



Derries Bog

Cutaway Bog Decommissioning and Rehabilitation Plan 2021

This document seeks to address the requirements of Condition 10.2 of IPC Licence Ref. P0500-01:

“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 Derries 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 permanently ceased at Derries 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 Derries bog, measures which go beyond that required by Condition 10 in the Licence, the list of measures 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’ measures together with the enhanced measures in this document allows the Scheme Regulator to distinguish and objectively determine the specific measures (and their associated costs) eligible for support under the proposed Scheme.

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

Any consideration of any other future after-uses for Derries 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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Note: This finalised version of the Rehabilitation Plan has been updated to take account that several planning actions listed in Section 8.1 have been completed and have been incorporated into the plan. This includes an Appropriate Assessment of the rehabilitation plan. See Derries Decommissioning and Rehabilitation Plan – Addendum 1 for more details.

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SUMMARY

Name of bog: Derries **Area:** 371 ha

Site description:

- Derries Bog is located in Co. Offaly, approximately 4km south east of Ferbane. It is located directly south of and adjacent to the Grand Canal pNHA, within the Lower Shannon water catchment area.
- Derries Bog was drained and developed for industrial peat production in the 1960s and has been in active peat production since 1964. Industrial peat production ceased circa 2005.
- The majority of the former industrial peat production footprint has already re-vegetated and a mosaic of Birch woodland and cutaway wetland habitats has developed. There is only a small amount of bare peat cover present.
- Part of the site was rehabilitated in 1999-2000 as part of the Lough Boora Discovery Park.
- Additional targeted rehabilitation was carried out in different sections of the site in 2017.
- Remnant peat depths are <1m on most of the site. Derries is considered a **shallow peat cutaway bog**.
- Derries Bog has a gravity drainage system.

Rehabilitation goals and outcomes

Bord na Moña 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 **deep peat re-wetting and optimising re-wetting on shallower cutaway areas** and eventually naturally functioning wetland/peatland habitats.
- Environmental stabilisation.
- Rehabilitation will support the National Policies on Climate Action and GHG mitigation by maintaining and enhancing the current peat storage capacity of the bog (locking the carbon into the ground). It is expected that the bog will have reduced emissions (reduced source) and in time develop its carbon sink function in part, as some peat-forming habitats develop on site. It will also support Ireland's commitments towards Water Framework Directive and the National River Basin Management Plan 2018-2021.
- Optimising hydrological conditions for the protection of exposed archaeological structures, their retention in situ and preservation into the future.

Scope of rehabilitation

The principal scope of this rehabilitation plan is defined by:

- The area of Derries Bog.
- EPA IPC Licence - Ref. P0500-01. As part of Condition 10.2 of this licence, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. 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 Derries Bog, in particular, optimising **climate action benefits**.
- The local environmental conditions of this bog.
- The key goals and outcomes of rehabilitation at this bog outlined above.

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

Criteria for successful rehabilitation:

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

- Rewetting of residual 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 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. potential silt-run-off). 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 (IPC Licence validation). This will be measured by the EPA WFD monitoring programme.
- Optimising the extent of suitable hydrological conditions for climate action (Climate action verification). This will be measured by an aerial survey after rehabilitation has been completed.
- Reduction in carbon emissions (Climate action verification). Baseline monitoring will be carried out 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).

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

Summary of measures:

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

- Planning actions, including developing a detailed site plan and carrying out a hydrology and drainage assessment.
- Carry out an ecological appraisal of the potential impacts of the planned rehabilitation.
- Carry out proposed measures, which will be a combination of drain blocking, peat field re-profiling, wetland creation and fertiliser applications targeting bare peat on headlands, high fields and other areas.
- Phase 2 measures may include seeding of targeted vegetation and inoculation of *Sphagnum*.
- 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 Derries Bog, as required to meet Condition 10 of the IPC Licence, is defined as:

- Quarterly monitoring assessments of the site to determine the general status of the site, assess the condition of the rehabilitation work, assess the progress of natural colonisation, monitoring of any potential impacts on neighbouring land and general land security. The number of site visits will reduce after 2 years to bi-annually. These site visits will assess the need to additional rehabilitation, if needed.
- **Water quality monitoring** will be established. Monitoring of key water quality parameters for 2 years after rehabilitation will include: Ammonia, Phosphorous, Suspended solids (silt), pH and conductivity.
- 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 during PCAS.
- Carbon emissions monitoring only be carried out on a small proportion of BnM sites to develop better understanding of carbon emissions and GHG emission factors from different types of BnM sites and will be developed on association with other established research programmes. Reduction in carbon emissions will be modelled by a combination of habitat condition assessment and application of appropriate carbon emission factors derived from other sites. Baseline monitoring (habitat condition) will be carried after rehabilitation is completed (during the Scheme). It is proposed that sites can be monitored against this baseline in the future.
- Monitoring as part of Climate Action Verification is dependent on support from the Climate Action Fund or other external funding.

Validation and IPC Licence surrender

Reporting to the EPA will continue until the IPC Licence 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 Boora Bog group (Ref. P0500-01). As part of Condition 10.2 of this licence, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The bog is part of the Boora bog group (see Appendix II for details of the bog areas within the Boora Bog Group). Derries Bog is located in Co. Offaly.

This document seeks to address the requirements of Condition 10.2 of IPC Licence Ref. P0500-01:

“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 actions;
- Budget and Costings; and
- Associated aftercare, maintenance and monitoring.

It is proposed by Government that Bord na Móna carry out a Peatlands Enhanced Decommissioning, Rehabilitation and Restoration Scheme (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 33,000ha 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. Interventions 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. Bord na Móna have now announced the complete cessation of industrial peat production across its estate (January 2021).

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

- more intensive management of water levels through outfall management, drain-blocking and management of water levels within the bog;
- re-profiling/re-wetting of extant deep peat 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 measures 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 carbon sink again. In some areas of dry cutaway this timeline will be significantly longer and it is not feasible in the short-term to re-wet some areas, which 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.

Derries Bog is proposed to be part of this this proposed Scheme (PCAS) and this rehabilitation plan outlines the approach taken.

1.1 Constraints and Limitations

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

Future land-use at Derries Bog has not been defined by Bord na Móna. Biodiversity and ecosystem services have been identified as the current primary land use at Derries Bog. Bord na Móna will continue to review the future after-use of its land-bank. Any consideration of any other future after-uses for Derries Bog, will be conducted in adherence to the relevant planning legislation and consultation with relevant authorities and will be considered within the framework of this rehabilitation plan.

Industrial peat extraction at Derries Bog ceased across the majority of the site before 2005. Some peat extraction occurred on a portion of the site up to 2015. Currently the former peat production area is revegetating 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 Derries 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 Derries 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 and or archaeology records.

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 enhanced rehabilitation plan also 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 Derries Bog, in particular, optimising **climate action benefits**.

2.1 Desk Study

The desk study involved collecting all relevant environmental and ecological data for the study area. The development of the rehabilitation plan also takes account of research, experience and engagement with other peatland restoration and rehabilitation projects and peatland research including Irish, UK, European and International best-practise guidance (full citations are in the References Section):

- Anderson *et al.* (2017). An overview of the progress and challenges of peatland restoration in Western Europe.
- Barry, T.A. *et al.* (1973). A survey of cutover peats and underlying mineral soils. Soil Survey Bulletin No. 30. Dublin, Bord na Móna and An Foras Taluntais.
- Bonn *et al.* (2017). Peatland restoration and ecosystem services- science, policy and practice.
- Carroll *et al.* (2009). *Sphagnum* in the Peak District. Current Status and Potential for Restoration. Moors for the Future Report No 16.
- Clark & Rieley (2010). Strategy for responsible peatland management.
- Eades *et al.* (2003). The Wetland Restoration Manual.
- Farrell & Doyle (2003). Rehabilitation of Industrial Cutaway Atlantic Blanket Bog, NW Mayo, Ireland.
- Gann *et al.* (2019). International Principles and Standards for the practice of Ecological Restoration.
- Hinde *et al.* (2010). *Sphagnum* re-introduction project: A report on research into the re-introduction of *Sphagnum* mosses to degraded moorland. Moors for the Future Research Report 18.

- Joosten & Clarke (2002). Wise Use of mires and peatlands – Background and Principles including a framework for Decision-making.
- Lindsay (2010). Peatbogs and Carbon: a Critical Synthesis to Inform Policy Development in Oceanic Peat Bog Conservation and Restoration in the Context of Climate Change.
- Mackin *et al.* (2017). Best practice in raised bog restoration in Ireland. Irish Wildlife Manuals, No. 99. National Parks and Wildlife Service,
- McBride *et al.* (2011). The Fen Management Handbook (2011), Scottish Natural Heritage.
- McDonagh (1996). Drain blocking by machines on Raised Bogs. Unpublished report for National Parks and Wildlife Service.
- NPWS (2017a). National Raised Bog Special Areas of Conservation management plan. Department of Arts, Heritage and the Gaeltacht.
- Quinty & Rochefort (2003). Peatland Restoration Guide, second edition. Canadian *Sphagnum* Peat Moss Association and New Brunswick Department of Natural Resources and Energy.
- Regan, et. al. (2020). Ecohydrology, Greenhouse Gas Dynamics and Restoration Guidelines for Degraded Raised Bogs. EPA Research Report. Prepared for the Environmental Protection Agency by Trinity College Dublin.
- Renou-Wilson *et al.* (2011). BOGLAND - Sustainable Management of Peatlands in Ireland. STRIVE Report No 75 prepared for the Environmental Protection Agency.
- Schouten (2002). Conservation and Restoration of Raised Bogs: Geological, Hydrological and Ecological Studies. Dúchas - The Heritage Service of the Department of the Environment and Local Government, Ireland;
- Thom (2019). Conserving Bogs – Management Handbook.
- Wheeler & Shaw (1995). Restoration of Damaged Peatlands – with Particular Reference to Lowland Raised Bogs Affected by Peat Extraction.
- Wittram *et al.* (2015). A Practitioners Guide to Sphagnum Reintroduction. Moors for the Future Partnership.

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

- Boora Integrated Pollution Control Licence;
- Boora 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 are contacted during the rehabilitation planning process for their views. See Section 4.

2.3 Field Surveys

Bord na Móna carried out a baseline ecological survey of all of its properties in 2009-2012 and developed habitat maps. As part of this exercise, Derries Bog was surveyed in 2009. The site was re-surveyed in 2013. Additional ecological walk-over surveys and visits have taken place at Derries Bog between 2013-2020 to inform rehabilitation planning and habitat maps have been updated, where required. The latest confirmatory visit took place in September 2020. This rehabilitation plan is informed by the original baseline survey as well as subsequent site walk-over surveys and visits, and updates to baseline data.

Habitat mapping followed best-practise guidance from Smith et al. (2011). Map outputs including all habitat maps and target notes were produced using GIS software application packages (ArcGIS). General marginal habitats and other habitats that had not been modified significantly by industrial peat extraction were classified using Fossitt *et al.* (2000). Plant nomenclature for vascular plants follows Stace (2010), while mosses and liverworts nomenclature follows identification keys published by the British Bryological Society (2010). A more detailed Bord na Móna classification system was developed for classifying pioneer cutaway habitats as Fossitt categories were deemed not to be detailed enough for cutaway bog (much of cutaway bog could be classified as Cutover Bog - PB4). Much of the pioneer cutaway vegetation is still at an early stage of its development and cannot be assigned to Fossitt Level 3 categories yet.

A detailed ecological survey report for Derries Bog is contained in Appendix III.

3. SITE DESCRIPTION

Derries Bog is located in Co. Offaly, just over 4km south east of Ferbane and 3km South West of Pollagh (see Figure 3.1). The surrounding landscape is a mosaic of habitats 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.

Derries Bog lies adjacent and south of the Grand Canal. It is linked to other Boora Bog Group bogs (also owned by Bord na Móna) to the north (Lemonaghan), east (Turraun) and south (Boora) by a railway line and machinery travel path, which provides the main access to the site.

Industrial peat production permanently ceased across the majority of the site before 2005. Some peat production continued, on a small portion of the site up to 2015. Some rehabilitation measures (Drain Blocking) have already been applied in parts of Derries Bog. Part of the site (south east section) was re-wetted as part of the Lough Boora Discovery Park rehabilitation project. Additional field drain blocking was carried out on the western small area (in 2018) that was used for peat extraction until more recently. These measures, combined with natural colonisation have resulted in the natural revegetating (Birch Woodland and Scrub) of large areas of the site (Figure 8.1).

There are several other adjacent BNM bogs nearby including Pollagh/Cornalaur, Boora, Oughter, Turraun, Lemonaghan and Killaranny.

3.1 Status and Situation

3.1.1 Site history

The majority of Derries Bog was in peat production from the 1960's until 2005. The peat was harvested for fuel peat to be used in the Derrinlough Briquette factory, Cloghan Power Station (now decommissioned) and West Offaly Power in Shannonbridge, Offaly.

3.1.2 Current land-use

The site is part of Lough Boora Discovery Park. A cycle track linking Boora and Turraun was developed along the south east margin of the site in 2016-2017.

There is still a Bord na Móna rail-link through the site linking other Boora Bogs to Derrinlough Brickette Factory.

3.1.2 Socio-Economic conditions

Bord na Móna has historically been a vital employer for the rural community of the Midlands of Ireland. Bord na Móna compiled a report on the role of peat extraction in the midlands historically in which they report that in 1986, by the end of Bord na Móna's Third Development Programme, a total of twenty-three work locations had been established around the country. The company had an average employment of approximately 4,688 in the mid 1980's, with a peak employment of 6,100 during the production season, which placed it among the country's largest commercial employers. The importance of such levels of employment were largely due to its regional concentration in the Midlands and the lack of alternative employment opportunities at the time.

According to the Energy Crop Socio-Economic Study undertaken by Fitzpatrick Associates in 2011, there were an estimated 1,443 jobs supported by the peat-to-power industry in Ireland at the time, some 81% of which were located in the catchment areas of the three peat-fired generating stations (Lough Ree, West Offaly, and Edenderry Power Stations). These constituted jobs in the plants and in peat extraction, jobs indirectly supported in upstream

supply industries and jobs induced through the trickle-down effects of the wages and salaries of those supported directly or indirectly. In respect of Derries Bog, jobs included in the above study would have included those to facilitate extraction of peat at this site, and associated processing and transfer to the relevant power station.

As the primary employer in many midland counties, Bord na Móna played a central role in building communities through several initiatives, including Education bursaries, support of local sporting clubs, the provision of community gain funds, charity programmes and the provision and building of amenity areas.”

These job numbers have now declined with the cessation of peat extraction at this bog. It is anticipated that the proposed scheme (PCAS) will provide some employment for a team of workers at this site for a period of time (> 1 year).

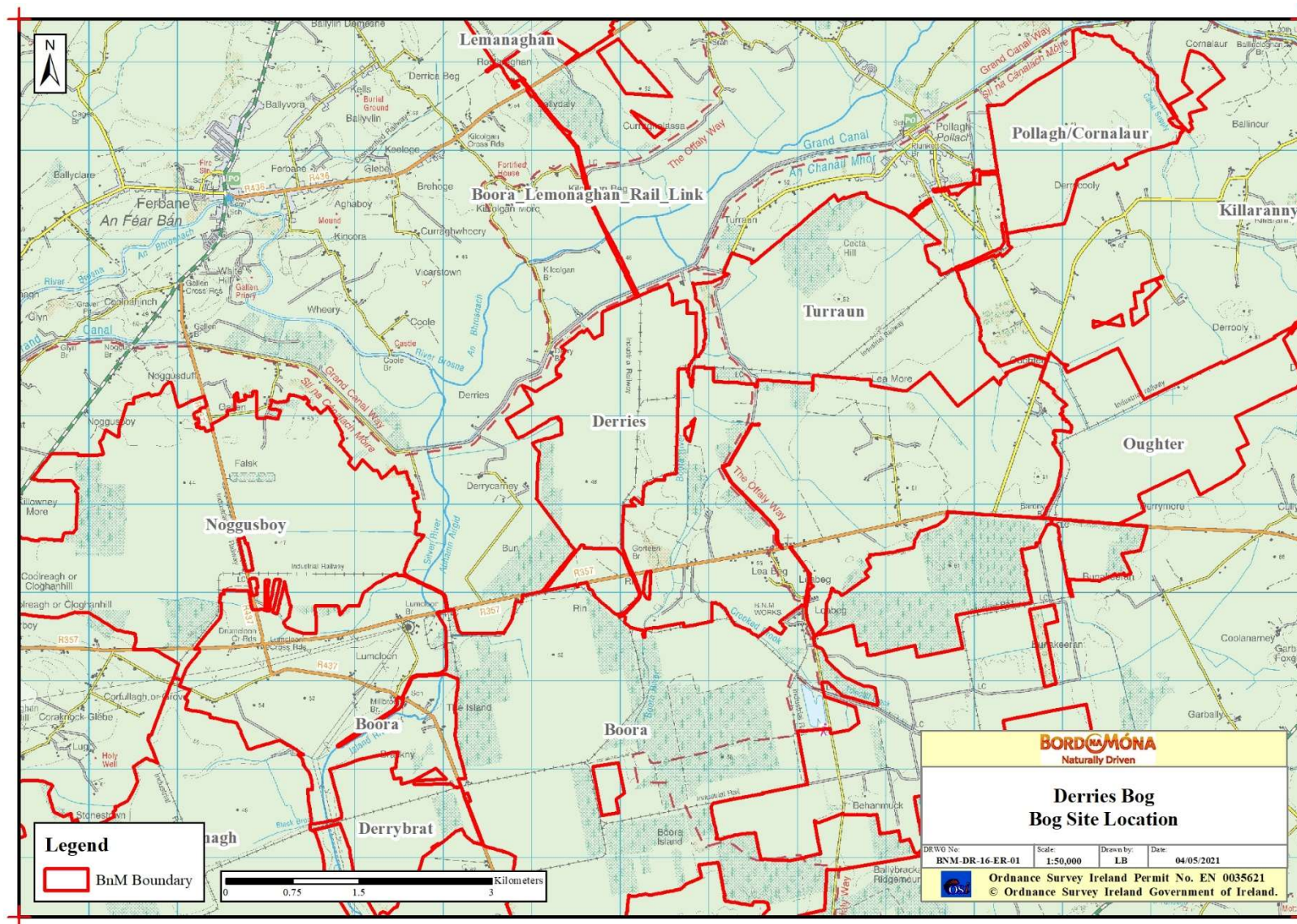


Figure 3.1 Location of Derries Bog in context to other Bord na Móna bogs, surrounding area.

