
3. PCAS Work will only be able to take place once the Bord na Móna Ecology Team has signed off on any required mitigation measures.
4. Adherence to any specified mitigation measures are to be subject to audit by the Bord na Móna Ecology Team and/or Site Supervisor/Environmental Officer or other specified person as appropriate.

	<b>Procedure: ECO-004</b>	<b>Rev: 1</b>
<b>Title: Vegetation Clearance</b>	<b>Approved:</b>	<b>Date: 04/05/21</b>

- Where non-compliance is detected, a system of follow up and corrective action will be implemented.

### Preparation

- Zones or locations containing confirmed sensitive receptors/areas to be avoided completely during the bird nesting season are to be delineated with signage at an appropriate distance to prevent disturbance.
- Alternatively, the extent of any zones may be provided by the Ecology Team via ArcGis online Cloud for use on tablets by operators.
- The above will be carried out by a suitably qualified Ecologist and/or under supervision by a suitably qualified ecologist.
- Surveys results will be confirmed where appropriate prior to scheduled activities commencing.

### Operator Training

- All PCAS operators will receive a toolbox talk by a suitably qualified Ecologist/ Bord na Móna ecology team, to educate them on any relevant restrictions prior to the commencement of activities.
- This will include any restricted areas, or areas where (if known) a confirmatory survey by an Ecologist is required in advance of vegetation clearance
- A copy or map illustrating the restriction zones<sup>s</sup> per bog, and periods wherein activities can be undertaken will be available at all times at the site office.
- Where pertinent, a schedule of Mitigation Measures per bog will also be available at all times in the site office.

### Responsibilities

- The appointed PCAS site supervisor/PSCS as appropriate will be responsible for recording attendance at toolbox talks and making sure all operators have access to the required reference material, including drawings of restricted areas/ ERZ's.
- The appointed PCAS site supervisor//PSCS as appropriate as will be responsible for the scheduling of activities
- The appointed PCAS site supervisor//PSCS as appropriate must be aware of any other site specific mitigation around vegetation clearance.
- The Bord na Móna ecology team or Project Ecologist is responsible for conformance auditing
- If a derogation/license is required, any activities under same will be overseen by the Bord na Móna ecology team or appointed Project Ecologist.
- Local NPWS will be made aware of any derogated or licensed works/activities before commencement.

### Carrying out Activities

- The following approach will be taken in order to comply with the Wildlife Acts:



<b>BORD NA MÓNA</b> Naturally Driven	<b>Procedure: ECO-004</b>	<b>Rev:</b> <b>1</b>
<b>Title: Vegetation Clearance</b>	<b>Approved:</b>	<b>Date: 04/05/21</b>

2. Where practical, vegetation clearance will be carried out outside of the restricted period (1<sup>st</sup> March to 31<sup>st</sup> August).
3. Where activities are required within the closed season, it is the responsibility of the Site Supervisor/Manager to inform the Project Ecologist and seek consultation as to compliance with Section 40.
4. If necessary, a survey will then be carried out by the Project Ecologist for the presence of active birds' nests (i.e. nests with eggs or young birds) as deemed likely to occur within a suitable timeframe preceding activities.
5. If such are found, where feasible the area will be avoided until the nesting attempt/breeding is complete. If avoidance is not feasible, the Project Ecologist will seek a derogation license from the NPWS. Such works cannot take place until this derogation license is received.
6. The locations of any temporarily restricted areas may be provided via ArcGIS cloud for Site Supervisor oversight.
7. Fire prevention must govern all work practices on or near all areas of gorse, bog and forestry.
8. The Project Ecologist can provide Guidance on when works may proceed.

## 5) Records

Evidence of approval (electronic)  
Archive files

Revision Index			
Revision	Date	Description of change	Approved

<b>BORD NA MÓNA</b> Naturally Driven	<b>Procedure: ECO-005</b>	<b>Rev:</b> <b>1</b>
<b>Title: Protection of Amphibians and Reptiles</b>	<b>Approved:</b>	<b>Date: 04/05/21</b>

### 1) Purpose

To describe the environmental measures required to protect Amphibians and Reptiles during Peatland Climate Action Scheme (PCAS) activities.

### 2) Scope

To avoid effects of disturbance/physical injury to and secondary habitat loss in respect of Amphibians and Reptiles which occur or are likely to occur at PCAS activities. This includes in situ spawn and adults, in suitable habitat or previously identified locations.

The potential for negative effects will be avoided through adherence to Best Practice measures and the use of confirmatory surveys pre-commencement of activities to establish any requirements such as restriction zones around colonies/areas of suitable habitat containing known Amphibian and Reptiles, and if required translocation in line with Best Practice.

This SOP sheet should be read in association with other sheets, in particular around vegetation clearance.

### 3) Related Documents

SOP for vegetation clearance – ECO-004

National Roads Authority (2008.) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. The National Roads Authority, Dublin.

‘Amphibian Habitat Management Handbook’. John Baker, Trevor Beebee, John Buckley, Tony Gent and David Orchard (2011). Amphibian and Reptile Conservation, Bournemouth, ISBN: 978-0-9566717-1.


Meehan, (2013) National Smooth Newt Survey 2013 Report, Irish Wildlife Trust

### 4) Procedure

#### Environmental Controls

1. The PCAS Project Team will liaise with the Bord na Móna Ecology Team who will approve and provide guidance on all on site activities which could have an ecological impact.
2. All PCAS staff will receive environmental training and/or an Environmental site induction/Toolbox talk before being allowed to work on a Bord na Móna bog.
3. PCAS Work will only be able to take place once the Bord na Móna Ecology Team has signed off on the installation of any required mitigation measures.
4. Adherence to any specified mitigation measures are to be subject to audit by the Bord na Móna Ecology Team and/or Site Supervisor/Environmental Officer or PSCS as appropriate.
5. Where non-compliance is detected, a system of follow up and corrective action will be implemented.

