

6. BIODIVERSITY

6.1 Introduction

This chapter assesses the likely significant effects (both alone and cumulatively with other projects) of the peat extraction and ancillary activities that took place at Lemanaghan Bog (the Application Site) from July 1988 to the present day on biodiversity. This chapter also assesses the potential impacts on biodiversity of the implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan for the Lemanaghan Bog, required under Condition 10 of its EPA Licence P0500-01, following the cessation of peat extraction and ancillary activities in June 2020. Particular attention has been paid to species and habitats of ecological importance. These include species and habitats with national and international protection under the Wildlife Acts 1976-2021 and EU Habitats Directive 92/43/EEC. A full description of all peat extraction and ancillary activities is provided in Chapter 4 Description of the Development of this remedial EIAR (rEIAR).

The chapter is structured as follows:

- The introduction provides a description of the legislation, guidance and policy context applicable to Biodiversity.
- This is followed by a comprehensive description of the ecological survey and impact assessment methodologies that were followed to inform the robust assessment of likely significant effects on ecological receptors.
- A description of the baseline ecological conditions (taking the baseline to be July 1988 as outlined in Chapter 4) and receptor evaluation is then provided.
- This is followed by an assessment of effects which are described with regard to peat extraction and ancillary activities from 1988 onwards. Specifically, the likely significant effects on biodiversity as a result of the Project are assessed under three separate phases covering the period from July 1988 onwards when the European Communities Environmental Impact Assessment (EIA) Directive was transposed into Irish Law and as defined in Chapter 1 Introduction of this rEIAR:
 - **Peat Extraction Phase** - peat extraction and ancillary activities at the Application Site from July 1988 to the cessation of peat extraction in June of 2020 (July 1988 to June 2020). The Peat Extraction Phase is described in detail in Sections 4.4 to Section 4.8 of Chapter 4
 - **Current Phase** - the management of the Application Site since June 2020 (June 2020 to present). The Current Phase is described in detail in Section 4.9 of Chapter 4; and
 - **Remedial Phase** - implementation of the proposed rehabilitation plan for Lemanaghan Bog, required under Condition 10 of its EPA Licence P0500-01, following the cessation of peat extraction in June 2020. The Remedial Phase is described in detail in Section 4.10 of Chapter 4.
- The potential cumulative effects in combination with other plans and projects are also fully assessed.
- Control and monitoring measures that were implemented during the Peat Extraction Phase and Current Phase are described and discussed in addition to measures proposed under the Remedial Phase. This is followed by an assessment of residual effects taking into consideration the effect of the implemented and proposed mitigation, control and best practice measures.
- The conclusion provides a summary statement on the overall significance of the likely effects on Biodiversity.

The following defines terms utilised in this chapter:

- For the purposes of this rEIA, Lemanaghan Bog is referred to as ‘the Application Site’ as shown in Figure 6-1.
- The Project refers to all phases of this rEIA, which are fully detailed in Chapter 4.
- “Key Ecological Receptor” (KER) is defined as a species or habitat occurring within the zone of influence of the Project upon which likely significant effects may have occurred or are anticipated.
- “Zones of Influence” (ZOI) for individual ecological receptors refers to the zone within which potential effects may have occurred or are anticipated. ZOIs differ depending on the sensitivities of particular habitats and species and were assigned in accordance with best available guidance and through adoption of a precautionary approach.

6.1.1.1 Site Location

The Application Site comprises Lemanaghan Bog, which is part of the Boora Bog Group. The Application Site comprises an area of 1,111 hectares (ha) within which bog drainage works began in 1950 followed by the commencement of peat extraction and ancillary activities from 1960. The Application Site is located 3km to the northeast of Ferbane, 7.8km southwest of Clara, and 8.7km south of Moate. The Application Site measures approximately 5km in length from north to south, and approximately 6.5km from east to west, at its widest point. Grid Reference co-ordinates for the approximate site centre are E216096, N228101.

The Application Site is connected by rail link to the Bellair South Bog to the north, the Boora Bog Group to the South and to the Blackwater Bog Group to the west. The R436 Regional Road passes along much of the southern boundary. Derrynagun and Curraghalassa bogs are both located south of the road R436. The N62 National Road skirts the extreme western tip of the Application Site. A local road passes through the northern part of the Application Site and cuts off the northernmost sector. The current main access points to the Application Site includes an existing entrance off the N62 National Road and along the R436 into the Lemanaghan Works in the south of the Application Site.



Map Legend

 Application Site Boundary



Drawing Title	
Application Site Location	
Project Title	
Extraction in Lemanaghan Bog, Co. Offaly	
Drawn By	Checked By
SS	RW
Project No.	Drawing No.
200804-e	Figure 6-1
Scale	Date
1:30,130	26.08.2025
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6.1.2 Statement of Authority

This report has been prepared by Sorchá Shanley (B.A., M.Sc.) and has been reviewed by Rachel Walsh (B.Sc. Env., MCIEEM) and John Hynes (B.Sc., M.Sc., MCIEEM).

