



Edera Bog

Cutaway Bog Decommissioning and Rehabilitation Plan 2021

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0504-01:

“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 Edera 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.

Industrial peat production has now fully ceased at Edera Bog.

In addition, to preparing this document to comply with Condition 10 of IPC Licence Ref. P0504-01, 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 the Edera Bog, activities which goes beyond that required by Condition 10 in the Licence, rehabilitation necessary to comply with the ‘standard’ requirement of Condition 10 (in the absence of the proposed Scheme) is also included, to estimate costs. 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 activities (and their associated costs) eligible for support under the proposed Scheme.

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

Any consideration of any other future after-uses for Edera Bog, such as amenity, 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.

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SUMMARY

Name of bog: Edera

Area: 282 ha

Site description:

- Edera Bog is located approximately 4.5km to the west of Ballymahon in Co. Longford.
- Edera Bog was drained and developed for industrial peat production in the 1990s and has been in active peat production since the 2003. Industrial peat production ceased in 2018.
- The majority of the former peat production footprint is bare peat (~75%) and contains active drainage channels.
- Remnant peat depths are in excess of 4m in large parts of Edera Bog. Where peat has largely been removed, wetlands have developed.
- Edera Bog is located adjacent to Lough Ree and several designated conservation sites. In winter, Edera can be partly inundated with water corresponding to water levels in Lough Ree.

Rehabilitation goals and outcomes

Bord na Móna is committed to discharging the obligations arising from Condition 10 of the IPC licence. The primary goals and outcomes of this plan are:

- Meeting conditions 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 **wetland creation and deep peat re-wetting**.
- Optimising hydrological conditions for the development of embryonic *Sphagnum*-rich vegetation communities in suitable deep residual peat areas.
- Optimising hydrological conditions for the development of wetland, Reed Swamp and fen habitats on shallow cutaway peats.
- 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.
- Note that it will take some time for stable naturally functioning peatland and wetland habitats to fully develop at Edera Bog.

Scope of rehabilitation

The principal scope of this rehabilitation plan is defined by:

- The area of Edera Bog.
- EPA IPC Licence - Ref. P0-504-01. 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 the bog, in particular, optimising **climate action benefits**.
- The local environmental conditions of this bog. Edera Bog has variable environmental characteristics with a range of residual peat depths, hydrology and topography. Part of the bog has large remnants of deep peats and is suited to deep peat re-wetting.

- The key goals and outcomes of rehabilitation at this bog outlined above.
- To minimise potential impacts on neighbouring land, some boundary drains around Edera Bog will be left unblocked, as blocking boundary drains could affect adjacent land.
- Other constraints including archaeology and rights of way.
- Bord na Móna have identified the main land-use at this bog as **biodiversity and ecosystem services**.

Criteria for successful rehabilitation:

The Criteria for successful rehabilitation to meet Condition 10 of the IPC Licence have been defined as:

- Rewetting of deep peat in the former area of industrial peat production to slow water movement across the site to retain silt, encouraging development of vegetation cover via natural colonisation, and reducing the area of bare exposed peat (IPC Licence validation). The target will be the delivery of rehabilitation measures and this will be measured by an aerial survey after rehabilitation is completed. (IPC Licence validation).
- Stabilising/improving key emissions to water (e.g. suspended solids). This will be measured via water quality monitoring (suspended solids and ammonia) for at least 2 years after the rehabilitation has been completed. (IPC Licence validation).
- Reducing pressure from peat production on the local river catchment (WFD) (IPC Licence validation).
- Optimising the extent of suitable hydrological conditions for climate action and setting the site on a trajectory towards establishment of a mosaic of compatible peatland and wetland habitats, and eventually towards a reduced carbon source/carbon sink (Climate action verification). This will be measured by an aerial survey and a bog condition assessment after rehabilitation has been completed.
- Reduction in carbon emissions (Climate action verification). 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.
- Improvement in biodiversity and ecosystem services. (Climate action verification).

Monitoring climate action verification criteria after the Scheme is completed is dependent on support from the Climate Action Fund or other sources of funding.

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 to have sufficient resources (staff and machinery) to deliver the planned rehabilitation.
- Weather conditions to be within normal limits over the rehabilitation plan timeframe
- Natural colonisation of vegetation to develop semi-natural habitats at a rate within the normal limits.

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 drainage and hydrology assessment.
- Carry out an ecological appraisal of the potential impacts of the planned rehabilitation.
- Carry out proposed measures, which will be a combination of wetland measures, drain blocking, peat field re-profiling, cell-bunding and fertiliser applications targeting headlands, high fields and other areas (where required).
- Phase 2 measures may include seeding of targeted vegetation and inoculation of *Sphagnum* in suitable areas.

- Silt ponds will continue to be maintained during the rehabilitation and decommissioning phase.
- 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.
- 2021: 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.
- For the avoidance of doubt, should the proposed Scheme and the associated statutory obligation on Bord na Móna not materialise, Bord na Móna will not carry out the enhanced decommissioning, rehabilitation and restoration measures described in this plan. Bord na Móna will instead plan to complete only the 'standard' decommissioning and rehabilitation required under Condition 10, see Appendix I, and for which financial provisions have been made, to comply with that element of the Licence.

Monitoring, after-care and maintenance

The monitoring, after-care and maintenance programme for Edera Bog, as required to meet Condition 10 of the IPC Licence and to validate climate action benefits, 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 to additional rehabilitation, if needed.
- **Water quality monitoring** will be established. Monitoring of key water quality parameters for 2 years after rehabilitation will include: pH, Flow, Suspended Solids, Total Solids, Total Phosphorus, Total Ammonia, Colour COD & TOC
- 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.

Additional Monitoring:

- The monitoring and validation of re-vegetation via natural colonisation and changes in bog condition will be carried out using an aerial remote sensing 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.

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 indicators are stabilising/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 Mount Dillon bog group (Ref. P0504-01). 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. Edera bog is part of the Mount Dillon bog group (see Appendix II for details of the bog areas within the Mount Dillon Bog Group). Edera Bog is located in Co. Longford.

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0504-01:

“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 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 key targets to validate rehabilitation.
- Proposed rehabilitation actions.
- Proposed timeframe to implement these measures.
- Budget and Costings.
- Associated aftercare, maintenance and monitoring.

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, 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 (a subset of the Bord na Móna 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 & 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. However, it is important for all stakeholders to understand that 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.

It is expected that the proposed Scheme (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 interventions will accelerate the trajectory towards a naturally functioning peatland ecosystem.

It is envisaged that the PCAS will support activities, improvements, 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 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. These will develop other habitats). 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.

Edera Bog is proposed to be part of this Scheme (PCAS) and this rehabilitation plan outlines the approach taken. In the event that additional external funding is not secured, Bord na Móna will revert to a standard rehabilitation plan (outlined in Appendix I). This adapted rehabilitation plan will also meet rehabilitation and decommissioning obligations under existing EPA IPC licence conditions.

1.1 Constraints and Limitations

This document covers the area of **Edera Bog**.

The future use of Edera Bog has not been defined by Bord na Móna but biodiversity and ecosystem services have been identified as the current primary land-use. Bord na Móna will continue to review the future after-use of its land-bank. Any consideration of any other future after-uses for Edera 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.

Peat production activities have the potential to impact the habitats and environment of a bog. The ecological processes involved in the creation and maintenance of functioning, active bog systems are complex, happen over very long time periods (>1,000 years) and not all are fully understood. Nevertheless, the basis for the proposed approaches and implementation outlined in the document is the experience gained in 40 years of research and implementation of the after-use development, rehabilitation and restoration of the Bord na Móna cutaway bogs as well as best practise internationally (see reference documents).

Industrial peat extraction at Edera Bog permanently ceased in 2018. Currently 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 Edera 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 Edera 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 Edera 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.
- 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:

- Moundillion Integrated Pollution Control Licence;
- Moundillion Annual Environmental Reports;
- Review of the National Biodiversity Data Centre (NBDC) webmapper;
- Inland Fisheries Ireland (IFI) Reports;
- Environmental Protection Agency database (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);
- Geological Survey of Ireland - National Draft Bedrock Aquifer map;
- Geological Survey of Ireland - Groundwater Database (www.gsi.ie);
- National Parks & Wildlife Services Public Map Viewer (www.npws.ie);
- Water Framework Directive catchments.ie/maps/ Map Viewer (www.catchments.ie);
- OPW Indicative Flood Maps (www.floodmaps.ie);
- CFRAM Preliminary Flood Risk Assessment (PFRA) maps (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 have been 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, Edera Bog was surveyed in July 2012 and surveyed again during 2018. Additional ecological walk-over surveys and visits have taken place at Edera Bog between 2012-2020 to inform rehabilitation planning and habitat maps have been updated, where required. 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 Edera Bog is contained in Appendix II.

3. SITE DESCRIPTION

Edera Bog is located approximately 4.5km to the west of Ballymahon in Co. Longford on the shore of Lough Ree (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. Lough Ree is immediately adjacent to the south-west corner of the site and the Bilberry River flows through the site (see Figure 3.2). A relatively large section of wet grassland along with a remnant section of raised bog still exist on the site.

A rail line connects Edera bog with Derrycolumb Bog to the north, and this is the main access to the site, with a small tea centre and machinery travel path at this entrance to the bog. A machinery bridge and separate rail bridge are present in the centre of the site to cross the Bilberry River.

3.1 Status and Situation

3.1.1 Site history

Edera Bog has only been in peat production since 2003, with all commercial peat extraction ceasing on site in 2018. The peat was harvested from this site was used for fuel peat Lough Ree Power in Lanesborough. Several small peat stock-piles are still present on the site and these will be removed before rehabilitation and decommissioning is complete. (Appendix VII & IX).

3.1.2 Current land-use

Industrial peat production has now permanently ceased at Edera Bog. Future land-use has not been defined by Bord na Móna but biodiversity and ecosystem services has currently the primary land-use.

The entire bog is not within the ownership of Bord na Móna and domestic turf cutting (private turbarry) is having a significant impact on the bog, both within and outside the BnM boundary.

There is a right of way in the southern part of the site. This will be considered and incorporated into the rehabilitation plan.

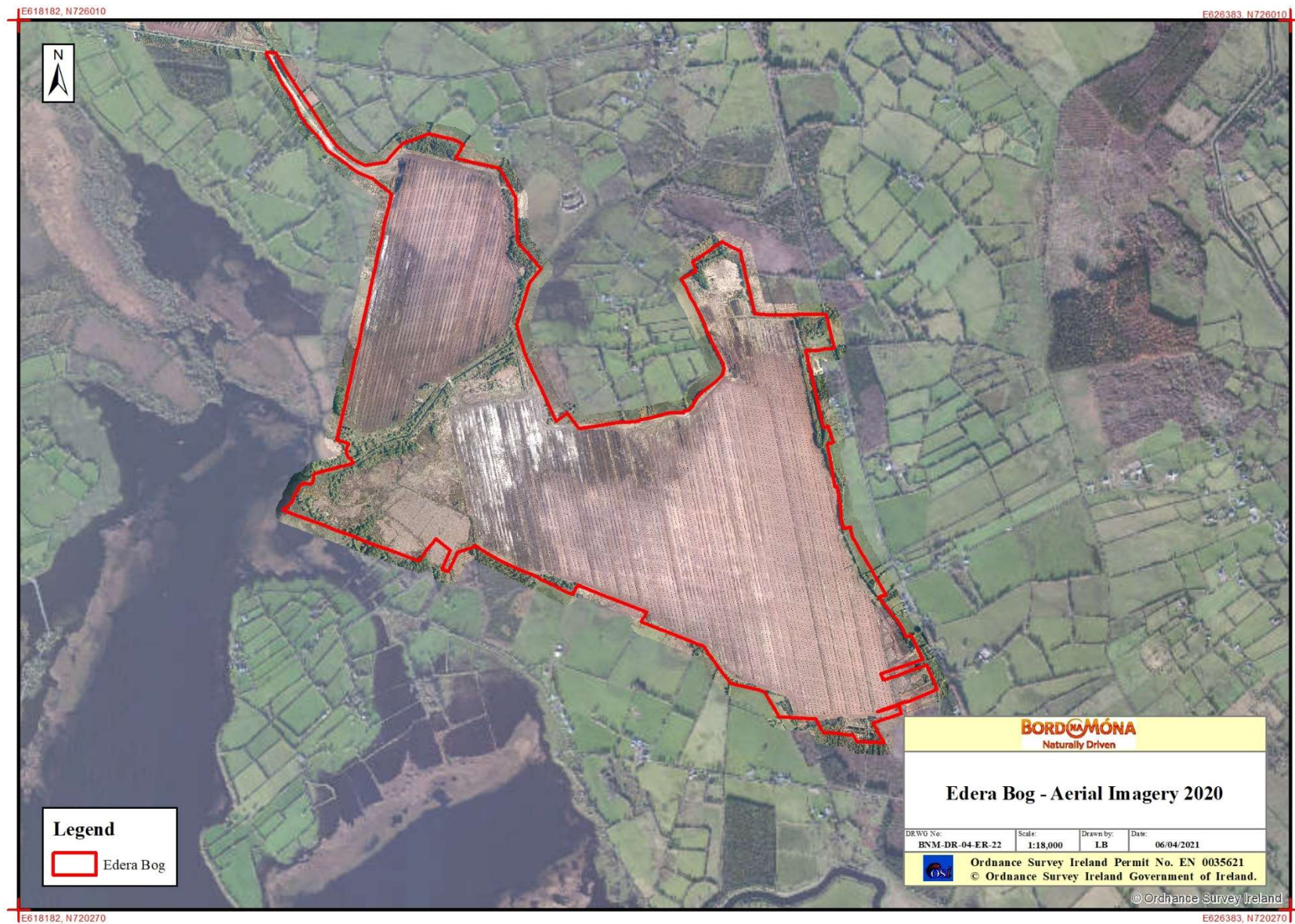
3.1.3 Socio-Economic conditions

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.



Location of Edera in context to other Bord na Móna bogs and surrounding area



Aerial photo of Edera Bog (2020).

Figure 3.2

In respect of Edera 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).

3.2 Geology and Peat Depths

3.2.1 Sub-soil geology

The majority of the underlying geology at Edera Bog is limestone and shale bedrock, with a small extrusion on the eastern site of lime-mudstone¹. The underlying soils and sub-soils are classed as ‘Raised Bog Cutover Peat’.

3.2.2 Peat type and depths

Commercial peat extraction has only been undertaken at Edera Bog relatively recently (within the past 20 years). As a result, there are substantial peat depths of over 4 m across most of the site (Figure 8.2). The peat harvested on site is mostly “red” or “*Sphagnum* peat” and was used as fuel peat supplying Lough Ree Power.

3.3 Key Biodiversity Features of Interest

The majority of Edera Bog within the Bord na Móna boundary is bare peat as this site was in production until 2018. A significant area of scrub (WS1), raised bog (PB4) and wet grassland (GS4) is located in the west of the site. This area is located next to Lough Ree and has never been in industrial peat production; however, some domestic turf cutting has been carried out in this area. The remnant section of raised bog does not appear to contain deep peat and is located in the transition zone between what was the former intact raised bog (Edera) and the wet grassland that borders Lough Ree.

A small area of remnant raised bog and cutaway bog is located along the north-eastern boundary of the site. This area is used extensively for domestic turf production under licence to Bord na Móna. The Bilberry River running through the centre of the site is likely to be an important wildlife corridor and is a key link for connectivity of habitats and species

3.3.1 Current habitats

Some small sections of the production bog at Edera appear to have been cut away with marl protruding in areas. Common Reed is becoming established on these areas and in some of the field drains.

The Bilberry river flows through the site and there are two crossing points that machinery and trains use to cross this river (see Figure 3.3). The river still retains some natural features such as bends in the river and some deeper pools. The River is surrounded on both sides by relatively extensive areas of wet grassland that are subject to

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

flooding when the River is in flood. The grassland was comprised of species such as Soft Rush, Floating Sweet-Grass, Yorkshire Fog, Reed Canary Grass, Yellow Rattle, Purple Moor Grass, Marsh Arrow Grass and Iris. Scattered trees consisting of Alder and Willow are located throughout this area. Several silt ponds are also located in this area. A small round clump of Birch and Alder are in one area and this feature is thought to be the remains of a Crannog by archaeologists. To the south of this area lies the location of an old house that has local historical importance.

A significant area of scrub, raised bog and wet grassland is located in the west of the site. Purple Moorgrass is dominant across much of this section of raised bog along with species such as Bog Asphodel, Sundew, Yellow Rattle, Willow, Bog Myrtle, Devil's Bit-Scabious, Gorse, Bog Cotton, Heather, *Sphagnum papillosum*, *S. subnitens*, *S. squarrosum* and *Aulacomnium palustre*. Occasional tufts of Black Bog Rush are located along the edges of this habitat. This area, immediately adjacent to Lough Ree, can flood in winter of lake water levels are high (See Figure 3.4).

Other habitats along the margins of the site include Birch woodland, wet grassland, dry heath and cutover bog.



Figure 3.3 View of the Bilberry River that runs through the centre of the site (July 2012)

A habitat map of the site is shown in Figure 3.5.



Figure 3.4 View of the flooded habitats in south-western part of the site (January 2015)

3.3.2 Species of conservation interest

Marsh Harrier, Kestrel and Water Rail have all been recorded at Edera Bog, and Sand Martin have been recorded nesting in peat face banks on site. Badger, Otter and Pine Marten have also been recorded on the bog.

Marsh Fritillary have been recorded just outside the Bord na Móna property to the north and south-east (NBDC data viewer) but there are no on-site records yet.

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. No such instances are known at Edera Bog. 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 (Appendix V).