#### Preparation

 <p><b>BORD NA MÓNA</b> Naturally Driven</p>	<p><b>Procedure: ECO-005</b></p>	<p><b>Rev:</b> <b>1</b></p>
<p><b>Title: Protection of Amphibians and Reptiles</b></p>	<p><b>Approved:</b></p>	<p><b>Date: 04/05/21</b></p>

1. Confirmatory surveys will be undertaken by a suitably qualified ecologist to identify the presence of Amphibians and Reptiles.
2. All surveys will take place prior to the commencement of any scheduled PCAS activities and will follow Best Practice survey techniques.
3. The results of surveys will be communicated to the PCAS PSCS/ Site Supervisor/Environmental Officer or PSCS (as appropriate) responsible for scheduling activities.
4. Zones or locations containing confirmed high usage areas (e.g. drains containing frog spawn / Newts) are to be delineated with signage at an appropriate distance to prevent disturbance.
5. Alternatively, the extent of any zones may be provided by the Ecology Team via ArcGis online Cloud for use on tablets by operators.
6. These Ecological Restriction Zones (e.g. 5m around identified colonies will be marked out at regular intervals using a combination of appropriate signage or visual markers as appropriate, prior to works commencing during the identified sensitive period.
7. The above will be carried out by a suitably qualified Ecologist and/or under supervision by a suitably qualified ecologist.
8. Surveys results will be confirmed where appropriate prior to scheduled activities commencing.

#### Operator Training

1. All PCAS operators will receive a toolbox talk by a suitably qualified Ecologist/ Bord na Móna Ecology Team, to educate them on any relevant restrictions prior to the commencement of activities.
2. This will include any restricted areas, the requirement for same, the location of reference documentation such as the schedule of mitigation measures, and the procedure to follow if in doubt as to the locations of activities in respect of any restricted areas.
3. A copy or map illustrating the restriction zones per bog, and periods wherein activities can be undertaken will be available at all times at the site office.
4. Where pertinent, a schedule of Mitigation Measures per bog will also be available at all times in the site office.

#### Responsibilities

1. The appointed PCAS Site Supervisor/PSCS as appropriate will be responsible for recording attendance at toolbox talks and making sure all operators have access to the required reference material, including drawings of restricted areas/ ERZ's.
2. The appointed PCAS Site Supervisor /PSCS as appropriate as will be responsible for the scheduling of activities
3. The appointed PCAS Site Supervisor /PSCS as appropriate must be aware of any other site specific mitigation around disturbance to amphibians or reptiles.
4. The Bord na Móna Ecology Team or Project Ecologist is responsible for conformance auditing
5. If a derogation/license is required, any activities under same will be overseen by the Bord na Móna Ecology Team or appointed Project Ecologist.

<b>BORD NA MÓNA</b> Naturally Driven	<b>Procedure: ECO-005</b>	<b>Rev:</b> <b>1</b>
<b>Title: Protection of Amphibians and Reptiles</b>	<b>Approved:</b>	<b>Date: 04/05/21</b>

6. Local NPWS will be made aware of any derogated or licensed works/activities before commencement, such as translocation.


### Carrying out Activities

1. Should PCAS activities be proposed and scheduled for areas proximal to previously identified habitat suitable for breeding common frog or smooth newt during the species' respective breeding seasons (frogs: January-March and newts: March-May), confirmatory surveys following standardised methodologies will be required at those locations to confirm the presence/absence of breeding adults and/or spawn. Licenses may be required for certain survey types.
2. If evidence of frog or newts is confirmed proximal to the work locations, it is essential the areas are fenced off with appropriate signage in order to protect these areas during construction activities;
3. Protecting the hydrological regime of the habitat is particularly important. Thus, it is particularly important that the Project Ecologist/Site Supervisor has a clear understanding of the drainage characteristics of wet areas such as ponds, pools and drains which have the potential to support breeding amphibians along the route to ensure that these areas are maintained into the future;
4. No works or activities are to be carried out in restricted areas or identified ERZ's during the relevant period as specified by the project ecologist.
5. Only operators who have received the required training and toolbox talks are to be assigned duties within the above period.
6. Conformance will be audited through compliance checks by the PCAS Project Ecologist/ PSCS/Site supervisor as appropriate (with 'stop-works' authority).
7. Activities may occur in ERZ's in instances where breeding has finished or species are confirmed by the Project Ecologist as not present – this can only occur following confirmation from the Project Ecologist that it is OK for activities to proceed
8. Certain activities may be permitted once no usage of vehicles with the potential for trampling ground areas are being used i.e. activities by hand, carried out on foot etc.
9. As a conservation measure, translocation should be an option of last resort, and any necessary license should be obtained before undertaking translocation, following consultation with NPWS.
10. NPWS may require notification of the receiving location in advance of issuing a license.
11. NPWS License link is as follows:
12. <https://www.npws.ie/licences/disturbance/breeding-places>
13. See also Appendix I for extracted translocation procedure from the 'Amphibian Habitat Management Handbook'

## 5) Records


Evidence of approval (electronic)  
Archive files

Revision Index
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	<b>Procedure: ECO-005</b>	<b>Rev: 1</b>
<b>Title: Protection of Amphibians and Reptiles</b>	<b>Approved:</b>	<b>Date: 04/05/21</b>

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	<b>Procedure: ECO-005</b>	<b>Rev: 1</b>
<b>Title: Protection of Amphibians and Reptiles</b>	<b>Approved:</b>	<b>Date: 04/05/21</b>