Sorchá is a Project Ecologist at MKO and holds a BA (Hons) in Zoology and an M.Sc. in Marine Biology. Sorchá has over three years' experience working in ecological consultancy with experience in undertaking habitat and species surveys and working on Ecological Impact Assessment and Appropriate Assessment for a wide range of projects.

Rachel is a Senior Ecologist at MKO with 5 years' experience in ecological consultancy and holds full membership with the Chartered Institute of Ecology and Environmental Management (MCIEEM). Rachel has worked on a wide range of ecological impact assessments for projects such as renewable energy infrastructure projects, wastewater infrastructure projects, extractive industry and residential projects.

John Hynes is the Ecology Director at MKO, with over 12 years' professional experience in the public and private sector. John holds a B.Sc. in Environmental Science and a M.Sc. in Applied Ecology. John is experienced as a coordinator of large multi-disciplinary teams on complex ecological projects and has been involved as a lead Ecologist on a range of energy infrastructure, commercial, transport, housing, forestry, biodiversity net gain and nature restoration projects. John is a Full member of the Chartered Institute of Ecology and Environmental Management.

The baseline ecological surveys were undertaken by Patrick Ellison (B.Sc., M.Sc., ACIEEM), Rachel Walsh (B.Sc. Env. MCIEEM), Neansaí O' Donovan (B.Sc.), Cuan Feely, Adam Scott, David Mesarcik, Valerie Kendall, Kate Greaney, Frederick Mosley, David Culleton, Nathan Finn, Keith Costello and Cathal Bergin of MKO.

All surveyors have relevant academic qualifications and are competent in undertaking the ecological surveys in which they were involved.

6.1.3 Requirements for Ecological Impact Assessment

National Legislation

The Wildlife Act, 1976 (as amended), is the principal piece of legislation governing protection of wildlife in Ireland. The Wildlife Act provides strict protection for species of conservation value. The Wildlife Act conserves wildlife (including game) and protects certain wild animals and flora. These species are therefore considered in this report as ecological receptors.

Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) are heritage sites that are designated for the protection of flora, fauna, habitats and geological sites. Only NHAs are designated under the Wildlife (Amendment) Act 2017. NHAs are legally protected from damage from the date they are formally proposed for designation. A list of pNHAs were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, these sites are considered to be of significance for wildlife and habitats as they may form statutory designated sites in the future.

The Flora (Protection) Order 2022 (S.I. No. 235) lists the species, hybrids and/or subspecies of flora protected under Section 21 of the Wildlife Acts. It provides protection to a wide variety of protected plant species in Ireland including vascular plants, mosses, liverworts, lichens and stoneworts. Under the Flora Protection Order it is illegal to cut, pick, collect, uproot or damage, injure or destroy species listed or their flowers, fruits, seeds or spores or wilfully damage, alter, destroy or interfere with their habitat (unless under licence).

National Policy

Ireland's 4th National Biodiversity Action Plan 2023-2030 (Department of Housing, Local Government and Heritage, 2024) (the "NBAP"). The NBAP strives for a "whole of government, whole of society" approach to the governance and conservation of biodiversity. It demonstrates Ireland's continuing commitment to meeting and acting on its obligations to protect Ireland's biodiversity for the benefit of future generations and will implement this through a number of key targets, actions and objectives.

The Wildlife (Amendment) Act 2023 introduced a new public sector duty on biodiversity. The legislation provides that every public body, as listed in the Act, is obliged to have regard to the objectives and targets in the NBAP. The NBAP sets out five key objectives as follows:

- **Objective 1: Adopt a Whole-of Government, Whole of-Society Approach to Biodiversity.** Proposed actions include capacity and resource reviews across Government; determining responsibilities for the expanding biodiversity agenda providing support for communities, citizen scientists and business; and mechanisms for the governance and review of this National Biodiversity Action Plan.
- **Objective 2: Meet Urgent Conservation and Restoration Needs.** Supporting actions will build on existing conservation measures. Efforts to tackle Invasive Alien Species will be elevated. The protected area network will be expanded to include the Marine Protected Areas. The ambition of the EU Biodiversity Strategy will be considered as part of an evolving work programme across Government.
- **Objective 3: Secure Nature's Contribution to People.** Actions highlight the relationship between nature and people in Ireland. These include recognising the tangible and intangible values of biodiversity, promoting nature's importance to our culture and heritage and recognising how biodiversity supports our society and our economy.
- **Objective 4: Enhance the Evidence Base for Action on Biodiversity.** This objective focuses on biodiversity research needs, as well as the development and strengthening of long-term monitoring programmes that will underpin and strengthen future decision-making. Action will also focus on collaboration to advance ecosystem accounting that will contribute towards natural capital accounts.
- **Objective 5: Strengthen Ireland's Contribution to International Biodiversity Initiatives.** Collaboration with other countries and across the island of Ireland will play a key role in the realisation of this Objective. Ireland will strengthen its contribution to international biodiversity initiatives and international governance processes, such as the United Nations Convention on Biological Diversity.