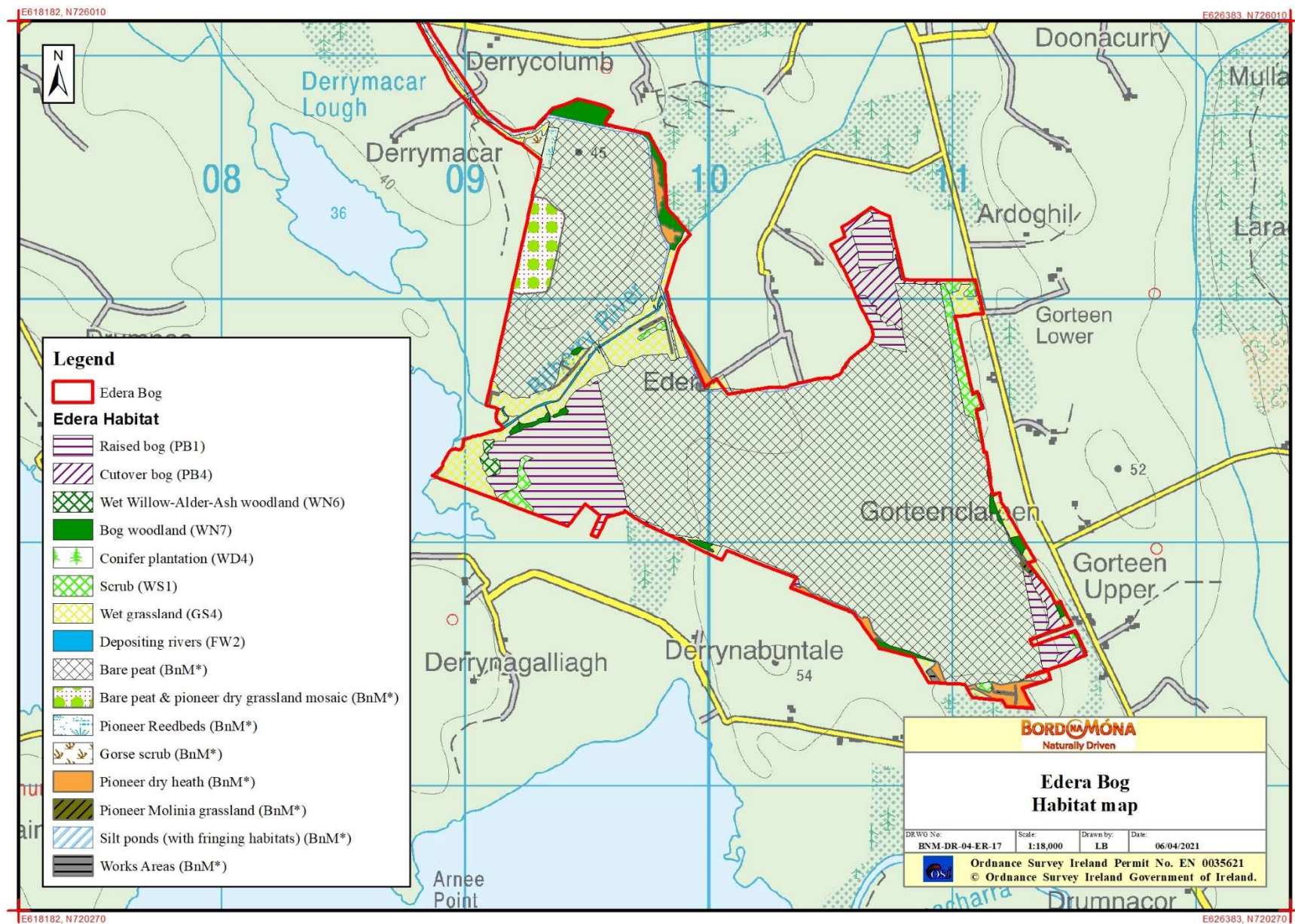


Figure 3.5 Habitat map of Edera Bog showing Bord na Móna habitat categorisation

3.4 Statutory Nature Conservation Designations

Edera Bog partially overlaps with Lough Ree SAC and pNHA (NPWS Site Code: 000440) and Lough Ree SPA (NPWS Site Code: 004064) on the western corner of the site (see Figure 3.6). Lough Ree SAC (and pNHA) is designated for the natural eutrophic lake as well as active raised bogs, degraded raised bogs capable of natural regeneration, bog woodland and Otter. Lough Ree SPA is designated for the assemblage of wintering wildfowl, many species of which occur in nationally important numbers as well, in addition to breeding Common Tern and Common Scoter. No rehabilitation measures are proposed for the area of the site that overlaps with this designation.

Derry Lough pNHA is situated within 1km of the northern boundary of Edera Bog and the Royal Canal pNHA lies within 2km of the eastern boundary of the site.

3.5 Hydrology and Hydrogeology

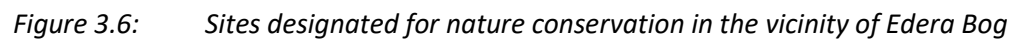
Edera Bog has a gravity drainage regime. The majority of the bog has active functioning drains. Part of the site is prone to seasonal winter inundation via the Bilberry River and this reflects seasonal water fluctuations in Lough Ree. Initial hydrological modelling indicates the bog has topographical basins that are expected to develop a mosaic of wetland habitats when rehabilitation is carried out and drains are blocked, in particular to either side of the Bilberry River corridor. Some of the bog on the south-eastern side is also modelled as being relatively dry due to more elevated topography and slopes (Figure 8.3).

Edera Bog is located in the Upper River Shannon catchment. The majority of the bog is drained by the Bilberry River which flows through the centre of the site and into Lough Ree. The south-east corner drains into the River Inny just upstream of the point where it meets Lough Ree, and the eastern side of the site drains into a small, unnamed watercourse that also drains into the River Inny.

Silt ponds are present within the centre of the site to manage discharges into the Bilberry River, with further silt ponds to the eastern and south-eastern edges of the site (which discharge into the River Inny). The bog to the north-east of the Bilberry River has field drains running in a north-northeast to south-southwest orientation; to the south-west of the Bilberry River the field drains run in a north-northwest to south-southeast orientation.

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 m³/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 located in an area mapped by GSI as of low groundwater 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. .



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 (present on an adjacent cutaway site). 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

Drainage is an important feature of industrial peat production and there were extensive field drains maintained throughout bog areas to facilitate industrial peat production annually, each of which eventually drains into a terminal silt pond that allows for settlement of suspended solids before entering the main river systems (see Figure 3.8).

Silt ponds are the key silt control infrastructure to control potential emissions from industrial peat production sites. As required under licence, BNM have a number of procedures for how it manages and maintains its silt pond network. The silt that builds up in silt ponds is excavated on a regular basis by Bord na Móna to facilitate an efficient level of silt control. Silt ponds will continue to be maintained during the rehabilitation and decommissioning. Silt pond decommissioning will be considered when sites are deemed to be on a trajectory of environmental stability and peatland rehabilitation has been completed. There are six silt ponds at Edera Bog, with three located around the eastern periphery of the site and three located in the centre.

Edera bog surface water outlets discharge to the Ledwithstown IE_SH_26L840850 water body via the Bilberry River which is a sub catchment and main receiving water of Edera Bog. This water body is currently unassigned with no biological or chemistry monitoring data available, but peat extraction is identified as pressure in the second cycle of the river basin management plan but is not indicated as remaining so in the third cycle, currently under preparation.

Other silt ponds drain to the east and south to the River Inny IE_SH_26I011400, and while this water body is listed as a peat pressure WB in the second cycle of the river basin management plan and is indicated as remaining so in the third cycle, currently under consideration, the section under pressure is in the upper reaches above Lough Derravarragh.

The main emission limit value associated with this bog is 35mg/l suspended solids, with trigger levels for ammonia of 1.42 mg/l and COD 100mg/l.

Initial monthly ammonia concentrations from August to January 2021 have a range of 0.044 to .473mg/l with an average of .161mg/l.

From an analysis of any monitoring over the past 5 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 and COD. See Table 3.1 below.

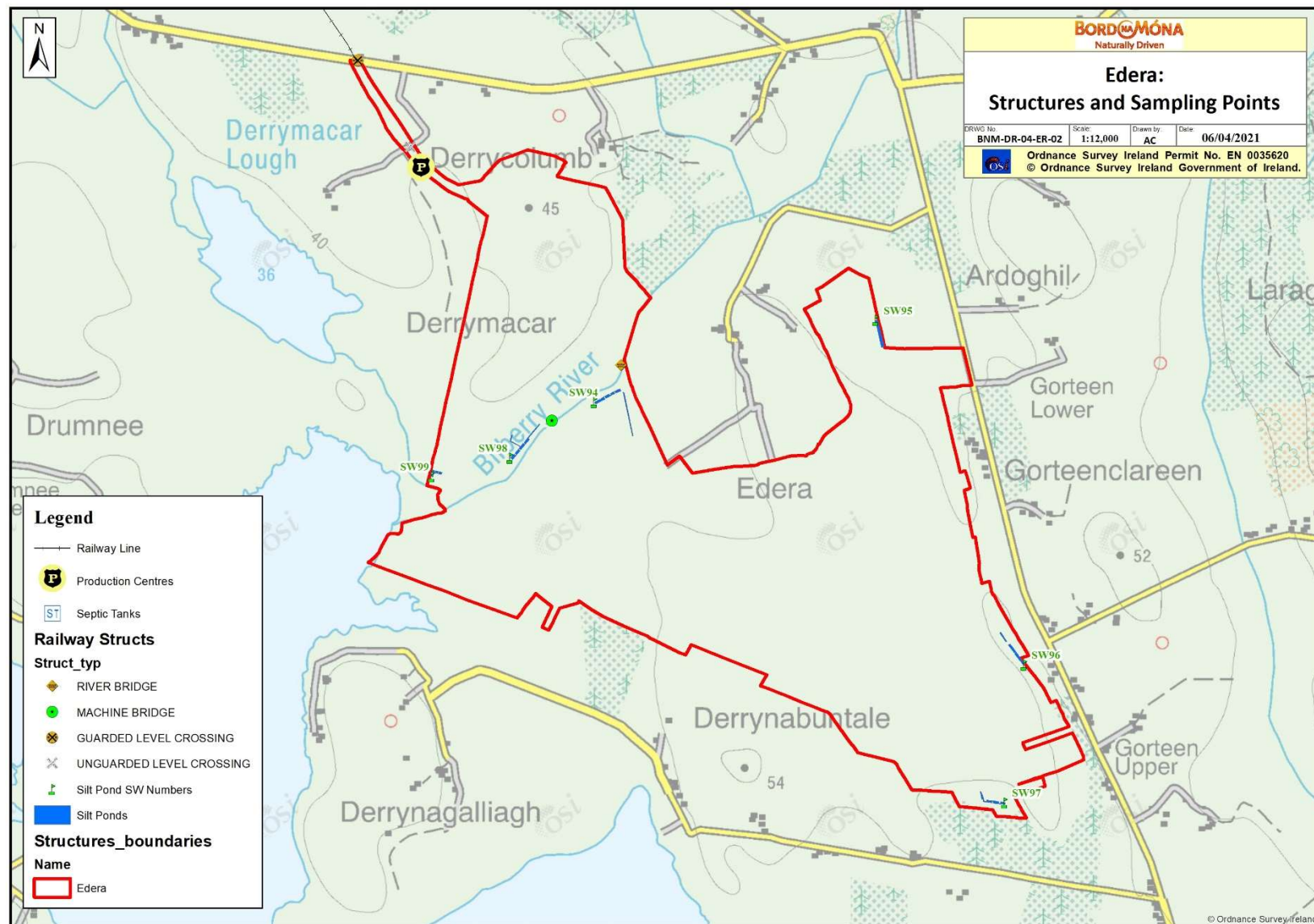


Figure 3.7. Map of Edera Bog showing structures and designated emission points

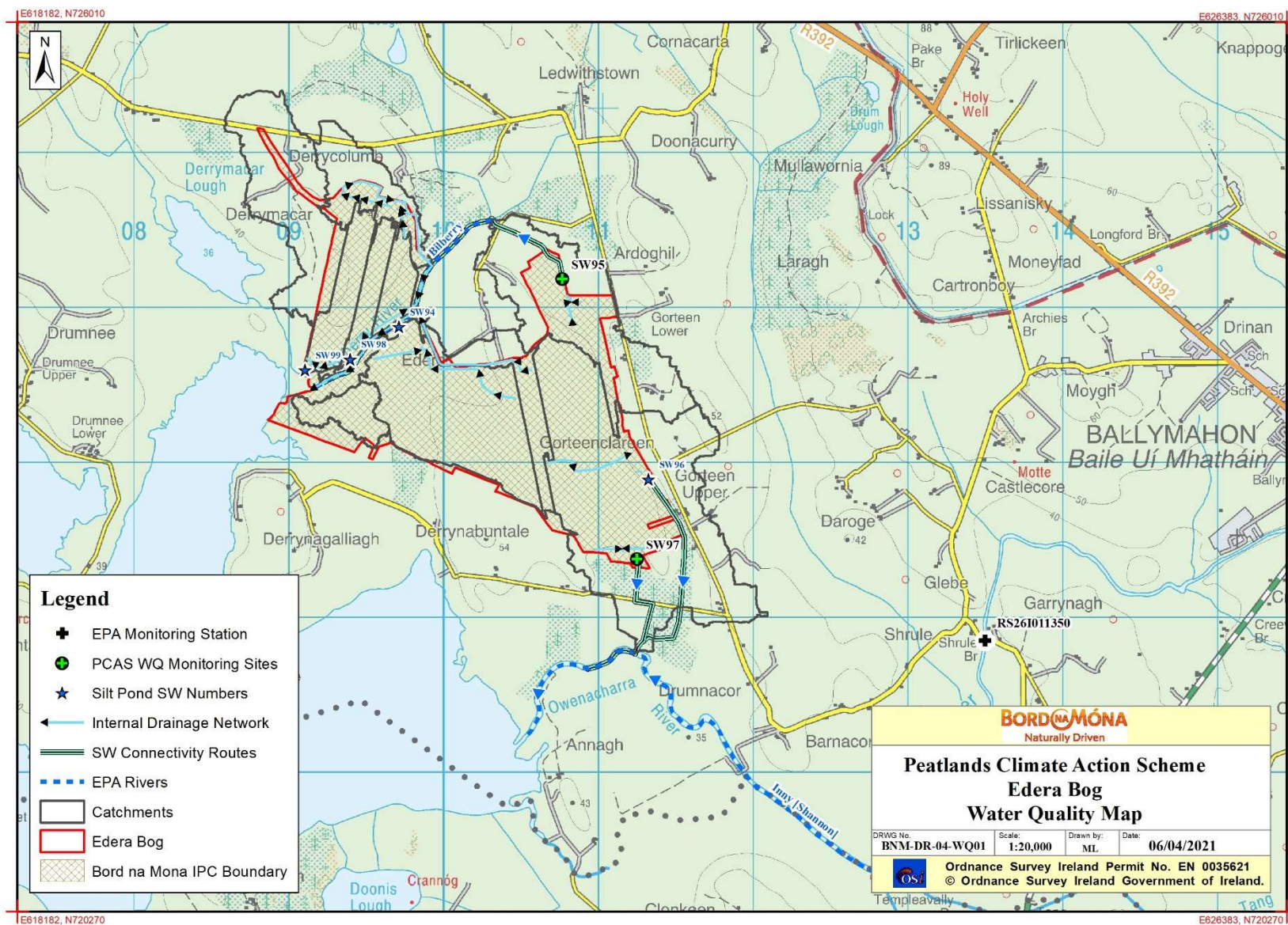


Figure 3.8. Map of Edera Bog showing water management features and water quality monitoring points.

Table 3.1. EPA Monitoring data (EPA) for the previous five years in relation to Edera Bog

Bog	SW	Monitoring	Sampled	pH	SS	TS	Ammonia	TP	COD	Colour
Edera	SW-97	Aug-20	18/08/2020	6.9	<2	189	0.473	<.05	91	416
Edera	SW-95	Sep-20	19/08/2020	7.3	2	293	0.209	<.05	78	393
Edera	SW-95	Q1 20	24/03/2020	8.1	2	371	0.064	<.05	17	50.7
Edera	SW-96	Q1 20	24/03/2020	8.3	5	284	0.075	<.05	54	202
Edera	SW-97	Q1 20	24/03/2020	7.9	2	268	0.085	<.05	20	51.3
Edera	SW-98	Q1 20	24/03/2020	7.8	2	343	0.213	<.05	41	157
Edera	SW-99	Q1 20	24/03/2020	8.2	6	376	0.067	0.1	39	119
Edera	SW-94	Q3 17	14/08/2017	8	9	399	0.1	<.05	36	77
Edera	SW-95	Q3 17	14/08/2017	7.7	8	286	0.37	0.1	41	155
Edera	SW-96	Q3 17	14/08/2017	7.9	5	318	0.17	<.05	41	108
Edera	SW-97	Q3 17	14/08/2017	7.8	5	316	0.02	0.07	28	72
Edera	SW-98	Q3 17	14/08/2017	8.1	10	354	0.09	<.05	34	66
Edera	SW-99	Q3 17	14/08/2017	8	5	380	0.02	<.05	17	32
Edera	SW-95	Q3 16	12/09/2016	7.1	5	154	0.09	<.05	97	315
Edera	SW-96	Q3 16	12/09/2016	7.5	5	216	0.03	0.09	63	121
Edera	SW-97	Q3 16	12/09/2016	7.6	5	250	0.14	0.07	64	122

Rehabilitation of cutaway peatland is closely linked with control of emissions. One of the criteria for successful rehabilitation is stabilisation through re-vegetation, which will stabilise all substrates and in turn remove the need for further silt control measures. Re-wetted peat also aid the primary objective of stabilizing peat, as when peat is re-wetted it is not vulnerable to wind erosion. Re-wetted peat and the development of wet peatland habitats can also act as sinks for silt and mobile peat, and increases additional retention time for solids, and the peatland vegetation can quickly stabilise this material within blocked drains on site (by acting like constructed wetlands).

Water quality of water discharges from restored peatlands normally improves as a result of bog restoration measures and the restoration of natural peatland processes (Bonn *et al.*, 20017). Bog restoration is also expected to improve water attenuation of the site as the drains are blocked, slowing water movement and water release from the site. Restored peatlands help slow the release of water and aid the natural regulation of floods downstream (Minayeva *et al.*, 2017). The National River Basin Management Plan (NRBMP) 2018-2021 (DHPCLG, 2017) is the key national plan for Ireland to achieve the objectives of the Water Framework Directive (WFD). The NRBMP outlines how key actions such as the Bord na Móna raised bog restoration programme is expected to have a positive impact on water quality and help the NWBMP deliver its objectives in relation to the WFD.

Water will still discharge from designated emission points when rehabilitation at Edera has been completed. This discharge will have improving water quality and there will be increased wetland attenuation, meaning slower release of water. This is expected to have a positive impact on status of the key water body receptor, Lough Ree, and is expected to support the retention of the current and future status of the Lough Ree as being of Good Status.

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 Móna 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 (Figure 3.8). Similarly monitoring of surface water ammonia emissions from a Corlea bog in Mountdillon over the past 3 yrs. post cessation of peat extraction with ongoing rehabilitation, indicate downward trends (Figure 3.9).

As the monthly monitoring program at Edera Bog 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.