3.2 Geology and Peat Depths

3.2.1 Sub-soil geology

The underlying geology at Derries Bog is Waulsortian limestones¹. A band of Tournaisian limestone also exists in the south central area of the site. The underlying soils and sub-soils are classed as 'Raised Bog Cutover Peat'. The peat is underlain by glacial deposits, mineral alluvial and alluvial marl type soils. The glacial deposits generally consist of grey gravelly clay/silt and are exposed as gravel mounds and ridges in places.

3.2.2 Peat type and depths

Commercial peat extraction has been undertaken at Derries Bog since the 1960s. As a result, the remaining peat depths are generally shallow, on average >1m across most of the site. The residual peat left on site is mostly fen peat.

3.3 Key Biodiversity Features of Interest

3.3.1 Current habitats

Derries Bog is now developing a mosaic of Birch woodland and cutaway wetland habitats (Figure 3.2-3.3 & Figure 8.1). There are pockets of Reed Swamp, pioneer poor fen, wet scrub and woodland and some open water in the wetter areas.

There is some open water scattered around the site forming water bodies of various sizes and depths. Around this open water area there are a mosaic of wetland communities including some large Reedbeds, dominated by Bulrush and Common Reed. Poor fen pioneer communities showing some typical zonation from wet to dry zones are also present.

There are several 'mineral mounds' or low hills formed by underlying glacial material with shallow or no residual peat. The vegetation on these areas is drier and dominated by Heather with some dry Birch scrub, a minor amount of dry grassland and disturbed or colonising vegetation. These mounds vary in height with the most significant in the central area. Other lower ridges pass through the southern section creating some drier grassland and scrub that crosses several fields.

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



Figure 3.2. View of the typical wetland vegetation found in Derries Bog.

A habitat map of the site is shown in Figure 3.3.

3.3.2 Species of conservation interest

Records indicate the presence of pine marten *Martes martes*, otter *Lutra lutra*, Irish hare *Lepus timidus hibernicus*, badger *Meles meles* and red squirrel *Sciurus vulgaris* at Derries Bog. Badger and hare activity was recorded on site in Sept 2020 during a routine walkover survey. While the records for pine marten, otter and red squirrel are historical, suitable habitat is currently present on site and so extant population may exist. Leisler's bat *Nyctalus leisleri*, soprano pipistrelle *Pipistrellus pygmaeus* and common pipistrelle *Pipistrellus pipistrellus* have been recorded using the site.

Historical records of breeding marsh fritillary *Euphydryas aurinia* exist for Derries Bog. Two occupied webbing casts were also recorded during a BnM walkover survey in Sept 2020. As such, Marsh Fritillary is considered to be using the site as a breeding ground.

Historical breeding records for lapwing *Vanellus vanellus*, redshank *Tringa totanus*, common sandpiper *Actitis hypoleucos*, ringed plover *Charadrius hiaticula* and snipe *Gallinago gallinago* have all been recorded on site. Black-headed gull *Chroicocephalus ridibundus* have also been recorded breeding on Derries Bog, but do not currently appear to be nesting on site. Water rail *Rallus aquaticus* have also been recorded at Derries Bog. Hen harrier *Circus cyaneus* and merlin *Falco columbarius* are regularly observed at Derries Bog. Wintering bird species records on site include; pintail *Anas acuta*, shoveler *Spatula clypeata*, tufted duck *Aythya fuligula*, golden plover *Pluvialis apricaria* and whooper swan *Cygnus Cygnus*.

In recent years, revegetating bare peat and reduction in open water habitat has resulted in a decline in the number of whooper swan using the site.

Records for common frog *Rana temporaria* and smooth newt *Lissotriton vulgaris* presence exist for Turraun Bog which lies adjacent and east of Derries Bog. Given the close proximity and the similar habitats available at the two sites, both species are likely present on Derries Bog also.

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 activities are described here.

A broad range of common garden escapees/Invasive Alien Species are occasionally detected on or close to former peat production sites. All invasive flora species detected will be treated in line with Best Practice during PCAS activities, where necessary (Appendix V). Records exist for American Mink *Mustela vison*, Fallow Deer *Dama dama* and Sycamore *Acer pseudoplatanus* at Derries but these species are unlikely to be further dispersed during or as a result of PCAS activities.

3.4 Statutory Nature Conservation Designations

There is a small overlap between the BnM property and The Grand Canal pNHA along the northern side. Three small sections of remnant high bog exist outside of the BnM lands, along the northern site boundary. (Figure 3.1).

3.4.1 Other Nature Conservation Designations

The Ramsar Convention entered into force in Ireland on 15th March 1985. Ireland currently has 45 sites/wetlands designated as Wetlands of International Importance (Ramsar Sites). These cover a surface area of 66,994ha. There are no Ramsar Sites in the local vicinity of Derries Bog (i.e. within 3km) The closest Ramsar Sites to Derries Bog include Mongan Bog, The Slieve Bloom Mountains and Clara Bog.

<https://www.arcgis.com/apps/MapTour/index.html?appid=cd6e1a247bdc4179b9dfc0461e950f1e#>

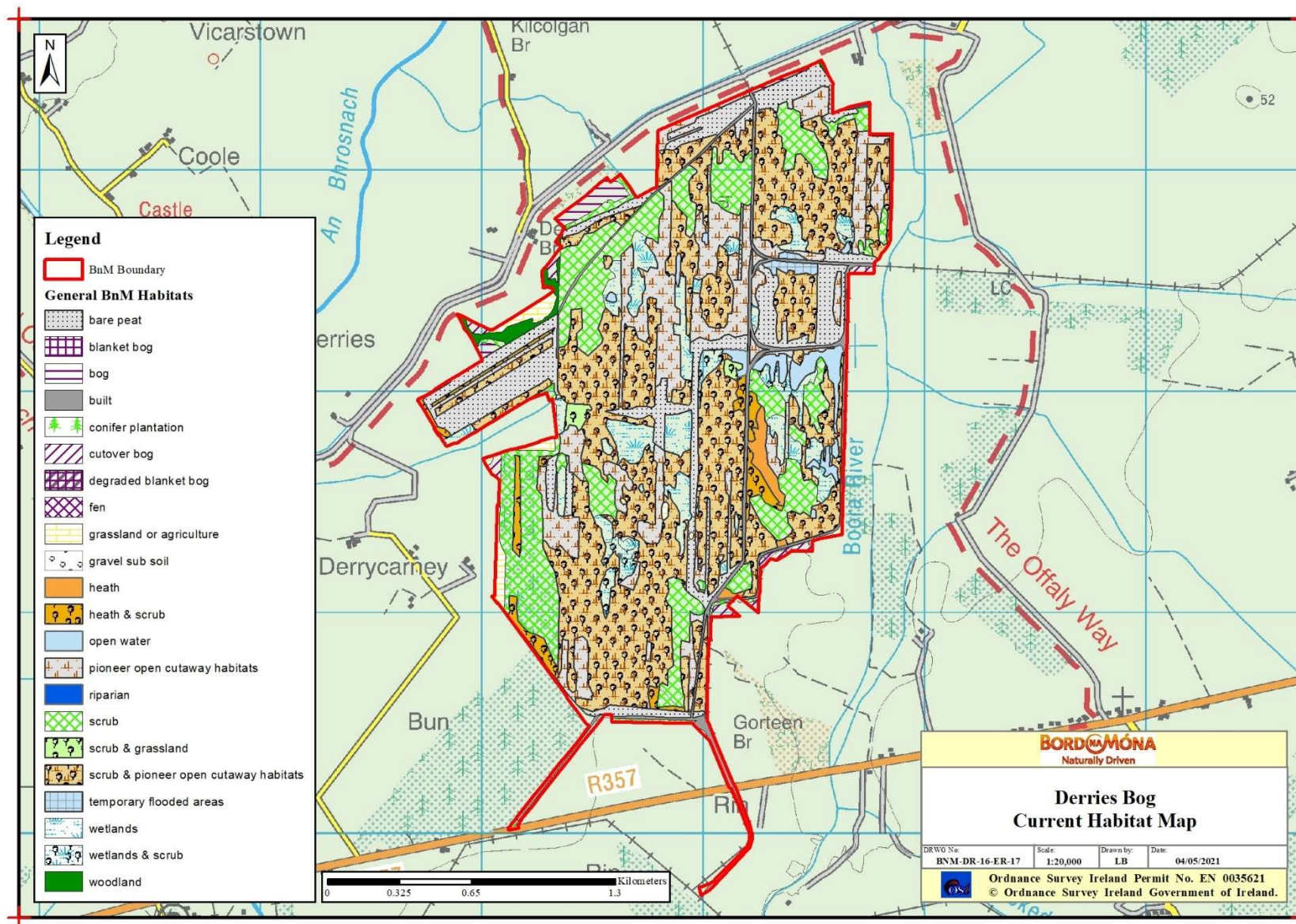


Figure 3.3. Habitat map of Derries Bog showing Bord na Móña habitat categorisation.

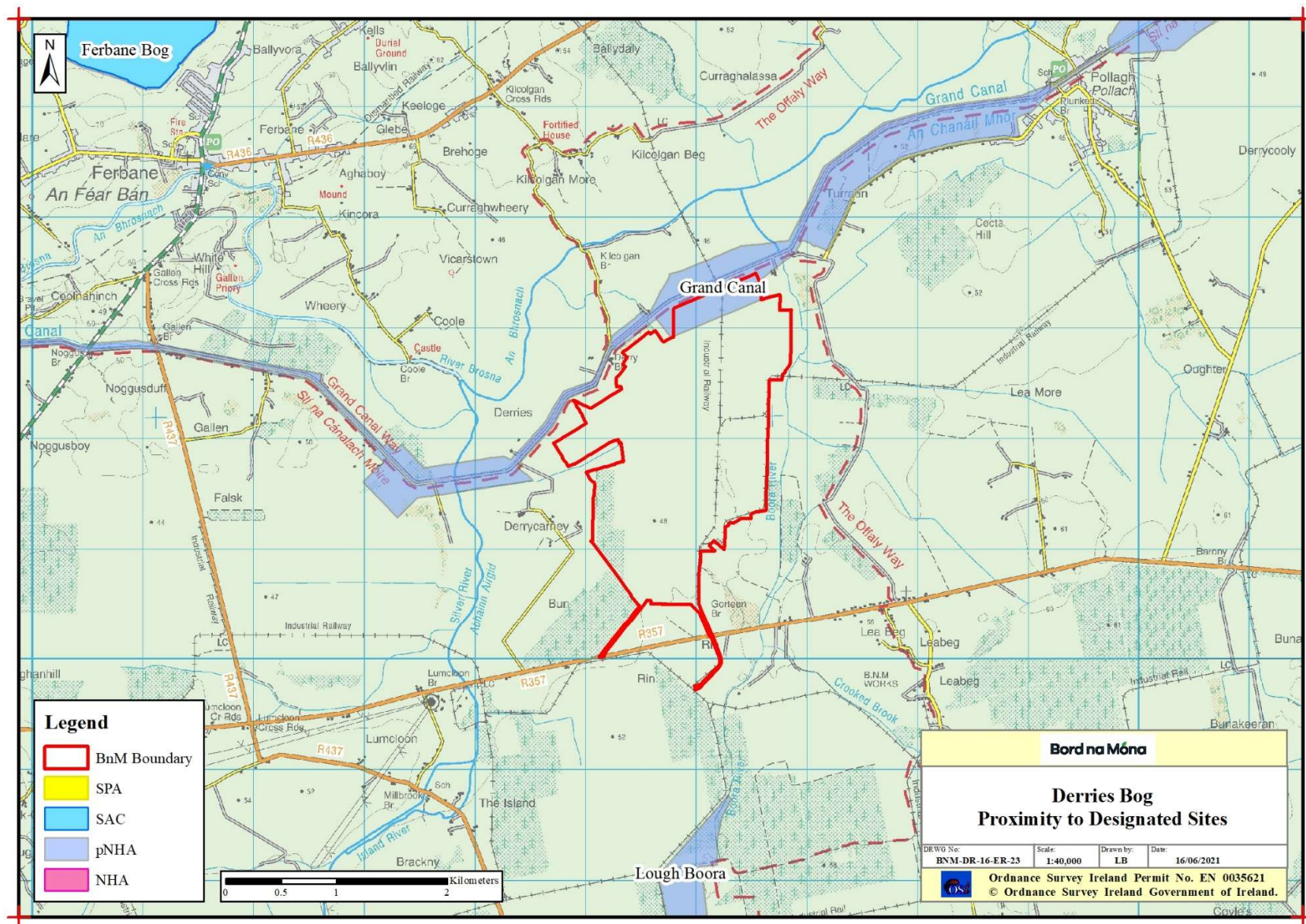


Figure 3.4. Map of Derries Bog showing proximity to sites designated for conservation.

3.5 Hydrology and Hydrogeology

Derries Bog is located in the Lower River Shannon Catchment (Shannon_Lwr). It is mainly drained to the east by the Boora River (EPA Code 25B08) and the west by the Silver River (EPA Code 25S02). Both rivers flow north, passed Derries Bog and into the Brosna (EPA Code 25B09).

Silt ponds are present in the west of Derries to manage discharges into the Silver River and in turn the Brosna. Other silt ponds exist, in close proximity to Derries eastern border on Turraun Bog to manage silt discharge to the Boora River.

The largest section of the bog has field drains running in a general north-south orientation. The dogleg section of on the west side of Derries bog, has drains running in a north-east to south-west orientation.

The bog is located in an area with a locally important bedrock aquifer. 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 mostly low groundwater vulnerability (GSI Mapviewer). A small portion of land located in the south-central region of Derries is listed as High vulnerability. 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, and where surface streams sink underground at swallow holes. These data indicate there is generally low risk of groundwater contamination occurring at this site.

The peat is underlain by glacial deposits interbedded with glacio-fluvial deposits over Dinantian Pure Unbedded 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 blocked 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 rehabilitation to interact or impact on underlying groundwater is very low.

3.6 Emissions to surface-water and water-courses

Derries bog has bog surface water outlets to the Brosna River IE_SH_25B090761, via the Silver River IE_SH_25S020700 and the Boora River IE_SH_25B080100. Peat extraction was identified as a pressure in the second cycle of the river basin management plan for the Silver and Boora rivers and is indicated as remaining so in the third cycle, currently under preparation, with a Brosna River remaining as not under pressure from peat.

Details of silt ponds, associated surface water emission points and those being monitored and sampled as part of the PCAS scheme are detailed on the attached water quality map (Figure 3.7).

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

The main emission limit value associated with this bog is 35mg/l suspended solids, with trigger levels for ammonia of 3.7mg/l and COD 100mg/l.

Initial monthly ammonia concentrations from September 2020 to March 2021 have a range of 0.06mg/l to 0.856mg/l with an average of 0.163mg/l.

From an analysis of any monitoring over the past 3 yrs. of the IPC licence environmental monitoring of some of the discharges from this bog, indicate that results were under the ELV for SS and trigger levels for ammonia and COD.

Bog	SW	Monitoring	pH	SS	TS	Ammonia	TP	COD	Colour
Derries	SW-14	Q3 18	7.6	5	396	0.02	0.05	33	66
Derries	SW-14A	Q3 18	7.9	21	336	0.78	0.05	60	125
Derries	SW-14	Q1 17	7.5	75	370	0.02	0.05	96	253
Derries	SW-14A	Q1 17	7.4	53	342	0.02	0.05	89	239

3.6.1. Decommissioning and Rehabilitation Programme Water Quality Monitoring.

The licence obligation of quarterly sampling regime on a selected number of ponds to be sampled over a 3 year cycle will not be sufficient to be able to appropriately track the changing water chemistry that will occur as part of this enhanced rehabilitation programme, so this sampling regime will occur on a monthly basis.

In order to assist in monitoring surface water quality from this bog, it was agreed to increase the existing licence monitoring requirements of the IPC Licence, to sampling for the same parameters every month.

This new sampling programme commenced in November 2020 and is enabling a baseline to be established, with sampling to progress during the scheduled works, and for a period of up to 2 years post rehabilitation. Depending on the period required to confirm that the main two parameters, suspended solids and ammonia as remaining compliant with the licence emission and trigger limit values and there is an improving trajectory in these two parameters i.e. reduction in concentration, the monitoring programme and intensity will be periodically reviewed and amended.

In the preparation of this monitoring programme, Bord na Mona have been providing the Local Authority Water Programme (LAWPRO) with details of the surface water emissions points associated with this bog and will be amending some of the proposed monitoring locations on foot of this engagement. LAWPRO have in turn provided details of their 2021 monitoring programme and these are included in the Water Quality Map.

This is necessary to ensure that there is alignment with the WFD monitoring programme and that where possible, the monitoring programme will enable any improvements in water quality or establishing trends to be quantified against any available WFD monitoring data. It will also enable the periodic sharing of data which will inform the monitoring reports, success criteria and enable LAWPRO under the Water Framework Directive to track any changes in pressures and be aware of changes in water chemistry.

This enhanced monitoring programme will aim to include a minimum of 70% of a bog's drainage catchments, whatever number of surface water outlets these include.

Monitoring results will be maintained, trended every six months and reported on each year and as required, as part of the requirement to report on Condition 10.1 of the IPC Licence on Bog Rehabilitation in the Annual Environmental Report, and will be provided to LAWPRO and the EPA as required to inform progress and national monitoring requirements under the WFD. These results will also be available in April each year as a requirement of the Annual Environmental Report at www.epa.ie.

The parameters to be included as per condition 6.2 of the IPC Licence include monthly monitoring for pH, Flow, Suspended Solids, Total Solids, Total Phosphorus, Total Ammonia, Colour & COD. In addition, DOC has been included as a parameter to try and identify any changes in carbon in the surface water, and where required by LAWPRO, to assist in investigating other changes in water chemistry, the series of parameters can be reviewed and amended.