In addition, the National Biodiversity Data Centre published guidance on Pollinator-friendly management of Wind Farms. This identifies an evidence-based action plan for wind farm operators that can help pollinators by employing changes to existing management strategies.

Such policies have informed the evaluation of ecological receptors recorded within the Application Site and the ecological assessment process.

European Legislation

Habitats and species of European importance are provided legal protection under the EU Habitats Directive 92/43/EEC (the Habitats Directive) and the EU Birds Directive 2009/147/EC (the Birds Directive) this legislation forms the cornerstone of Europe's nature conservation within the EU. It is built around two pillars: the Natura 2000 network of protected sites (hereafter referred to as European Sites³) and the strict system of species protection. Both the Habitats and Bird Directives have been transposed into Irish law by Part XAB of the Planning and Development Acts 2000 (as amended) (from a land use planning perspective) and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011).

Annex I of the Habitats Directive lists habitat types whose conservation requires the designation of Special Areas of Conservation (SAC). Priority habitats, such as Turloughs, which are in danger of disappearing within the EU territory are also listed in Annex I. Annex II of the Directive lists animal and plant species (e.g. marsh fritillary, Atlantic salmon, and Killarney fern) whose conservation also requires the designation of SAC. Annex IV lists animal and plant species in need of strict protection such as lesser horseshoe bat and otter, and Annex V lists animal and plant species whose taking in the wild and exploitation may be subject to management measures. In Ireland, species listed under Annex V include Irish hare, common frog and pine marten. Species can be listed in more than one Annex, as is the case with otter and lesser horseshoe bat which are listed on both Annex II and Annex IV. The disturbance of species under Article 12 of the Habitats Directive (and in particular avoidance of deliberate disturbance of Annex IV species, particularly during the period of breeding, rearing, hibernation and migration and avoidance of deterioration or destruction of breeding sites or resting places) has been specifically assessed in this EIAR.

The Birds Directive instructs Member States to take measures to maintain populations of all bird species naturally occurring in the wild state in the EU (Article 2). According to Recital 1 of the Birds Directive, Council Directive 79/409/EEC on the conservation of wild birds was substantially amended several times and in the interests of clarity and rationality, the Birds Directive codifies Council Directive 79/409/EEC. Such measures may include the maintenance and/or re-establishment of habitats in order to sustain these bird populations (Article 3). A subset of bird species has been identified in the Directive and are listed in Annex I as requiring special conservation measures in relation to their habitats. These species have been listed on account of inter alia: their risk of extinction; vulnerability to specific changes in their habitat; and/or due to their relatively small population size or restricted distribution. Special Protection Areas (SPAs) are to be identified and classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

In summary, the species and habitats provided National and International protection under these legislative and policy documents have been considered in this Ecological Impact Assessment. A detailed assessment of the likelihood of the Project having either a significant effect or an adverse impact on any relevant European Sites (i.e. SACs, cSACs, SPAs or cSPAs) has been carried out in the Appropriate Assessment (AA) Screening Report and Natura Impact Statement. A separate assessment has not been carried out in this chapter, to avoid duplication of assessments. However, the relevant conclusions have been cross-referenced and incorporated.

In addition to the above, the following legislation applies with respect to habitats, fauna, invasive species and water quality in Ireland and has been considered in the preparation of this chapter:

- The International Convention on Wetlands of International Importance especially Waterfowl Habitat (Concluded at Ramsar, Iran on 2 February 1971)
- S.I. No. 272 of 2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009 and S.I. No. 722 of 2003 European Communities (Water Policy) Regulations 2003 which give further effect to EU Water Framework Directive (2000/60/EC).
- The following legislation applies with respect to non-native species - Regulation 49 and 50 of European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011).

6.1.4 Assessment Methodology and Relevant Guidance

The assessment methodology is based primarily upon the Transport Infrastructure Ireland (TII)'s (formerly the National Roads Authority) Guidelines for Assessment of Ecological Impacts of National Road Schemes Rev 2 (TII, 2009a) (referred to hereafter as the TII Ecological Impact Assessment Guidelines), and the survey methodology is based on the TII Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (TII, 2009b). Although these

survey methodologies relate to road schemes, these standard guidelines are recognised survey methodologies that ensure good practice regardless of the development type.

In addition, other guidance including the following guidelines were consulted in the preparation of this document to provide the scope, structure and content of the assessment:

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater and Coastal (CIEEM, 2018).
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR) (EPA 2022).

This assessment has been carried out in accordance with the Environmental Impact Assessment guidance as outlined in Chapter 1 of this rEIAR.

The following planning policies and strategy guidance documents listed below were also considered in the preparation of this assessment:

- Offaly County Development Plan 2021-2027, Offaly County Development Plan 1987
- Partial versions of Historic County Development Plans for Offaly including 2014-2020, 2009-2015, 2003-2009, 1995 and 1967, where accessible. Further detail on historic county development plans are provided in Section 2.2.3 in Chapter 2 Background.