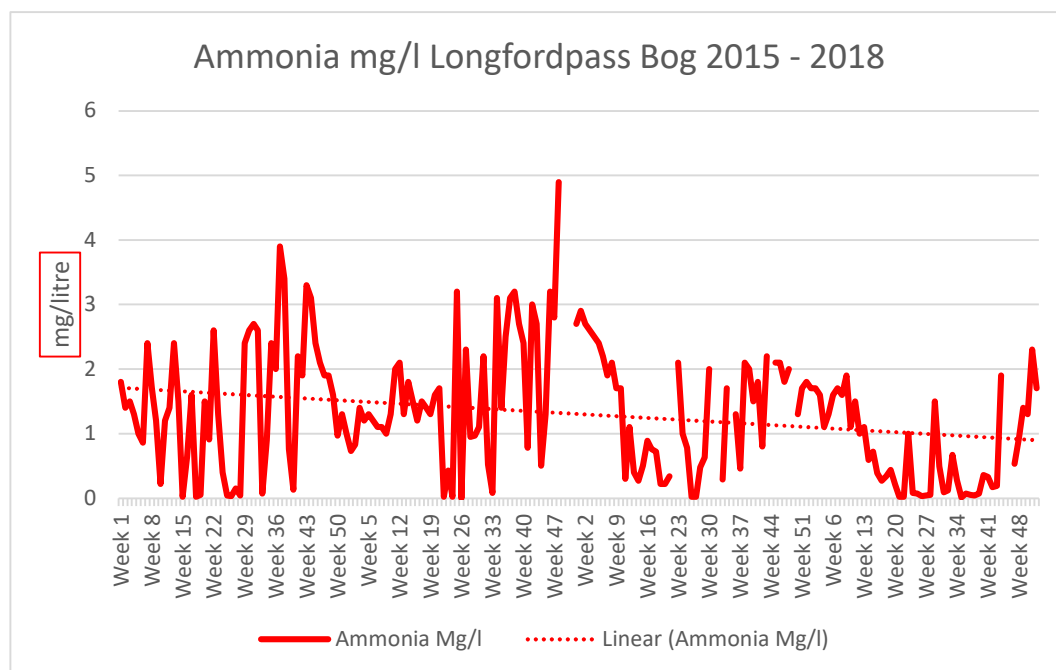


Figure 3.8 Ammonia monitoring results from Longfordpass Bog, 2015-2018

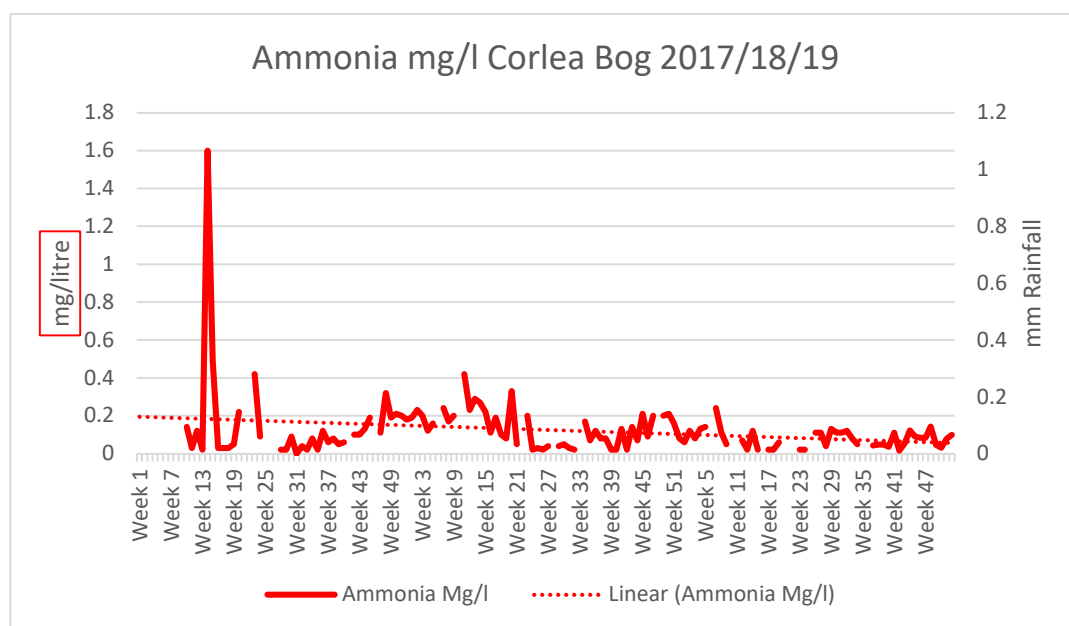


Figure 3.9 Ammonia monitoring results from Corlea Bog, 2017-2019

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 currently a carbon source as it is a drained (degraded) peatland with some active drainage, which facilitates the oxidation of peat. Peat extraction generally transforms a natural peatland 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 C-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 CO₂ and a source for Methane) 6 years after bog restoration was carried out (Renou-Wilson *et al.* 2018).

It is expected that Edera Bog will become a reduced Carbon source following rehabilitation. The site does have potential to become a carbon sink, in part, in the longer-term. The potential of any cutaway site to develop as a 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 embryonic *Sphagnum*-rich peat-forming habitats along with scrub, some fen and some wetland habitats such as Reed Swamp. 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 Lough Ree SAC (NPWS Site Code: 000440) and Lough Ree SPA (NPWS Site Code: 004064) on the western section of the site and this area is deemed to be of **International Importance**.

The area of remnant high bog in the western section of Edera Bog is rated as being of **county importance**, due to this habitat undergoing a decline in quality and extent at the national level (NRA, 2009). The Bilberry River and associated wet grassland habitats are likely to be of **Local Importance (higher value)** as they will be used as a wildlife corridor, linking habitats. The majority of this site is deemed to be of **Local Importance (lower value)** due to the dominance of bare peat formerly managed for industrial peat production.

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 more extensive areas of active raised bog.

3.10 Edera Bog Characterisation Summary

Edera Bog is located approximately 4.5km to the west of Ballymahon in Co. Longford on the shore of Lough Ree. Edera Bog only commenced peat production in 2003, with all commercial peat extraction ceasing in 2018. The majority of the bog is therefore classed as deep peat cutover, as it has deep residual peat (>2 m). Edera is located close to Lough Ree and a portion of the bog along the Bilbery River is prone to seasonal flooding. The margin of Edera partially overlaps two European protected sites which occur where Lough Ree adjoins the western boundary.

The bog can be broadly divided into four categories: (1) bog remnants, (2) deep residual peat, (3) shallow cutaway bog prone to winter flooding, (4) marginal and other dry areas of the former production area. (The bog is developed into these four 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) The western bog remnant is the only bog remnant with raised bog restoration potential. Other bog remnants are quite small, narrow and subject to ongoing turf cutting via turbary.
- (2) 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.
- (3) The cutaway bog prone to winter flooding is located along the Bilbery River. This part of the former production area has shallow or no residual peat and the sub-soil is exposed. The sub-soil is limestone-based glacial deposits and lacustrine marl, and likely to have a more alkaline influence on the vegetation. This area is expected to develop wetland vegetation with fen and Reeds swamp. Rehabilitation measures are proposed to block drains to manage summer water-levels and create a shallow wetland with emergent vegetation. This area will continue to be inundated with winter flooding. A berm is proposed to protect the marginal land, help maintain summer water levels and direct water flows.
- (4) Some parts of the former production area will be relatively dry. This includes headlands and high fields. Two areas of higher ground have also been identified 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.

There is a minor amount of former production area that is constrained from rehab due to archaeology or rights of way.

Longford Council are proposing the construction of a walkway along the former railway at Edera. These proposed project is compatible with the proposed rehabilitation.

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 Mountdillion group bogs including Edera Bog with various stakeholders in relation to:

- Longford Wetland Wilderness (general proposal led by Longford County Council and other stakeholders. This has had several iterations. See Lough Ree and Mid Shannon, Spirit Level 2017. A feasibility study for Longford County Council).
- Feehan, J. (2004) A Long-Lived Wilderness; the future of the north midlands peatland network UCD/NWWPC.
- Lauder, A. & O'Toole L. (2017). Concept development for a landscape-scale Wetland Wilderness Park in the Mid Shannon Region. A report funded by the Heritage Council's Heritage Grant Scheme.
- Foss, P.J., Crushell, P. & Gallagher, M.C. (2017). Counties Longford & Roscommon Wetland Study. Report prepared for Longford and Roscommon County Councils.
- Midlands & East Regional WFD Operational Committee (River Basin Management Plans).
- Sub-committee on Shannon Flooding Work Programme and Measures (OPW, Waterways Ireland, ESB, LA's, Fisheries Ireland, NPWS, etc.).
- Archaeological Liaison Committee (National Museum of Ireland & Dept. of Culture, Heritage and the Gaeltacht).
- Proposed greenway development (Longford County Council).

To inform the current Plan, both national and local stakeholders, including neighbours whose land adjoins Edera 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 Edera Bog (see Appendix XI).

Consultation was carried out in 2019 on an earlier draft of this plan and additional consultation was carried out in 2020/2021.

Consultation in 2019 included:

- May 2019: Separate meetings with neighbour and representative from Longford County Council's Planning Section.
- May 2019: Written response received from IPCC in relation to consultation invitation on Edera Bog.
- June 2019: Meeting (on site) with regional NPWS representative.

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 Edera Bog. These letters included information about PCAS as well as contact details for further information. An

advertisement about PCAS was also printed in the Longford Leader (January 2021) (a local newspaper that covers the Edera 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 both the current and previous drafts of the rehabilitation plan for Edera Bog – these are summarised below.

4.2.1 Assessments of rehabilitation

Queries on pre-rehabilitation assessments were raised by NPWS, Longford County Council and the National Museum of Ireland in relation to Appropriate Assessment, Environmental Impact Assessment and Strategic Environmental Assessment.

4.2.2 *Sphagnum* inoculation

NPWS raised the idea of inoculating some of the rehabilitated deep peat areas with *Sphagnum* if the site did not naturally see *Sphagnum* re-colonisation after 2-3 years. A potential donor site of Fisherstown Bog was indicated during discussions.

4.2.3 Restoration scope

Restoration/rehabilitation of marginal habitats was raised by IPCC and BCI as worthy of consideration within the rehabilitation measures to support carbon sequestration and biodiversity objectives.

4.2.4 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.

4.2.5 Flooding

The IFA, ICMSA and two neighbours of Edera Bog 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.

4.2.6 *Conservation grazing*

A neighbouring farmer suggested it may be of value to explore conservation grazing with ponies on part of the site. Trialling this management option was supported in discussions with NPWS regional staff.

4.2.7 *Other issues*

Other issues (raised by IPCC) included after use of the bog and turf cutting on the margins of the bog (outside of the area owned by Bord na Móna).

Longford County Council proposes to undertake a project comprising the construction of amenity trackway through part of Edera Bog.

A technical issue relating to a Bord na Móna railway bridge on the site was raised.

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*

AA screening will be undertaken on all the bogs as part of PCAS and this is currently being undertaken by external consultants for Edera 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. Bord na Móna aim to achieve this through 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 *Sphagnum inoculation*

Sphagnum inoculation has been proposed at Edera Bog as part of PCAS measures

4.3.3 *Restoration scope*

As part of the PCAS, all restoration/rehabilitation options have been developed to support climate action and biodiversity objectives.

4.3.4 *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 Edera 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 Edera Bog. The re-colonisation of species such as Large Heath is likely to take a longer timeframe.

4.3.5 *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 Edera Bog will generally result in reduced runoff and drainage from the existing peat fields through a mixture of techniques including drain blocking, cell bunding and re-profiling. 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.

4.3.6 *Conservation grazing*

The primary aim of the rehabilitation of Edera is the re-wetting of habitats to restore Carbon-sink function and improve these habitats for biodiversity. Conservation grazing can be a valuable tool in supporting biodiversity-rich habitats in agricultural landscapes, but would be less common in wetland and peatland habitats (although there are examples of using conservation graziers in fen habitats). From an animal welfare perspective, it would be important to ensure that the habitats post-re-wetting are suitable to support animals, and that appropriate types and breeds are available, along with animal husbandry resources. As a result, conservation grazing is not being proposed in the short-term rehabilitation options for Edera Bog, but may be considered in the medium-

term if suitable habitats for conservation graziers are present, and an appropriate mechanism for the management and supervision of such stock can be identified and secured.

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.

Amenity such as the greenway proposed by Longford County Council can be positively aligned and integrated to after-use plans following the completion of the proposed rehabilitation at Edera Bog. Rehabilitation measures proposed for Edera Bog do not need to be amended to integrate any future amenity track positioned along the margin of the former production bog or along the former bog railway.

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 Mid-Shannon Wilderness Park and proposed Biosphere Reserve. Bord na Móna are currently working with Longford County Council to develop c.10km of greenway trails through our peatlands at Corlea, Knappogue and Derryarogue.

Other issues, including after-use and management issues outside the boundary of Edera Bog, are acknowledged but are specifically outside the scope of this rehabilitation plan. This includes the technical issue relating to a Bord na Móna railway bridge on the site, which is currently being investigated and a response will be issued to the query as soon as this has been resolved internally. However, this issue does not directly relate to the proposed rehabilitation measures in PCAS.

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 future potential amenity (greenway).

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 Edera 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).

- Re-wetting will benefit the future preservation of most known and unknown archaeological features.

6. SCOPE OF REHABILITATION

The principal scope of this enhanced rehabilitation plan is to rehabilitate the bog. This is defined by:

- The area of Edera Bog (Figure 3.1).
- EPA IPC Licence - Ref. P0504-01. 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 proposed rehabilitation is designed to exceed the requirements as defined by the IPC Licence. PCAS is designed to enhance the ecosystem services of Edera 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 Edera 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 Edera 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 Edera 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 Edera Bog that overlaps with the protected European sites (no measures proposed as there are no drains to target).

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 Edera 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.
- **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 Edera 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 Edera 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 Edera 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 measure successful rehabilitation and what critical success factors are needed to achieve successful rehabilitation. All criteria used to indicate successful rehabilitation will be measured to validate the achievement of the rehabilitation goals and outcomes and validate the completion of the rehabilitation.

The key objective of this enhanced 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 key emissions (e.g. potential silt run-off).

In addition, Bord na Móna wish to optimise climate action and other ecosystem service benefits via additional rehabilitation measures. These measures will significantly go beyond what is required to meet rehabilitation and decommissioning obligations under existing EPA IPC licence conditions. The proposed improvements 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.

In general, the key objective will be to optimise the area of suitable hydrological conditions for climate action benefits (re-wetting peat and keeping water levels close to the peat surface) across this heterogeneous cutaway landscape to accelerate the trajectory of establishment of embryonic *Sphagnum*-rich habitats on suitable deep peat areas and optimise water levels in the shallow cutaway areas for the development of Reed swamp and fen habitats.

7.1. Criteria for successful rehabilitation to meet EPA IPC licence conditions:

- Rewetting of deep 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 through a combination of rehabilitation measures, and reducing the area of bare exposed peat. 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 stabilizing/improving concentration of suspended solids and ammonia in discharges from Bord na Móna 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.

(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	Monthly Water quality monitoring. Started in advance of the proposed rehabilitation.	2021-2023
IPC validation	Reducing pressure from	At Risk classification will see improvements in the	EPA WFD monitoring programme	WFD schedule

	peat production on the local water body catchment (WFD)	associated pressures from this peatland or if remaining At Risk, that there is an improving trajectory in the pressure from this peatland	Additional BnM water quality monitoring	
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 may 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 enhanced measures to optimise climate action. This will focus on collecting a range of scientific data that can then quickly be adapted 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 8.1-8.4) 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 future refinement of the enhanced rehabilitation measures.)

These enhanced measures for Edera bog will include (see Figure 8.5):

- Re-wetting the deep peat areas of the bog using berms, drain blocking 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 more intensive drain blocking using an excavator to create up to a max of 7 no. peat blockages every 100 m along each field drain, along with field re-profiling and drain infilling if required;
- Re-alignment of piped drainage;
- Blocking drains in targeted marginal (degraded) high bog/cutaway areas and re-wetting, where possible, using an excavator to install peat blockages, up to a max of 7/100m. Some bog remnants are too small to benefit from this approach;
- Targeted fertiliser applications on bare peat areas to accelerate vegetation establishment on headlands and high fields.
- Seeding of vegetation and inoculation of *Sphagnum* in suitable deep residual peat; and
- Modifying water levels at outfalls. This will further slow the movement of water through and out of Edera Bog.
- Water level management through blocking of outfalls, overflow management, field re-profiling, and the creation of berms to rewet cutaway.
- 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).

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).

8.1 Short-term planning actions (0-1 years)

- Seek formal approval of the enhanced plan 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 PCAS) will be applied to Edera 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 assessment of the proposed enhanced rehabilitation measures;
- Carry out a review of known archaeology and an archaeological impact assessment 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. A known right of way exists along across one of the Bord na Móna 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, 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, cell-bunding and fertiliser applications targeting headlands, high fields and other areas (where required). All rehabilitation will be carried out with regard to 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 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;
- Evaluate opportunity for conservation grazing option post re-wetting including available resources for management and husbandry;
- 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).

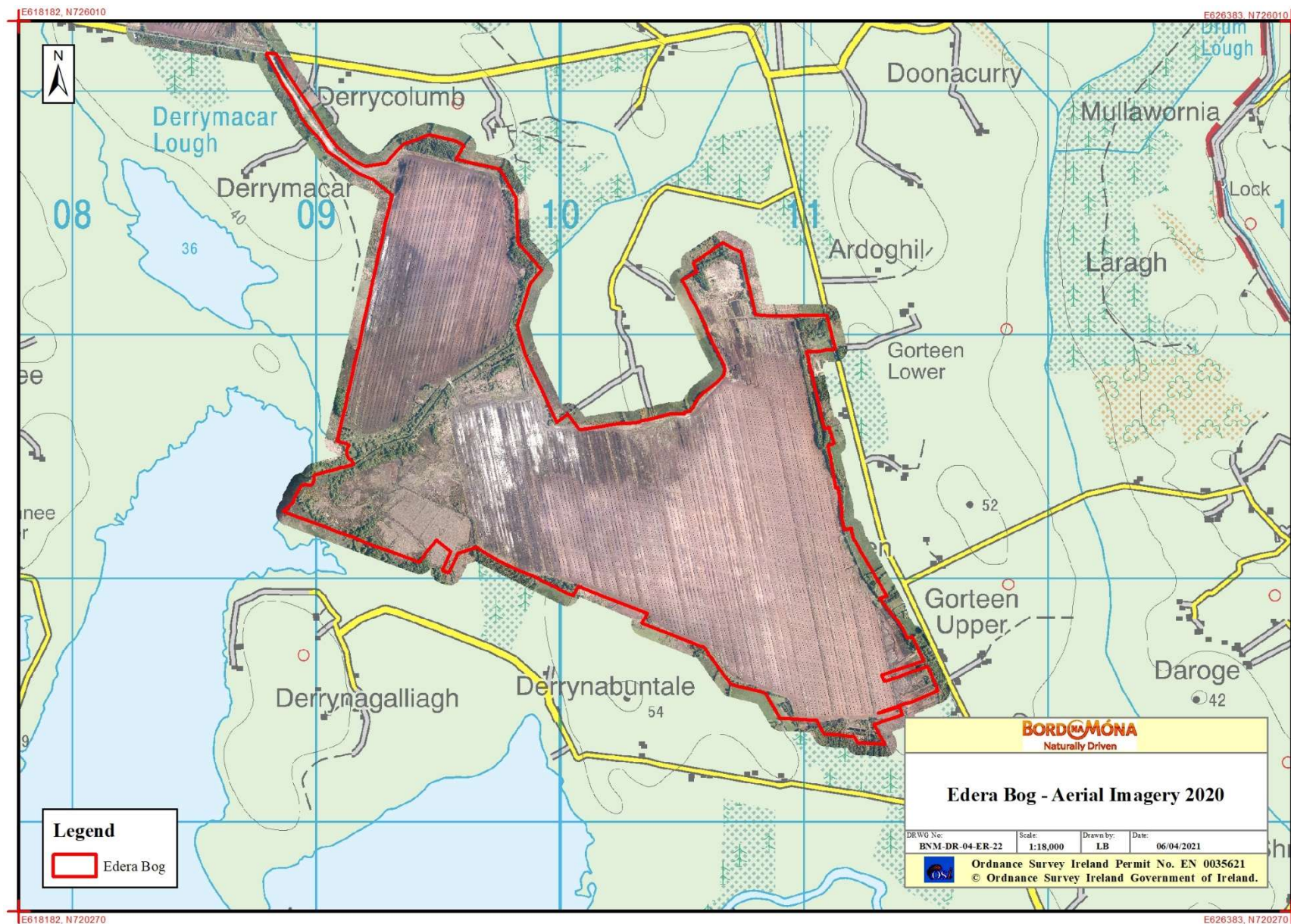


Figure 8.1. Aerial photo of Edera Bog. The production bog is bare peat. The cutaway area is visible as exposed whitish sub-soil.