## Appendix 1 Translocation Procedures

### *Translocation of Common Frog spawn*

- **Site security:** Proposed translocation sites should have a sympathetic land owner and appropriate land management plus, ideally, nature reserve status and statutory nature conservation designation.
- **Habitat quality** both aquatic and terrestrial habitats should meet the criteria outlined in Section 9 of the ‘Amphibian Habitat Management Handbook’ or be readily restorable to such condition. Any necessary restoration should be completed prior to translocation.
- **Predators and competitors:** Large populations of predators such corvids, gulls, rats and aquatic invertebrates should be absent from a reintroduction site and its environs.
- **Consultation and agreements:** It is essential to consult widely with and gain the approval of all interested parties including landowners and managers of recipient sites.
- **Preparing a reintroduction site:** Where necessary the terrestrial habitat should be managed to meet the necessary criteria before ponds are created. Preference should be given to creating scrapes of differing depths based on the natural water table rather than using lined pools. An advantage of lined pools is that they may be topped up with water artificially and, even if not needed for the long term, temporary lined pools may be a useful insurance against desiccation at the start of a project. Artificial refugia should be provided to help maximise the number of froglets surviving to disperse from the damp pond margins. Discarded roof tiles, slightly raised to allow froglets to crawl beneath or leafy branches, e.g. sycamore, which dry to provide many hiding places, should be laid around the water’s edge.
- **Translocating Spawn:** The donor population should be the closest one to the new site and certainly within the same geographical area. To ensure the best chance of success a reintroduction should take place over three successive years. This establishes a mixed-age structure in the new population relatively rapidly. The equivalent to at least approximately 4,000-8,000 eggs, should be obtained from the donor site.
- **Freshly laid spawn** is best because it travels well. Sections should be cut with sharp scissors and transported in a bucket containing approximately 5 l of water (at a depth of approximately 5-10 cm) from the ponds in which the spawn originated. Buckets with snap-on lids make good transport containers. A hole cut in the centre of the lid allows ventilation but prevents water spillage during transport. Spawn should be moved to the recipient site rapidly, certainly within one or two days. During transportation care should be taken to avoid exposing the spawn to extreme temperatures (for example leaving it in the sun).
- **Free swimming tadpoles** without any signs of limb development can also be moved. Well-developed spawn, or tadpoles showing signs of metamorphosis, should not be translocated because mortality during transportation can be high in these developmental stages. Tadpoles are susceptible to suffocation and should be moved in cool water with minimal amounts of dissolved or suspended organic matter.




	<b>Procedure: ECO-005</b>	<b>Rev: 1</b>
<b>Title: Protection of Amphibians and Reptiles</b>	<b>Approved:</b>	<b>Date: 04/05/21</b>

*Translocation of Smooth Newts*

NRA (2008) provides guidance on mitigation, compensation and enhancement measures (at p80) which should be considered.

*“In those situations where capturing and relocating important newt populations is considered appropriate, breeding ponds should be encircled by drift fencing and pitfall traps prior to the spring migration period, and newts captured on their way to breed. Netting and draining-down of ponds should also take place to remove as many of the remainder as possible. Where large populations of newts are found close to the proposed works, amphibian-proof fencing can be helpful in protecting the resident animals. Permanent fencing can also be used to guide newts to purpose-built tunnels and other safe crossing structures, although their effectiveness for newts remains largely unknown.”*

DRAFT

	<b>Procedure: ECO-006</b>	<b>Rev: 1</b>
<b>Title: Invasive Species</b>	<b>Approved:</b>	<b>Date: 04/05/21</b>

### 1) Purpose

To describe the Environmental/Biosecurity Measures required to avoid the introduction, establishment and spread of non-native invasive species (Terrestrial Flora) from activities associated with the PCAS Scheme.

### 2) Scope

To avoid likely significant effects from the introduction, establishment and spread of non-native invasive species to Bord na Mona works during activities undertaken under PCAS.

The potential for negative effects will be avoided through adherence to Best Practice measures and the use of confirmatory surveys pre-commencement of activities to establish any requirements such as e.g. restriction zones (15m) around Invasive Plant species infestation locations as appropriate.

This SOP should be read in association with other sheets, in particular around vegetation clearance.

### 3) Related Documents

SOP for vegetation clearance – ECO-004

Waste Management Procedures

Managing Japanese knotweed on development sites - The Knotweed Code of Practice produced by the Environmental Agency (2013);

NRA Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (2010);


Managing Invasive Non-native Plants in or near Freshwater, Environment Agency (2010);

Best Practice Management Guidelines Japanese knotweed *Fallopia japonica*, Invasive Species Ireland (2015);

### 4) Procedure

#### Environmental Controls

1. The PCAS Project Team will liaise with the Bord na Móna Ecology Team who will approve and provide guidance on all on site activities which could have an ecological impact.
2. All PCAS staff will receive environmental training and/or an Environmental site induction/Toolbox talk before being allowed to work on a Bord na Móna bog.
3. PCAS Work will only be able to take place once the Bord na Móna Ecology Team has signed off on the installation of any required mitigation measures.
4. Adherence to any specified mitigation measures are to be subject to audit by the Bord na Móna Ecology Team and/or PCAS Site Supervisor/Environmental Officer or PSCS as appropriate.

	<b>Procedure: ECO-006</b>	<b>Rev: 1</b>
<b>Title: Invasive Species</b>	<b>Approved:</b>	<b>Date: 04/05/21</b>

- Where non-compliance is detected, a system of follow up and corrective action will be implemented.