6.2 Methodology

The following sections describe the methodologies followed to glean information on the baseline ecological condition of the Application Site and surrounding area in July 1988 as well as the present day.

6.2.1 Desk Study

The desk study undertaken for this assessment included a thorough review of available data pertaining to the Application Site and surrounding area including the following:

- Bord na Móna Habitat Mapping for the Application Site
 - The Application Site was subject to detailed habitat surveys by Bord na Móna ecologists between 2011 and 2012 (with follow-up site visits in subsequent years as outlined below) and detailed habitat maps were prepared.
- Draft Bord na Móna Cutaway Bog Decommissioning and Rehabilitation Plan for Lemanaghan Bog (included in Appendix 4-2 of this rEIAR)
- Aerial imagery for the years 1973, 1988, 1995, 2004 and 2020 (included in Appendix 4-4 of the rEIAR).
- Bird Atlases: (Sharrock, 1976; Lack, 1986; Gibbons *et al.*, 1993; Balmer *et al.*, 2013).
- Bord na Móna Breeding and Wintering Bird Survey Reports (2014-2020) undertaken by Biosphere Environmental Services (BES).
- National Parks and Wildlife Service (NPWS) (2016) Clara Bog SAC (site code 000572) - Conservation Objectives supporting document – raised bog habitats Version 1. June 2016.
- NPWS (2016) Mongan Bog SAC (site code 000580) – Conservation Objectives supporting document – raised bog habitats Version 1. June 2016.
- NPWS (2015) Raheenmore Bog SAC (site code 000582) - Conservation Objectives supporting document – raised bog habitats Version 1. June 2015.
- Aquatic Report (2024) and Fisheries Report (2024) for proposed Lemanaghan Wind Farm prepared by Triturus Environmental Ltd (included as Appendix 6-3).

- Bat Report (2025) for Extraction at Lemanaghan Bog, Co Offaly, prepared by MKO (included as Appendix 6-2).
- Bird Report (2025) for Extraction at Lemanaghan Bog, Co Offaly, prepared by MKO (included as Appendix 6-4).

The following sources were also consulted in order to obtain information on the ecology of the Application Site and wider area:

- Review of historic 6 inch and 25 inch maps of the Application Site and surrounding area (<https://webapps.geoheive.ie/mapviewer/index.html>).
- Records from the NPWS web-mapper and review of specially requested records from the NPWS Rare and Protected Species Database for the hectads in which the Application Site is located.
- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper.
- Review of online web-mappers: NPWS, EPA (Envision), Water Framework Directive (WFD) and Inland Fisheries Ireland (IFI).
- Review of NPWS Article 17 maps 2019, 2013 and 2007.
- IFI Reports, where available.
- Data on potential occurrence of protected bryophytes – as per NPWS online map viewer; Flora Protection Order Map Viewer – Bryophytes¹.
- Review of relevant available plans, including the Offaly County Development Plan 2021–2027 and Offaly County Development Plan 1987 and partial versions of other plans (Offaly County Development Plan 2014–2020, Offaly County Development Plan 2009–2015, Offaly County Development Plan 2003–2009, Offaly County Development Plan 1995, Offaly County Development Plan 1967), where accessible. The National Biodiversity Action Plan 2007–2013 and National Biodiversity Action Plan 2023–2030 were also reviewed.
- Review of the Bat Conservation Ireland (BCI) Private Database.

6.2.2 Scoping and Consultation

MKO undertook a scoping exercise during preparation of this rEIAR, as described in Chapter 2, Section 2.6 of this rEIAR. Scoping was initially issued in September 2022 and again, due to the passage of time, in June 2024.

Copies of all scoping responses are included in Appendix 2-1 of this rEIAR. Details of scoping responses pertaining to biodiversity are included in Table 6-1 below.

Table 6-1 Scoping Responses

No.	Consultee	Response
1	An Taisce	Email acknowledged however no response received to date
2	Bat Conservation Ireland	None to date
3	Bird Watch Ireland	Email acknowledged however no response received to date
7	Department of Agriculture, Food and the Marine (including forestry)	None to date
8	Department of the Environment, Climate and Communications	None to date
11	Department of Housing, Local Government and Heritage	Email acknowledged however no response received to date

¹ NPWS, 2019, Online map viewer; Flora Protection Order Map Viewer – Bryophytes. Online, Available at: <http://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e>