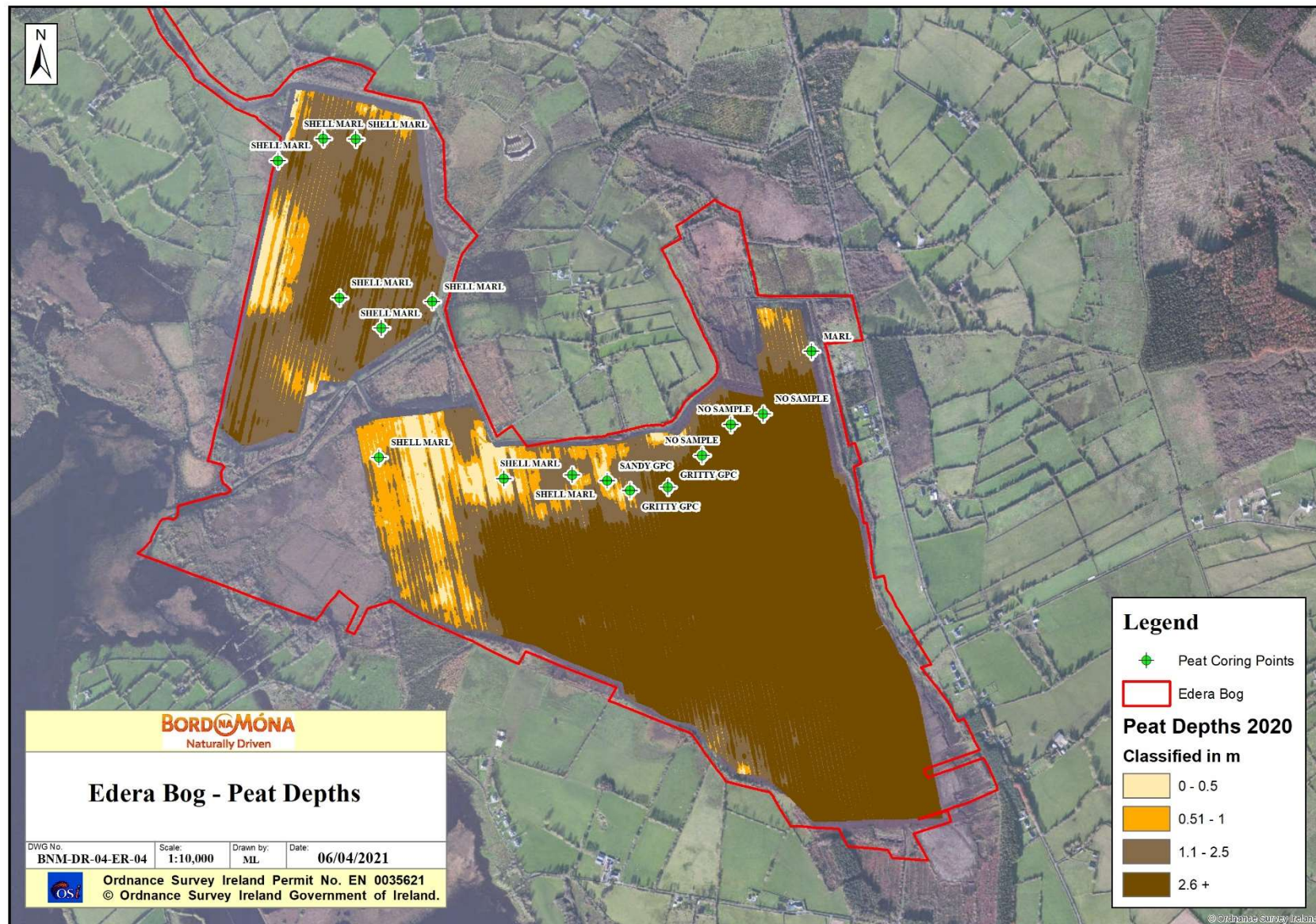


Figure 8.2. Peat depth map for Edera Bog. The majority of the bog is characterised as deep peat cutover bog.

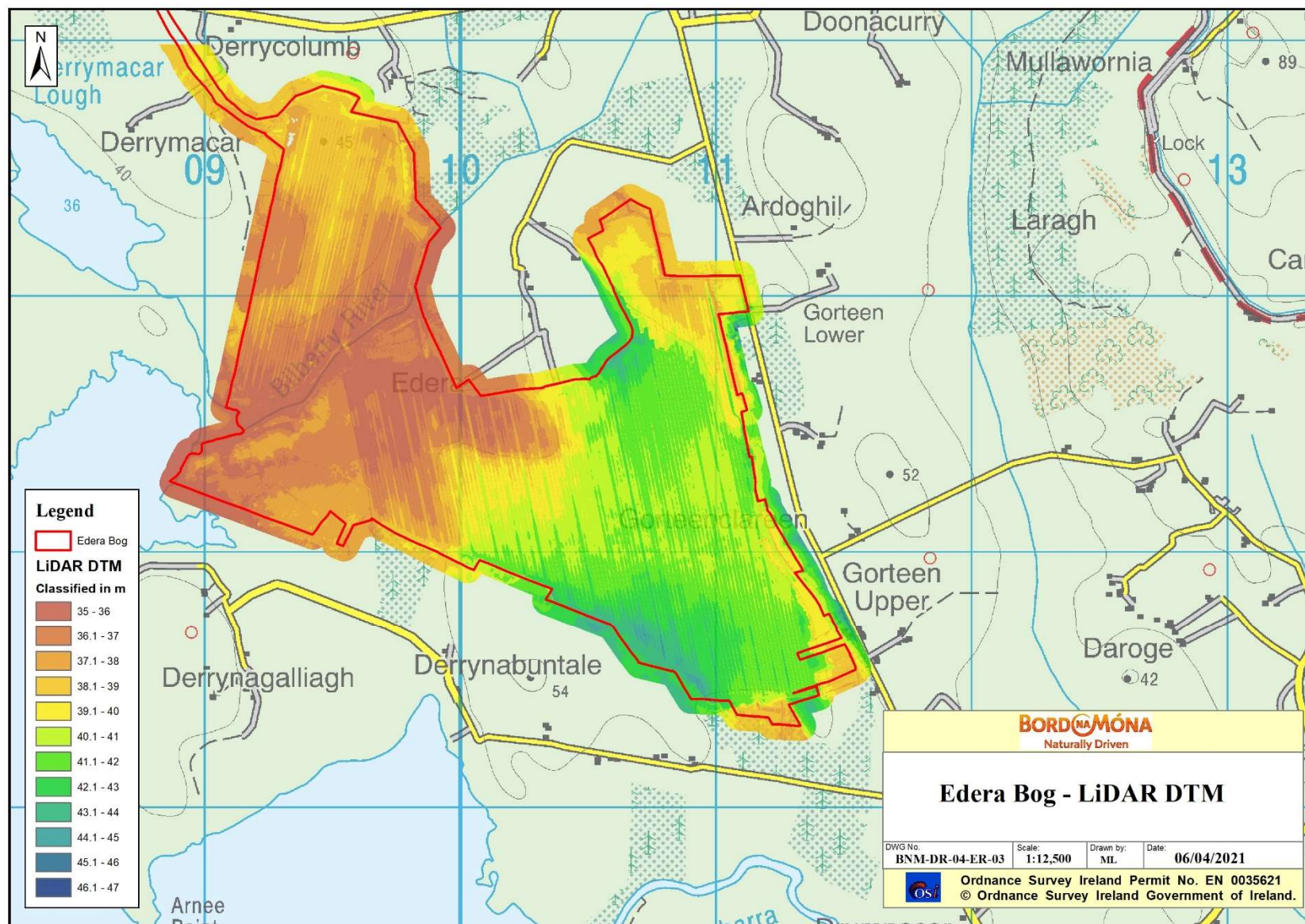


Figure 8.3. LIDAR topography map of Esker Bog. Low areas and basins are orange-yellow, more elevated areas are blue-green.

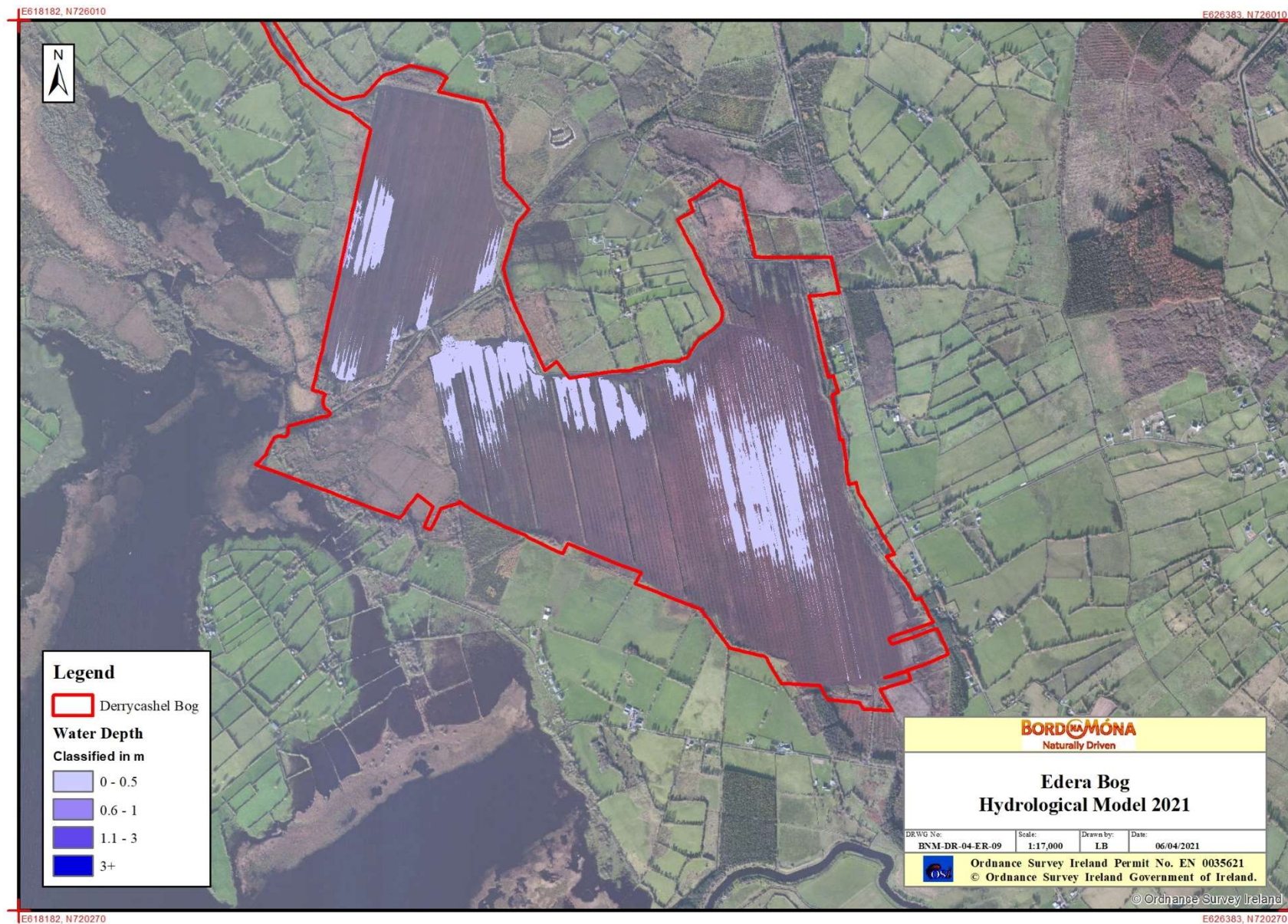


Figure 8.4. Hydrological modelling for Edera Bog showing range of expected water depths based on current topography.

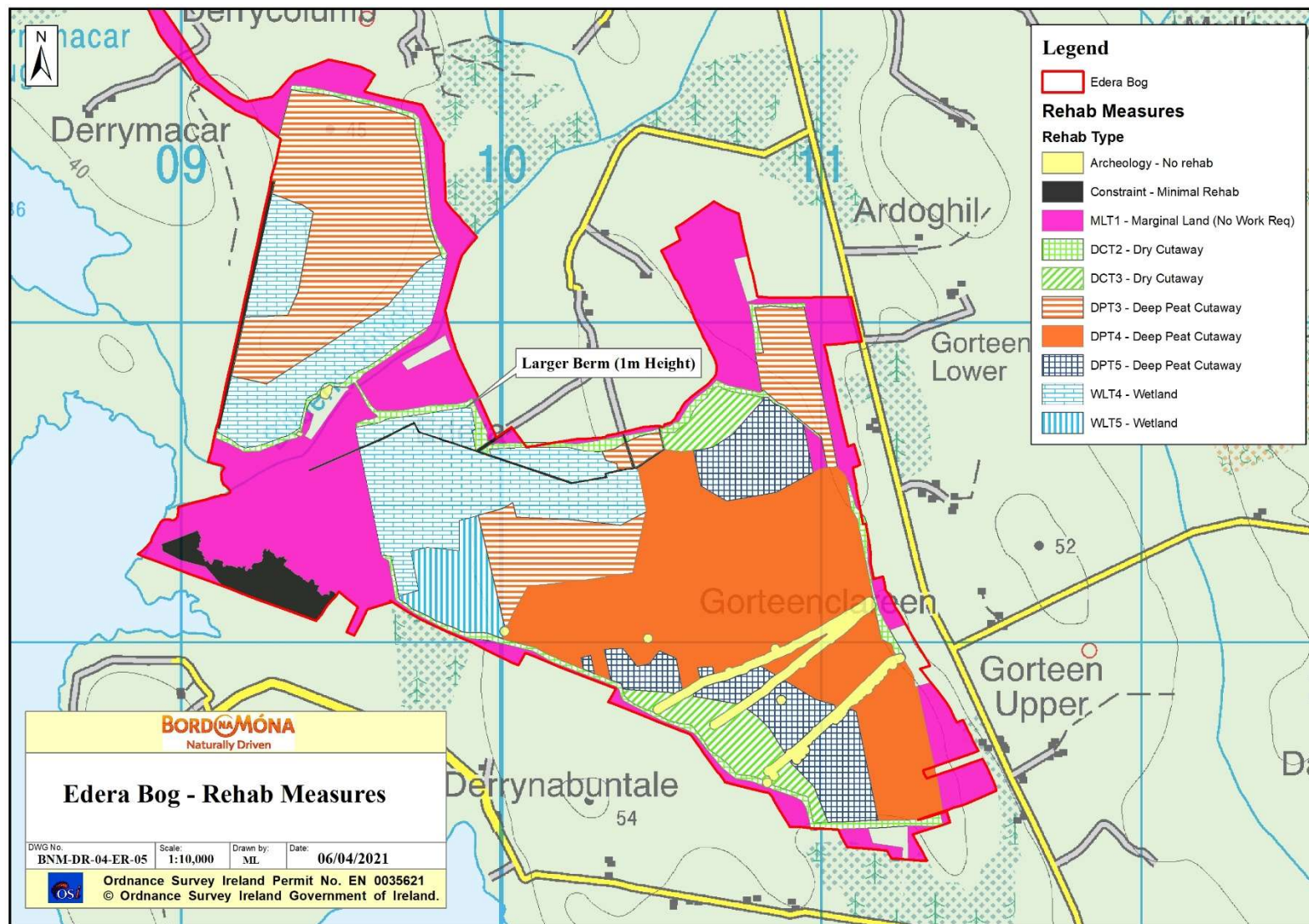


Figure 8.5. Indicative Enhanced Rehabilitation Plan for Edera Bog. Note that the actual distribution of these measures may be subject to change in response to stakeholder consultation and refinement of the enhanced rehabilitation measures.

Table 8.1 *Enhanced rehabilitation measures and target area at Edera Bog. 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.*

Type	Code	Description	Area (Ha)
Deep peat cutover bog	DPT1	Regular drain blocking (max 3/100 m) + blocking outfalls and managing water levels with overflow pipes	
	DPT2	More intensive drain blocking (max 7/100 m) + blocking outfalls and managing overflows (follows best practise raised bog restoration for drained high bog)	
	DPT3	More intensive drain blocking (max 7/100 m), + field reprofiling + blocking outfalls and managing overflows	48.9
	DPT4	Berms and field re-profiling (45m x 60m cell) + blocking outfalls and managing overflows + drainage channels for excess water + <i>Sphagnum</i> inoculation	60.5
	DPT5	Cut and Fill cell bunding (30m x 30m cell) + blocking outfalls and managing overflows + drainage channels for excess water + <i>Sphagnum</i> inoculation	19.7
Dry cutaway	DCT1	Blocking outfalls and managing water levels with overflow pipes	
	DCT2	Regular drain blocking (max 3/100 m) + blocking outfalls and managing water levels with overflow pipes + targeted fertiliser treatment	10.3
	DCT3	More intensive drain blocking (max 7/100 m) + blocking outfalls and managing overflows + targeted fertiliser treatment	9.7
Wetland cutaway	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 (max 7/100 m), + blocking outfalls and managing overflows + transplanting Reeds and other rhizomes	41.9
	WLT5	More intensive drain blocking (max 7/100 m), + field reprofiling + blocking outfalls and managing overflows + transplanting Reeds and other rhizomes	7.0
Marginal land	MLT1	No work required	67.4
	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	3.3
		Constraints	6.7
		Archaeology constraints	6.7
Total			282.1

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. This will be used to verify completion of rehabilitation measures. The extent of bare peat will be assessed using this baseline data, and habitat maps will be updated, if required.
- **Water quality monitoring** at the bog will be established. 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.
- 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 enhanced 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 criteria for successful rehabilitation are being achieved and key targets 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 criteria for successful rehabilitation have **not** been achieved and key targets 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 that are compatible the provision of biodiversity and ecosystem services, 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 enhanced rehabilitation. These proposed monitoring measures will be funded by the proposed Climate Action Fund 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 key targets 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 Edera Bog (Figure 3.1).
- EPA IPC Licence - Ref. P0-504-01. 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. Edera bog is part of the Mount Dillon 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 Edera Bog will be left unblocked as blocking boundary drains could affect adjacent land.