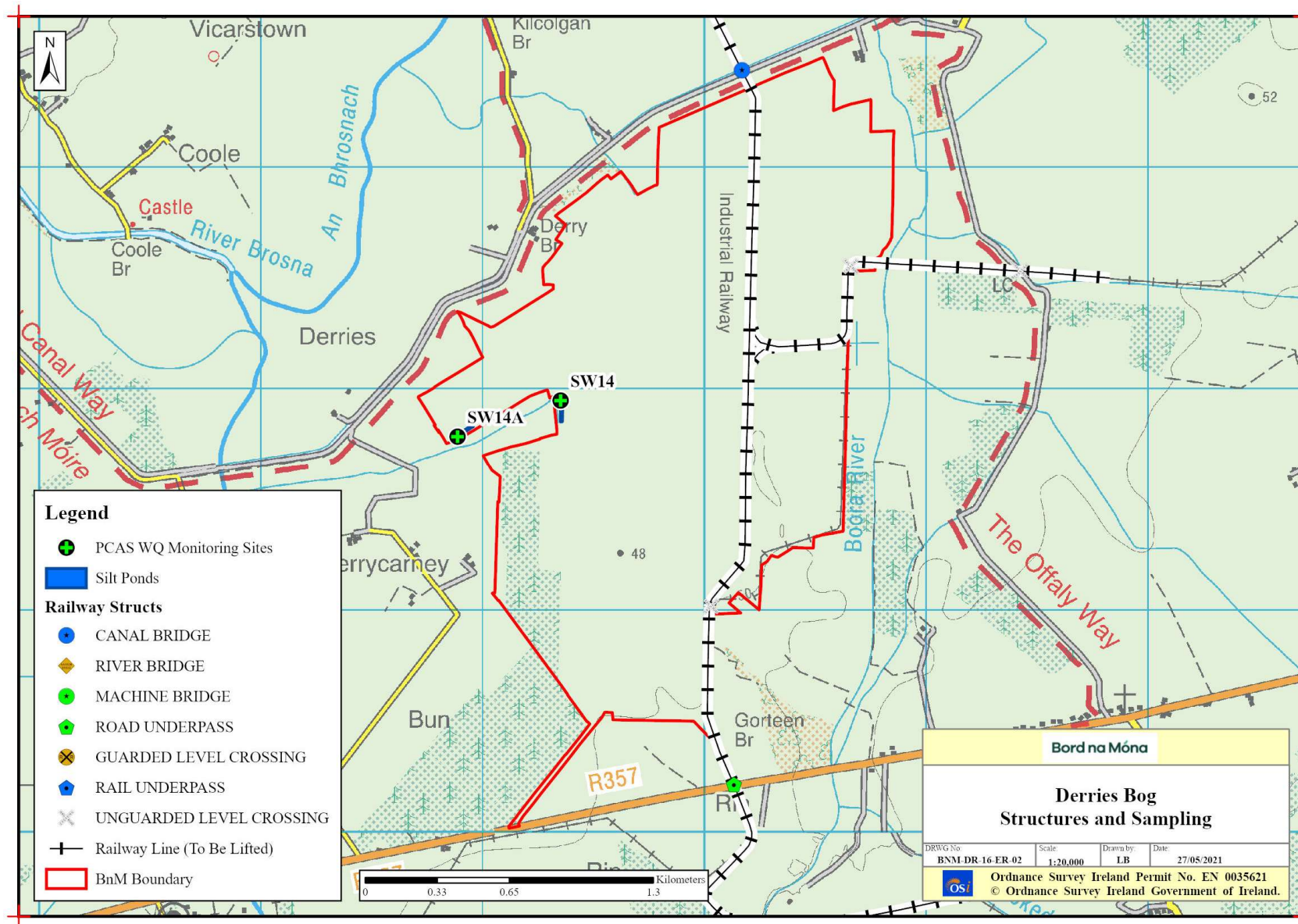


Figure 3.5. Map of Derries Bog showing structures and designated emission points.

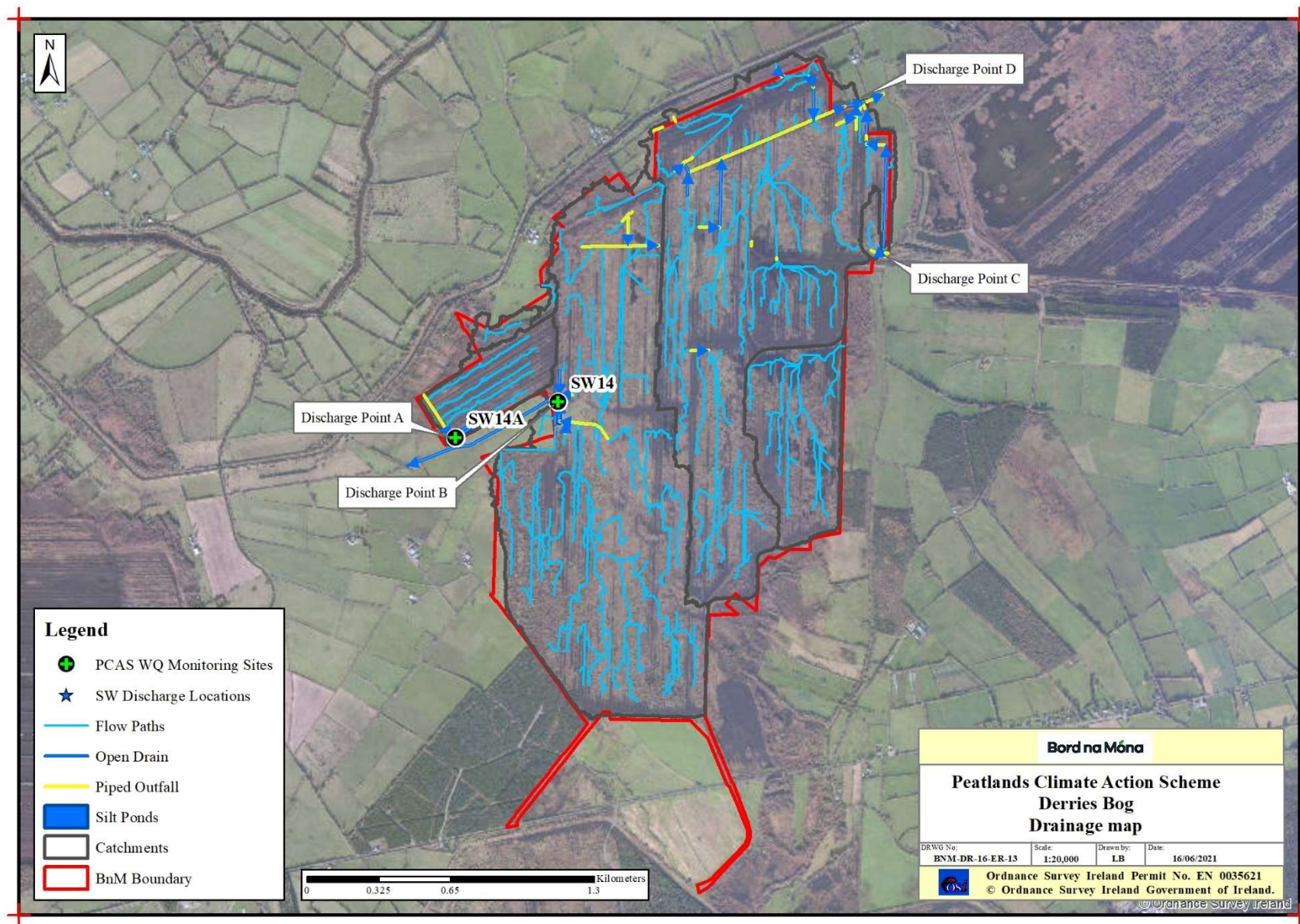


Figure 3.6. Drainage map of Derries Bog showing drainage features and drainage paths.

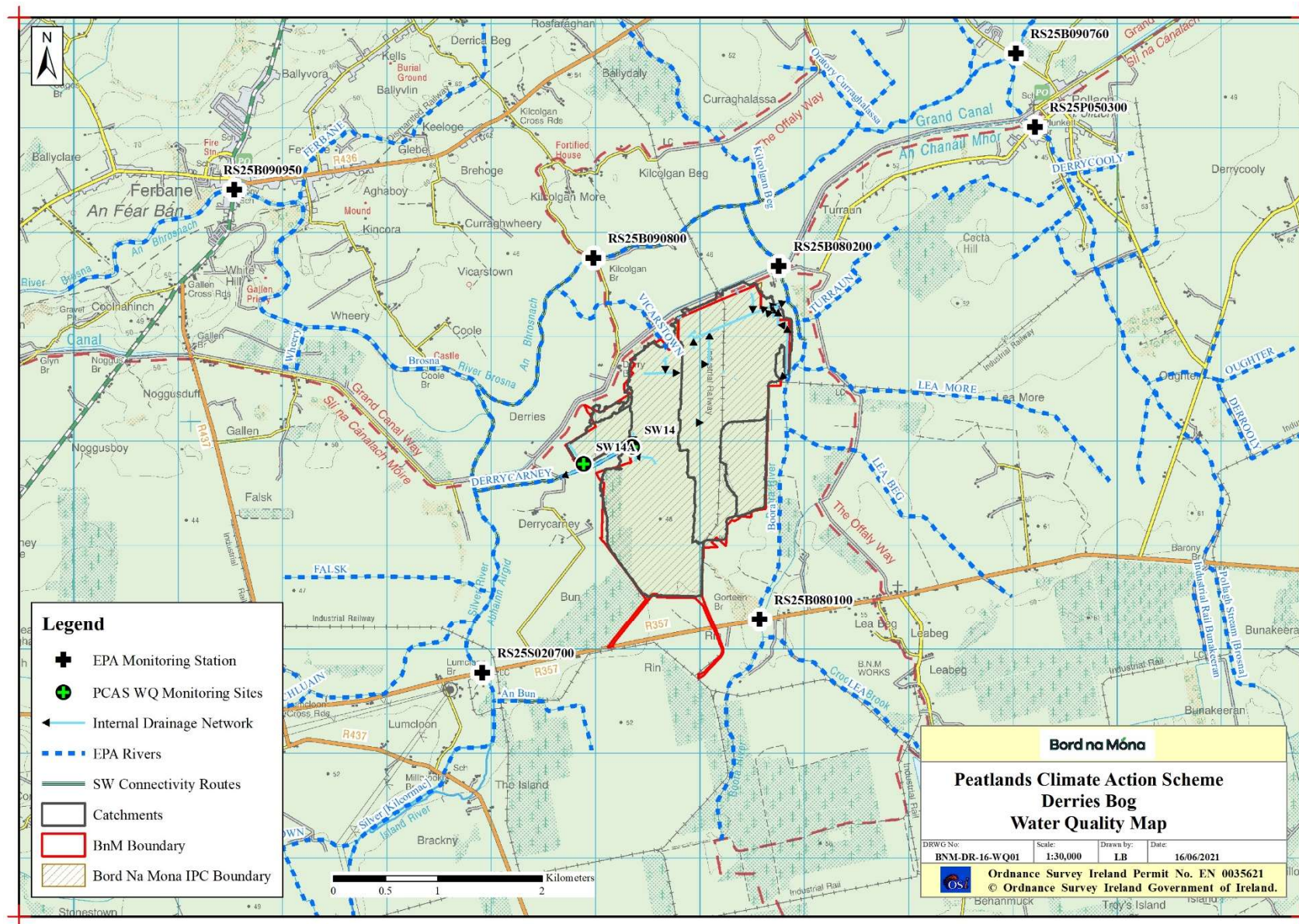


Figure 3.7. Map of Derries Bog showing water management features and water quality monitoring points.

3.7 Fugitive Emissions to air

The bog is no longer in industrial peat production. Rehabilitation of the cutaway peatland will seek to re-wet the dry peat where possible and re-vegetate all areas (whether wet or dry). Collectively, ceasing industrial peat production, re-wetting and re-vegetating will minimise any risk of emission to air from dust.

3.8 Carbon emissions

The bog is likely to be a carbon source as it is a drained (degraded) peatland with currently active drainage, which facilitates the oxidation of peat. Peat extraction generally transforms a natural raised bog which acts as a modest carbon sink into a cutaway ecosystem which is a large source of carbon dioxide (2–5 t C/ha/year) (Waddington & McNeil, 2002; Alm *et al.*, 2007; Wilson *et al.*, 2007, Wilson *et al.*, 2015). Furthermore, they are also a significant source of methane (Huttunen *et al.*, 2003; Laine *et al.*, 2007a) as a consequence of the conditions within the peat body that provide a suitable environment for the microbial breakdown of plant litter and root exudates. Degraded peatlands also release carbon/GHG emissions via the fluvial/aquatic pathway (Dissolved Organic Carbon – DOC, Suspended Solids/Particulate Matter, degassing of GHGs from water).

The EPA-funded CarbonRestore Project (Renou-Wilson *et al.* 2012) found that rewetting of drained peatlands can lead to restoration of functional peatland, such as the return of typical plant and animal species, which in turn may lead to the restoration of peat-formation and the carbon sink function. The EPA NEROS project carried out GHG flux research at Moyarwood Bog and found that Moyarwood Bog was overall a Carbon sink (sink for CO₂ and a source for Methane) 6 years after bog restoration was carried out (Renou-Wilson *et al.* 2018).

It is expected that Derries Bog can become a reduced carbon source following rehabilitation. 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 a mosaic of fen, Reed swamp, wet woodland, scrub. Birch woodland is expected to develop on the drier mounds and peripheral headlands. Where Birch is developing on areas with minimal or no residual peat, these areas have potential to become carbon sinks due to development of biomass.

3.9 Current ecological rating

(Following NRA (2009) Evaluation Criteria)

The majority of this site can be rated as having a high local ecological value (D) as it is dominated by a significant area of naturalising cutaway habitats in good condition. Habitats and species of a national interest such as Marsh Fritillary have been recorded breeding on site.

It is expected that the overall ecological value of this site will increase in the future as the site continues to mature and forms semi-natural habitats, such as more extensive areas of wetlands and Reed swamp.

3.10 Derries Bog Characterisation Summary

Derries Bog is located in Co. Offaly, just over 4km south east of Ferbane and 3km South West of Pollagh. It is part of the Boora Bog group and is located adjacent and south of the Grand Canal. It is linked to other Boora Bog Group bogs (also owned by Bord na Móina) to the north (Lemonaghan), east (Turraun) and south (Boora) by a railway line and machinery travel path, which provides the main access to the site.

Derries Bog has been in peat production since the 1960's. The peat was harvested for fuel peat to be used in Edenderry Power and West Offaly Power in Shannonbridge, Offaly. Industrial peat extraction has now completely ceased at Derries Bog (2015). The majority of the bog is therefore classed as shallow peat cutaway bog, with residual peat depths of generally <1 m.

Derries Bog is located in the Lower River Shannon Catchment (Shannon_Lwr). It is mainly drained to the east by the Boora River (EPA Code 25B08) and the west by the Silver River (EPA Code 25S02). Both rivers flow north, passed Derries Bog and into the Brosna (EPA Code 25B09).

Regarding sites designated for conservation, there is a small overlap between the BnM property and The Grand Canal pNHA along the northern side. The northern section of Derries Bog contains a small area of remnant high bog outside of the BnM lands boundary.

The bog can be broadly divided into four categories: (1) Wetland cutaway bog (2) Deep residual peat (3) Dry cutaway and marginal areas of the former production area (4) Other marginal areas with no rehabilitation proposed. (The bog is divided 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 topography of the site forms a large basin located between the centre and the north east of the site. There is a separate, smaller basin located in the east of the site. The basin areas of the former production area will develop into wetland habitats post rehabilitation. Dependant on local water chemistry conditions a mosaic of fen and Reeds swamp habitats are expected to develop in these areas.
- (2) A portion of the former production area in the west (western dogleg) and a smaller portion in the east have 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 dry cutaway and marginal areas of the former production areas are located across the site. Drain-blocking and some fertiliser application is proposed for these areas. A large portion of the site will develop in this way post rehabilitation. This part of the former production area has a raised topography and is generally developing scrub or birch woodland habitat. The habitats already present are expected to continue to develop post rehabilitation. Enhanced rehabilitation measures are expected to facilitate and expedite the development of cutaway birch and scrub habitat in these areas.

- (4) Some parts of the former production area are constrained from rehabilitation to prevent unintended consequences from occurring on neighbouring lands. There is a minor amount of former production area that is constrained from rehab due to the presence of archaeology.

4. CONSULTATION

4.1 Consultation to date

Consultation will seek 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, in operation since 2010. National Stakeholders includes relevant government departments and agencies, relevant semi-state bodies, NGOs and other environmentally-focused groups with a national remit. Stakeholders can be emailed a copy of this draft plan when it has been finalised internally by Bord na Móna, and invited to make submissions on the objectives and content of this plan in relation to Derries Bog.

There has been ongoing consultation about rehabilitation and other general issues over the years about Derries Bog with various stakeholders in relation to:

- General consultation with range of stakeholders at annual Bord na Mona Biodiversity Action Plan review days 2010-2018.
- 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).
- The development of Lough Boora Discovery Park (Offaly County Council);
- Bird surveys carried out by Birdwatch Ireland for Bord na Móna,
- the development of the cycle track (Offaly Leader and Offaly County Council);
- development of a management plan for Lough Boora with local stakeholders from Pollagh (Birdwatch Ireland 2018)
- interaction with the Grand Canal with Waterways Ireland.

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- interaction with the Grand Canal with Waterways Ireland.

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

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 Derries Bog – these are summarised below.

4.2.1 Assessments of rehabilitation

Queries on pre-rehabilitation assessments were raised by NPWS, Offaly 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. Offaly County Council also requested that the after use of the BnM bogs be considered as part of PCAS.

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, Offaly County Council and ICMSA 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 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).

Offaly County Council expressed concerns regarding potential issues with security, fire risk and water pollution arising as a result of PCAS.

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 Derries 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 in the planning process of rehabilitation works and implementing and exclusion or buffer zone around these features. These measures should sufficiently protect any archaeology in these areas, during any ground works 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 Derries 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. After use of the bog is outside the scope of PCAS. However, it is envisaged that potential after uses of Derries Bog for instance, amenity walkways/cycleways should not be adversely impacted by PCAS.

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 Derries 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 Derries 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 Derries 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 *Other issues*

Creating amenity such as walking tracks is not part of the direct scope of PCAS. However, PCAS will enable and support future amenity development. This site is part of Lough Boora Discovery Park and a cycle track already exists along the margin of the site. There can be further opportunities to extend amenity at this site. Any future amenity can be positively aligned and integrated to after-use plans following the completion of the proposed rehabilitation at Derries Bog. Rehabilitation measures proposed for Derries 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.

Bord na Móna considers issues regarding estate security, fire risk and water pollution of utmost importance. BnM intends to maintain security and manage fire risk over the entirety of the estate. In this regard, PCAS activities, should have no detrimental impact on these issues. Regarding water pollution, BnM is regulated by the EPA and as such adheres to the strict water pollution measures laid out by the same.

Other issues, including after-use and management issues outside the boundary of Derries Bog, are acknowledged but are specifically outside the scope of this rehabilitation plan.

4.3.7 *Concluding statement.*

- Derries bog is largely stabilised and developing a mosaic of habitats already. This will not be radically changed.
- 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 and assessment, and corresponding adaptations to incorporate Drainage Management Plan mitigation measures.
- Several marginal drains will not be blocked to avoid impacts on adjacent lands, Coillte forestry, rights of way or turf-banks. A drain will be left open through the site to continue to facilitate water movement through the site from adjacent land. This does not change the overall rehabilitation goals and outcomes and can be integrated with the other rehabilitation measures to allow cutaway re-wetting.
- No changes were required to the rehabilitation plan to enable any future potential amenity (greenway).