No.	Consultee	Response
15	Environmental Protection Agency	Having regard to the specific characteristics of the project and likely impact on the environment, the Agency is of the opinion that the scope and level of detail to be included in the remedial environmental impact assessment report should as a minimum: (i) address the matters raised in the responses received from the bodies detailed above; (ii) have regard to the rehabilitation plan(s) required under Condition 10 of Licence Reg No. P0500-01 for any relevant bog areas; (iii) consideration should be given to inclusion of any relevant bog areas in an enhanced rehabilitation scheme, e.g., under the Peatlands Climate Action Scheme (PCAS). (iv) have regard to relevant water quality monitoring data. Any gaps in water quality data for receiving waters should be filled by a sampling programme over an appropriately representative period of time. (v) have regard to the EPA's Guidelines on the information to be contained in Environmental Impact Assessment Reports, which are available at the following link: https://www.epa.ie/publications/monitoring-assessment/assessment/guidelines-on-the-information-to-be-contained-in-environmental-impactassessment-reports-eiar.php.
17	Inland Fisheries Ireland	Email acknowledged however no response received to date
18	Irish Peatland Conservation Council	None to date
19	Irish Red Grouse Association	None to date
20	Irish Raptor Study Group	None to date
21	Irish Water	None to date
22	Irish Wildlife Trust	None to date
24	National Parks and Wildlife (DAU)	None to date
26	Office of Public Works	None to date
27	Offaly County Council - Planning Department	Email acknowledged however no response received to date

6.2.3 Field Surveys

A comprehensive survey of the biodiversity of the Application Site was undertaken on various dates between 2020 and 2025 (refer to Table 6-2 below for specific dates). Detailed habitat maps of the Application Site provided by Bord na Móna were used to set the baseline and inform the surveys. Whilst a number of the surveys described below were undertaken to inform the EIAR for the proposed Lemanaghan Wind Farm, the study area for both the proposed Lemanaghan Wind Farm and the Application Site boundary for this rEIAR overlap. These surveys provide the information necessary to undertake a robust assessment of the likely impacts of the peat extraction and ancillary activities, both

past and present, and the implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan on the Application Site.

Table 6-2 Summary of surveys undertaken to inform the remedial Ecological Impact Assessment and remedial Natura Impact Statement (rNIS)

Survey	Dates
Multidisciplinary Walkover Surveys	21 st April 2021 30 th July 2021 3 rd August 2022 25 th July 2023 10 th August 2023 14 th September 2023 20 th July 2025 29 th July 2025
Detailed Habitat and Vegetation Composition Surveys	29 th June 2023 25 th July 2023 17 th July 2024 18 th July 2024 19 th August 2024 29 th August 2024 10 th September 2024 3 rd October 2024 9 th October 2024 29 th July 2025
Otter Surveys	17 th August 2021 18 th August 2021 18 th August 2024 19 th August 2024 10 th September 2024
Aquatic Surveys	17 th August 2021 18 th August 2021

Survey	Dates
	18 th August 2024 19 th August 2024
Bird Surveys	Various dates between October 2020– March 2024
Marsh Fritillary Surveys	18 th August 2021 14 th September 2023 29 th August 2024 10 th September 2024
Badger Surveys	30 th July 2021 3 rd August 2022 19 th August 2024 10 th September 2024
Bat Surveys	April, June, August 2021 April, May, July, August, October, November 2024

The results of the surveys were used to inform this rEIAR chapter. The following sections fully describe the ecological surveys that have been undertaken and provide details of the methodologies, dates of survey and guidance followed.

6.2.3.1 Multidisciplinary Walkover Surveys

Multidisciplinary walkover surveys of the Application Site were undertaken in order to ground-truth the habitat mapping provided by Bord na Móna, based on their ecological surveys of the Application Site in 2011.

The Bord na Móna ecology team originally classified the habitats on the Application Site according to the Bord na Móna habitat classification system, provided in Appendix 6-1. Correspondence with the Heritage Council's *'Guide to Habitats in Ireland'* (Fossitt, 2000) is also described in Appendix 6-1. Habitats recorded within the Application Site by MKO during the walkover surveys were classified according to the guidelines set out in *'A Guide to Habitats in Ireland'* (Fossitt, 2000), which classifies habitats based on the vegetation present and management history. The survey timings fall within the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith *et al.*, 2011).

The walkover surveys were also designed to detect the presence, or likely presence, of a range of protected habitats and species.

The multidisciplinary walkover surveys comprehensively covered the Application Site with further detailed targeted surveys carried out for features and locations of ecological significance. These surveys

were carried out in accordance with TII *Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna* on National Road Schemes (TII, 2009b).

During the multidisciplinary surveys, a search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) was conducted.

Other targeted survey methodologies undertaken at the Application Site are described in the following subsections.

6.2.3.2 Dedicated Habitat and Vegetation Composition Surveys

Detailed habitat classification and assessment was undertaken by MKO at targeted locations within the Application Site boundary, with relevés undertaken within representative habitats recorded within the Application Site. Relevés were 4x4 metres for all habitats. The extent of each habitat on site was mapped using aerial photography, handheld GPS and smartphone technology. A representative photograph was also taken for each of the habitats recorded on site, including all relevés.

All habitats recorded on site and described in this rEIA chapter have been classified in accordance with Fossitt (2000).