### Preparation

- Desktop review to check available baseline data to identify potential disturbance risks from proposed PCAS activities to known infestations of invasive species. If there is potential for disturbance risks, then confirmatory surveys are required.
- Confirmatory surveys will be undertaken by a suitably qualified ecologist to identify the presence of any infestations or locations of invasive species.
- All surveys will take place prior to the commencement of any scheduled PCAS activities, and will follow Best Practice survey techniques.
- Unknown infestations that are recorded during the scheme will also be managed in the same way.
- The results of surveys will be communicated to the PCAS PSCS/ Site Supervisor/Environmental Officer responsible for scheduling activities.
- Zones or locations containing confirmed invasive species are to be delineated with signage at an appropriate distance to prevent disturbance.
- Alternatively, the extent of any zones may be provided by the Ecology Team via ArcGIS online Cloud for use on tablets by operators/supervisors.
- These Ecological Restriction Zones (e.g. 15m around identified Japanese Knotweed) will be marked out at regular intervals using a combination of appropriate signage or visual markers as appropriate, prior to activities commencing.
- The above will be carried out by a suitably qualified Ecologist and/or under supervision by a suitably qualified ecologist.
- Surveys results will be confirmed where appropriate prior to scheduled activities commencing.

### Operator Training

- All PCAS operators will receive a toolbox talk by a suitably qualified Ecologist/ Bord na Móna Ecology Team, to educate them on any relevant restrictions prior to the commencement of activities.
- This will include any restricted areas, the requirement for same, the location of reference documentation such as the schedule of mitigation measures, and the procedure to follow if in doubt as to the locations of activities in respect of any restricted areas.
- A copy or map illustrating the restriction zones per bog, and periods wherein activities can be undertaken (if applicable) will be available at all times at the site office.
- Where pertinent, a schedule of Mitigation Measures per bog will also be available at all times in the site office.

### Responsibilities

- The appointed PCAS Site Supervisor/PSCS as appropriate will be responsible for recording attendance at toolbox talks and making sure all operators have access to the required reference material, including drawings of restricted areas/ ERZ's.
- The appointed PCAS Site Supervisor /PSCS as appropriate as will be responsible for the scheduling of activities

<b>BORD NA MÓNA</b> Naturally Driven	<b>Procedure: ECO-006</b>	<b>Rev:</b> <b>1</b>
<b>Title: Invasive Species</b>	<b>Approved:</b>	<b>Date: 04/05/21</b>

3. The appointed PCAS Site Supervisor /PSCS as appropriate must be aware of any other site specific mitigation around invasive species, such as steam clean protocols.
4. The Bord na Móna Ecology Team /Project Ecologist or Environmental Officer is responsible for conformance auditing.

Carrying out Activities

*Invasive terrestrial Flora such as Japanese Knotweed*

1. A toolbox talk will be provided by the invasive Project Ecologist with the PSCS, Site engineers and general operatives to explain about all invasive species identified within the bog and the restrictions that will apply for the duration of any planned activities.
2. The toolbox talk will cover all pertinent topics including all relevant invasive species close to activities or works and the biosecurity measures to be implemented while working. The invasive species toolbox talk will cover the full lifecycle of every activity.
3. If required any Japanese Knotweed infestations will be treated or suitably contained.
4. This will take place under supervision from the Project Ecologist/Site Supervisor/Environmental Manager.
5. All surveys will take place prior to the commencement of activities and will follow Best Practice survey techniques.
6. No General Operative will be allowed to work without completing the toolbox talk;
7. The PSCS/Site Manager will ensure that only licensed hauliers are collecting and disposing or any potentially contaminated materials;
8. The Schedule of Mitigation Measures per bog will also be available at all times in the site office.

**5) Records**

Evidence of approval (electronic)  
Archive files

Revision Index			
Revision	Date	Description of change	Approved

<b>BORD<sup>NA</sup>MÓNA</b> Naturally Driven	<b>Procedure:</b> ENV017	<b>Rev: 1</b>
<b>Title: Archaeological Findings</b>	<b>Approved: EM</b>	<b>Date: 13/10/2020</b>

### 1) Purpose

The purpose of this procedure is to describe the arrangements in Bord na Móna for findings of Archaeological material (Stray Finds).

**All objects, sites or monuments, no matter how fragmentary, are important elements of our heritage.**

### 2) Procedure

1. Check whether there are any known archaeological monuments in your area.
2. Be vigilant at all times - objects or traces of structures can be found on the field surfaces, in the drain faces, on the bog margins or caught within the mechanics of machinery.
3. If an object is found leave it in place, if it is safe to do so, note its position and immediately contact your Archaeological Liaison Officer who will assess the situation and contact the Duty Officer of the National Museum of Ireland.
4. Resist the temptation to investigate the find spot as this may disturb fragile archaeological deposits.
5. If the object is already dislodged or is in imminent danger, remove it carefully, mark its find spot and report it immediately to your Archaeological Liaison Officer.
6. Objects made of wood, leather or textile, which are removed from peat should be kept in conditions similar to those in which they are found. This can be done by packing them in peat or, if waterlogged, placing them in a clean basin of water and sealing the container. Resist the temptation to clean or remove peat from the object.
7. If timbers or other materials, such as gravel or stones, which could be part of a man-made structure are noted on the bog, mark the location and report it immediately to your Archaeological Liaison Officer. If you suspect the find is of archaeological importance, resist the temptation to expose it any further as this could result in damage to the structure.
8. Report anything that looks unnatural in the bog – your Archaeological Liaison Officer will decide whether it should be referred to the appropriate authorities.