5. REHABILITATION GOALS AND OUTCOMES

The rehabilitation goals and outcomes outline what Bord na Móina 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 Móina 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 Derries 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).

- Bord na Móna are also planning rehabilitation measures in some adjacent bogs (e.g. Pollagh) in 2021. There are expected to be cumulative water quality and other ecosystem service benefits to receiving water bodies such as the River Brosna from rehabilitation more than one bog in the same catchment.
- Re-wetting in general 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 Derries Bog (Figure 3.1).
- EPA IPC Licence - Ref. P0500-01. As part of Condition 10.2 of this licence, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. Derries Bog is part of the Boora Bog group.
- The proposed Scheme is designed to exceed the stabilisation requirements as defined by the IPC Licence. This Scheme is designed to enhance the ecosystem services of Derries Bog, in particular, optimising **climate action benefits**. The proposed interventions will mean that environmental stabilisation is achieved (meaning IPC obligations are met) and, in addition, significant other ecosystem service benefits particularly for climate action will be accrued.
- The local environmental conditions of Derries Bog identify targeted cutaway re-wetting as the most suitable rehabilitation approach for this site. Re-wetting will lead to the development of fen, Reed Swamp and other associated wetland/peatland habitats. Deep peat re-wetting is proposed for a small portion of the 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 Derries Bog as **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**. Some of the drier areas on the bog will likely develop birch woodland.
- Enhanced Rehabilitation of Derries Bog will support multiple national strategies of climate action, biodiversity action and other key environmental strategies such as the Water Framework Directive.
- The time frame for the delivery of the planned rehabilitation will be undertaken according to available resources and appropriate constraints.
- It is not proposed to carry out any rehabilitation in the marginal cutover bog zone as this is quite fragmented by private turbary.

6.1 Key constraints

- **Bog conditions.** Rehabilitation outcomes of sites are constrained by the environmental characteristics of these particular areas. For example, there is potential for raised bog restoration at some sites where there has not been significant industrial peat extraction and the peat body is largely intact (deep peat sites that are drained). At other sites, most of the peat mass has been removed, the environmental characteristics of these areas have therefore changed radically (peat depths, hydrology, water chemistry, substrate type, nutrient status), and there will therefore be different habitat outcomes (wetlands, fen, heathland, grassland and Birch woodland). At Derries Bog, the majority of the site has been cutaway. The majority of Derries Bog has shallow peat deposits present throughout most of the site. Local environmental factors will influence (e.g. peat depth and or topography) the future trajectory of this site which need to be considered as part of the wider rehabilitation work.
- **Surrounding landscape and neighbours.** Another key constraint is the interaction between the Bord na Móna sites and the surrounding landscape. Care has to be taken that no active rehabilitation management is carried out that could negatively and knowingly impact on surrounding land. This

includes any hydrological management on neighbouring farmland, 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.

- **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 Derries Bog was carried out (Appendix XII). This indicates there are several known archaeological features. Rehabilitation in these zones will be avoided or minimised (peat barriers located to avoid damage to any archaeological features) (Figure 8.4). Rehabilitation methodologies in these areas will be amended or the areas excluded, depending on the AIA, to minimise or remove any impact.
- **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 during the consultation work associated with the decommissioning and rehabilitation work described here.
- **Other Constrained areas.** Lough Boora Discovery Park cycle track. This is out of scope of the Rehabilitation Plan

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 raised bog restoration trajectory of the site. 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. It is expected that this rehabilitation plan will set the site on an enhanced and accelerated trajectory towards deep peat re-wetting. The plan does not set any goals or outcomes, for example, the extent (specific area) of active raised bog habitat (ARB) that may develop at this site. This is beyond the scope of this rehabilitation plan.
- This plan is not intended to be an after-use or future land-use plan for Derries Bog.
- The longer-term management of this site, potentially as a nature conservation site, or for amenity, or for other uses in the future. This will require further engagement with stakeholders.

7. CRITERIA FOR SUCCESSFUL REHABILITATION

This section outlines what criteria will be used to indicate 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 Móina 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 Móina wish to optimise climate action and other ecosystem service benefits via enhanced rehabilitation measures. Enhanced rehabilitation will significantly go beyond what is required to meet rehabilitation and decommissioning obligations under existing EPA IPC licence conditions. The proposed interventions will mean that environmental stabilization is achieved (meaning IPC obligations are met) and, in addition, significant other benefits particularly for climate action will be accrued.

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

- Rewetting of residual peat in the former area of industrial peat production to offset potential silt run off and to encourage/accelerate development of vegetation cover via natural colonisation and reducing the area of bare exposed peat. See Table 7.1 for a summary of the criteria for successful rehabilitation and associated monitoring. The target will be the delivery of measures and this will be measured by an aerial survey after rehabilitation is completed.

The key water quality success criteria associated with this enhanced rehabilitation are as follows:

- That there is a stabilising/improving concentration of suspended solids and ammonia in discharges from Bord na Móina 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.

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.

As the monthly monitoring program at Derries 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.

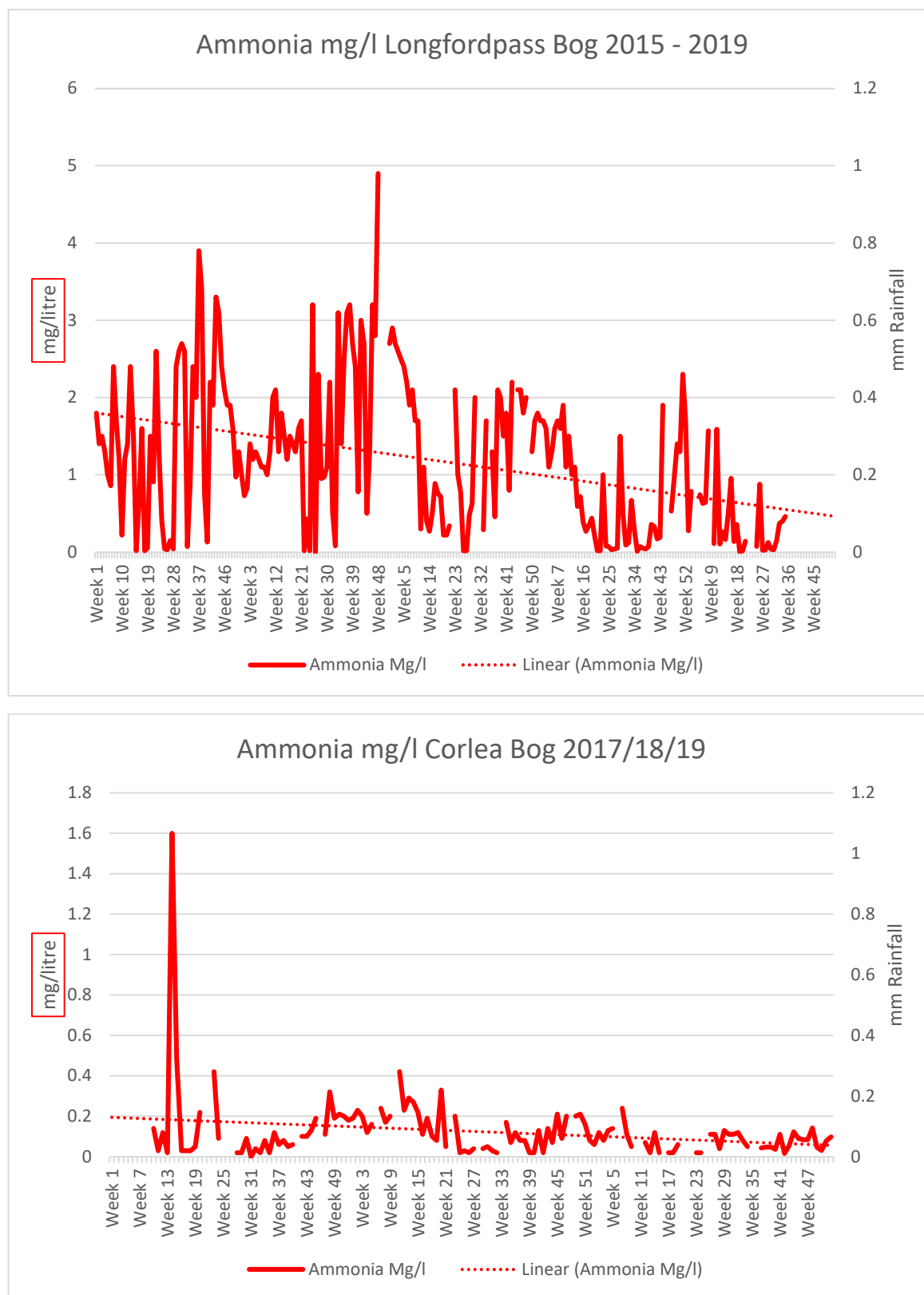


Figure 7.1. Ammonia levels over the period 2015-2019 at Longfordpass and Corlea.

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 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. 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 (similar to ecotope mapping). 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. These metrics will be defined in the context of the overall Scheme resources and after consultation with stakeholders.

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 in the former area of industrial peat production	Delivery of rehabilitation measures Reduction in bare peat.	Aerial photography after rehabilitation has been completed – to demonstrate measures (drain-blocking) Establishment of a baseline for future monitoring of bare peat, vegetation establishment and habitat condition.	2021-2025
IPC validation	Key water quality parameters	Reduction or stabilisation of key	Water quality monitoring. Started in advance of the proposed rehabilitation.	2021-2023

	Ammonia, Phosphorous, Suspended solids, pH and conductivity	water quality parameters		
IPC validation	Reducing pressure from peat production on the local water body catchment (WFD)	Where the section of the water body, that this bog drains to, 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, confirms that there is an improving trajectory in water quality from the peat extraction associated with activities at this bog.	EPA WFD monitoring programme	WFD schedule
Climate action verification	Optimising the extent of suitable hydrological conditions to optimise climate action	Optimal extent of suitable hydrological conditions	Aerial photography 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	Reduction in carbon emissions.	Reduction in carbon emissions	Carbon emissions – estimated using a high bog condition assessment and appropriate carbon emission factors.	2021-2025

Climate action verification	Setting the site on a trajectory towards establishment of a mosaic of compatible habitats	Establishment of compatible cutaway habitats	Habitat map, Cutaway bog condition map 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 birds Pollinators	Improvement in biodiversity and ecosystem services.	Metrics that relate to selected biodiversity and ecosystem services (to be defined). Presence of key species – Sphagnum – Walkover survey Breeding birds – Breeding bird survey Pollinators – Pollinator walk	2021-2025

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 8.3 & 8.4) will be important in planning the future peatland landscapes and planning the use of the most appropriate rehabilitation methodologies to maximise climate action benefits. Hydrological modelling (Figure 8.4) indicates those areas that are likely to re-wet when drains are blocked, based on the current topography, and areas where water levels may have to be modified, where needed. Enhanced rehabilitation measures will look to optimise hydrological conditions for re-wetting peat in other areas. This planning is also essential for matching the most sustainable rehabilitation methodology to the most suitable cutaway environment to maximise the benefits of the resource outlay (maximising cost/benefit).

The rehabilitation actions will be a combination of PCAS measures to re-wet peat. The distribution of these measures is provisionally outlined in Figure 8.5. (Note that the actual distribution of these measures may be subject to change in response to stakeholder consultation and refinement of the enhanced rehabilitation measures.)

These enhanced measures for Derries Bog will include:

- Modifying water levels through targeted rehabilitation by altering levels within internal outfalls and piped drainage, and increasing the extent of wetland habitat mosaics. This will further slow the movement of water through and out of Derries Bog.
- Re-wetting some 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.
- Seeding of vegetation and inoculation of *Sphagnum* in suitable deep peat areas.
- Targeted fertiliser applications to accelerate vegetation establishment on headlands and high fields.
- 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).
- Seeding of vegetation is not required at this site as natural colonisation and the development of pioneer habitats is already significantly progressed.

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

- Seek formal approval of the enhanced plan, noting the alternative standard plan should funding from the proposed Scheme not materialise, from the EPA;
- Agree an *ex ante* budget of eligible costs (based on the approved enhanced plan) with the Scheme regulator;

- Develop a detailed site plan with detailed site drawings outlining how the various rehabilitation methodologies (within the proposed PCAS) will be applied to Derries Bog. This will take account of peat depths, topography, drainage and hydrological modelling. (See Figure 8.5 for an indicative view of the application of different rehabilitation methodologies);
- A hydrology and drainage management assessment of the proposed enhanced rehabilitation measures was carried with no significant issues identified;
- A review of known archaeology and an archaeological impact appraisal of the proposed rehabilitation was carried out. The results of this assessment were incorporated into the rehabilitation plan to minimise known archaeological disturbance, where needed;
- A review of issues that may constrain rehabilitation such as, land-use, known rights of way, archaeology, turbary, and existing land agreements was carried out and incorporated into the rehabilitation plan;
- A review of remaining milled peat stocks was carried out. There are no peat stocks remaining on this bog.
- An ecological appraisal of the potential impacts of the planned rehabilitation such as the presence of sensitive ground-nesting bird breeding species (e.g. breeding waders) or larval webs of Marsh Fritillary butterfly, etc was carried out. The scheduling of rehabilitation operations has been adapted to avoid disturbance to nesting bird species during the breeding season.
- Ensure all activities comply with the environmental protection requirements of the IPC Licence.
- Carry out Appropriate Assessment of the Rehabilitation Plan. Incorporate any required mitigation measures from the AA in the plan for the delivery of rehabilitation and decommissioning across the site. (Note that an AA screening of Derries Bog has been carried out and the rehab plan has screened out at Stage 1).
- See Derries Bog Decommissioning and Rehabilitation Plan – Addendum 1 for more details of the AA screening conclusion.
- Track implementation and enforcement of the relevant IPC Licence conditions, the mitigation measures (AA) and other environmental control measures during the implementation of the rehabilitation plan.

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 pump management, drain blocking, peat field re-profiling, cell-bunding and fertiliser applications targeting headlands, high fields and other areas. 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 measures 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.

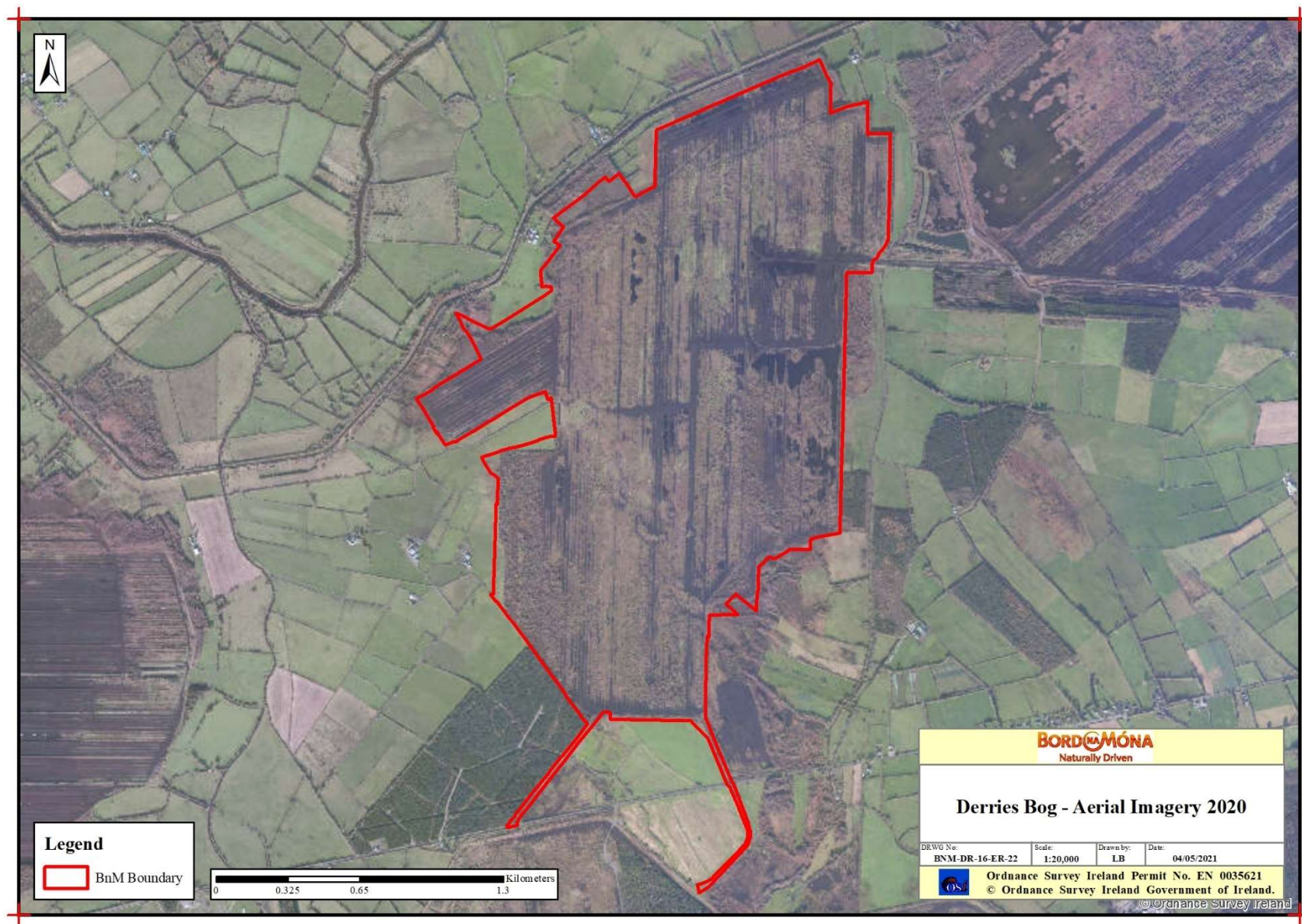


Figure 8.1. Aerial photo of Derries Bog. The majority of the bog is vegetated.