Rehabilitation goals and outcomes

The key rehabilitation goal and outcome for Edera 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/excavator to create regular peat blockages (three blockages per 100 m) along each field drain;
- Creation of a low berm to retain water on site between former production area and Bilberry River.
- Re-alignment of piped drainage.
- No measures are planned for the other surrounding marginal peatland habitats.
- Silt ponds will continue to be maintained during the rehabilitation and decommissioning phase.
- 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. 1st phase of rehabilitation. Field drain blocking.
- 2021. 2nd phase. Further realignment of piped drainage and other re-wetting measures dependent on success of 1st 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.

Budget and Costing

- Bord na Móina maintains a Provision on its balance sheet to pay for the future costs of rehabilitation and decommissioning when industrial peat extraction ceases. This is updated every year. For more information see the Bord na Móina Annual Report (Bord na Móina 2020). Bord na Móina is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence.
- At this time, a basic rehabilitation provision has been allocated to the site based on the area degraded raised bog across the site.

Table AP-1. Rehabilitation measures and target area.

Type	Code	Description	Area (Ha)
Deep peat	DPT1	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes	138.7
Dry cutaway	DCT1	Blocking outfalls and managing water levels with overflow pipes	13.1
Wetland	WLT1	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes	53.6
Silt Pond			4.4
	MLT1	No work required (Marginal land including Silt Ponds)	70.9
Archaeology			0.6
Constraint			0.9
Total			282.1

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.
- 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.

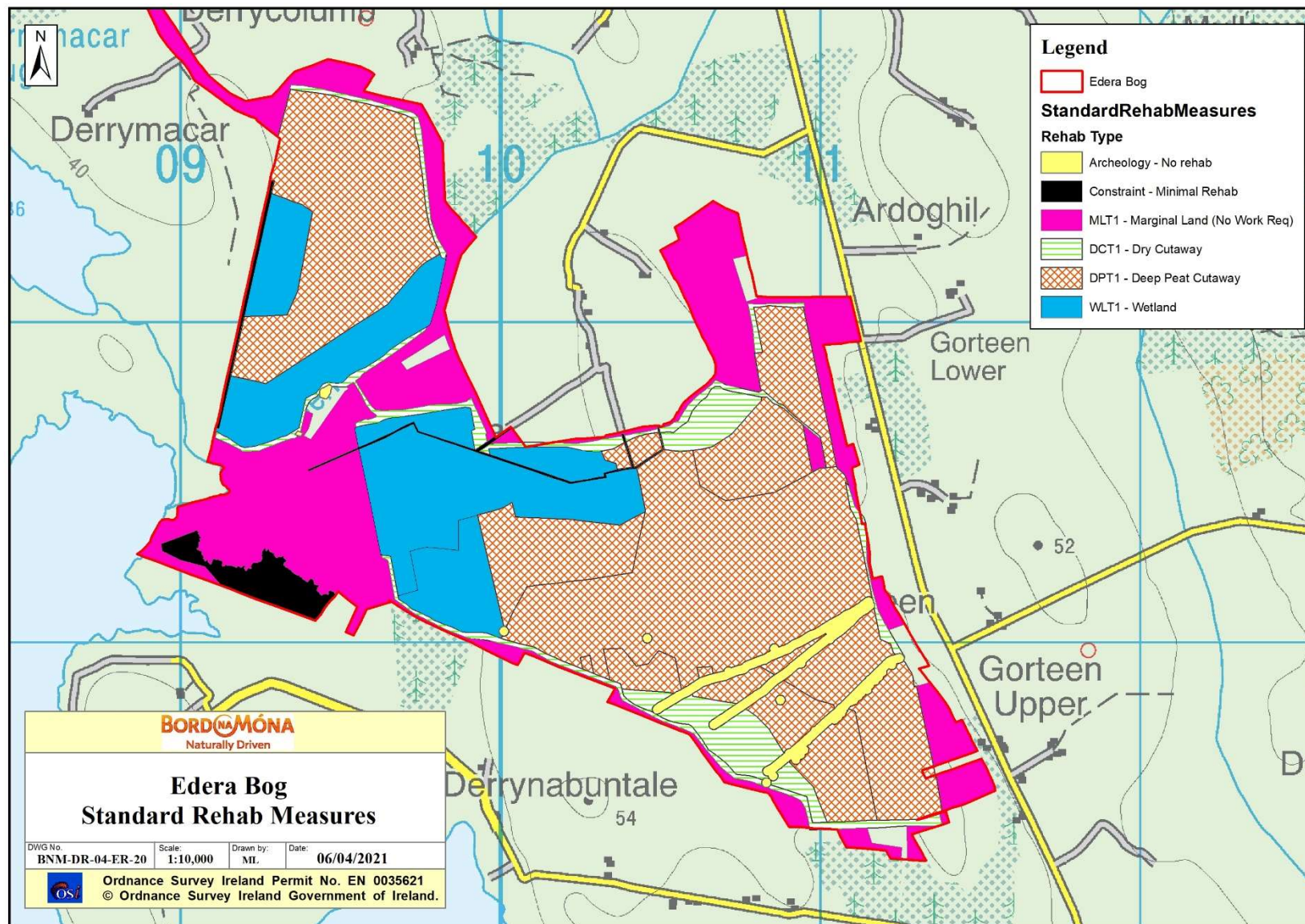


Figure Ap-1. Indicative standard rehabilitation plan for Edera Bog.

APPENDIX II: BOG GROUP CONTEXT

The Mount Dillon Bog Group IPC Licensed area is made up of two sub-groups Mount Dillon and Mostrim) and have been in industrial peat production for several decades. There are 28 defined sites covering a total area of 11,138 ha. Of the 28 sites, 23 mainly straddle the River Shannon within counties Roscommon and Longford, with five sites partially in County Westmeath to the east. 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 Lanesborough (LRP) or for horticultural peat products.

Industrial peat extraction in the Mount Dillon Bog Group ceased in 2019. It is planned to supply remaining milled peat stocks to Lanesborough (LRP) during 2020. Both power stations will cease using peat by the end of 2020. All remaining peat stocks will also be removed. Intensive decommissioning and rehabilitation for the Mount Dillon Bog Group is expected to start in 2020/2021.

One bog site, Cloonmore, was never used for industrial peat production and several bogs in the Mostrim group have been drained but never fully developed and still retain typical high bog characteristics. These include Clonwhelan, Glenlough and a section of Mostrim. These sites have been zoned for biodiversity and a high bog drain blocking will be used to re-wet the high bog and encourage restoration of the raised bog habitat. Several sites (Glenlough, Mostrim, Clonwhelan and Clynan) were assessed by consultants for NPWS as part of the review of the raised bog Natural Heritage Area network (NPWS 2014).

A breakdown of the component bog areas for the Mount Dillon Bog Group IPC License Ref. PO504-01 is outlined in Table Ap-2. These areas are also outlined on Figure Ap-2 (Map of the Mount Dillon Bog Group).

Industrial peat production history varies across the Mount Dillon bog group, so there is a wide range of peat depths at present. Bogs close to Lanesborough tend to have shallower peat depths or have been cutaway, while some bogs on the periphery of the group tend to have deeper peat reserves. Several sites such as Mount Dillon and Garryduff have been mostly cutaway to the fen peat layers or in some cases to expose the underlying gravel/sub-soil. Several bogs in the Mostrim group have only been partially developed or have had no industrial peat production, and have relatively deep peat depths.

Table Ap-2a: Mount Dillon Bog Group names, area and indicative status (Mount Dillon Energy Peat sub-group).

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Begnagh	265	Cutover Bog Industrial peat production commenced at Begnagh Bog in 1977. Deep peat reserves remain on much of the former production area. Pumped bog drainage.	Begnagh Bog formerly supplied fuel peat for Lough Ree Power Some areas of cutaway on site are developing pioneer cutaway vegetation communities. LCC are proposing an amenity walkway for this bog	2020	Draft 2017
Clooneeny	358	Cutover Bog Industrial peat production commenced at Clooneeny Bog in 1985 and ceased in 2020. Deep peat reserves remain on much of the former production area. Clooneeny is considered a deep peat cutover bog. Pumped bog drainage.	Clooneeny Bog formerly supplied including; horticultural peat and fuel peat for Lough Ree Power Most of the former production area on site is bare peat. Some areas of cutaway on site are developing pioneer cutaway vegetation communities. Bog restoration has been carried out in a bog remnant that was damaged by turf cutting trespass.	2020	Draft 2017

			LCC are proposing an amenity walkway for this bog		
Cloonmore	102	N/A	Never developed for industrial peat production; scattered plots.	N/A	N/A
Cloonshannagh	494	Cutover Bog Industrial peat production commenced at Cloonshannagh Bog in 1985. Deep peat reserves remain across the former production area. Cloonshannagh is considered a deep peat cutover bog.	Cloonshannagh Bog formerly supplied horticultural peat, and fuel peat for Lough Ree Power Restoration work has been carried out on a 38ha section of high bog within Cloonshannagh Bog. Some of the former production area on site is developing pioneer cutaway vegetation communities, the remainder of the site is bare peat	2020	Draft 2017
Cloonshannagh Rail Link	28	Cloonshannagh rail link is a link between sites.	N/A	N/A	N/A
Corlea	163	Cutaway Bog Industrial peat production commenced at Corlea Bog in 1960. Long-term peat extraction has created shallow cutaway. Corlea was a pumped bog. Pumped bog drainage – pumping has ceased.	The former production area at Corlea has already extensively colonised. Pioneer wetland and scrub development has occurred over much of the site. Large wetlands have developed with the cessation of pumping. Some wetland and rehabilitation management was undertaken between 2016-2019. Part of site leased to local community development group to develop amenity walkway in association with Longford County Council. LCC are proposing an amenity walkway for this bog	2018	Finalised 2019
Derraghan	289	Cutover Bog Industrial peat production commenced at Derraghan Bog in the 1940's. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derraghan is considered a shallow peat cutover bog. Pumped bog drainage.	Derraghan Bog formerly supplied fuel peat for Lough Ree Power. Part of the site developed into a licenced ash facility for Lough Ree Power. Much of the former production area at Derraghan has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities. A small area has been used for a BirchWater trail as part of the BnM Herbs Project.	2020	Draft 2017
Derryadd	653	Cutover Bog Industrial peat production commenced at Derryadd Bog in 1960. Long-term peat extraction has left shallow cutaway. Some pockets of deep peat remain. Pumped bog drainage.	Much of the former production area has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities Derryadd Bog is part of the footprint of Derryadd Windfarm for which planning permissions were granted in 2020. An amenity walkway is proposed.	2020	Draft 2019
Derryadd2	328	Cutover Bog Industrial peat production commenced at Derryadd 2 Bog in 1960. Long-term peat extraction has left shallow cutaway. Some pockets of deep peat remain. Pumped bog drainage.	Much of the former production area has been out of peat production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities Derryadd 2 Bog is part of the footprint of Derryadd Windfarm for which planning permissions were granted in 2020. An amenity walkway is proposed.	2020	Draft 2019
Derryarogue	895	Cutaway Bog Industrial peat production commenced at Derryarogue Bog in 1941. Long-term peat extraction has left shallow cutaway. Some pockets of deep peat remain. Pumped bog drainage – pumping has been reduced.	Much of the former production area has been out of production for some time. These areas have already extensively colonised with pioneer wetland, cutaway and scrub vegetation communities. Derryarogue Bog is part of the footprint of Derryadd Windfarm for which planning permissions were granted in 2020. An amenity walkway is proposed.	2020	Draft 2019

Derrycashel	388	Cutaway Bog Industrial peat production commenced at Derrycashel Bog in 1951. Long-term peat extraction has left shallow cutaway. Some pockets of deep peat remain. Pumped bog drainage – pumping has been reduced.	Derrycashel Bog formerly supplied fuel peat for Lough Ree Power Much of the former production area at Derrycashel has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities. Some wetland and rehabilitation management was undertaken (c.60ha) between 2014-2015.	2018	Draft 2021
Derrycolumb	454	Cutaway & Cutover Bog Industrial peat production commenced at Derrycolumb Bog in the 1980's. Most of the former production area still has deep peat reserves. Pumped bog drainage.	Derrycolumb Bog formerly supplied fuel peat for Lough Ree Power Much of the former production area at Derrycolumb has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities. LCC are proposing an amenity walkway for this bog	2019	Draft 2021
Derrymoylin	356	Cutover Bog Industrial peat production commenced at Derrymoylin Bog in 1985 and ceased in 2020. This site still has residual deep peat.	Derrymoylin Bog formerly supplied fuel peat for Lough Ree Power. Most of the former production area on site is bare peat.	2020	Draft 2017
Derryshannoge	452	Cutover Bog Industrial peat production commenced at Derryshannoge Bog in 1985 and ceased in 2020. This site still has residual deep peat. Pumped bog drainage.	Derryshannoge Bog formerly supplied fuel peat for Lough Ree Power. Much of the former production area at Derryshannoge has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation communities.	2020	Draft 2017
Edera	281	Cutover Bog Development for industrial peat production commenced at Edera Bog in 1990's. Active extraction from Edera began in 2003 and ceased in 2018. This site still has residual deep peat.	Edera Bog formerly supplied fuel peat for Lough Ree Power. The majority of the former production area is bare peat. LCC are proposing an amenity walkway for this bog	2020	Draft 2021
Erenagh	93	Cutover Bog Development for industrial peat production commenced at Erenagh Bog in 1970's. This site still has residual deep peat. Pumped bog drainage.	Erenagh Bog formerly supplied; fuel peat for Lough Ree Power. Much of the former production area has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation communities.	2020	Draft 2017
Granaghan	212	Cutover Bog Development for industrial peat production commenced at Granaghan Bog in 1980's. This site still has residual deep peat. Pumped bog drainage.	Granaghan Bog formerly supplied horticultural peat, and fuel peat for Lough Ree Power. The majority of Granaghan Bog former production area is bare peat.	2020	Draft 2017
Killashee	110	Cutover Bog Development for industrial peat production commenced at Killashee Bog in 1985. This site still has residual deep peat.	Killashee Bog formerly supplied horticultural peat, and fuel peat for Lough Ree Power. The majority of Killashee Bog former production area is bare peat. Some areas have colonised with pioneer cutaway and scrub vegetation communities.	2020	Draft 2017
Knappoge	313	Cutaway Bog Peat Production at Knappoge bog commenced in 1963. Peat depths on the former production area are generally shallow. Pumped bog – pumping has now been stopped	Knappoge Bog formerly supplied fuel peat for Lough Ree Power. The majority of Knappoge Bog former production area is bare peat. Some areas have colonised with pioneer cutaway and scrub vegetation communities. Ceasing pumping has created large wetlands. An amenity trackway is under construction.	2018	Draft 2021
Lough Bannow	739	Cutaway Bog Peat Production at Lough Bannow bog commenced in the 1960's. Peat depths on the former production area are generally shallow.	Much of the former production area at Lough Bannow has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation communities.	2020	Draft 2019

		Pumped bog	A small (35ha) conifer plantation was established in 1980's by Coillte. Lough Bannow is part of the footprint of Derryadd Windfarm for which planning permissions were granted in 2020. An amenity walkway is proposed.		
Moher	483	Cutover Bog Peat Production at Moher bog commenced in the 1960's.. Peat depths on the former production area remain relatively deep. Pumped bog drainage.	Moher Bog formerly supplied fuel peat for Lough Ree Power. Much of the former production area is bare peat	2020	Draft 2017
Mount Dillon	592	Cutaway Bog Peat Production at Mount Dillon bog commenced in the 1940's. Peat depths on the former production largely shallow. Pumped bog	Mount Dillon Bog formerly supplied fuel peat for Lough Ree Power. Much of the former production area at Mount Dillon has been out of production for some time. These areas have already extensively colonised with pioneer cutaway, wetland and scrub vegetation communities.	2020	Draft 2017

Table Ap-2b: Mount Dillon Bog Group names, area and indicative status (Mostrim sub-group).