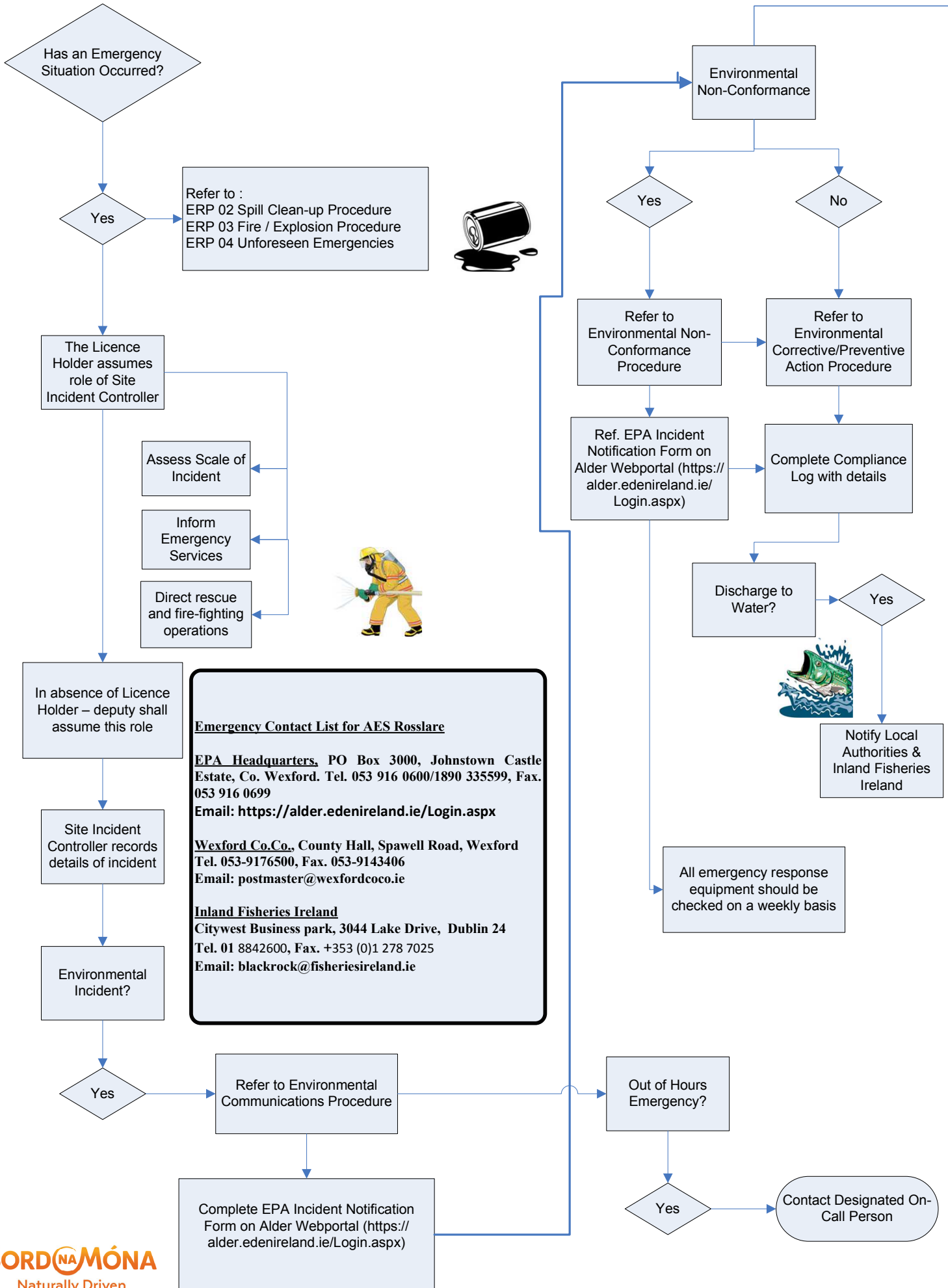
**NOTE:** Our archaeological heritage is a finite, non-renewable resource. Once a site is destroyed its information is lost forever and we have lost the chance to understand a little more about our past, where we have come from and perhaps the opportunity to learn for the future.

Your Archaeological Liaison Officer is .....

### 3) Records

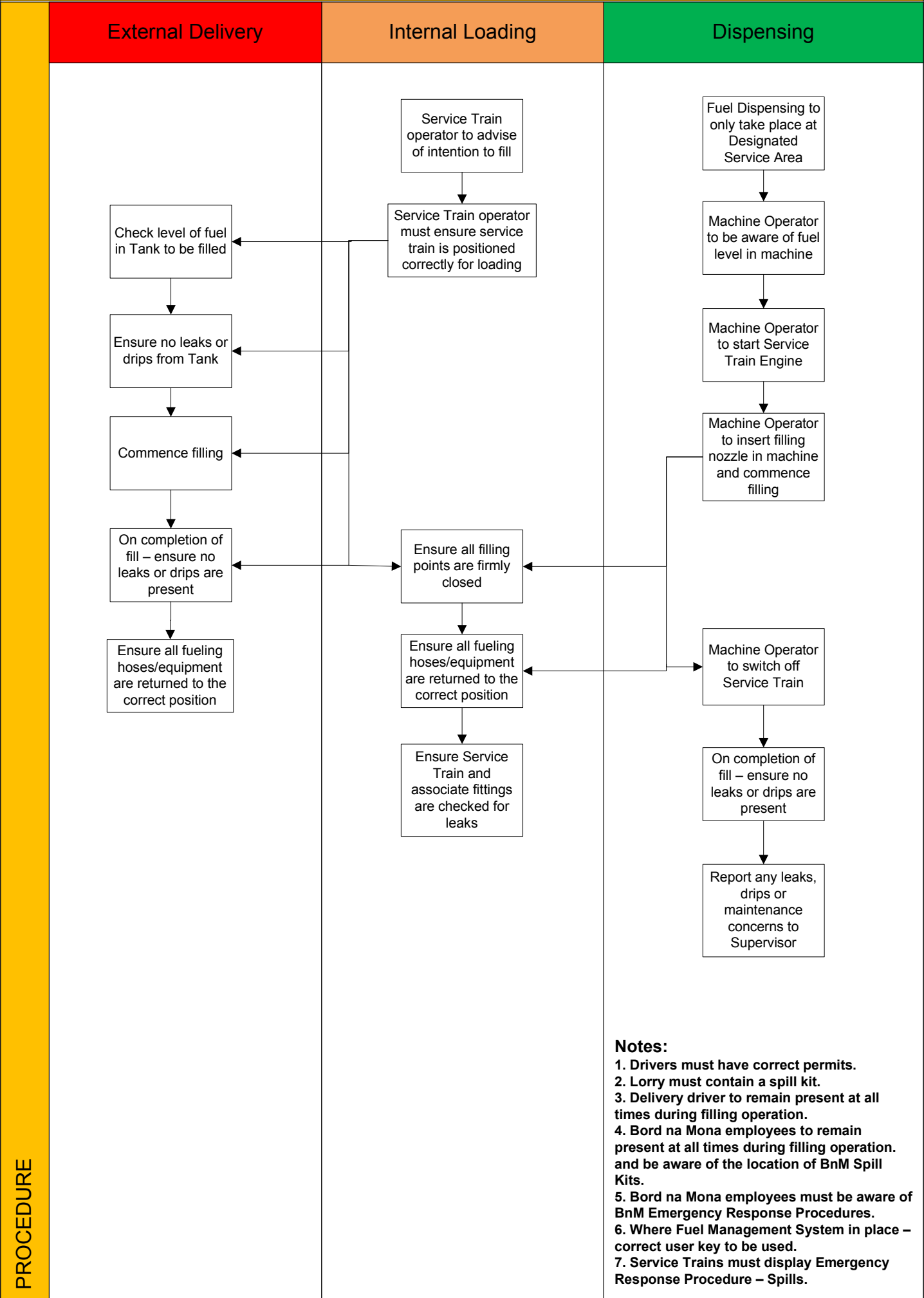
Revision Index			
Revision	Date	Description of change	Approved
1	13/19/2020	First release	EMcD
2			