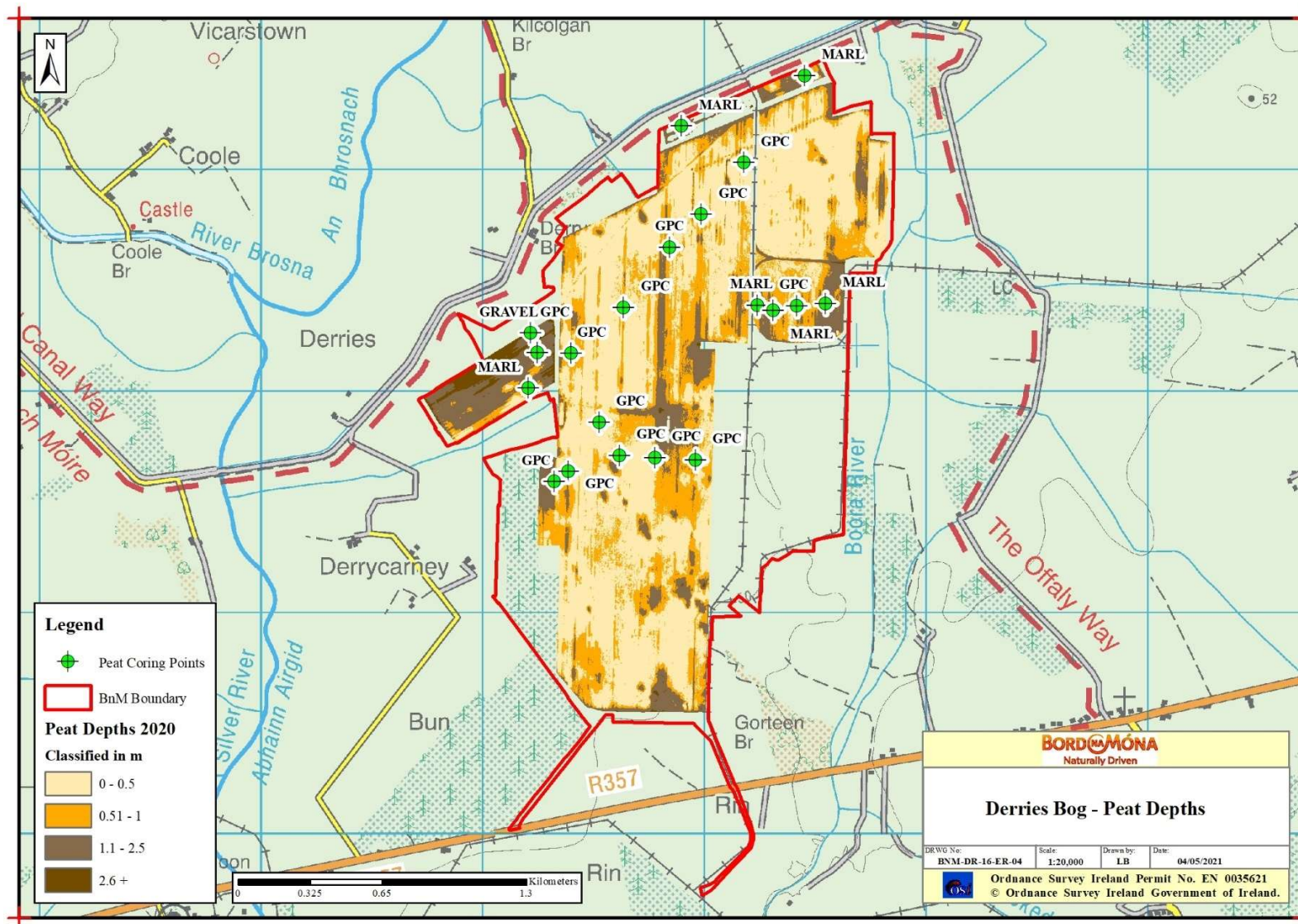


Figure 8.2. Peat depth map for Derries Bog. Most of the bog is characterised as shallow peat cutaway bog. Deep peat reserves persist on the western dogleg area.

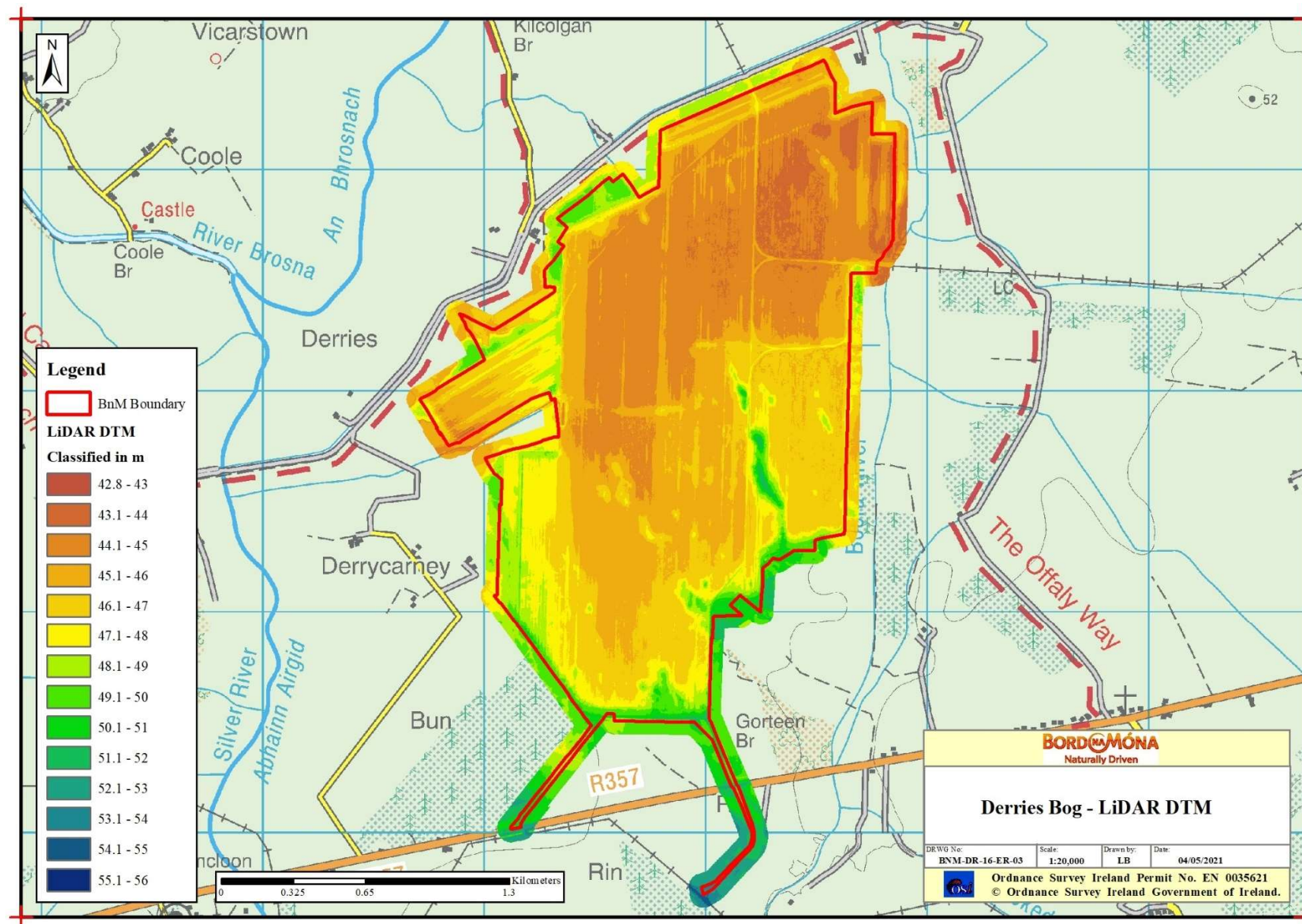


Figure 8.3. LIDAR topography map of Derries Bog. Low areas and basins are orange-yellow, more elevated areas are blue-green.

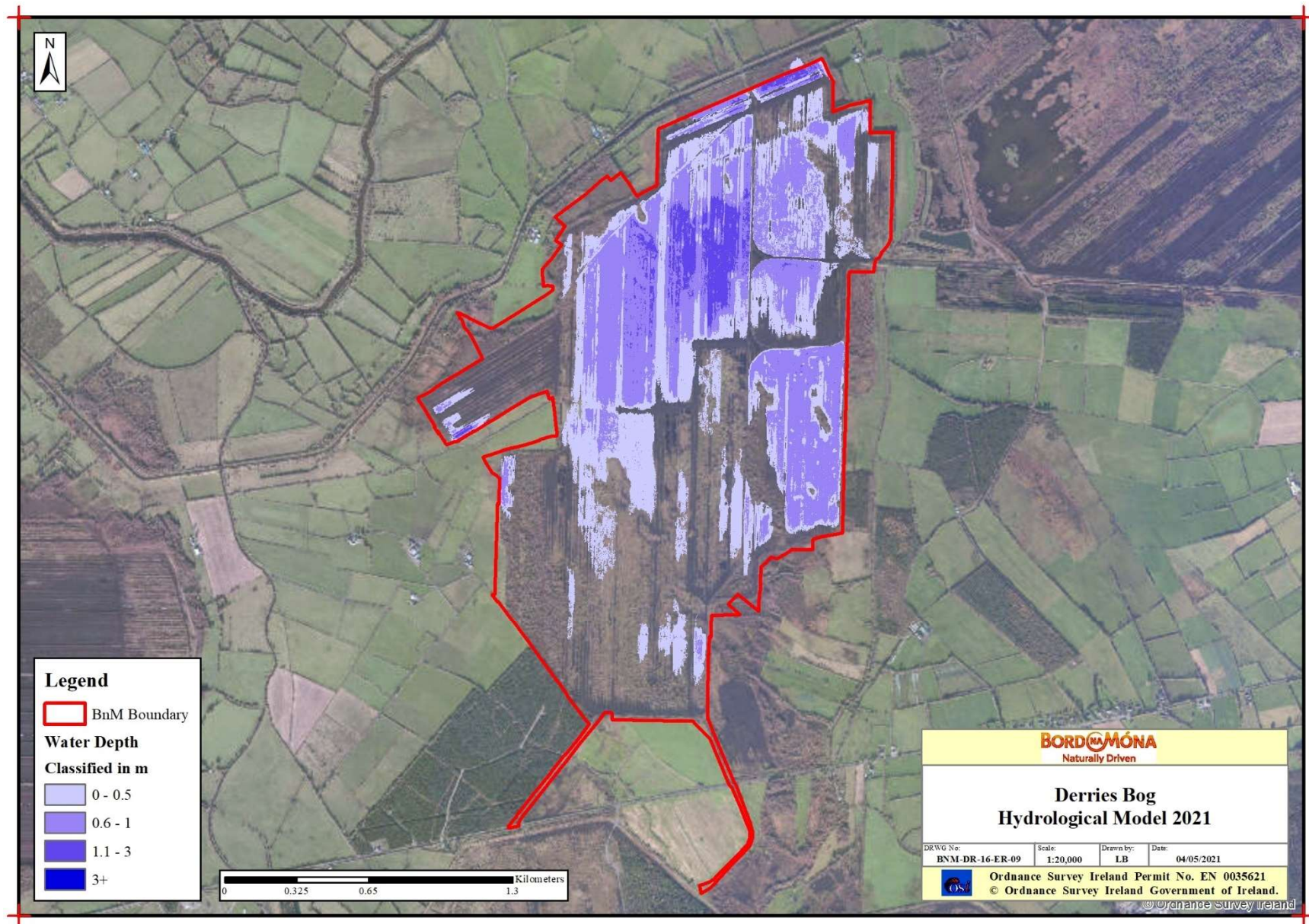


Figure 8.4. Hydrological modelling for Derries Bog showing range of expected water depths based on current topography and key flow-paths.

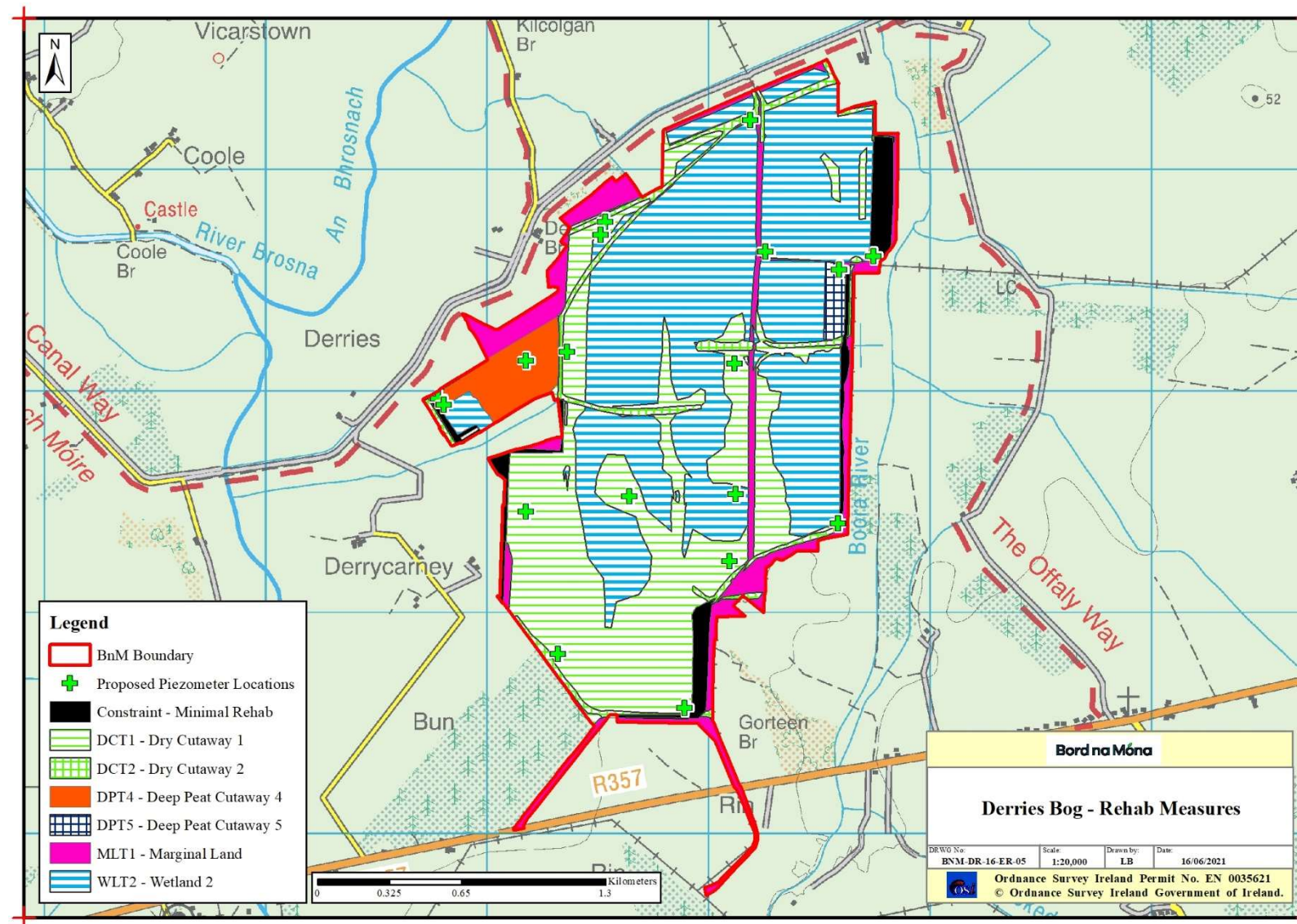


Figure 8.5. Derries Bog Enhanced Rehabilitation Plan

Table 8.1. Enhanced rehabilitation measures & target area.

Type	Code	Description	Area (Ha)
Deep peat cutover bog	DPT1	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes	
	DPT2	More intensive drain blocking (7/100 m) + blocking outfalls and managing overflows with a controlled weir outfall	
	DPT3	More intensive drain blocking (7/100 m), + field reprofiling + blocking outfalls and managing overflows with a controlled weir outfall	
	DPT4	Berms and field re-profiling (45m x 60m cell) + blocking outfalls and managing overflows with a controlled weir outfall + drainage channels for excess water + <i>Sphagnum</i> inoculation	12.31
	DPT5	Cut and Fill cell bunding (30m x 30m cell) + blocking outfalls and managing overflows with a controlled weir outfall + drainage channels for excess water + <i>Sphagnum</i> inoculation	3.17
Dry cutaway	DCT1	Blocking outfalls and managing water levels with overflow pipes	112.45
	DCT2	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes + targeted fertiliser treatment	14.69
	DCT3	More intensive drain blocking (7/100 m) + blocking outfalls and managing overflows with a controlled weir outfall + targeted fertiliser treatment	
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	181.03
	WLT3	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site + constructing larger berms to re-wet cutaway + transplanting Reeds and other rhizomes	
	WLT4	More intensive drain blocking (7/100 m), + blocking outfalls and managing overflows with a controlled weir outfall + transplanting Reeds and other rhizomes	
	WLT5	More intensive drain blocking (7/100 m), + field reprofiling + blocking outfalls and managing overflows with a controlled weir outfall + transplanting Reeds and other rhizomes	
Marginal land	MLT1	No work required	31.93
	MLT2	More intensive drain blocking (7/100 m)	
	MLT3	More intensive drain blocking (7/100 m) + blocking outfalls and managing overflows with a controlled weir outfall + boundary berm	
Other		Silt-ponds	0.2
Constraint	Constraint	Constraint no rehab required	15.19
Total			370.98

8.3 Long-term (>3 years)

- Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- Delivery of a monitoring, aftercare and maintenance programme (See section 10.2 below).
- Decommissioning of silt-ponds will be assessed and carried out, where required.
- Reporting to the EPA will continue until the IPC Licence 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 costs of **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 'standard' 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).

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 needed.
- **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 three 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 rehabilitation. These proposed monitoring measures will be funded by the proposed Scheme or additional other funding. Monitoring of climate action and other ecosystem service benefits will be designed to take account of the requirements of monitoring benefits of the overall Scheme and will be stratified; that is not all monitoring will be carried out in each site. These are defined as:

- Vegetation and habitat monitoring after rehabilitation is completed using a cutaway bog condition assessment (Similar to ecotope mapping). This assessment will include assessment of on environmental and ecological indicators such as vegetation cover, vegetation communities, presence of key species, *Sphagnum* cover, bare peat cover and water levels.
- The condition of the bog can be assessed using the condition assessment and suitable Greenhouse Gas (GHG) emission factors can be assigned to different habitats. GHG emission factors have been determined for various peatland habitats in Ireland (Wilson *et al.*, 2015) and are constantly being refined with more and more research. BnM is actively supporting research into GHG fluxes in different rehabilitated peatland habitats. This means that potential GHG emissions can be estimated from the site, as the site continues along its trajectory towards a naturally functioning peatland ecosystem.
- It is proposed to monitor the improvement of some biodiversity ecosystem services. A breeding bird and Pollinator monitoring programme will be established. Specific pollinator indicators will be monitored (Bee and Butterfly). To be defined in relation to monitoring of the overall proposed Scheme and after consultation with stakeholders.