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Clonwhelan	212	Development Bog. Clonwhelan Bog was drained in the 1980's but never brought into commercial peat production. Clonwhelan is a deep peat development bog.	Rehabilitation complete Raised bog restoration completed 2019	N/A	Finalised 2018
Clynan	402	Development Bog. Clynan Bog was drained in the 1980's. Sod peat production occurred around the margins and over a portion of the site.	Clynan Bog formerly supplied horticultural peat (sod moss) & fuel turf. Some rehabilitation work has been carried out on Clynan bog East already to buffer an undrained bog remnant. Raised bog restoration potential.	2020	Draft 2017
Coolcraff	412	Cutover Bog Industrial peat production commenced at Coolcraff Bog in the 1980's. The site was developed for milled peat production 2015-2018. Deep peat reserves remain over the majority of the former production area.	Coolcraff Bog formerly supplied a range of commercial functions including; horticultural peat. Much of the former production area at Coolcraff is bare peat. One section of high bog to the north of site was excluded from production and so never developed on the basis of high conservation value raised bog habitat.	2020	Draft 2017
Coolnagun	668	Cutaway Bog Industrial peat production commenced at Coolnagun Bog in 1941. Coolnagun is considered a deep peat cutover bog with areas of shallow cutaway.	Coolnagun Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power. Much of the former production area at Coolnagun is bare peat. Some small patches of pioneer cutaway vegetation communities are developing. Some bog restoration work was undertaken already along the eastern margin.	2020	Draft 2017

Glenlough	328	<p>Development bog</p> <p>Glenlough Bog was first developed in the 1980's. It was re-ditched in 2003-2005. Only a small part of the bog was fully brought into peat production for sod peat. Deep peat reserves remain over the majority of the former production area. Some of the bog has never been subject to commercial peat extraction.</p>	<p>Glenlough Bog formerly supplied a range of commercial functions including; horticultural peat.</p> <p>Degraded high bog vegetation remains over the majority of the bog. The former production area is a mosaic of vegetation.</p> <p>This site has raised bog restoration potential.</p>	2020	Draft 2020
Milkernagh	627	<p>Cutover Bog</p> <p>Industrial peat production commenced at Milkernagh Bog in 1950. Long-term peat extraction has created shallow cutaway in places. Deep peat reserves remain in parts on the former production area. Milkernagh is considered cutover bog with variable peat depths. Milkernagh has a pumped drainage regime.</p>	<p>Milkernagh Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power.</p> <p>Much of the former production area at Milkernagh is bare peat. Pioneer cutaway vegetation communities are developing in places.</p>	2020	Draft 2017
Mostrim	442	<p>Development Bog/Cutover Bog</p> <p>The majority of Mostrim was drained but never developed. Industrial peat production commenced in parts of Mostrim Bog in the 1980's. Peat extraction has significantly affected parts of this bog but deep peat reserves remain on the former production area.</p>	<p>Mostrim Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power.</p> <p>Raised bog restoration at Mostrim is ongoing with > 50% completed in Jan 2021.</p>	2020	Finalised 2020



APPENDIX III: ECOLOGICAL SURVEY REPORT

Ecological Survey Report			
<p><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></p>			
Bog Name:	<u>Edera</u>	Area (ha):	283ha
Works Name:	Mount Dillon	County:	Longford
Recorder(s):	BnM Ecology Section	Survey/ monitoring Date(s):	13 th July 2012 December 2013 March 2015 January 2019
<p>Habitats present (in order of dominance)</p> <p>The most common habitats present at this site include:</p> <ul style="list-style-type: none"> • Bare peat. • Pioneer dry heath communities • Silt Ponds with associated habitats such as scrub, Bracken, rank grassland, dry calcareous grassland and typical pioneer communities of disturbed areas. <p>The most common habitats present around the margins at this site include:</p> <ul style="list-style-type: none"> • Birch woodland • Scrub (Gorse scrub and Birch scrub developing of dry high bog around margins) • Raised bog • Cutover bog (several small fragments) • Wet grassland along the edges of the site and along the course of the Bilberry River. 			
<p>Description of site</p> <p>Edera Bog is located approximately 9km to the west of Ballymahon in County Longford. This site is located on the shore of Lough Ree. Industrial peat production ceased on site in 2018. The peat was used as fuel peat in Lough Ree Power in Lanesborough. The Bilberry River flows through the site and a relatively large section of wet grassland and remnant section of raised bog still exist on the site. A rail line connects Edera bog with Derrycolumb Bog to the north. Edera bog is underlain with both marl and gravel.</p> <p>The main section of production bog to the south of the Bilberry River has only been in production for <20 years and slopes towards the Bilberry River.</p> <p>The Bilberry river flows through the site and there are two crossing points that machinery and trains use to cross this river. The River has been canalised to an extent but it still retains some natural features such as bends in the river and some deeper pools. The River is surrounded on both sides by relatively extensive areas of wet grassland that are subject to flooding when the River is in flood. The grassland was comprised of species such as Soft Rush, Floating Sweet-Grass, Yorkshire Fog, Reed Canary Grass, Yellow Rattle, Purple Moor Grass, Marsh Arrow Grass and Iris. Scattered trees consisting of Alder and Willow are located throughout this area. There was no evidence</p>			

of grazing in the area and it is likely to be too wet for any significant amounts of grazing to be carried out. A number of silt ponds are also located in this area. A small round clump of Birch and Alder are located in one area and this feature is thought to be the remains of a Crannog by archaeologists. To the south of this area lies the location of an old house that has local historical importance.

To the north of the Bilberry river an area of production bog is located. This area contains between 1-2.5 m of peat; however some small sections appear to have been cut away with marl protruding in areas. Common Reed is becoming established on these areas and in some of the field drains.

A significant area of scrub, raised bog and wet grassland is located in the west of the site. This area is located next to Lough Ree and has never been in industrial peat production; however, some domestic turf cutting has been carried out in this area. The remnant section of raised bog does not appear to contain deep peat and is located in the transition zone between what was the former intact raised bog (Edera) and the wet grassland that borders the Lake. Purple Moorgrass was dominant across much of this section of raised bog along with species such as Bog Asphodel, Sundew, Yellow Rattle, Willow, Bog Myrtle, Devil's Bit-Scabious, Gorse, Bog Cotton, Heather, *Sphagnum papillosum*, *S. subnitens*, *S. squarrosum* and *Aulacomnium palustre*. Occasional tufts of Black Bog Rush were located along the edges of this habitat. This area still retained a quaking feel in most parts. This area had been burned in the past two years. The area of wet grassland that occurs between the remnant section of raised bog and Lough Ree was flooded at the time of the ecological survey and could not be accessed.

A small area of remnant raised bog and cutaway bog is located along the north-eastern boundary of the site. This area is used extensively for domestic turf production. This is licensed by Bord na Móna. Sand Martins are nesting in some sections of face bank in this area.

Other habitats along the margins of the site include Birch woodland, wet grassland, dry heath and cutover bog. Overall this bog is young in terms of industrial peat production and still retains a dome towards the centre of the site. The bog is gravity drained and does not have any pumps.

Designated areas on site (cSAC, NHA, pNHA, SPA other)

The Lough Ree SPA and the Lough Ree SAC (site codes 004064 and 000440 respectively) overlap with a section of the western edge of the site.

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 Bilberry River flows through the site. This River flows into Lough Ree.
- The Owenacharra River flows within 0.5km of the southern boundary of the site.
- The western edge of the site is adjacent to Lough Ree.

Peat type and sub-soils

The majority of the site contains "red" or "*Sphagnum*" peat, especially in the main area of production bog. The peat is underlain with marl and gravel.

Fauna biodiversity**Birds**

Several bird species were noted on the site during the survey.

- Marsh Harrier (Bilberry River)
- Water Rail
- Kestrel
- Sand Martin
- Raven
- Other more common species include Grey Heron, Gold Finch, Wood Pigeon, Grey Crow, Robin, Blackbird and Swallow.

Mammals

Signs of several mammal species were noted on the site during the survey.

- Fox.
- Badger.
- Mink.
- Pine Marten.
- Otter.

Other species

Large Heath, Green Veined and Meadow Brown butterfly.

References

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- 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 bowzers. Only dedicated trained and competent personnel will carry out refuelling operations.
- Mobile storage such as fuel bowzers will be bunded to 110% capacity to prevent spills. Tanks for bowzers 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

No invasive flora species have been recorded at Edera Bog.

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 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 plague² will be adhered with throughout all rehabilitation measures and activities.

² <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 Mount Dillon bog group (Ref. PO504-01). 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 (a subset of the BnM estate that has been used for energy production). 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.

For the avoidance of doubt, should the proposed Scheme and the associated statutory obligation on Bord na Móna not materialise, Bord na Móna will not carry out the enhanced decommissioning, rehabilitation and restoration measures described in this plan. Bord na Móna will instead plan to complete an adapted standard decommissioning and rehabilitation measures required under Condition 10 and outlined in Appendix I.

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 NRBMP 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 2nd 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.

Edera Bog partially overlaps with Lough Ree SAC and pNHA (NPWS Site Code: 000440) and Lough Ree SPA (NPWS Site Code: 004064) on the western corner of the site. Lough Ree SAC (and pNHA) is designated for the natural eutrophic lake as well as active raised bogs, degraded raised bogs capable of natural regeneration, bog woodland and Otter. Lough Ree SPA is designated for the assemblage of wintering wildfowl, many species of which occur in nationally important numbers as well, in addition to breeding Common Tern and Common Scoter.

Derry Lough pNHA lies within 1km of the northern boundary of Edera Bog and the Royal Canal pNHA lies within 2km of the western boundary of the site.

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.

Edera Bog is located in an area zoned by Longford County Council as open countryside³.

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

³ <http://www.longfordcoco.ie/services/planning/development-plan-2015-2021/longford-cdp-2015-2021-written-statement.pdf>

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 Edera 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 policies.

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

1. 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	Edera 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.

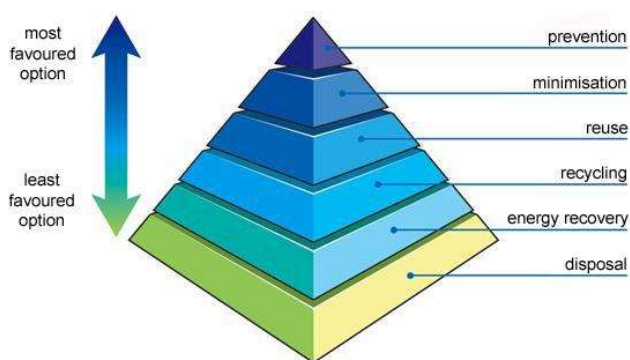
7.3.5 The tonnages and EWC Code for the waste materials listed in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* sent off-site for disposal/recovery.

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	Edera 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 P0504-01, Mountdillon Group of Bogs in Counties Roscommon, Longford 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 Mountdillon 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 is 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 P0504-01 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 31st 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 Mountdillon IPPC Licence P0504-01.

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 ³ 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 ³ 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

Bog Name	Contact Organisation	Contact Name	Date of Issue	Communication Format	Date Response Received	Response format
Edera	Longford County Council - Director of Services (Strategic Infrastructure and Climate Change)	General e-mail contact	01/12/2020	E-mail		
Edera	Longford County Council	General e-mail contact	01/12/2020	E-mail	01/12/2020, 22/12/2020	E-mail
Edera	Longford County Council - Heritage Officer	General e-mail contact	01/12/2020	E-mail		
Edera	Eastern and Midland Regional Assembly	General e-mail contact	04/12/2020	E-mail		
Edera	Chairperson of Longford County Council	General e-mail contact	04/12/2020	E-mail		
Edera	Longford County Councillors - Ballymahon District	Cllr. Colm Murray	04/12/2020	E-mail		
Edera	Longford County Councillors - Ballymahon District	Cllr. Mick Cahill	04/12/2020	E-mail		
Edera	Longford County Councillors - Ballymahon District	Cllr. Mark Casey	04/12/2020	E-mail		
Edera	Longford County Councillors - Ballymahon District	Cllr. Gerard Farrell	04/12/2020	E-mail		
Edera	Longford County Councillors - Ballymahon District	Cllr. Pat O'Toole	04/12/2020	E-mail		
Edera	TD Roscommon - Longford Westmeath	Peter Burke	04/12/2020	E-mail		
Edera	TD Roscommon - Longford Westmeath	Sorca Clarke	04/12/2020	E-mail		
Edera	TD Roscommon - Longford Westmeath	Joe Flaherty	04/12/2020	E-mail		
Edera	TD Roscommon - Longford Westmeath	Robert Troy	04/12/2020	E-mail		
Edera	National Parks and Wildlife Service	General e-mail contact	01/12/2020	E-mail	02,03,07,09/12/2020	E-mail
Edera	NPWS Regional Network	District Conservation Officer	01/12/2020	E-mail		
Edera	NPWS Regional Network	General e-mail contact	01/12/2020	E-mail		
Edera	Dept of the Housing Local Government and Heritage	Malcom Noonan (Minister of State for Heritage and Electoral Reform)	04/12/2020	E-mail		
Edera	National Monuments Service	General e-mail contact	04/12/2020	E-mail		

Edera	National Museum of Ireland (Irish Antiquities Division)	General e-mail contact	04/12/2020	E-mail	28/12/2020	E-mail
Edera	Dept of Environment Climate and Communications	Minister - Eamon Ryan	04/12/2020	E-mail		
Edera	Dept of Environment Climate and Communications	General e-mail contact	01/12/2020	E-mail		
Edera	Inland Fisheries Ireland	General e-mail contact	01/12/2020	E-mail		
Edera	Waterways Ireland	General e-mail contact	04/12/2020	E-mail		
Edera	The Heritage Council	General e-mail contact	04/12/2020	E-mail		
Edera	Longford Wilderness Park (Clandillon Civil Consulting)	General e-mail contact	01/12/2020	E-mail		
Edera	Longford Wilderness Park (Longford County Council)	General e-mail contact	01/12/2020	E-mail		
Edera	An Forum Uisce (The Water Forum)	General e-mail contact	04/12/2020	E-mail		
Edera	North West Regional Assembly	General e-mail contact	04/12/2020	E-mail	07/12/2020	E-mail
Edera	An Taisce	General e-mail contact	01/12/2020	E-mail		
Edera	Friends of the Irish Environment	General e-mail contact	04/12/2020	E-mail		
Edera	Friends of the Earth	General e-mail contact	04/12/2020	E-mail		
Edera	Birdwatch Ireland	General e-mail contact	01/12/2020	E-mail		
Edera	Irish Peatlands Conservation Council	General e-mail contact	01/12/2020	E-mail	07/12/2020	E-mail
Edera	Irish Wildlife Trust	General e-mail contact	01/12/2020	E-mail		
Edera	Bat Conservation Ireland	General e-mail contact	04/12/2020	E-mail		
Edera	Woodlands of Ireland	General e-mail contact	04/12/2020	E-mail		
Edera	Butterfly Conservation Ireland	General e-mail contact	01/12/2020	E-mail	11/12/2020	E-mail
Edera	Community Wetlands Forum (part of Irish Rurallink)	General e-mail contact	04/12/2020	E-mail		
Edera	Turf Cutters and Contractors Association	General e-mail contact	04/12/2020	E-mail		
Edera	Longford Public Participation Network (PPN)	General e-mail contact	04/12/2020	E-mail		
Edera	Sustainable Water Action Network (SWAN)	General e-mail contact	04/12/2020	E-mail		
Edera	Irish Farmers Association (Roscommon/ Sligo/ Leitrim/Longford)	General e-mail contact	04/12/2020	E-mail		
Edera	Irish Farmers Association (Head Office)	General e-mail contact	04/12/2020	E-mail	08/12/2020	E-mail
Edera	National Association of Regional Game Councils	General e-mail contact	04/12/2020	E-mail		

Edera	Midlands & East Regional WFD Operational Committee	Co-ordinator Local Authority Water Programme	01/12/2020	E-mail		
Edera	Shannon Flood Risk State Agency Co-ordination Working Group	General e-mail contact	01/12/2020	E-mail		
Edera	ICMSA (Irish Creamery Milk Suppliers Association)	General e-mail contact	04/12/2020 25/01/2021	E-mail	07/12/2020 25/01/2021	E-mail

Table APXI -2 Response summary from Consultees contacted

Organisation	Summary of Response by Stakeholder	BnM Response
Longford County Council	1) Longford County Council - Supports proposed rehabilitation measures and any actions that seek to enhance the biodiversity of the region. Acknowledges the role BnM play in the rehabilitation of post industrialised lands in the just transition of agenda within the state. State that a AA screening and EIA screening is desirable. Suggest tree planting programme be integrated into rehabilitation measures. Describes the potentially positive impact the PCAS scheme can have on the application for biosphere reserve designation of the surrounding lands. 2) Correspondence on 01/12/2021 to provide new plans for an amenity walkway for Edera bog.	BnM acknowledged via e-mail on 01/12/2020 to assure BnM will give due cognisance to all points raised in submission by Longford County Council, when developing the rehabilitation plan for Edera Bog.
National Parks and Wildlife Service	NPWS responded through e-mail thread on the 02, 03,07,09/12/2020 in relation to all PCAS bogs. The main points discussed were to advise of the requirement to investigate if assessment under the SEA and Birds directives for each site.	BnM acknowledged via e-mail throughout discussions 02-12/12/2020; Also, a phone conversation with local NPWS Conservation Ranger on 12/01/2021.
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 via e-mail on 28/12/2020 to assure BnM will give due cognisance to all points raised in submission by NMI, when developing the rehabilitation plan for Edera Bog. A virtual meeting on PCAS between BnM and NMI was held on 18/01/2021
Irish Peatlands Conservation Council	Responded to consultation through e-mail on 07/12/2020. Issues raised were; 1. A list of the 80 sites involved in the enhanced rehabilitation programme. 2. The carbon store in each site which we understand totals 109m tonnes. 3. The GHG quantity expected to be sequestered in each site which we understand totals 3.2m tonnes. 4. Details of the logistics of the 350 employees benefitting from this scheme and the roles which they will play. 5. Could you give us a breakdown of the budget for each rehabilitation site.	BnM acknowledged via e-mail on 09/12/2020 to assure BnM will give due cognisance to all points raised in submission by IPCC when developing the rehabilitation plan for Edera Bog.
Butterfly Conservation Ireland	Responded to consultation via e-mail on 11/12/2020 with submission on Edera. Concerns raised were; 1) Alterations to the text of the rehab plan. 2) Request for all turf cutting on BnM land to end. 3) Suggest monitoring for Large Heath Butterfly or food plant Hare's-tail Cottongrass. 4) Suggested alterations to habitat design in rehab plan to further connect regional high bog habitats. 5) Raised concerns over future land use.	BnM acknowledged via e-mail to assure BnM will give due cognisance to all points raised in submission by BCI when developing the rehabilitation plan for Edera Bog. A phone conversation between a BnM ecologist and BCI took place on to discuss PCAS and 19/01/2021.
The Heritage Council	Responded to consultation via e-mail on 04/01/2021 asking for more information on PCAS and looking to be involved in any seminar or information events.	BnM responded via phone conversation on 11/01/2021. Dialogue is ongoing.
Irish Farmers Association	Responded to consultation via email on 29/01/2021 with submission on Edera. Concerns raised were: 1) Flooding 2) Health and Safety 3) Perceived potentially detrimental impact of PCAS on property value	A working group has been established at a high level between BnM and IFA on various issues including PCAS. A meeting was held between BnM and IFA representatives on 18/02/2021 to present details on PCAS. Dialogue is ongoing.
Irish Creamery Milk Suppliers Association	Responded through email 07/12/2020 to request meeting on the potential impacts of PCAS on neighbouring farmlands.	BnM acknowledged via e-mail on 08/12/2020 to assure BnM will give due cognisance to all points raised in submission by ICMSA when developing the rehabilitation plan for Edera Bog. Dialogue is ongoing.
Irish Raptor Study Group	Responded to consultation via email on 09/01/2021 asking for more information on PCAS.	BnM acknowledged and responded to queries via email on 11/01/2021; Phone conversation 21/01/2021.

Local Resident A	On the 18/01/2021 Phone conversation between BnM Community Liaison Officer and Local Resident A. Issues discussed include; 1) Maintenance of boundary drains into the future. 2) The level of the water table once rehabilitation work has been finished.	Phone conversation 29/01/2021
Local Resident B	BnM received two letters from Local Resident B in relation to issues at Edera Bog.	A response will be provided as soon as possible pending the results of an internal investigation on this matter.

APPENDIX XII. ARCHAEOLOGY

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

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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.



	Procedure: ENV017	Rev: 1
Title: Archaeological Findings	Approved: EM	Date: 13/10/2020

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			

Archaeological Impact Assessment of Proposed Bog Rehabilitation at Edera Bog, Co. Galway. Dr. Charles Mount. Nov 2020.