# EP 5.0 General Emergency Preparedness & Response





# Gas Oil Loading Procedure – Rev.1



**Notes:**

1. Drivers must have correct permits.
2. Lorry must contain a spill kit.
3. Delivery driver to remain present at all times during filling operation.
4. Bord na Mona employees to remain present at all times during filling operation. and be aware of the location of BnM Spill Kits.
5. Bord na Mona employees must be aware of BnM Emergency Response Procedures.
6. Where Fuel Management System in place – correct user key to be used.
7. Service Trains must display Emergency Response Procedure – Spills.

\_\_\_\_\_  
**Operations Manager**

**Date:** \_\_\_\_\_

## **Silt Pond Inspection Procedure**

### **1. Purpose**

The purpose of this procedure is to provide for visual inspection of all silt ponds on a fortnightly basis in accordance with Condition 6.7 of the Bord na Mona Energy Ltd IPC Licence's P0499-01 to P0507-01. This will be used for determining the silt pond de-silting roster.

### **2. Scope**

The scope of this procedure covers all silt ponds treating drainage water from production bogs across the licence areas P0499-01 to P0507-01. .

### **3. Responsibility**

It is the responsibility of the Operations Leader and the Team Leader to ensure all silt ponds are inspected on a fortnightly basis and that these inspections are returned to the Environmental Co-ordinator for filing at the facility office.

### **4. Procedure**

4.1 Record the Silt Pond identification number on the Inspection Log.

4.2 Inspect the full length of the Silt Pond including inlets and outlet, noting the location of peat silt visible on the surface.

4.3 Tick the appropriate box on the Inspection Log to indicate the condition of the pond and record the date and time.

4.4 For ponds in series, the final pond should be clean at all times.

4.5 If a pond is observed as being 3/4 full during the fortnightly inspection, or at any other time arrangements should be made for the de-silting of the pond immediately.

4.6 Inspect the Outfall from the silt pond to the receiving water (River) and record any observations.

4.7 Once the silt pond has been cleaned, the date of de-silting should be logged on the Inspection Log and recorded on the Silt Pond Wall Chart.

\_\_\_\_\_  
**Operations Manager**

**Date:** \_\_\_\_\_

## **Silt Pond Maintenance Procedure**

### **1. Purpose.**

The purpose of this procedure is to provide for a maintenance procedure of all silt ponds associated with IPC Licence's P0499-01 to P0507-01. Pond cleaning will be determined by the silt pond inspection procedure.

### **2. Scope.**

The scope of this procedure covers all silt ponds treating drainage water from the Licence areas P0499-01 to P0507-01.

### **3. Responsibility.**

It is the responsibility of the Operations Manager to ensure ponds are cleaned as required by the silt pond inspection procedure.

### **4. Procedure**

4.1 If the silt pond system has a by-pass channel or a stand-by pond then the drainage should be diverted through these. If not, then the inlet to the pond should be blocked using a gate valve or by switching off any applicable pumps, for the duration of the maintenance activity.

4.2 If the outlet from the pond has a weir then the level should be lowered so as to de-water the silt. If not, then the outlet pipe should be blocked.

4.3 The pond should be cleaned from the inlet to the outlet either from one side, if the width allows, or from both sides, if not.

4.4 The silt should be deposited as far back from the silt pond as possible on top of the existing silt pond or retained in a peat berm, if sludge is at risk of leaking back into the silt pond.

4.5 When the pond has been cleaned the inlet should be opened and the pond allowed to fill before lowering the outlet weir.

4.6 If the drainage was diverted during the maintenance, then it should be redirected back into the pond.

4.7 If there are signs of peat silt deposited upstream or downstream of the pond, within the site boundary, then they should also be cleaned, starting up-stream. This should occur once the pond has been cleaned and before the outlet weir has been lowered.

4.8 Once cleaned, the date should be entered on to the inspection log.

4.9 All machine operators must be fully versed with the above procedure with a copy posted in the machine.

## Waste Management Procedure

### 1. Purpose

To define the correct procedure to be followed when removing and disposing of wastes from sites across all licenced bogs.

### 2. Scope

The scope of this procedure covers all bogs in the Licence areas P0499-01 to P0507-01, and Waste Facilities WL0049-02 and WL0199-02. It also covers the requirements of Condition 7 of these IPC licences and is detailed in Bord na Mona Peat/AES Service Level Agreement (SLA).