9.2 Rehabilitation plan validation and licence surrender – report as required under condition 10.4

IPC Licence 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 Licence 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 Derries Bog (Figure 3.1).
- EPA IPC Licence - Ref. P0500-01. As part of Condition 10.2 of this licence, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. Derries Bog is part of the Boora Bog group.
- The current condition of Derries Bog. The majority of the site has already developed a mosaic of Birch woodland and cutaway wetland habitat and is quite well vegetated.
- To minimise potential impacts on neighbouring land, some boundary drains around Derries Bog will be left unblocked as blocking boundary drains could affect adjacent land.

Rehabilitation goals and outcomes

The key rehabilitation goal and outcome for Derries Bog is environmental stabilisation of the site via environmental stabilisation of the site via wetland creation and residual 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 wetland and peatland habitats.

Criteria for successful rehabilitation:

- Rewetting of residual peat in the former area of industrial peat production to offset potential silt run off and to encourage development of vegetation cover via natural colonisation, and reducing the area of bare exposed peat.

- 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 watercourses associated with surface water from this bog are excluded in the EPA's list of peat pressure water bodies as reported in the River Basin Management Plans. Where the watercourse 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 indicators – key targets

- Demonstrating the delivery of the rehabilitation through site visits and through updated aerial photography (indicating presence of peat drain-blocks and re-wetting).
- Stabilising potential emissions from the site (silt run-off). The critical success factor 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.

Rehabilitation measures: (see Figure Ap-1)

- Blocking piped drainage and outfalls in targeted positions within the former industrial production area to raise general water levels and increase wetland habitat. The field drains across the bog have already been blocked by Bord na Móna or have blocked naturally.
- Fertiliser treatment of high fields and headlands (typically slow to naturally re-colonise) to encourage natural colonisation, if needed.
- No measures are planned for the 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 with dozer.
- 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.
- 2023-2024. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- 2023-2024. Decommission silt-ponds, if necessary.

Table AP-1. Rehabilitation measures, target area and costs.

Type	Code	Description	Area (Ha)
Deep peat	DPT1	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes	15.48
Dry Cutaway	DCT1	Blocking outfalls and managing water levels with overflow pipes	127.14
Wetland	WLT1	Turn off or reduce pumping to re-wet cutaway & blocking outfalls and managing water levels with overflow pipes	181.03
Marginal land	MLT1	No work required	31.93
Constraint /Archaeology		Areas constrained by archaeology, public rights of way etc.	15.19
Silt ponds		Silt-ponds	0.2
Total			370.98

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 for additional rehabilitation, if needed.
- 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.

Validation and IPC Licence surrender

Reporting to the EPA will continue until the IPC Licence is surrendered. The bog will be included in the full licence surrender process as per the Guidance to Licensees on Surrender, Cessation and Closure of Licensed Sites EPA, 2012, when:

- The planned rehabilitation has been completed.
- Water quality monitoring demonstrates that water quality of discharge is stabilising or improving.
- The site has been environmentally stabilised.

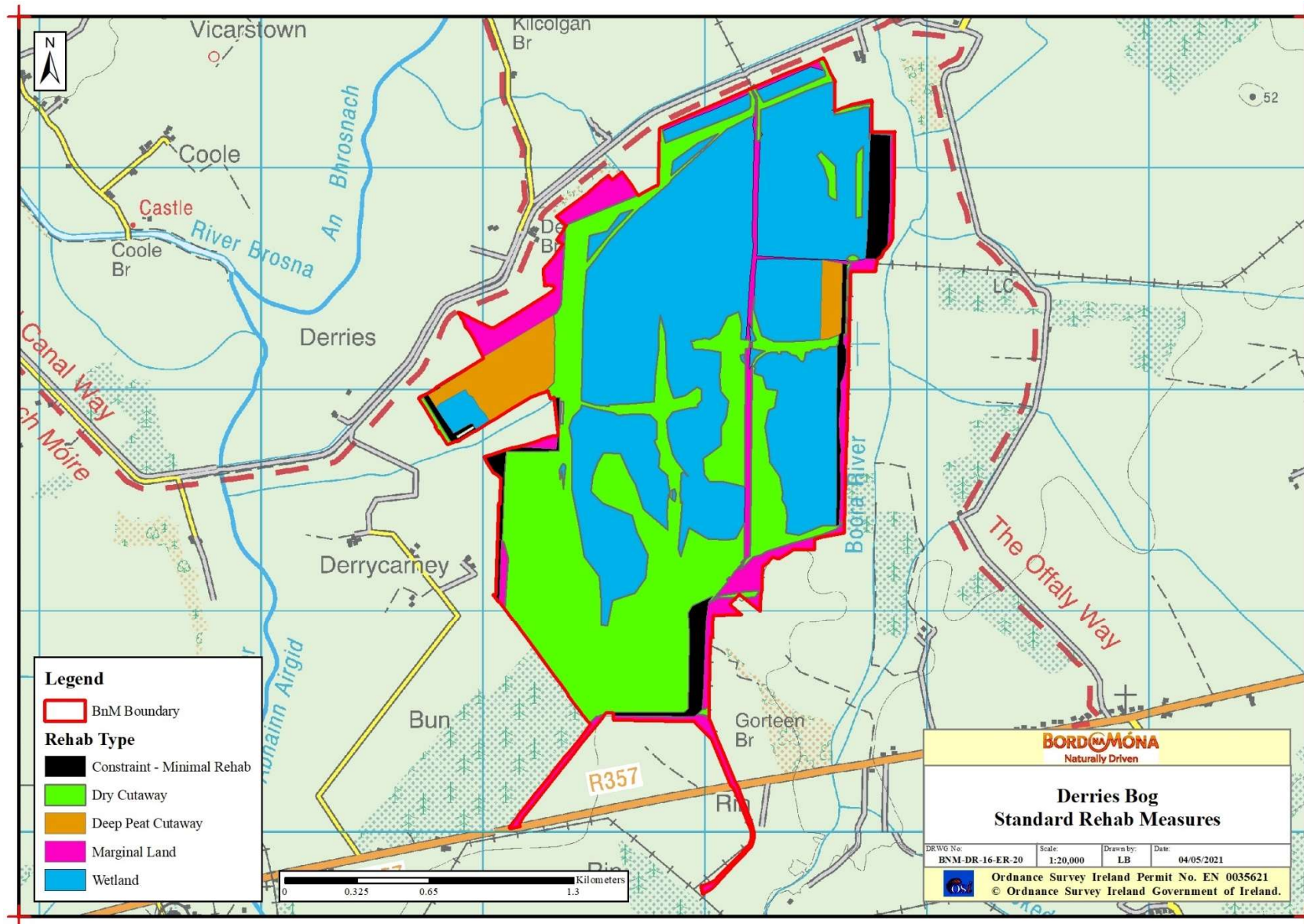


Figure Ap-1. Indicative adapted standard rehabilitation plan for Derries Bog.

APPENDIX II: BOG GROUP CONTEXT

The Boora group of bogs are sited between Killeigh (Offaly) in the East to Banagher (Offaly) in the West and between Kinnitty (Offaly) in the south and Clara (Offaly) in the North. The River Shannon is the major river catchment for the area with a smaller area lying within the Barrow catchment.

The Boora Group is one of the oldest bog groups in Ireland. Bord na Móna was set up in 1946 and it commenced the development of the Boora Bogs in 1946 with milled peat production commencing in 1955. Milled peat was produced in the Boora Bog for the supply of fuel peat to the power station in Fermanagh which commenced power generation in 1957 and closed in 2001. The Boora bogs were also developed for the supply of milled peat to the Derrinlough Briquette factory, which commenced production in 1957.

Much of the Boora Bog complex became cutaway as it was in peat production at an early stage. A number of rehabilitation measures comprising naturalisation and development of alternative after-uses have been already explored at the Boora Bog Group, including coniferous forestry, biomass, agricultural grassland, amenity use, rare species conservation management (specifically Grey Partridge) and wetland creation. Some of this was carried out in the 1980s. While agricultural fields and coniferous forestry have been developed successfully on the cutaway bogs at Boora, it was found that these require financial investment that at this time exceeds any potential commercial output value. The Lough Boora Discovery Park encompasses all areas relating to amenity and biodiversity. www.loughboora.com.

The bogs in The Boora Bog Group have been used in the past to supply milled peat for the horticultural market, local power stations (Fermanagh, Shannonbridge and West Offaly Power) and Derrinlough Briquette factory.

A breakdown of the component bog areas for the Boora Bog Group IPC Licence Ref. PO500-01, and current, indicative Peat Production Status, is outlined in Table Ap-2. These areas are also outlined on Figure Al-2 (Map of the Boora Bog Group).

Table Ap-2: Boora Bog Group names, area and indicative status

Bog	Area (Ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Killaun	359.5	Cutover Bog Industrial peat production commenced at Killaun Bog in 1996 and ceased in 2020. Only the upper most layers of peat have been harvested. Deep peat reserves remain on site. Killaun is considered a deep peat cutover bog.	Killaun Bog formerly supplied a range of commercial customers including; horticultural peat and fuel peat. Most of the former production area is bare peat.	2020	Draft 2017
Boora	1,842.4	Cutaway Harvested since the 1950's resulting in the exhaustion of the commercially viable peat resource at the bog. The majority of Boora Bog is considered a shallow peat cutaway bog. Some areas of deep peat persist at this site.	The majority of Boora bog has already been rehabilitated. A significant area of cutaway bog has been re-wetted, developed as conifer forestry (Coillte) and developed as farmland (1980s). This site now forms the core of Lough Boora Discovery Park.	2020	Finalised 2021

Pollagh/ Cornalaur	280.8	<p>Cutaway</p> <p>At Pollagh Bog, industrial peat production began in 2004 and ceased in 2020.</p> <p>Peat reserves of variable depth remain on site. Some deep peat areas remain. Pollagh is considered a cutover bog with variable peat depths.</p>	<p>Pioneer emergent peatland vegetation communities are developing throughout the bog.</p> <p>The adjacent Cornalaur Bog was never developed for peat production.</p>	2020	Finalised 2021
Noggusboy	917.4	<p>Cutaway Bog</p> <p>Industrial peat production commenced at Noggusboy during the 1950's and ceased in 2020. Long-term peat extraction has exhausted commercially viable peat reserves on this bog. Noggusboy is considered a shallow peat cutaway bog.</p>	<p>Part of the site was developed for conifer forestry by Coillte.</p> <p>Part of the site was developed as Cloghan Lake, as part of Lough Boora Discovery Park, in 1999.</p> <p>There is some emerging naturally colonising cutaway.</p>	2020	Draft 2017
Drinagh	1,339.1	<p>Cutaway Bog</p> <p>Industrial peat production commenced at Drinagh during the 1950's and ceased in 2020. Some small pockets of deep peat reserves remain in parts of Drinagh Bog but most of the commercially viable peat reserves have been exhausted. Drinagh is considered a shallow peat, cutaway bog.</p>	<p>Drinagh East is cutaway and has been extensively rehabilitated as wetland. This part of the site has extensive development of naturally functioning peatland habitats.</p> <p>Some Coillte conifer forestry is also present.</p> <p>There is some emerging naturally colonising cutaway in Drinagh West.</p>	2020	Draft 2017
Killaranny	242.8	<p>Cutover Bog</p> <p>Industrial peat production commenced at Killaranny during the 1980's. Deep peat reserves remain on much of the bog. Killaranny is considered a deep peat cutover bog.</p>	<p>Killaranny Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat.</p> <p>A portion of the site is leased by NPWS since 2011 as a re-location area for turf cutters from nearby Clara Bog SAC.</p>	2020	Draft 2017
Oughter	352.9	<p>Cutaway</p> <p>Development of Oughter Bog commenced in the 1960's. Industrial peat production ceased in 2012. Shallow peat depths remain over much of the former production bog area. Oughter is considered a shallow peat cutaway bog.</p>	<p>The site has naturally been re-wetting and there is already significant natural colonisation.</p> <p>Part of the site has been developed as the Midlands National Shooting Centre of Ireland.</p>	2012	Finalised 2021
Galros	191.5	<p>Cutover Bog</p> <p>Industrial peat production commenced at Galros during the 1980's and ceased in 2020. Some areas of deep peat remain on the former production area. Galros is considered a cutover bog of variable peat depth.</p>	<p>Galros Bog formerly supplied a range of commercial customers including; horticultural peat and fuel peat.</p> <p>Some naturally emerging cutaway habitats are developing in part of the site.</p>	2020	Draft 2017
Clongawny More	987.2	<p>Industrial peat production commenced at Clongawny More during the 1950's and ceased in 2020. Some pockets of deep peat persist, particularly in the south-</p>	<p>Part of the site rehabilitated, as part of Lough Boora Discovery Park, in 1999.</p>	2020	Draft 2017

		western portion of the former production area. Clongawny More is considered a cutover bog with variable peat depths throughout the site.	Some Coillte conifer forestry is also present. The site has naturally been re-wetting and there is already significant natural colonisation. BnM currently have submitted an application for renewable energy development on this bog.		
Derrinboy	305.7	Cutover Bog Derrinboy was first developed by BnM in the 1980's. Peat production ceased at Derrinboy in 2020. This bog was used to supply horticultural peat. Only the upper layers of peat have been harvested. Derrinboy is considered a deep peat cutover bog.	Derrinboy Bog formerly supplied a range of commercial customers including; horticultural peat and fuel peat.	2020	Draft 2017
Moneitta	707.5	Cutover Bog Moneitta was first developed by BnM in the 1970's. Peat production ceased at Moneitta in 2020. This bog was used to supply horticultural peat. Only the upper layers of peat were harvested. Moneitta is considered a deep peat cutover bog.	Moneitta Bog formerly supplied a range of commercial customers including; horticultural peat and fuel peat.	2020	Draft 2017
Boora Lemanaghan Rail_Link	6.9	N/A	Not applicable	N/A	N/A
Derries	368.2	Cutaway Bog Development of Derries Bog commenced in the 1960's. Industrial peat production ceased in 2005. Shallow peat depths remain over much of the former production bog area. Derries Bog is considered a shallow peat cutaway bog.	Wetland rehabilitation carried out over part of site in 1999. Amenity trackway development in 2015. Part of the Lough Boora Discovery Park. The site has now been extensively naturally colonised and is a mosaic of wetland and Birch woodland habitats.	2005	Finalised 2021
Turraun	534.5	Cutaway Bog Development of Turraun Bog commenced in the 1950's. Industrial peat production ceased in 2018. Turraun is considered a shallow peat cutaway bog.	Wetland rehabilitation carried out over part of area in 1999 as part of the Lough Boora Discovery Park. This section of the site has now been extensively naturally colonised and is a mosaic of wetland and Birch woodland habitats.	2018	Finalised 2021
Derryclure	327.6	Cutover Bog Derryclure was first developed by BnM in the 1980's. Peat production ceased at Derryclure in 2020. This bog was used to supply horticultural peat. Only the upper layers of peat were harvested. Derryclure is considered a deep peat cutover bog.	Derryclure Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat.	2020	Draft 2021
Lemanaghan	1,253.7	Cutover Bog Industrial peat production commenced at Lemanaghan during the 1950's and ceased in 2019. Varied peat depths across the site. Deep peat reserves remain on	Lemanaghan Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat.	2020	Draft 2017

		much of the former production area of Lemanaghan Bog. It is considered a cutover bog.	There are some naturally emerging cutaway habitats.		
Belair North	565.7	Cutover Bog Belair North was first developed by BnM in the 1960's. TPeat production ceased at Belair North in 2020. This bog was used to supply horticultural peat. Only the upper layers of peat were harvested. Belair North is considered a deep peat cutover bog.	Belair North Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat.	2020	Draft 2017
Derrybrat	171.6	Cutaway Bog Industrial peat production commenced at Derrybrat during the 1950's and ceased in 2016. Derrybrat has shallow peat depths across the site. It is considered a shallow peat cutaway bog.	The site has been partially rehabilitated and there is already significant natural colonisation. Some conifer forestry has been developed by Coilte on the site.	2016	Finalised 2021
Belair South	228.8	Cutover Bog Belair South was first developed by BnM in the 1970's. Peat production ceased at Belair South in 2020. This bog was used to supply horticultural peat. As a result, only the upper layers of peat were harvested. Belair South is considered a deep peat cutover bog.	Belair South Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat.	2020	Draft 2017