Archaeological Impact Assessment of Proposed Bog Decommissioning and Rehabilitation at Edera Bog, Co. Longford

Report For

Bord Na Móna Energy Ltd.

Author

Dr. Charles Mount

Bord Na Móna Project Archaeologist



Introduction

The EPA (2020) *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.275 hectares at Edera, Co. Longford 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 Edera 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 blockages every 100 m along each field drain;
- 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 blockages. Some bog remnants are too small to benefit from this approach;
- Targeted fertiliser applications to accelerate vegetation establishment on headlands and high fields;
- Seeding of vegetation and inoculation of Sphagnum; and
- Modifying water levels at outfalls, as it may be desirable to change and control water levels at the site over time, e.g. to increase water levels as the site becomes increasingly vegetated. This will further slow the movement of water through and out of Edera Bog.

Edera Bog is located 3.5km west of Ballymahon, Co. Longford and 0.4km east of Lough Ree and to the west of the L1128 road. The bog occupies the townlands of Ardboghill, Derrycolumb, Derrymacar, Derrynabuntale, Derrynagalliagh, Drumree, Edera, Gorteenclareen, and Ledwithstown on OS 6 inch sheets Longford 22 and 26.

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 Edera Bog. The extent of the rehabilitation is indicated in Fig. 1. This area was examined using information from:



- The Bord na Móna Peatland Survey
- 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. Longford which was established under Section 12 of the National Monuments (Amendment) Act, 1994 was examined as part of the assessment (DAHGI 1996). This record was published by the Minister in 1996 and includes sites and monuments that were known in Edera Bog before that date. This review established that there are no RMPs situated in the proposed rehabilitation area or vicinity (see Fig. 1). The closest RMP to the rehabilitation area, LF022-042----, a Ringfort – rath in Derrycolumb townland, is located more than c.0.12km north of the rehabilitation area.

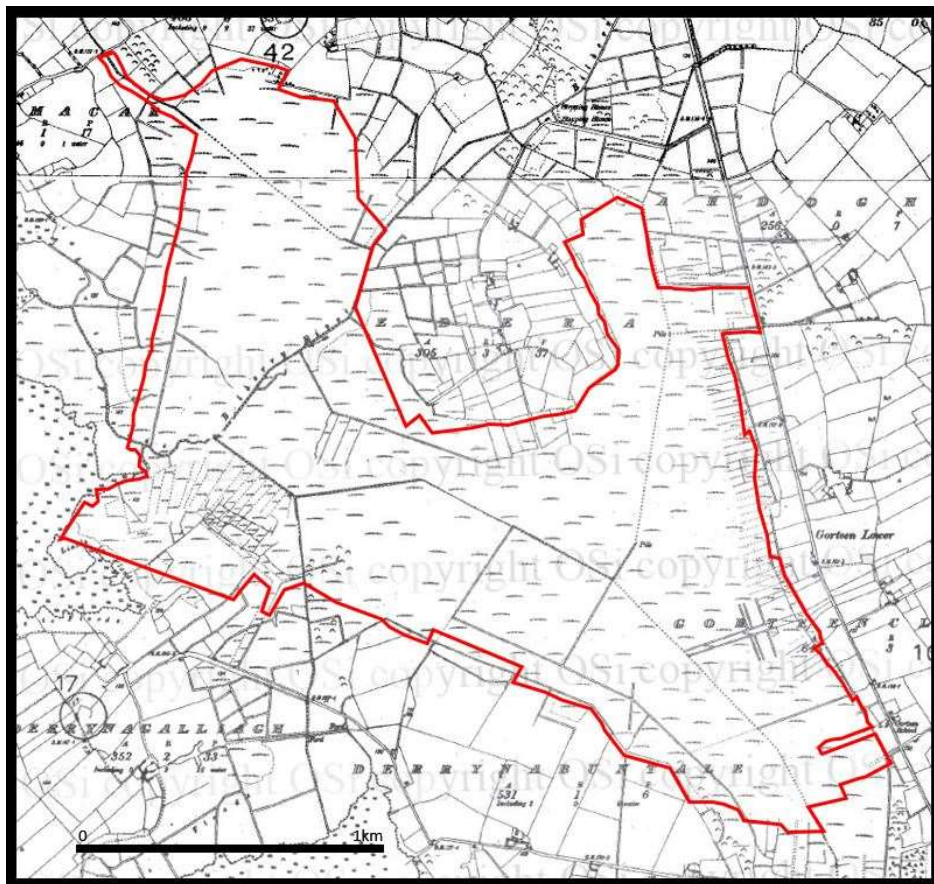


Fig. 1. Edera Bog, Co. Longford, detail of the Record of Monuments and Places map sheets Nos. 22 and 26. The proposed rehabilitation area is outlined with the redline. There are no Recorded Monuments in the area.



Peatland survey

Edera Bog was the subject of the Peatland Survey 2007 & 2008 which was commissioned by the Department of the Environment, Heritage and Local Government to assess the archaeological potential of the Bord na Móna production bogs and was carried out by Archaeological Development Services in August-September 2007 (Rohan 2009). The survey methodology involved the walked visual inspection of every second production field horizontal surface, and the visible vertical face of every second drain above the water level. In total, five toghers (LF-EDR001a-aq, LF-EDR002a-y, LF-EDR003a-ae, LF-EDR004a-u and LF-EDR005a-b) consisting of 122 individual sightings were recorded confined to the southern part of Edera Bog, in Derrynabuntale and Gorteenclareen townlands (Fig. 2). These toghers date to the period AD 542-880 and run almost in parallel crossing the bog in an east-north-east to west-south-west direction linking the dryland of Derrynabuntale to Gorteenclareen. These archaeological sightings were all notified to the Archaeological Survey of Ireland.

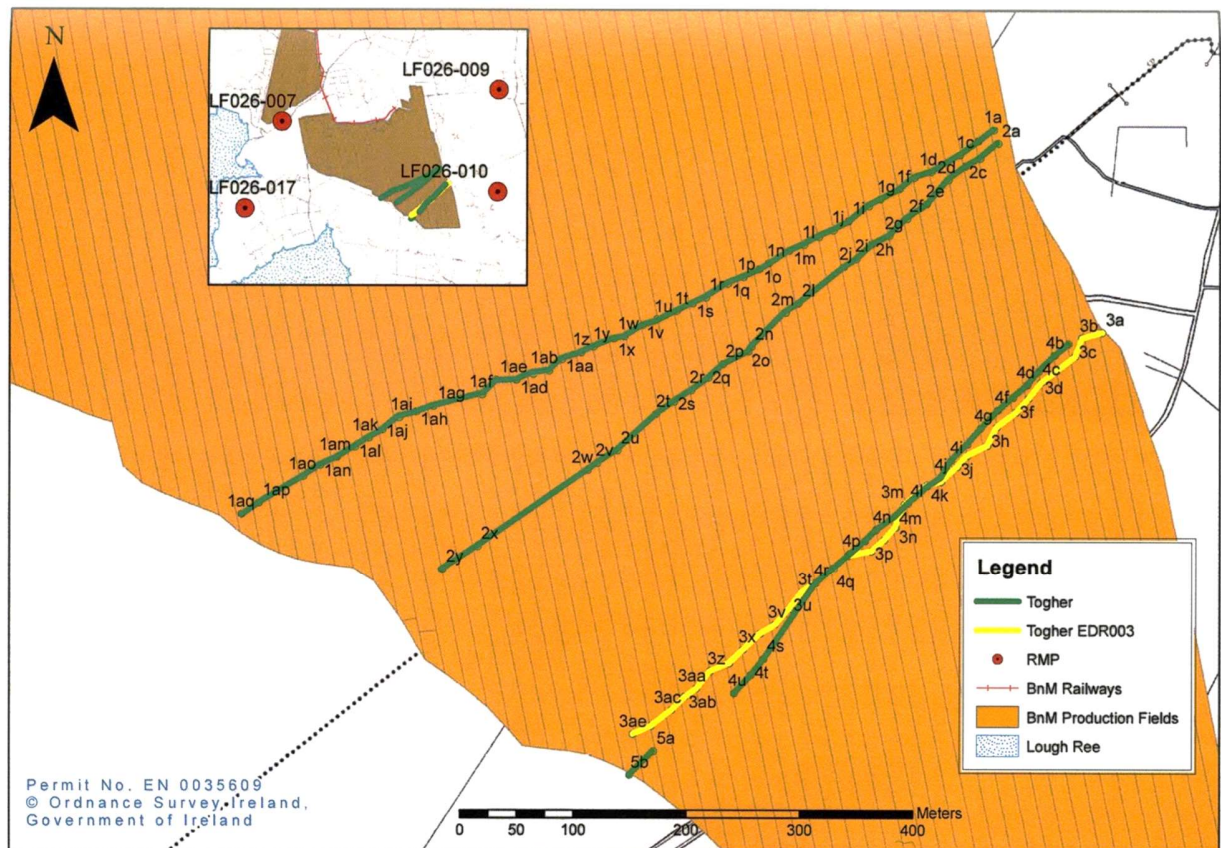


Fig. 2. Edera Bog, Co. Longford, archaeological sightings identified during the Peatland Survey 2007 & 2008 (From Rohan 2009).

Edera Bog commenced commercial peat production in 1999, finished production in 2018, and had production every year after the Peatland Survey 2007 & 2008. Estimates of the peat removed from the bog based on the results of a 2020 drone survey of the bog carried out by Bord na Móna allow the depth of bog at each sighting to be calculated for 2008 and 2020 and also the depth of bog removed calculated for each sighting (see Table 1). This data indicates that 60 sightings have been removed, 31 sightings survive on the surface, and 29 sightings survive below the surface.



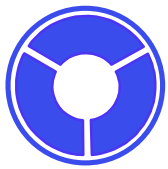
Site	Site Type	Depth of BS (m)	Depth of archology	2008 Depth	2020 Depth	Peat depth Removed	Current depth of archaeo BS	Depth of surviving archaeo	Status
LF-EDR001a	Togher	0.37	0.4	4.36	4.08	0.28	0.09		Survives below surface
LF-EDR001b	Togher	0.91	0.37	5.64	5.10	0.55	0.36		Survives below surface
LF-EDR001c	Togher	0.77	0.37	5.80	4.76	1.04	-0.27	0.10	Survives on Surface
LF-EDR001d	Togher	0.59	0.52	6.06	5.28	0.77	-0.18	0.34	Survives on Surface
LF-EDR001e	Togher	0.8	0.6	5.78	5.30	0.48	0.32		Survives below surface
LF-EDR001f	Togher	0.63	0.5	6.18	5.49	0.69	-0.06	0.44	Survives on Surface
LF-EDR001g	Togher	0.8	0.27	5.78	5.30	0.48	0.32		Survives below surface
LF-EDR001h	Togher	0.45	0.29	6.09	5.31	0.77	-0.32	-0.03	Removed
LF-EDR001i	Togher	0.7	0.18	6.05	5.21	0.84	-0.14	0.04	Survives on Surface
LF-EDR001j	Togher	0.8	0.19	3.84	2.83	1.00	-0.20	-0.01	Removed
LF-EDR001k	Togher	0.54	0.34	5.66	5.28	0.38	0.16		Survives below surface
LF-EDR001l	Togher	0.47	0.3	5.95	5.49	0.46	0.01		Survives below surface
LF-EDR001m	Togher	0.75	0.57	6.27	5.56	0.70	0.05		Survives on Surface
LF-EDR001n	Togher	1.07	0.27	4.47	4.08	0.39	0.68		Survives on Surface
LF-EDR001o	Togher	0.9	0.4	6.19	5.52	0.67	0.23		Survives below surface
LF-EDR001p	Togher	0.8	0.51	5.95	5.43	0.52	0.28		Survives below surface
LF-EDR001q	Togher	0.74	0.1	5.75	5.50	0.25	0.49		Survives on Surface
LF-EDR001r	Togher	0.95	0.3	5.25	4.41	0.84	0.11		Survives on Surface
LF-EDR001s	Togher	0.4	0.6	5.23	4.56	0.67	-0.27	0.33	Survives on Surface
LF-EDR001t	Togher	0.45	0.32	5.06	4.58	0.48	-0.03	0.29	Survives on Surface
LF-EDR001u	Togher	0.4	0.35	5.20	4.51	0.69	-0.29	0.06	Survives on Surface
LF-EDR001v	Togher	0	0.47	4.71	4.40	0.31	-0.31	0.16	Survives on Surface
LF-EDR001w	Togher	0.22	1.03	5.29	4.55	0.74	-0.52	0.51	Survives on Surface
LF-EDR001x	Togher	0.42	0.8	5.49	4.86	0.63	-0.21	0.59	Survives on Surface
LF-EDR001y	Togher	0.95	0.23	4.83	4.28	0.54	0.41		Survives below surface
LF-EDR001z	Togher	1.05	0.2	5.55	4.80	0.75	0.30		Survives below surface
LF-EDR001aa	Togher	0.62	0.43	4.71	4.71	0.00	0.62		Survives on Surface
LF-EDR001ab	Togher	0.64	0.6	5.02	4.44	0.59	0.05		Survives on Surface
LF-EDR001ac	Togher	0.43	0.34	4.95	4.33	0.62	-0.19	0.15	Survives on Surface
LF-EDR001ad	Togher	0.8	0.46	4.91	4.54	0.37	0.43		Survives on Surface
LF-EDR001ae	Togher	0.33	0.53	4.25	3.89	0.36	-0.03	0.50	Survives on Surface
LF-EDR001af	Togher	0.7	0.5	4.24	3.92	0.31	0.39		Survives below surface
LF-EDR001ag	Togher	0.6	0.75	4.98	4.37	0.60	0.00		Survives below surface
LF-EDR001ah	Togher	0.58	0.73	5.12	4.73	0.39	0.19		Survives below surface
LF-EDR001ai	Togher	0.62	0.63	4.73	4.20	0.53	0.09		Survives below surface
LF-EDR001aj	Togher	0.49	0.58	4.50	3.99	0.51	-0.02	0.56	Survives on Surface



LF-EDR001ak	Togher	0.84	0.5	4.54	4.03	0.51	0.33		Survives below surface
LF-EDR001al	Togher	0.95	0.36	4.57	3.94	0.63	0.32		Survives below surface
LF-EDR001am	Togher	0.98	0.3	4.63	4.03	0.60	0.38		Survives below surface
LF-EDR001an	Togher	0.83	0.36	4.51	4.00	0.51	0.32		Survives below surface
LF-EDR001ao	Togher	0.64	0.31	4.88	4.22	0.66	-0.02	0.29	Survives on Surface
LF-EDR001ap	Togher	1.05	0.22	4.39	3.96	0.43	0.62		Survives below surface
LF-EDR001aq	Togher	0.94	0.36	4.46	4.00	0.45	0.49		Survives below surface
LF-EDR002a	Togher	0	0.31	4.53	4.17	0.36	-0.36	-0.05	Removed
LF-EDR002b	Togher	0.18	0.08	5.24	4.97	0.27	-0.09	-0.01	Removed
LF-EDR002c	Togher	0	0.1	5.88	5.25	0.63	-0.63	-0.53	Removed
LF-EDR002d	Togher	0.03	0.68	5.58	5.11	0.48	-0.45	0.23	Survives on Surface
LF-EDR002e	Togher	0.17	0.63	6.02	5.32	0.70	-0.53	0.10	Survives on Surface
LF-EDR002f	Togher	0	0.35	6.11	5.41	0.70	-0.70	-0.35	Removed
LF-EDR002g	Togher	0.13	0.2	5.72	5.07	0.65	-0.52	-0.32	Removed
LF-EDR002h	Togher	0	0.06	5.06	4.74	0.32	-0.32	-0.26	Removed
LF-EDR002i	Togher	0.05	0.5	6.02	5.29	0.73	-0.68	-0.18	Removed
LF-EDR002j	Togher	0	0.1	5.60	5.27	0.33	-0.33	-0.23	Removed
LF-EDR002l	Togher	0.12	0.76	5.25	4.80	0.46	-0.34	0.42	Survives on Surface
LF-EDR002m	Togher	0.2	0.22	5.26	4.68	0.58	-0.38	-0.16	Removed
LF-EDR002n	Togher	0.2	0.51	4.59	4.46	0.13	0.07		Survives below surface
LF-EDR002o	Togher	0.13	0.06	5.32	5.01	0.30	-0.17	-0.11	Removed
LF-EDR002p	Togher	0.55	0.11	5.08	4.55	0.54	0.01		Survives below surface
LF-EDR002q	Togher	0.2	0.065	4.48	3.94	0.54	-0.34	-0.28	Removed
LF-EDR002r	Togher	0.14	0.27	3.77	3.78	0.00	0.14		Survives below surface
LF-EDR002s	Togher	0.22	0.3	4.54	4.03	0.51	-0.29	0.01	Survives on Surface
LF-EDR002t	Togher	0.29	0.14	4.18	3.96	0.23	0.06		Survives below surface
LF-EDR002u	Togher	0.43	0.1	3.64	3.05	0.59	-0.16	-0.06	Removed
LF-EDR002v	Togher	0	0.05	3.59	3.42	0.17	-0.17	-0.12	Removed
LF-EDR002w	Togher	0	0.09	3.93	3.65	0.27	-0.27	-0.18	Removed
LF-EDR002x	Togher	0	0.47	3.42	2.84	0.58	-0.58	-0.11	Removed
LF-EDR002y	Togher	0	0.12	2.50	1.80	0.71	-0.71	-0.59	Removed
LF-EDR003a	Togher	0.07	0.4	4.02	3.98	0.03	0.04		Survives below surface
LF-EDR003b	Togher	0	0.11	4.91	4.14	0.77	-0.77	-0.66	Removed
LF-EDR003c	Togher	0.06	0.14	5.44	4.85	0.59	-0.53	-0.39	Removed
LF-EDR003d	Togher	0.12	0.23	5.26	5.09	0.17	-0.05	0.18	Survives on Surface
LF-EDR003e	Togher	0.1	0.09	5.72	5.15	0.57	-0.47	-0.38	Removed
LF-EDR003f	Togher	0.2	0.16	5.96	5.40	0.56	-0.36	-0.20	Removed
LF-EDR003g	Togher	0	0.12	5.06	5.13	0.00	0.00		Survives below surface
LF-EDR003h	Togher	0.08	0.11	6.00	5.42	0.58	-0.50	-0.39	Removed
LF-EDR003i	Togher	0	0.06	5.40	5.00	0.40	-0.40	-0.34	Removed