The habitat surveys have been undertaken with reference to the following guidelines and interpretation documents:

- Cross, J. & Lynn, D. (2013) Results of a monitoring survey of bog woodland. Irish Wildlife Manuals, No. 69. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- Fernandez, F., Connolly K., Crowley W., Denyer J., Duff K. & Smith G. (2014) Raised Bog Monitoring and Assessment Survey 2013. Irish Wildlife Manuals, No. 81. National Parks and Wildlife Service, Department of Arts, Heritage and Gaeltacht, Dublin, Ireland.
- Commission of the European Communities (2007) Interpretation manual of European Union habitats. Eur 27. European Commission DG Environment.
- Foss, P.J. & Crushell, P. (2008) Guidelines for a National Fen Survey of Ireland, Survey Manual. Report for the National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Ireland.
- NPWS (2013) The Status of EU Protected Habitats and Species in Ireland. Habitat Assessments Volume 2. Version 1.1. Unpublished Report, National Parks and Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill.
- Smith, G. F., & Crowley, W. (2020) The Habitats of Cutover Raised Bog. Irish Wildlife Manuals 128. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Habitats were identified and classified, with emphasis on those of ecological significance, particularly those with the potential to correspond to Annex I of the EU Habitats Directive (92/43/EEC).

Plant nomenclature for vascular plants follows 'New Flora of the British Isles' (Stace, 2010), while mosses and liverworts nomenclature follows 'Mosses and Liverworts of Britain and Ireland - a field guide' (British Bryological Society, 2010).

6.2.3.3 Terrestrial Fauna Surveys

The results of the desk study, scoping replies and incidental records of protected species recorded during multidisciplinary walkover surveys were used to inform the scope of targeted ecological surveys required. While the surveys described below were undertaken to inform the EIAR for the proposed Lemanaghan Wind Farm, the study area for both the proposed Lemanaghan Wind Farm and the Application Site boundary for this rEIAR overlap, and these surveys provide the information necessary to undertake a robust assessment.

Based on the above, dedicated surveys for marsh fritillary, bats, otter, badger, birds and aquatic fauna were undertaken at the times set out below with the methodologies followed also provided below. Following the completion of ecological walkover surveys, no requirement for further dedicated faunal surveys was identified. During the multidisciplinary walkover surveys, records of invertebrates including butterflies, damselflies, dragonflies, moths, beetles etc. were recorded.

6.2.3.3.1 Badger Survey

Areas within the Application Site boundary identified as providing potential habitat for badger were subject to specialist targeted survey. The badger surveys were not constrained by vegetation given the nature of the habitats within the Application Site.

The badger surveys were conducted in order to determine the presence or absence of badger signs within the Application Site. This involved a search for all potential badger signs as per TII (2009b) (latrines, badger paths and setts). If encountered, setts would be classified as per the convention set out in TII (2009b) (i.e. main, annexe, subsidiary, outlier).

The badger survey was conducted adhering to best practice guidance (TII, 2009b) and followed the 'Guidelines for the Treatment of Badger Prior to the Construction of National Roads Schemes' (TII, 2006 and CIEEM best practice competencies for species surveys (CIEEM, 2013).

Camera traps

Camera traps were deployed at the location of a badger sett identified within the Application Site during dedicated badger surveys undertaken on the 19th of August and 10th of September 2024 to determine whether the sett was in use. The camera traps were deployed for 22 days.

6.2.3.3.2 Otter Survey

Following a review of the previously completed ecological surveys and the results of the multidisciplinary walkover survey; areas identified as providing potential habitat for otter were subject to specialist targeted survey. Additional otter surveys were undertaken during a fisheries assessment of the watercourses both within and downstream of the targeted otter study area on the 17th and 18th August 2021 and the 18th and 19th August 2024.

The otter survey was conducted as per TII (2009b) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes). This involved a search for all otter signs e.g. spraints, scat, prints, slides, trails, couches and holts. In addition to the width of the rivers/watercourses, a 10m riparian buffer (both banks) was considered to comprise part of the otter habitat (NPWS, 2009). The dedicated otter survey also followed the guidance as set out in TII (2008a) 'Guidelines for the Treatment of Otters Prior to the Construction of National Roads Schemes' and following CIEEM best practice competencies for species surveys (CIEEM, 2013).

6.2.3.3.3 Marsh Fritillary Surveys

Following the identification of suitable habitat for marsh fritillary within the Application Site during walkover surveys undertaken as well as the results of the desk study, targeted larval web surveys for the species were undertaken between 2021 and 2024. The surveys were undertaken within the optimal period for undertaking marsh fritillary larval web surveys, i.e. August – September, in addition to during other stages of its life cycle. All surveys were undertaken on dry days, with no rain and no to little wind.

The survey methodology followed that described in the TII (2009b) best practice guidance document. This involved walked surveys to identify suitable areas of marsh fritillary habitat within the Application Site. This was achieved by walking transects through areas of potentially suitable habitat. Where suitable habitat did occur, detailed surveys to locate larval webs were undertaken.