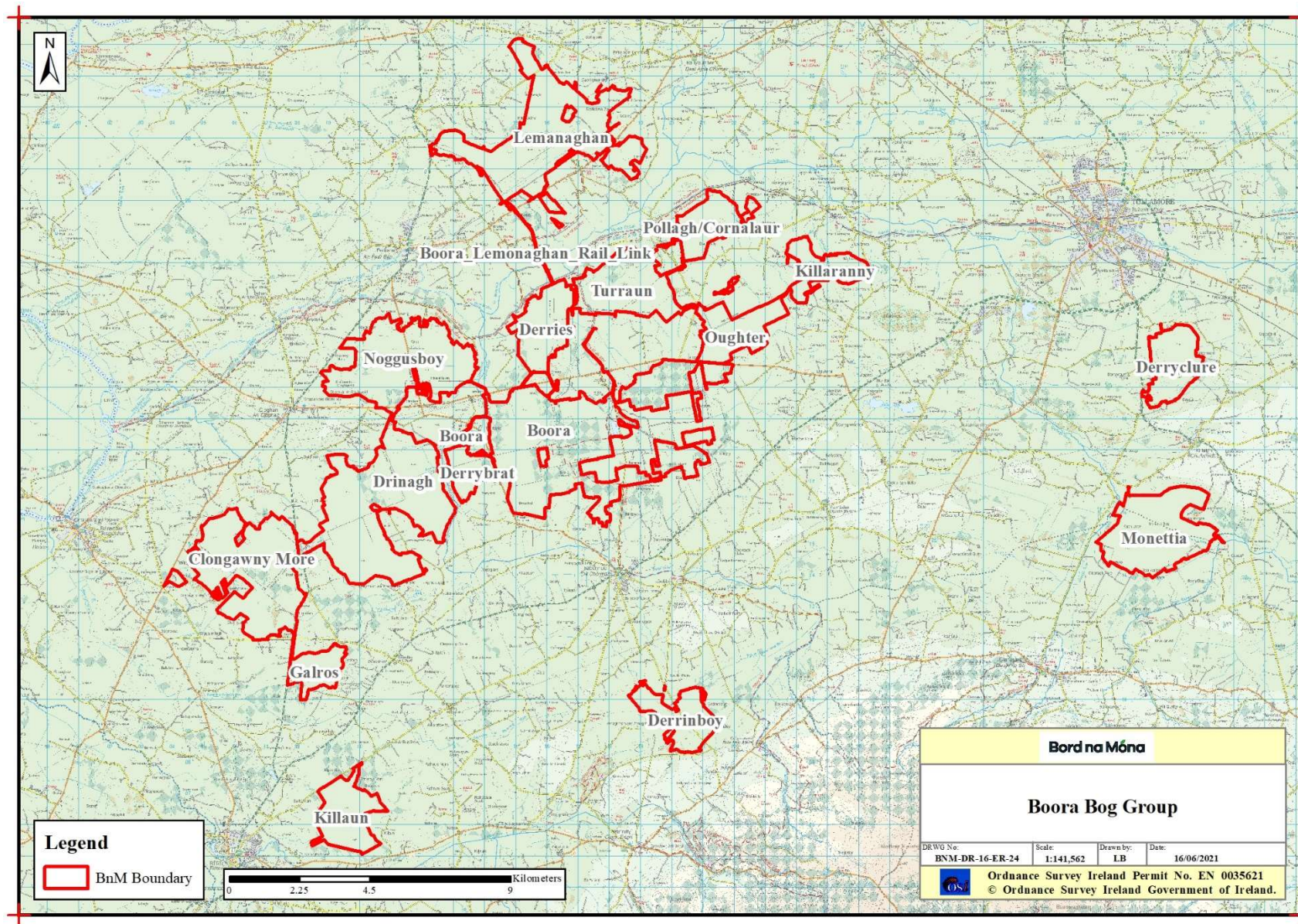


Figure Ap-2: Boora Bog Group

APPENDIX III: ECOLOGICAL SURVEY REPORT

Ecological Survey Report <i>Note: This report outlines a baseline 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>			
Bog Name:	<u>Derries</u>	Area (ha):	370.5ha
Industrial Area Name:	Boora	County:	Offaly
Recorder(s):	MMC & DF	Survey Date(s):	8-9/09/2009, 08/2015
Habitats present (in order of dominance) <p>The most common habitats present at this site include:</p> <ul style="list-style-type: none"> • Betula pubescens-dominated scrub (eBir, cBir) • Pioneer Poor Fen communities (pJeff, pEang, pTrig, pJbulb) • Bare peat • Open water (OW) • Reedbeds (pTyp, pPhrag) • Dry Heath (dHeath) • Dry grassland (gCal, gAn-H-Wq) • Dry disturbed/pioneer communities (DisCF, DisWill). <p>The most common habitats present around the margins at this site include:</p> <ul style="list-style-type: none"> • Scrub (Betula pubescens dominated and Ulex europaeus dominated), • Bog woodland (WN7) • Raised Bog (PB1 - marginal & sub-marginal ecotopes). • There are also several drainage ditches around the margins of the site (FW4). (Codes refer to Heritage Council habitat classification system, Fossitt 2000). 			
Description of site <p>The Derries is a small-medium sized site with the majority of the post-production area now re-vegetated. The most common habitats include a mosaic of Birch dominated scrub at different stages of development and several Poor fen pioneer communities, of which the Juncus effusus -dominated community is most prominent.</p> <p>The southern section has mature pioneer communities and bare peat is a minor component. Some of the Birch – dominated scrub is closing up and will soon develop a woodland canopy, particularly along the south-western boundary where the Birch seems to have emerged from a Heather-dominated pioneer community.</p> <p>The northern half is still a production-related area (see land-use map) with some active production fields on two smaller sections. The habitats in this area are less developed with a mosaic of open Birch scrub, pioneer Poor fen communities (mainly Juncus effusus) and bare peat.</p> <p>There is some open water scattered around the site forming pools and lakes of various sizes and depths, although none are extensive. Around this open water area there are a mosaic of wetland communities including some fringing Reedbeds, dominated by Reedmace, and Poor fen pioneer communities showing some typical zonation from wet to dry zones. Some of these pools are been completely covered with Reedmace, forming some large Reedbeds, but none are extensive relative to the overall size of the site.</p> <p>There are several ‘mineral mounds’ or low hills formed by underlying glacial material. The vegetation on these areas is drier and dominated by Heather with some dry Birch scrub, a minor amount of dry grassland and disturbed</p>			

or colonising vegetation with *Tussilago farfara*, *Chamaerion angustifolium* and *Rubus fruticosus*. These mounds vary in height with the most significant in the central area. Other lower ridges pass through the southern section creating some drier grassland and scrub that crosses several fields. These communities are also found around the margins.

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

There is a small overlap between the BnM property and The Grand Canal pNHA along the northern side. The eastern section contains a narrow fringe of high bog while the western part (more extensive) was not examined. The narrow fringe contains some Raised bog (PB1). The high bog is in surprisingly good condition with some *Sphagnum* cover including one *S. imbricatum* hummock and some *S. magellanicum* lawns around small dry pools. This raised bog is likely to degrade and become drier in the future as it is an isolated fragment.

Adjacent habitats and land-use

Range of habitats and land-use around the site includes grazing livestock on improved grassland (GA1), forestry (WD4) and peat-cutting on cutover bog (PB4). Some semi-natural habitats also present such as Bog woodland (WN7), Scrub (WS1), Grassland (GS1/2/4), Raised bog remnants (PB1) and Cutover bog (PB4).

Watercourses (major water features on/off site)

The Boora river flows north along the east side of the site.

A slit pond is present on the west side of the site. No emergent vegetation is present, although some aquatics such as *Potamogeton* sp. are present.

Fauna biodiversity

- Several bird species were recorded: Pied Wagtail (10), Greenfinch (2), Heron (1), Snipe (~10), Meadow Pipit (5), Robin (1), Unidentified Tit species (2), Blackbird (1).
- Two Hares spotted at different locations.
- Signs of Hares (prints and grazing) over majority of site
- Signs of Rabbits around site with active burrows in drier sections
- Extensive recent Badger activity along the west side and particularly in the north-west section.
- Some signs of Deer trails but not recent. Deer activity seems low.
- Frequent Dragonflies present
- Painted Ladies and Peacock Butterflies using a small area of dry grassland (gCal) with frequent patches of *Succisa pratensis* developed on an old temporary rail or track embankment.

Fungal biodiversity

Leccinum scabrum (Brown Birch Bolete), *Hygrocybe cantharellus* (Goblet Waxcap), *Lactarius vietus* (Grey Milkcap) and *Lycoperdon lividum* (Common Puffball).

APPENDIX IV. - ENVIRONMENTAL CONTROL MEASURES TO BE APPLIED TO BOG REHABILITATION MEASURES

- 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, 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 banded 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 banded 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 Moña staff and updated as required.

APPENDIX V. BIOSECURITY

No invasive flora species have been recorded at Derries 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'.

For a list of the invasive alien species recorded at Derries Bog see section 3.3.3. of the main text. American Mink, Fallow Deer and Sycamore have all been recorded at Derries Bog but are considered unlikely to proliferate or spread as a direct result of PCAS Activities. Nuttal's waterweed and Zebra Mussel have also been recorded (information on NBDC website) in the habitats surrounding Derries Bog. All activities during the PCAS will adhere to Best Practice with regard to these species for the duration of the project.

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 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 and Zebra Mussel will be adhered with throughout all rehabilitation 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 Boora Bog Group (Ref. P0500-01). As part of Condition 10.2 of this licence, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The bog is part of the Boora Bog Group. This regulatory requirement is the main driver of the development of this rehabilitation plan.

2 The Peatlands Climate Action Scheme (PCAS)

Bord na Móna (BnM) appreciates the Minister's intention to support, via the Climate Action Fund, Bord na Móna in developing a package of measures, 'the proposed Scheme', for the enhanced decommissioning, rehabilitation and restoration of cutaway peatlands, referred to as the 'Peatlands Climate Action Scheme'. The proposed Scheme includes lands previously used to supply peat for electricity generation within the State. The enhanced decommissioning, rehabilitation and restoration of the peatlands funded by the proposed Scheme will deliver benefits across climate action (GHG mitigation through reduced carbon emissions and acceleration towards carbon sequestration), enrich the State's natural capital, increase eco-system services, strengthen biodiversity, improve water quality and storage attenuation as well as developing the amenity potential of the peatlands.

It is envisaged that Bord na Móna carry out an enhanced decommissioning, rehabilitation and restoration scheme, (PCAS), across a footprint of 33,000 ha. This proposed scheme will significantly go beyond what is required to meet rehabilitation and decommissioning obligations under existing EPA IPC licence conditions. Interventions and measures supported by the Scheme will ensure that environmental stabilisation is achieved (meaning IPC obligations are met), and importantly, significant additional benefits, particularly relating to climate action and

other ecosystem services, will also be delivered. *However, only the costs associated with the additional and enhanced measures, i.e., those which go beyond the existing decommissioning and rehabilitation requirements arising from Condition 10, will be eligible for support under the proposed Scheme.*

The proposed enhanced rehabilitation measures detailed in this document, are predicated on the understanding that the element of the rehabilitation, over and above the ‘standard’ measures necessary to comply with pre-existing Condition 10 IPC Licence requirements, will be deemed eligible costs for the Scheme regulator.

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 the proposed **Scheme (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.

There is a small overlap between the BnM property at Derries Bog and The Grand Canal pNHA along the northern side. The northern section contains an area of remnant high bog outside of the BnM lands boundary (Figure 3.1).

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.

Derries Bog is located in an area zoned by Offaly 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 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.

³ <https://www.offaly.ie/eng/Services/Planning/Development-Plans/County-Development-Plan-2014-2020/Volume-1-9-10-14-FINAL-pdf.pdf>

- 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."*

This 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	Derries Bog 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	Decommission and Removal of Porto-cabin tea centre and materials store
6	Decommissioning Fuel Tanks and associated facilities	Decommissioning and De-Gassing Mobile Fuel Tanks
7	Decommissioning and Removal of Bog Pump Sites	Not Applicable

8	Decommissioning or Removal of Septic Tanks	De-sludge Septic Tank
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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.

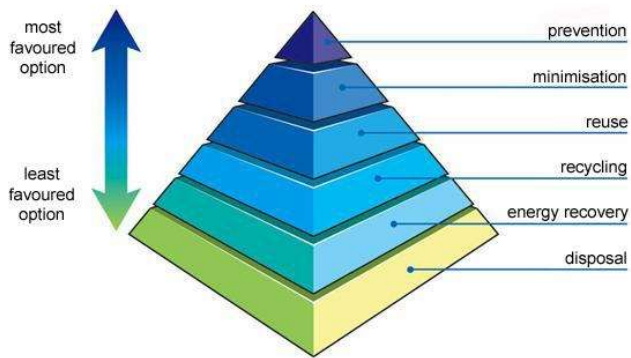
7.3.5 The tonnages and EWC Code for the waste materials listed in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* sent off-site for disposal/recovery.

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	Derries 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.*

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 have 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 Ref. P0500-01, Boora Group of Bogs in Offaly and Laois.

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 Boora 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:

Peat from the bogs is screened prior to processing. This screening removes oversized peat, stones and bog timbers. Schedule 3 (ii) of the IPPC licence permits disposal of these peat screenings back to the bog, where it is levelled and graded into the surrounding peat landscape. These locations have been agreed with the Agency as per condition 7.4 of the IPPC Licence, and as per the attached locations.

1.3 Bog Timbers:

During peat extraction operations, bog timbers often arise in the bog surface and are required to be cleared. These timbers consist of bog pine, oak and some yew. Some of these timbers, such as the oak and yew are removed for use in the wood craft industry, with the remaining bog pine stockpiled in locations at the opposite end of each bog, where it generally becomes a habitat for flora and fauna. These piles of timber are generally no higher than 1-2 metres.

2.0 P0502-01 IPPC Licence Extractive Waste Conditions

2.1 Condition 7.5 Extractive Waste Management

The licensee shall draw up a Waste Management Plan (to be known as an Extractive Waste Management Plan) for the minimisation, treatment, recovery and disposal of extractive waste. This Plan shall meet the requirements of regulation 5 of the Waste Management (Management of Waste from the Extractive Industries) Regulations, 2009. The Plan shall be submitted for agreement by the Agency by the 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 Boora 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 Boora IPPC Licence Ref. P0500-01.

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
Derries Bog	Offaly County Council	General E-mail Contact	08/01/2021	E-mail	Ongoing Dialogue	E-mail
Derries Bog	Offaly County Council - Senior Planner	General E-mail Contact	08/01/2021	E-mail	Ongoing Dialogue	E-mail
Derries Bog	Offaly County Council - Heritage Officer	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	Offaly County Councillors - Birr District	Cllr. John Carroll	08/01/2021	E-mail		
Derries Bog	Offaly County Councillors - Birr District	Cllr. John Clendennon	08/01/2021	E-mail		
Derries Bog	Offaly County Councillors - Birr District	Cllr. Eamonn Dooley	08/01/2021	E-mail		
Derries Bog	Offaly County Councillors - Birr District	Cllr. John Leahy	08/01/2021	E-mail		
Derries Bog	Offaly County Councillors - Birr District	Cllr. Clare Claffey	08/01/2021	E-mail		
Derries Bog	Offaly County Councillors - Birr District	Cllr. Peter Ormond	08/01/2021	E-mail		
Derries Bog	TD Laois/Offaly	Barry Cowen TD	08/01/2021	E-mail		

Derries Bog	TD Laois/Offaly	Charlie Flanagan TD	08/01/2021	E-mail		
Derries Bog	TD Laois/Offaly	Sean Fleming TD	08/01/2021	E-mail		
Derries Bog	TD Laois/Offaly	Carol Nolan TD	08/01/2021	E-mail		
Derries Bog	TD Laois/Offaly	Brian Stanley TD	08/01/2021	E-mail		
Derries Bog	Eastern and Midland Regional Assembly	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	Environmental Protection Agency	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	National Parks and Wildlife Service	General E-mail Contact	08/01/2021	E-mail	Ongoing Dialogue	E-mail
Derries Bog	Dept of the Housing Local Government and Heritage	malcolm.noonan@oireachtas.ie	12/01/2021	E-mail		
Derries Bog	National Monuments Service	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	National Museum of Ireland (Irish Antiquities Division)	General E-mail Contact	08/01/2021	E-mail	28/12/2020	E-mail
Derries Bog	Minister for Environment, Climate and Communications	eamon.ryan@oireachtas.ie	12/01/2021	E-mail		
Derries Bog	Dept of Environment, Climate and Communications	noel.regan@decc.gov.ie	08/01/2021	E-mail		
Derries Bog	Minister of state for Agriculture with responsibility for Land use and Biodiversity	pippa.hackett@oireachtas.ie	12/01/2021	E-mail		

Derries Bog	Inland Fisheries Ireland	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	Waterways Ireland	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	The Heritage Council	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	An Forum Uisce (The Water Forum)	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	OPW	General E-mail Contact	08/01/2021	E-mail	Ongoing Dialogue	E-mail
Derries Bog	An Taisce	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	Friends of the Earth	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	Friends of the Irish Environment	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	Birdwatch Ireland	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	Irish Peatlands Conservation Council	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	Irish Wildlife Trust	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	Bat Conservation Ireland	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	Woodlands of Ireland	General E-mail Contact	08/01/2021	E-mail		

Derries Bog	Butterfly Conservation Ireland	General E-mail Contact	08/01/2021	E-mail	Ongoing Dialogue	E-mail
Derries Bog	Community Wetlands Forum (part of Irish Rurallink)	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	Turf Cutters and Contractors Association	Postal Address	15/01/2021	Post		
Derries Bog	Offaly Public Participation Network (PPN)	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	Sustainable Water Action Network (SWAN)	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	Irish Farmers Association (Laois Offaly and Westmeath Office)	General E-mail Contact	08/01/2021	E-mail	Ongoing Dialogue	E-mail
Derries Bog	Irish Farmers Association (Head Office)	General E-mail Contact	08/01/2021	E-mail	Ongoing Dialogue	E-mail
Derries Bog	National Association of Regional Game Councils	General E-mail Contact	08/01/2021	E-mail	Ongoing Dialogue	E-mail
Derries Bog	Midlands National Shooting centre	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	ICMSA (Irish Creamery Milk Suppliers Association)	General E-mail Contact	08/01/2021	E-mail	Ongoing Dialogue	E-mail
Derries Bog	ICSA (Irish Cattle and Sheep Farmers Association)	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	Midlands & East Regional WFD Operational Committee	General E-mail Contact	08/01/2021	E-mail		
Derries Bog	Shannon Flood Risk State Agency Co-ordination Working Group	General E-mail Contact	08/01/2021	E-mail		

Derries Bog	Irish Raptor Study Group	General E-mail Contact	12/01/2021	E-mail		
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Table APXI -2 Response summary from Consultees contacted

Organisation	Summary of Response by Stakeholder	BnM Response
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Irish Peatlands Conservation Council	<p>Responded to consultation regarding Derries Bog and the PCAS project at large to express support for the project and list a number of comments on how the project might be improved;</p> <ol style="list-style-type: none"> 1) Potential for inclusion of local environmental groups in species specific conservation plans 2) Requested that a map of potentially suitable areas for such projects should be included in rehab plans 3) Promoted the idea of creating a biodiversity action plan that considers the use of site by all relevant stakeholders 4) Recommended following the NPWS community engagement strategy as it was largely successful in bring local communities along with restoration projects 	<p>BnM responded and advised that all issues raised will be taken into account in future drafts of plan. Also, BnM advised;</p> <ol style="list-style-type: none"> 1) BnM have included DOC as an additional parameter on our suite of water monitoring analysis. 2) BnM are working with LAWCO and WFD to align the BNM monitoring programme with the EPA's 2021 Monitoring programme 3) BnM have an extensive community consultation process ongoing with a dedicated Community Liaison Officer communicating to affected and interested parties
NPWS Regional Network	<p>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.</p>	<p>BnM acknowledged via e-mail to address queries on 09/12/2021. Also, a phone conversation with local NPWS Conservation Ranger on discussed biodiversity and rehabilitation measures on PCAS bogs including Derries Bog.</p>
National Museum of Ireland (Irish Antiquities Division)	<p>Responded through e-mail 28/12/2020 in relation to all PCAS bogs. Issues raised were;</p> <ol style="list-style-type: none"> 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 	<p>BnM acknowledged and responded via e-mail on 28/12/2020 to assure BnM will give due cognisance to all points within all rehabilitation plans for Derries Bog. A virtual meeting on PCAS between BnM and NMI was held on 18/01/2021</p>
Irish Farmers Association	<p>Responded to consultation regarding Derries Bog and the PCAS project at large on multiple dates throughout ongoing discourse.</p> <ol style="list-style-type: none"> 1) Potential for flooding on adjacent lands. 2) Health and Safety 3) Perceived potentially detrimental impact of PCAS on property value 4) Reiterated the desire of the IFA that people who have been cutting turf on bogs should retain this right. 	<p>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.</p>
The Heritage Council	<p>Responded to consultation via e-mail on 04/01/2021 asking for more information on PCAS in general and looking to be involved in any seminar or information events.</p>	<p>BnM responded via phone conversation on 11/01/2021. Dialogue is ongoing.</p>