LF-EDR003j	Togher	0.15	0.15	5.70	5.11	0.58	-0.43	-0.28	Removed
LF-EDR003k	Togher	0.2	0.24	5.55	5.22	0.33	-0.13	0.11	Survives on Surface
LF-EDR003l	Togher	0.16	0.05	5.20	4.67	0.53	-0.37	-0.32	Removed
LF-EDR003m	Togher	0.07	0.2	4.41	3.53	0.88	-0.81	-0.61	Removed
LF-EDR003n	Togher	0.15	0.13	4.56	4.17	0.39	-0.24	-0.11	Removed
LF-EDR003o	Togher	0.25	0.3	4.94	4.66	0.29	-0.04	0.26	Survives on Surface
LF-EDR003p	Togher	0.02	0.16	4.76	4.10	0.66	-0.64	-0.48	Removed
LF-EDR003q	Togher	0.07	0.19	3.81	3.41	0.41	-0.34	-0.15	Removed
LF-EDR003r	Togher	0	0.04	4.19	3.70	0.49	-0.49	-0.45	Removed
LF-EDR003s	Togher	0.09	0.3	3.83	3.05	0.78	-0.69	-0.39	Removed
LF-EDR003t	Togher	0.08	0.09	3.38	3.20	0.18	-0.10	-0.01	Removed
LF-EDR003u	Togher	0.37	0.15	3.57	3.25	0.33	0.04		Survives below surface
LF-EDR003v	Togher	0.08	0.16	3.83	3.23	0.60	-0.52	-0.36	Removed
LF-EDR003w	Togher	0	0.05	3.52	2.97	0.55	-0.55	-0.50	Removed
LF-EDR003x	Togher	0	0.13	2.96	3.01	0.00	0.00	0.13	Survives on Surface
LF-EDR003y	Togher	0	0.12	3.52	2.89	0.63	-0.63	-0.51	Removed
LF-EDR003z	Togher	0	0.06	3.10	2.44	0.66	-0.66	-0.60	Removed
LF-EDR003aa	Togher	0.05	0.29	2.72	2.68	0.04	0.01		Survives below surface
LF-EDR003ab	Togher	0	0.1	3.74	3.01	0.73	-0.73	-0.63	Removed
LF-EDR003ac	Togher	0	0.05	3.94	3.20	0.74	-0.74	-0.69	Removed
LF-EDR003ad	Togher	0	0.1	2.46	2.63	0.00	0.00		Survives below surface
LF-EDR003ae	Togher	0	0.06	2.74	2.08	0.66	-0.66	-0.60	Removed
LF-EDR004a	Togher	0.06	0.15	4.93	4.44	0.49	-0.43	-0.28	Removed
LF-EDR004b	Togher	0	0.05	5.77	5.14	0.63	-0.63	-0.58	Removed
LF-EDR004c	Togher	0	0.09	5.33	5.23	0.10	-0.10	-0.01	Removed
LF-EDR004d	Togher	0.05	0.15	5.71	5.09	0.63	-0.58	-0.43	Removed
LF-EDR004e	Togher	0.35	0.24	5.84	5.30	0.53	-0.18	0.06	Survives on Surface
LF-EDR004f	Togher	0.16	0.17	6.04	5.70	0.34	-0.18	-0.01	Removed
LF-EDR004g	Togher	0.2	0.07	5.47	5.03	0.44	-0.24	-0.17	Removed
LF-EDR004h	Togher	0.2	0.15	5.80	5.18	0.61	-0.41	-0.26	Removed
LF-EDR004i	Togher	0.19	0.15	5.45	5.10	0.35	-0.16	-0.01	Removed
LF-EDR004j	Togher	0.2	0.13	5.58	5.20	0.38	-0.18	-0.05	Removed
LF-EDR004k	Togher	0.16	0.1	5.18	4.65	0.53	-0.37	-0.27	Removed
LF-EDR004l	Togher	0.32	0.12	4.46	3.88	0.58	-0.26	-0.14	Removed
LF-EDR004m	Togher	0.07	0.07	4.49	3.94	0.55	-0.48	-0.41	Removed
LF-EDR004n	Togher	0.23	0.12	3.75	3.52	0.23	0.00	0.12	Survives on Surface
LF-EDR004o	Togher	0.12	0.07	4.56	3.95	0.61	-0.49	-0.42	Removed
LF-EDR004p	Togher	0.25	0.16	4.35	3.78	0.57	-0.32	-0.16	Removed
LF-EDR004q	Togher	0.02	0.1	4.00	3.50	0.50	-0.48	-0.38	Removed
LF-EDR004r	Togher	0.02	0.1	3.83	3.05	0.78	-0.76	-0.66	Removed



LF-EDR004s	Togher	0	0.08	3.52	2.93	0.59	-0.59	-0.51	Removed
LF-EDR004t	Togher	0	0.12	3.65	3.30	0.35	-0.35	-0.23	Removed
LF-EDR004u	Togher	0	0.1	3.26	2.80	0.46	-0.46	-0.36	Removed
LF-EDR005a	Togher	0	0.065	2.87	2.77	0.10	-0.10	-0.04	Removed
LF-EDR005b	Togher	0	0.05	NA	NA		0.00	?	?

Table 1. Sightings identified in the Peatland Survey 2007 & 2008 in Edera Bog indicating which sightings have been removed, which survive on the surface and which below.

Archaeological investigations

Five of the monuments identified in the Peatland Survey 2007 & 2008 (LF-EDR001a-aq, LF-EDR002a-y, LF-EDR003a-ae, LF-EDR004a-u and LF-EDR005a-b) were selected for investigation in 2012 as part of the 2010-2013 Bord na Móna excavation programme (Whitaker 2020). These monuments are noted below (Table 2). Site EDR005a-b / 12E0215 was not re-located during the excavation season.

SMR No.	License No.	Survey No.	Classification
LF026-034	12E0212	EDR002a-y	Road – Class 1 togher
LF026-036	12E0214	EDR004a-u	Road – Class 1 togher
LF026-035	12E0213	EDR003a-ae	Road – Class 1 togher
LF026-033	12E0211	EDR001a-aq	Road – gravel/stone trackway - peatland
LF026-037	12E0215	EDR005a-b	Road – Class 1 togher

Table 2. List of monuments in Edera Bog excavated in 2012.

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 12th of November 2020. 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 six monuments entered in the SMR in the proposed rehabilitation area. The monuments are indicated in Table 2 and Fig. 3 below.

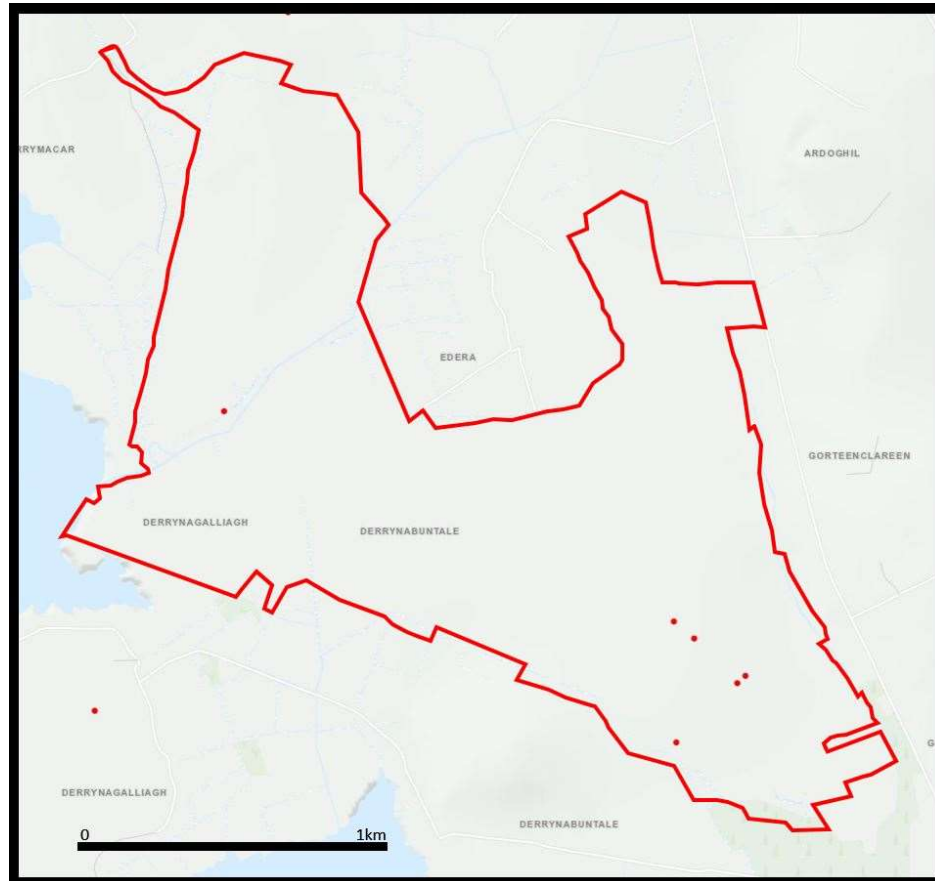


Fig. 3. Edera Bog, Co. Longford, detail of the Sites and Monuments Record. The proposed rehabilitation area is outlined with the redline. There are a six SMRs in the area.

Apart from LF026-007---- which is a Redundant Record (it is a natural feature), these are all monuments identified by the Peatland Survey 2007 & 2008 (Rohan 2009) that were notified to the Archaeological Survey of Ireland and subsequently archaeologically investigated in 2012.

SMR No.	Survey No.	License No.	Townland	Classification
LF026-007----	-	-	Derrymacar	Redundant record
LF026-033----	EDR001a-aq	12E0211	Derrynabuntale/Gorteenclaren	Road - gravel/stone trackway - peatland
LF026-034----	EDR002a-y	12E0212	Derrynabuntale/Gorteenclaren	Road - class 1 togher
LF026-035----	EDR003a-ae	12E0213	Derrynabuntale/Gorteenclaren	Road - class 1 togher
LF026-036----	EDR004a-u	12E0214	Derrynabuntale/Gorteenclaren	Road - class 1 togher



LF026-037----	EDR005a-b	12E0215	Derrynabuntale/Gorteenclaren	Road - class 3 togher
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Table 3. List of sites and monuments included in the SMR in Edera Bog.

Reports of archaeological excavations and licensed monitoring in the study area listed in the excavations database at excavations.ie were examined as part of the assessment. There are no additional reports of any archaeological investigations carried out in the rehabilitation area.

Reported finds

No reports of archaeological finds from Edera Bog are recorded in the topographical files of the National Museum of Ireland.

Previous assessments

Edera 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 Peatland Survey 2007 & 2008 and noted that there was a high potential for archaeological features to be uncovered during the course of any future development works in Edera Bog.

Impact assessment

There are 122 known sightings of archaeology belonging to five toghers in the rehabilitation area. Of these 60 sightings have been removed, at least 31 sightings survive on the surface, and 29 sightings survive below the surface. Table 4 lists the sightings that survive in the rehabilitation area.

Site	Site Type	East	Right	Depth BS (m)	Depth archaeo	2008 Depth	2020 Depth	Peat depth Removed	Current depth archaeo BS	Depth of surviving archaeo	Status
LF-EDR001a	Togher	211151	257128	0.37	0.4	4.36	4.08	0.28	0.09		Survives below surface
LF-EDR001b	Togher	211137	257118	0.91	0.37	5.64	5.10	0.55	0.36		Survives below surface
LF-EDR001c	Togher	211121	257106	0.77	0.37	5.80	4.76	1.04	-0.27	0.10	Survives on Surface
LF-EDR001d	Togher	211096	257091	0.59	0.52	6.06	5.28	0.77	-0.18	0.34	Survives on Surface
LF-EDR001e	Togher	211081	257086	0.8	0.6	5.78	5.30	0.48	0.32		Survives below surface
LF-EDR001f	Togher	211068	257076	0.63	0.5	6.18	5.49	0.69	-0.06	0.44	Survives on Surface
LF-EDR001g	Togher	211081	257086	0.8	0.27	5.78	5.30	0.48	0.32		Survives below surface
LF-EDR001i	Togher	211024	257040	0.7	0.18	6.05	5.21	0.84	-0.14	0.04	Survives on Surface
LF-EDR001k	Togher	210997	257034	0.54	0.34	5.66	5.28	0.38	0.16		Survives below surface
LF-EDR001l	Togher	210984	257027	0.47	0.3	5.95	5.49	0.46	0.01		Survives below surface



LF-EDR001m	Togher	210971	257022	0.75	0.57	6.27	5.56	0.70	0.05		Survives on Surface
LF-EDR001n	Togher	210458	257013	1.07	0.27	4.47	4.08	0.39	0.68		Survives on Surface
LF-EDR001o	Togher	210945	257006	0.9	0.4	6.19	5.52	0.67	0.23		Survives below surface
LF-EDR001p	Togher	210931	256999	0.8	0.51	5.95	5.43	0.52	0.28		Survives below surface
LF-EDR001q	Togher	210917	256993	0.74	0.1	5.75	5.50	0.25	0.49		Survives on Surface
LF-EDR001r	Togher	210898	256981	0.95	0.3	5.25	4.41	0.84	0.11		Survives on Surface
LF-EDR001s	Togher	210886	256976	0.4	0.6	5.23	4.56	0.67	-0.27	0.33	Survives on Surface
LF-EDR001t	Togher	210872	256969	0.45	0.32	5.06	4.58	0.48	-0.03	0.29	Survives on Surface
LF-EDR001u	Togher	210856	256981	0.4	0.35	5.20	4.51	0.69	-0.29	0.06	Survives on Surface
LF-EDR001v	Togher	210842	256957	0	0.47	4.71	4.40	0.31	-0.31	0.16	Survives on Surface
LF-EDR001w	Togher	210826	256947	0.22	1.03	5.29	4.55	0.74	-0.52	0.51	Survives on Surface
LF-EDR001x	Togher	210817	256945	0.42	0.8	5.49	4.86	0.63	-0.21	0.59	Survives on Surface
LF-EDR001y	Togher	210799	256938	0.95	0.23	4.83	4.28	0.54	0.41		Survives below surface
LF-EDR001z	Togher	210788	256933	1.05	0.2	5.55	4.80	0.75	0.30		Survives below surface
LF-EDR001aa	Togher	210771	256927	0.62	0.43	4.71	4.71	0.00	0.62		Survives on Surface
LF-EDR001ab	Togher	210760	256917	0.64	0.6	5.02	4.44	0.59	0.05		Survives on Surface
LF-EDR001ac	Togher	210746	256914	0.43	0.34	4.95	4.33	0.62	-0.19	0.15	Survives on Surface
LF-EDR001ad	Togher	210731	256909	0.8	0.46	4.91	4.54	0.37	0.43		Survives on Surface
LF-EDR001ae	Togher	210713	256909	0.33	0.53	4.25	3.89	0.36	-0.03	0.50	Survives on Surface
LF-EDR001af	Togher	210701	256896	0.7	0.5	4.24	3.92	0.31	0.39		Survives below surface
LF-EDR001ag	Togher	210658	256886	0.6	0.75	4.98	4.37	0.60	0.00		Survives below surface
LF-EDR001ah	Togher	210643	256881	0.58	0.73	5.12	4.73	0.39	0.19		Survives below surface
LF-EDR001ai	Togher	210628	256876	0.62	0.63	4.73	4.20	0.53	0.09		Survives below surface
LF-EDR001aj	Togher	210613	256865	0.49	0.58	4.50	3.99	0.51	-0.02	0.56	Survives on Surface
LF-EDR001ak	Togher	210601	256858	0.84	0.5	4.54	4.03	0.51	0.33		Survives below surface
LF-EDR001al	Togher	210589	256850	0.95	0.36	4.57	3.94	0.63	0.32		Survives below surface



LF-EDR001am	Togher	210573	256841	0.98	0.3	4.63	4.03	0.60	0.38		Survives below surface
LF-EDR001an	Togher	210558	256834	0.83	0.36	4.51	4.00	0.51	0.32		Survives below surface
LF-EDR001ao	Togher	210543	256824	0.64	0.31	4.88	4.22	0.66	-0.02	0.29	Survives on Surface
LF-EDR001ap	Togher	210504	256801	1.05	0.22	4.39	3.96	0.43	0.62		Survives below surface
LF-EDR001aq	Togher	210489	256791	0.94	0.36	4.46	4.00	0.45	0.49		Survives below surface
LF-EDR002d	Togher	211111	257084	0.03	0.68	5.58	5.11	0.48	-0.45	0.23	Survives on Surface
LF-EDR002e	Togher	211092	257063	0.17	0.63	6.02	5.32	0.70	-0.53	0.10	Survives on Surface
LF-EDR002l	Togher	210979	256976	0.12	0.76	5.25	4.80	0.46	-0.34	0.42	Survives on Surface
LF-EDR002n	Togher	210940	256935	0.2	0.51	4.59	4.46	0.13	0.07		Survives below surface
LF-EDR002p	Togher	210913	256923	0.55	0.11	5.08	4.55	0.54	0.01		Survives below surface
LF-EDR002r	Togher	210885	256900	0.14	0.27	3.77	3.78	0.00	0.14		Survives below surface
LF-EDR002s	Togher	210875	256820	0.22	0.3	4.54	4.03	0.51	-0.29	0.01	Survives on Surface
LF-EDR002t	Togher	210854	256879	0.29	0.14	4.18	3.96	0.23	0.06		Survives below surface
LF-EDR003a	Togher	211247	256951	0.07	0.4	4.02	3.98	0.03	0.04		Survives below surface
LF-EDR003d	Togher	211193	256907	0.12	0.23	5.26	5.09	0.17	-0.05	0.18	Survives on Surface
LF-EDR003g	Togher	211154	256868	0	0.12	5.06	5.13	0.00	0.00		Survives below surface
LF-EDR003k	Togher	211105	256820	0.2	0.24	5.55	5.22	0.33	-0.13	0.11	Survives on Surface
LF-EDR003o	Togher	211055	256769	0.25	0.3	4.94	4.66	0.29	-0.04	0.26	Survives on Surface
LF-EDR003u	Togher	210972	256708	0.37	0.15	3.57	3.25	0.33	0.04		Survives below surface
LF-EDR003x	Togher	210931	256672	0	0.13	2.96	3.01	0.00	0.00	0.13	Survives on Surface
LF-EDR003aa	Togher	210890	256638	0.05	0.29	2.72	2.68	0.04	0.01		Survives below surface
LF-EDR003ad	Togher	210850	256605	0	0.1	2.46	2.63	0.00	0.00		Survives below surface
LF-EDR004e	Togher	211168	256894	0.35	0.24	5.84	5.30	0.53	-0.18	0.06	Survives on Surface
LF-EDR004n	Togher	211048	256778	0.23	0.12	3.75	3.52	0.23	0.00	0.12	Survives on Surface
LF-EDR005b	Togher	210831	256562	0	0.05	NA	NA		0.00	?	?

Table 4. List of surviving monument sightings in Edera Bog with grid references.



Recommendations

All the 60 surviving sightings of archaeology identified in Table 4 should be preserved *in situ* and be avoided by the rehabilitation works. 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 122 known known sightings of archaeological heritage in the rehabilitation area and at least 60 of these survive *in situ*. All the 60 surviving sightings of archaeology identified in Table 4 should be preserved *in situ* and 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.

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