### 3. Responsibility

The implementation of this Procedure is the responsibility of the Resource Manager or his/her deputy.

### 4. Reporting

- Prior to the recovery and handling of waste, please liaise with your Environmental Coordinator and/or Compliance Operations Lead to schedule and coordinate its disposal.
- Ensure that a record of all waste receipts is maintained and a copy provided to the relevant Environmental Coordinator.
- On a monthly basis, stores shall provide the relevant IPC Licence Coordinator with a copy of all waste receipts for the Waste Management file.
- On a quarterly basis, AES shall provide each store and the IPC Licence Coordinator with a quarterly report as per the SLA.

### 5. Waste Collection Procedure

Table 1 outlines the procedures for the handing of waste and subsequent disposal routes.

### 6. Reference Documents


Attachment 1: AES Service Level Agreement (SLA).

Litter Action Plan: Prevention and control of litter arising from Bord na Mona's activities and from unauthorised dumping on and around its property.

Table 1: Waste Management Plan		
Waste Type	Waste Handling Procedure	Disposal Route
Plant & Equipment	<ul style="list-style-type: none"> <li>All production equipment shall be transferred to tea centers/workshops for assessment for retention, sale or scrapping.</li> </ul>	-
	<ul style="list-style-type: none"> <li>Tractors, trailers, excavators, dozers identified for D&amp;R work, peat sales or drainage/silt pond maintenance shall be retained at the main works.</li> </ul>	
Hazardous Waste	<ul style="list-style-type: none"> <li>Hazardous materials/liquids/batteries shall be removed from all machinery identified for scrap.</li> </ul>	-
	<ul style="list-style-type: none"> <li>All waste or unused fuels, oils, greases, batteries etc shall be brought into the main works and deposited into existing hazardous waste receptacles i.e. barrels, waste oils tanks, battery boxes etc.</li> </ul>	AES/ENVA
Transformers	<ul style="list-style-type: none"> <li>Redundant transformers shall be transported to workshops. Prior to disposal, transformer oils shall be testing for the presence of PCB's. Only third part contractors ENVA ltd shall be permitted to pump and disposed of transformer oils.</li> <li>Transformer shall be then send for metals recycling</li> </ul>	AES/ENVA/ (Subcontractor - metals recycling)
Scrap Metal	<ul style="list-style-type: none"> <li>All scrap metal collected shall be stored in short to medium term designated areas with adequate hard standing, space and access for collection by AES contractors using heavy equipment (scissors, grab, articulated trucks).</li> </ul> <p><b>Note: to maximise the potential scrap value, store scrap loose and do not deposited into skips</b></p>	AES (Subcontractor - metals recycling)
Polythene	<ul style="list-style-type: none"> <li>All waste polythene, rolled and loose shall be gathered and stored at designated areas with adequate hard standing, access and easy reach for collection. In order of preference, polythene shall be disposed of as follows: <ol style="list-style-type: none"> <li><b>Rolled Polythene</b> – collected by ADN Ltd for recovery/recycling - <b>qualifies for a financial rebate.</b></li> <li><b>Loose Polythene</b> - collected by ADN Ltd for recovery/recycling - no financial rebate due to transportation costs.</li> <li><b>Contaminated Polythene</b> – polythene rejected by ADN Ltd shall be disposed of to landfill via AES ltd.</li> </ol> </li> </ul>	ADN Ltd / AES
Polybrane	<ul style="list-style-type: none"> <li>All waste polybrane recovered from both permanent and temporary rail shall be stored separately to polythene and assessed for reuse/ disposal. Polybrane designated for disposal shall be directly transferred to Drehid landfill.</li> </ul>	Reuse – to be determined Disposal - Drehid Landfill
Tyres	<ul style="list-style-type: none"> <li>All used tyres shall be gathered and stored in a suitable hard standing area for collection</li> </ul>	AES
Concrete Pipes	<ul style="list-style-type: none"> <li>Redundant concrete pipes shall be: <ul style="list-style-type: none"> <li>collected and transported to the nearest compound for reuse (D&amp;R projects/Drainage/neighboring farm use).</li> <li>Crushed in-situ.</li> </ul> </li> </ul>	-
Asbestos	<ul style="list-style-type: none"> <li>Removal and disposal of asbestos carried out by specialist's waste contractors only. If found, do not handle or disturbed and ensure Health &amp; safety guidelines are adhered to.</li> </ul>	Specialist's waste contractors
C&D Waste	<ul style="list-style-type: none"> <li>All C&amp;D waste shall be segregated to ensure disposal costs are minimised as follows: <ul style="list-style-type: none"> <li>Remove of all internal appliances, furniture, windows, roof felt, guttering etc to general waste skip.</li> <li>Segregate timber from concrete and place in separate skips</li> <li>Segregate metals and transport to nearest loose metals storage compound</li> </ul> </li> </ul>	AES (Subcontractor - metals recycling)
Peat Stockpiles	<ul style="list-style-type: none"> <li>Unsalable stockpiles shall be leveled/decommissioned as per SOP FS-BM-02 "Bog Maintenance Plan"</li> </ul>	Operations
Illegal fly tipping	<ul style="list-style-type: none"> <li>The locations of illegal dumping and fly tipping sites shall be documented and reported to local BnM environmental officers.</li> </ul> <p>Note: The local county council should be notified of the dumping and a landfill levy exemption letter requested prior to the removal or disposal of waste.</p>	AES



## **Appendix G Protection of Otter Standard Operating Procedures**

	<b>Procedure: ECO-001</b>	<b>Rev: 1</b>
<b>Title: Protection of Otter</b>	<b>Approved:</b>	<b>Date: 16/03/21</b>

### 1) Purpose

To describe the environmental measures required to protect Otter across all Bord na Móna activities.