The Irish Wildlife Trust	Responded to consultation via e-mail on 01/02/2021 to acknowledge receipt of PCAS plans and indicate desire to make a submission. Submission received on 23/03/2021 supporting the PCAS scheme and specifically requesting: 1. Consideration of statutory protection for rehabilitated bogs; 2. Consideration for re-wilding in determining future habitats and species presence, including species re-introductions; 3. Appropriate monitoring is established.	BnM responded via email and phone throughout February and March. A virtual meeting/PCAS presentation was held for IWT on 17/02/2021. Dialogue is ongoing.
Trinity College	A researcher at Trinity College, Dublin, made a submission on PCAS by e-mail 24/01/2021. The following points were raised; 1) Advised that the consultation phase of the project should be given more time 2) Advised that there is little evidence of pre-project and post-project measurement 3) Advised that further community engagement with local stakeholders and research-based stakeholders would benefit the project	BnM acknowledged and will give due cognisance to all points raised in the submission by Trinity College Researcher in the rehabilitation plan for Derries Bog and other PCAS projects. BnM raised responded via e-mail.
Dept. of Agriculture, Food & the Marine (DAFM)	Submission by e-mail to express support for PCAS in general. Submission recommended; 1) That local landowners and stakeholders be considered as part of the consultation process. 2) EIA assessment be carried out prior to PCAS works. 3) Hydrological assessments are carried out with a view to protecting adjoining lands from adverse impacts.	BnM acknowledged and responded via e-mail on 02/03/2021 to assure that all points raised within the submission will be considered. A virtual meeting/PCAS presentation was held for DAFM on 11/12/2020.
Butterfly Conservation Ireland	Responded to consultation via e-mail with submission on Derries Bog. Concerns raised were: 1) Alterations to the text of the rehab plan. 2) Request for all turf cutting on BnM land to end. 4) Suggest monitoring for Large Heath Butterfly or food plant Hare's-tail Cottongrass. 5) Suggested alterations to habitat design in rehab plan to further connect regional high bog habitats and create further raised bog habitat on site. Also, BCI reiterated need to protect valuable habitat such as species rich grassland 6) Advised BnM to ensure that quality habitats already found on site are not damaged by PCAs activities.	BnM acknowledged via e-mail; Phone conversation with BCI on 19/01/2021.
ICMSA (Irish Creamery Milk Suppliers Association)	Virtual meeting/PCAS presentation organised for 03/03/2021.	A meeting was held by BnM on 03/03/2021 to present details on PCAS to the ICMSA and members. Dialogue is ongoing.
University College Dublin	A researcher from UCD contacted BnM with a submission on PCAS. The researcher suggested that the rehabilitations contain a good level of detail regarding rehab but could be improved by including more detail on water table level monitoring and measuring.	BnM acknowledged and will give due cognisance to all points raised in the submission by UCD Researcher in the

		rehabilitation plan for Derries Bog and other PCAS projects.
Office of Public Works	Responded via e-mail 01/12/2020 querying the reason for inclusion of OPW in the PCAS stakeholders list.	BnM responded with an explanation via e-mail on 01/12/2020.
Offaly County Council	Request for all draft rehabilitation plans in Co. Offaly.	BnM provided the requested documents. A virtual meeting, including a general PCAS presentation, was held for Offaly County Council on 10/02/2021.
Offaly County Council	Offaly County Council e-mailed a submission to outline potential for integration of PCAS with opportunities regarding the Offaly County Council Inaugural Digital Strategy 2020-2022.	A meeting on Offaly's digital strategy was held between BnM and Offaly County Council on 04/03/2021.
Offaly County Council	<p>Submission provided on behalf of Offaly County Council on a number of PCAS bogs including Derries Bog on 22/02/2021. Key points raised were;</p> <ol style="list-style-type: none"> 1) Requested that details of security fencing to be identified and detailed on plans. 2) Long term rehabilitation plan to be provided addressing above areas of consideration post 2024 if required. 3) Public Rights of Way access locations are to be maintained with relevant stakeholders and marked on drawings. 4) A number of technical issues with draft rehabilitation plans. 5) Advised BnM to carefully consider after use of bogs as part of PCAS 6) Request that the impact of PCAS on surrounding roads be considered as part of rehabilitation plans. 7) Advised that Appropriate assessment and the habitats directive are taken into account by BnM. 8) Advised that BnM consider management of flooding & water pollution, fire risk, invasive species and waste management as part of PCAS. 	<p>A virtual meeting/general presentation on PCAS to between BnM and Offaly Councillors and OCC personnel was conducted on 10/02/2021.</p> <p>BnM provided further PCAS documentation on request, via e-mail on 27/01/2021.</p> <p>Refer to Section 4 for response on issues raised. Dialogue with Offaly County Council is ongoing.</p>

APPENDIX XII. ARCHAEOLOGY

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

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

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			

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

4) 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.

5) Procedure

9. Check whether there are any known archaeological monuments in your area.
10. 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.
11. 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.
12. Resist the temptation to investigate the find spot as this may disturb fragile archaeological deposits.
13. 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.
14. 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.
15. 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.
16. 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

6) Records

Revision Index			
Revision	Date	Description of change	Approved
1	13/19/2020	First release	EMcD
2			



Archaeological Impact Assessment of Proposed Bog Decommissioning and Rehabilitation at Derries Bog, Co. Offaly

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 of c.371 hectares at Derries Bog, Co. Offaly 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 Derries Bog will include:

- Blocking field drains in parts of the former industrial production area using a dozer/excavator to create regular peat blockages (three barriers per 100 m) along each field drain.
- Re-alignment of piped drainage to manage water levels across the site.
- Realignment of gravity outfalls (where needed).
- Fertiliser treatment of high fields and headlands (typically slow to naturally re-colonise) to encourage natural colonisation, if needed. (It is noted that the application of fertiliser may need additional assessment and approval as per the IPC Licence).
- No measures are planned for the surrounding marginal peatland habitats.
- No measures are proposed for areas that have already stabilised.
- Silt ponds will continue to be maintained during rehabilitation and decommissioning.
- Evaluate success of short-term rehabilitation measures and enhance where necessary.
- Decommissioning of silt-ponds will be assessed and carried out, where required.

Derries Bog is located c.3.5km south-east of Ferbane, Co. Offaly, directly south of the Grand Canal and to the north of the R357 road. The bog occupies the townlands of Bun, Derries, Derrycarney, Lea Beg, Rin and Turraun on OS 6 inch sheets Offaly Nos. 15 and 23.

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

- The IAWU 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. Offaly which was established under Section 12 of the National Monuments (Amendment) Act, 1994 was examined as part of the assessment (DAHGI 1995). This record was published by the Minister in 1995 and includes sites and monuments that were known in Derries 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, OF023-001---- is an enclosure situated on dryland in Lea Beg townland more than c.0.26km east of the rehabilitation area.

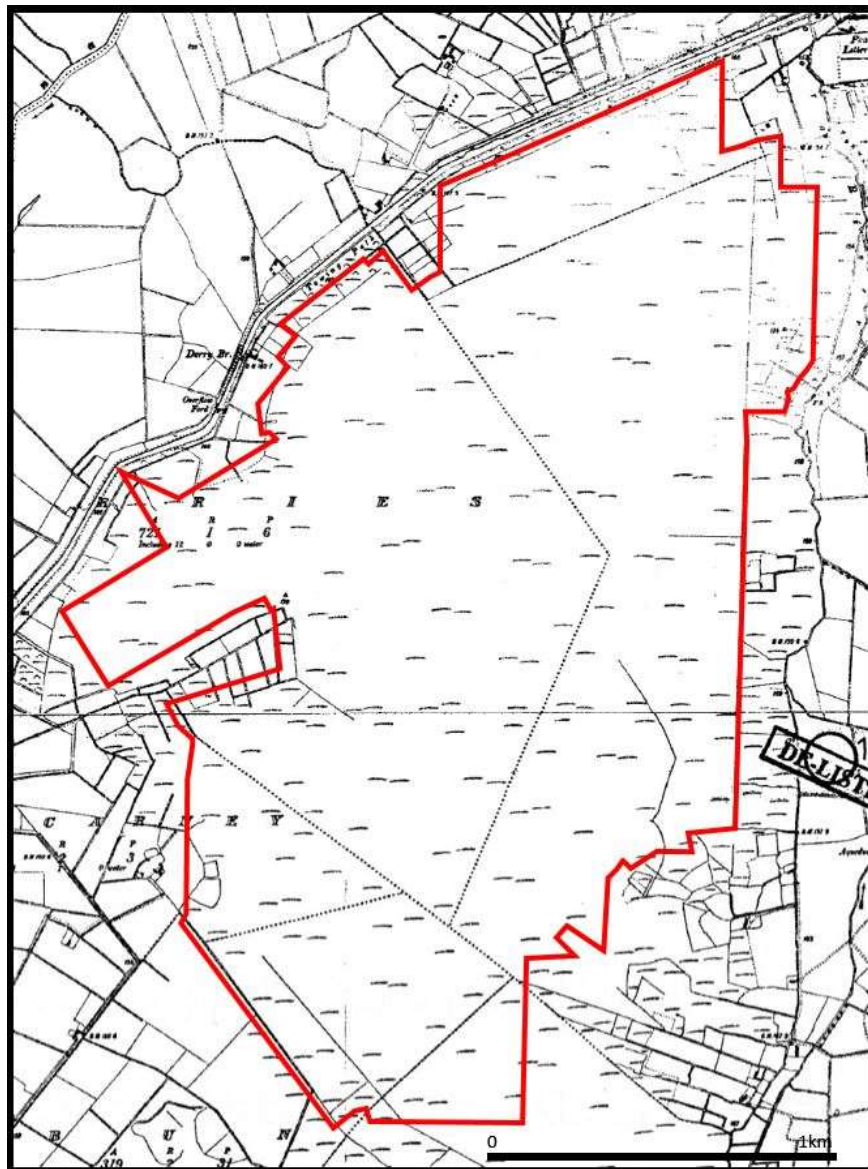


Fig. 1. Derries Bog, Co. Offaly, detail of the Record of Monuments and Places map sheets Nos. 15 and 23. The proposed rehabilitation area is outlined with the redline. There are no Recorded Monuments in the rehabilitation area.



Peatland survey

Derries Bog was surveyed (unlicensed) by the Irish Archaeological Wetland Unit in 1993 as part of the Archaeological Survey of Ireland Peatland Survey. In total, three toghers (OF015-490----, OF015-492---- and OF015-493----) consisting of three individual sightings and three quantities of worked and unworked wood were recorded in Derries townland in the very western part of the bog (Table 1). These archaeological sightings were all notified to the Archaeological Survey of Ireland.

SMR_NO	IAWU Cat_No.	Site type	Townland	N.G.R. E	N.G.R. N	Depth BS	Depth features
OF015-489----	OF-DRS 0001	Redundant record-Worked wood	Derries	215150	221994	0.00	0.15
OF015-490----	OF-DRS 0002	Road - class 3 togher	Derries	215252	222041	0.30	0.15
OF015-491----	OF-DRS 0003	Redundant record-Unworked wood	Derries	215252	222023	1.00	0.12
OF015-492----	OF-DRS 0004	Road - class 3 togher	Derries	215147	221977	0.26	0.43
OF015-493----	OF-DRS 0005	Road - class 3 togher	Derries	215143	221974	0.12	0.27
OF015-494----	OF-DRS 0006	Redundant record-Unworked wood	Derries	214970	221867	0.33	0.13

Table 1. List of sites recorded by the IAWU in Derries Bog.

Archaeological investigations

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.

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 2nd of February 2021. The SMR consists of records included in the RMP and sites and monuments notified to the Dept. since the publication of the RMP. This review established that there are six monuments entered in the SMR in the proposed rehabilitation area. The monuments are indicated in Table 1 above and Fig. 2 below. These are all monuments identified by the IAWU survey in 1993 that were notified to the Archaeological Survey of Ireland. Three of these sightings, described by the IAWU as worked wood or unworked wood, have been rejected as monuments by the Archaeological Survey and are now classed as Redundant records.

Reported finds

There is a single stray find of animal remains (2013:417) listed in the Topographical Files of the National Museum of Ireland. The remains were fragmentary and were found '7ft deep in the bog' in Derries townland.

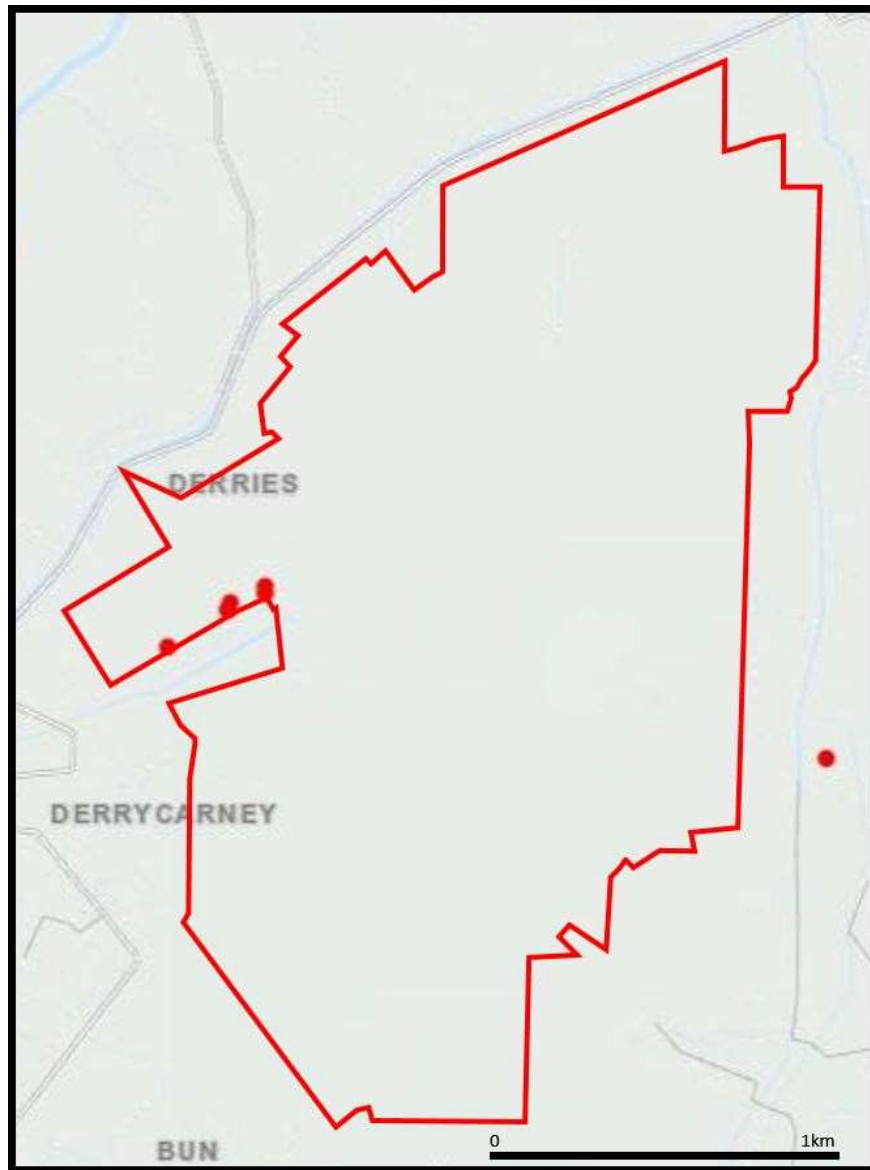
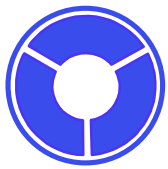


Fig. 2. Derries Bog, Co. Offaly, detail of the Sites and Monuments Record. The proposed rehabilitation area is outlined with the redline. There are a six SMRs in the very western part of the area.

Previous assessments

Derries Bog has been the subject of an Environmental Impact Assessment Report carried out by Irish Archaeological Consultancy LTD in 2018 for Bord na Móna Energy Limited in relation to IPC Licence P0500-01. The assessment noted the monuments identified in the IAWU survey in 1993 and noted that there was a moderate potential for archaeological features to be uncovered during the course of any future development works in Derries Bog.



Impact assessment

There are six known sightings of archaeology in the rehabilitation area. 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 the period 2008-2020 and also the depth of bog removed calculated for each sighting (see Table 2). The depth of peat removed in the period 1994-2008 can be estimated at c.100mm per year. Combining the data to establish the total depth of peat removed indicates that all six sightings have been removed (see Table 2).

SMR_NO	IAWU Cat. No.	Site type	Townland	N.G.R. E	N.G.R. N	Depth feature	Depth BS	Peat removed 1994-2008	Peat removed since 2008	Status
OF015-489----	OF-DRS 0001	Redundant record-Worked wood	Derries Bog	215150	221994	0.15	0.00	c.1.5m	0.26	Removed
OF015-490----	OF-DRS 0002	Road - class 3 together	Derries Bog	215252	222041	0.15	0.30	c.1.5m	0.00	Removed
OF015-491----	OF-DRS 0003	Redundant record-Unworked wood	Derries Bog	215252	222023	0.12	1.00	c.1.5m	0.30	Removed
OF015-492----	OF-DRS 0004	Road - class 3 together	Derries Bog	215147	221977	0.43	0.26	c.1.5m	0.00	Removed
OF015-493----	OF-DRS 0005	Road - class 3 together	Derries Bog	215143	221974	0.27	0.12	c.1.5m	0.00	Removed
OF015-494----	OF-DRS 0006	Redundant record-Unworked wood	Derries Bog	214970	221867	0.13	0.33	c.1.5m	0.23	Removed
OF015-489----	OF-DRS 0001	Redundant record-Worked wood	Derries Bog	215150	221994	0.15	0.00	c.1.5m	0.26	Removed
OF015-490----	OF-DRS 0002	Road - class 3 together	Derries Bog	215252	222041	0.15	0.30	c.1.5m	0.00	Removed
OF015-491----	OF-DRS 0003	Redundant record-Unworked wood	Derries Bog	215252	222023	0.12	1.00	c.1.5m	0.30	Removed

Table 2. List of sites recorded in Derries Bog with depth of peat removed since 1993.

Recommendations

There is no known surviving archaeological material in Derries Bog. 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.

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 six known sightings of archaeological heritage in the rehabilitation area none of which survive. Should any previously unknown archaeological material be uncovered during the rehabilitation works, it should be avoided and reported to the Bord na Móna Archaeological Liaison Officer and the National Museum of Ireland.

References

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