6.2.3.3.4 Bat Surveys

A detailed description of bat survey methodologies undertaken at the Application Site is provided in the Bat Report in Appendix 6-2, along with dates and details of all surveyors. Surveys carried out in 2024 were in accordance with NatureScot (2021) and form the core dataset for the assessment of effects on bats. The 2024 results are supplemented by data collected during surveys undertaken at the Application Site in 2021.

All surveys were undertaken in accordance with best practice guidance, including *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2023) and NatureScot (2021). The survey programme included bat walkover surveys to assess the suitability of the Application Site to support roosting, foraging and commuting bats, as well as targeted roost surveys, manual activity surveys and ground-level static surveys, summarised as follows:

- **Roost Surveys:** All buildings and trees within and adjacent to the Application Site were assessed for Potential Roost Features (PRFs). Three structures adjacent to the Application Site boundary were subject to detailed internal and external inspections and dusk emergence surveys. Tree assessments were carried out from ground level to identify signs of rot holes, cracks, or other PRFs.
- **Manual Activity Surveys:** Walked and driven transect surveys were conducted across the Application Site in Spring, Summer, and Autumn 2024, using full-spectrum bat detectors (Batlogger M). Dusk emergence surveys were also undertaken at selected structures in 2021 and 2024. All bat activity was recorded for subsequent analysis to confirm species identifications
- **Ground-level Static Detector Surveys:** Full-spectrum static detectors (Song Meter SM4BAT) were deployed at 12 locations across a representative range of habitats during Spring, Summer, and Autumn 2024. Detectors were programmed to record from 30 minutes before sunset to 30 minutes after sunrise for at least 10 nights per season. Weather conditions were monitored throughout to ensure appropriate conditions were captured.

All recorded bat calls were analysed using Kaleidoscope Pro software and manually verified to species or genus level, where possible, and activity levels were quantified as bat passes per hour (bp/h).

6.2.3.3.5 Aquatic surveys

Aquatic surveys of the watercourses draining the Application Site were conducted by Triturus Environmental Ltd. on the 17th and 18th August 2021 and the 18th and 19th August 2024. The surveys assessed watercourses and ponds within and downstream of the Application Site to evaluate fisheries potential, biological water quality, and the presence of aquatic species and habitats of conservation interest. A total of 13 sites were surveyed. The site locations are shown in Figure 2-1 of the Aquatic Report in Appendix 6-3. While the surveys were undertaken to inform the EIAR for the proposed

Lemanaghan Wind Farm, the survey covered all watercourses draining the Application Site and the survey effort was considered sufficient to provide comprehensive information on the nature of the watercourses within and draining the Application Site.

The surveys included Biological Water Quality (Q sampling) which was assessed through kick sampling, electrofishing and a broad aquatic habitat assessment at each location which assessed watercourses in terms of:

- Physical watercourse/waterbody characteristics (i.e., width, depth etc.).
- Substrate type, listing substrate fractions in order of dominance (i.e., bedrock, boulder, cobble, gravel, sand, silt etc.).
- River profile in the sampling area.
- An appraisal of the macrophyte and aquatic bryophyte community at each site.
- Riparian vegetation composition.

The methodologies for the aquatic surveys are described within the aquatic report.

6.2.3.3.6 Bird Surveys

Bird surveys were undertaken by MKO at the Application Site between October 2020 and March 2025 consisting of four breeding seasons (April – September) and five non-breeding seasons (October – March). While the surveys were undertaken to inform the EIAR for the proposed Lemanaghan Wind Farm, the study area for the bird surveys covered the entire Application Site. These surveys provide the information necessary to undertake a robust assessment of the likely impacts of the peat extraction and ancillary activities, both past and present, and the implementation of the proposed rehabilitation plan on the Application Site. These field surveys were undertaken in compliance with Scottish National Heritage (now known as Nature Scot as of 2023) guidance (SNH 2017). The relevant survey methodologies and effort are described in full detail in Appendix 6-4 and relevant information summarised below.

Vantage Point Surveys

Vantage point surveys were undertaken at the Application Site from October 2020 to March 2025. Surveys were conducted monthly throughout the survey period from six fixed point vantage points to allow as comprehensive as possible coverage of the Application Site.

Data Recording and Digitisation

Data on bird observations and flight activity was collected from a scanning arc of 180° and a 2km radius by an observer at each fixed location for six hours per month. Surveys were scheduled to provide a spread over the full daylight period including dawn and dusk watches to coincide with the highest periods of bird activity.

Each flight observation was assigned a unique identifier when mapped in the field and subsequently digitised using GIS software.

Breeding Walkover Surveys

Breeding walkover surveys were undertaken to determine the presence of bird species of high conservation concern and identify areas of possible, probable or confirmed breeding for bird species observed within the Application Site and 500m radius. The methodology was based on Brown and Shepherd (1993) and Calladine *et al.* (2009), combined with Common Bird Census methods (British Trust for Ornithology, 2021) for dense habitat. Transect routes were walked across different habitat complexes within the survey area where access allowed. Using binoculars, the surveyor regularly scanned the surroundings of each transect for target species. All target species were mapped and

breeding status was assigned following British Trust for Ornithology (BTO) breeding status codes². In addition, the presence of any non-target species was recorded to inform the evaluation of supporting habitat.