### 2) Scope

To avoid likely significant effects of disturbance, displacement or physical injury to Otter which occur or are likely to occur at any locations where Bord na Móna may be carrying out activities with the potential for effects.

The potential for negative effects will be avoided through adherence to Best Practice measures and the use of confirmatory surveys to establish any requirements such as derogations and/or restriction zones around confirmed breeding or resting sites as appropriate.

This Procedure should be read in association with any other pertinent procedures, in particular around vegetation clearance and working near water.

### 3) Related Documents

Bord na Mona Silt Pond Maintenance Procedure

Bord na Mona Silt Pond Inspection Procedure

National Roads Authority (2006). Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes. The National Roads Authority, Dublin.

National Roads Authority (2008.) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. The National Roads Authority, Dublin.


Highways Agency (1999). Design Manual for Roads and Bridges - Nature Conservation Advice in Relation to Otters HA81/99. The Highways Agency, London.

### 4) Procedure

#### Environmental Controls

1. Each project, scheduled activity or proposed works will liaise with the Bord na Móna ecology team who will approve and provide guidance on all on site activities which could have an ecological impact.
2. All staff will receive environmental training and/or an Environmental site induction/Toolbox talk before being allowed to work on a Bord na Móna bog.
3. Work will only be able to take place once the Bord na Móna ecology team has signed off on the installation of any required mitigation measures.
4. Adherence to any specified mitigation measures are to be subject to audit by the Bord na Móna ecology team and/or Site Supervisor/Environmental Officer or PSCS as appropriate.
5. Where non-compliance is detected, a system of follow up and corrective action will be implemented.

#### Preparation

 <p><b>BORD NA MÓNA</b> Naturally Driven</p>	<b>Procedure: ECO-001</b>	<b>Rev: 1</b>
<b>Title: Protection of Otter</b>	<b>Approved:</b>	<b>Date: 16/03/21</b>

1. Confirmatory surveys will be carried out 150m upstream and downstream of suitable Otter habitat where relevant activities are programmed to occur. This will include silt ponds (cleaning and maintenance), channelized sections of watercourses and bog drainage channels with connectivity to suitable habitat. These confirmatory Otter surveys will be undertaken no more than 12 months in advance of proposed activities, during the period November and April when vegetation cover is reduced. For silt ponds surveys will include an area comprising the pond plus a 50m buffer.
2. Confirmatory surveys will be undertaken by a suitably qualified ecologist.
3. The results of surveys will be communicated to the site manager responsible for scheduling activities on a need to know basis.
4. Zones or locations containing confirmed breeding or resting locations (holts/couches) are to be delineated with signage at an appropriate distance (150m) to prevent disturbance.
5. In addition, any restriction zones are to be digitised and provided in shapefile format for upload to machine PDA's where this facility is available.
6. These Ecological Restriction Zones will be marked out at regular intervals using a combination of appropriate signage or visual markers as appropriate, prior to works or activities commencing during the identified sensitive period.
7. The above will be carried out by a suitably qualified Ecologist/ Bord na Móna ecology team.
8. Surveys results will be confirmed no less than 3 days prior to scheduled activities commencing.
9. If required any derogation applications will be made by the Bord na Móna ecology team/designated project manager.

#### Operator Training

1. All operators will receive a toolbox talk by a suitably qualified Ecologist/ Bord na Móna ecology team, to educate them on any relevant restrictions prior to the commencement of activities.
2. This will include any restricted areas, the requirement for same, the location of reference documentation such as the schedule of mitigation measures, and the procedure to follow if in doubt as to the locations of activities in respect of any restricted areas.
3. A copy or map illustrating the restriction zones's per bog, and periods wherein activities can be undertaken will be available at all times at the site office.
4. Where pertinent, a schedule of Mitigation Measures per bog will also be available at all times in the site office.

#### Responsibilities

1. The appointed site manager/PSCS as appropriate will be responsible for recording attendance at toolbox talks and making sure all operators have access to the required reference material, including drawings of restricted areas/ ERZ's.
2. The appointed site manager/PSCS as appropriate as will be responsible for the scheduling of activities
3. The appointed site manager/PSCS as appropriate must be aware of any other site specific mitigation around Otter
4. The Bord na Móna ecology team or Project Ecologist is responsible for conformance auditing

<b>BORD NA MÓNA</b> Naturally Driven	<b>Procedure: ECO-001</b>	<b>Rev:</b> <b>1</b>
<b>Title: Protection of Otter</b>	<b>Approved:</b>	<b>Date: 16/03/21</b>

5. If a derogation is required, any activities under same will be overseen by the Bord na Móna ecology team or appointed Project Ecologist.
6. Local NPWS will be made aware of any derogated works/activities before commencement.

#### Carrying out Activities

1. No works or activities are to be carried out in restricted areas or identified ERZ's during the relevant period as specified by the project ecologist. No works will be carried out within 150m of an active holt.
2. NPWS will be notified of any confirmed active holts.
3. As per NRA (2006) guidelines, following consultation with NPWS, works or activities closer to such breeding holts may take place – provided appropriate mitigation measures are in place, e.g. screening and/or restricted working hours on site;
4. No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance will not take place within 15m of such holts, except under licence (NRA, 2006);
5. Where holts are present in close proximity to invasive activities, but are determined not to require destruction, such activities may commence once recommended alternative mitigation measures to address otters have been complied with (NRA, 2006);
6. Only operators who have received the required training and toolbox talks are to be assigned duties within the above period.
7. Conformance will be audited through compliance checks by the Bord na Móna ecology team /Project Ecologist with 'stop-works' authority.
8. Activities will only be carried out between 08.00 and 17.30 to minimise the potential for disturbance.

#### **5) Records**

Evidence of approval (electronic)  
Archive files

Revision Index			
Revision	Date	Description of change	Approved