Breeding walkover surveys were carried out at dawn over four visits during the core breeding season months April to July (2021, 2022, 2023 & 2024), with the Application Site being visited three consecutive days per month on each occasion. Following all survey visits, the field maps were analysed to determine the number and location of breeding territories. All non-breeding individuals and species encountered were also recorded.

Breeding Raptor Surveys

Raptors include all harrier, falcon, buzzard, eagle, hawk, owl, kite and osprey species. Breeding raptor surveys were undertaken within the Application Site and to a 2km radius to identify occupied territories and monitor their breeding success near or within the Application Site. Survey methodology followed Hardey *et al.* (2013). Breeding raptor watches of 3 hours (supplemented by transects if necessary) were conducted during daylight at a total of eleven breeding raptor locations over the four breeding seasons. All raptor species observed were recorded and mapped and breeding status was assigned following BTO breeding status codes. Surveyors did not approach nest sites to avoid disturbance.

Breeding Woodcock Surveys

Breeding woodcock surveys were undertaken within the Application Site and to a 500m radius. The aim of the survey was to identify breeding woodcock territories within the Application Site by locating roding (breeding display) males. Survey methodology followed Gilbert *et al.* (1998): the surveyor walked transects within the survey area for two hours from dusk until last visible light during which all woodcock observations were mapped, with particular reference to roding observations. Each transect was surveyed three times during the core breeding season of May and June (2021, 2022, 2023 & 2024).

Breeding Kingfisher Surveys

Following observations of kingfisher activity along a bog drain during a vantage point survey in early May 2023, a dedicated breeding kingfisher survey was undertaken at this location in May 2023. The aim of the survey was to confirm presence of a breeding kingfisher territory at this location by locating kingfishers or signs of nesting. Survey methodology followed Cummins *et al.* (2010): the surveyor walked along the subject drains searching for kingfisher, nest holes or suitable nesting banks during daylight hours. All such observations were recorded and mapped.

This location was subsequently surveyed as part of breeding walkover surveys in breeding season 2024.

Breeding Barn Owl Surveys

Following an incidental observation of a barn owl within a building in March 2021 during a dusk vantage point survey, breeding barn owl surveys were subsequently undertaken at this location during breeding seasons 2021, 2022 & 2023. Survey methodology followed TH (2021). The surveyor conducted a watch at potential nest sites from 30 mins before sunset until 1 hour after sunset, searching for barn owls provisioning young, listening for the sound of chicks, and observing for barn owl pellets, feathers or whitewash. All such observations were recorded and mapped and a breeding status was assigned following TH (2021). The potential nest site was surveyed a minimum of three times during the core breeding season May to July (2021, 2022 & 2023).

² <https://www.bto.org/our-science/projects/birdatlas/methods/breeding-evidence>

Winter Walkover Surveys

Winter walkover surveys were undertaken to record the presence of bird species within the Application Site to a 500m radius, including areas between vantage point locations. The methodology was adapted from the breeding walkover methodology outlined in Bibby *et al.* (2000) and adapted Brown and Shepherd surveys', combined with Common Bird Census methods (British Trust for Ornithology, 2021). Transect routes were walked across different habitat complexes within the survey area where access allowed. All target species were recorded and mapped. In addition, the presence of any non-target species was recorded to inform the evaluation of supporting habitat.

Winter walkover surveys were conducted in daylight hours over four visits between October and March (i.e. four visits in winter 2020/2021, four visits in winter 2021/2022, four visits in winter 2022/2023, four visits in winter 2023/2024 and four visits in winter 2024/2025).

Waterbird Distribution and Abundance Surveys

Waterbirds include: swans, geese and ducks; cormorant, shag, divers and grebes; auks and seabirds; gulls, terns and skuas; herons, egrets and crane; rails and crakes; waders; and kingfisher. Significant wetlands and waterbodies within 8km of the Application Site were surveyed for waterbirds during the 2020/2021, 2021/2022, 2022/2023, 2023/2024 and 2024/2025 winter and passage seasons (August to May inclusive) to provide information on their distribution in relation to the Application Site. The area surveyed exceeds the 500m for foraging waterbirds and 1km for roosting waterbirds requirements of SNH (2017) and follows the recommendations of SNH (2016) to account for the core foraging ranges of whooper swan (<5km) and Greenland white-fronted goose (5-8km) which are Annex I waterbirds listed as species of special conservation interest (SCI) of SPAs within 15km of the Application Site.

Survey methodology follows Gilbert *et al.* (1998) and the Irish Wetland Bird Survey (BirdWatch Ireland, 2021). Surveys were undertaken during daylight hours from suitable vantage points at wetlands and waterbodies. All target waterbird species were recorded and mapped. Survey effort, including details of survey duration and weather conditions, is presented in Appendix B of the Bird report included as Appendix 6-4 of this chapter. Figure 2-6 shows the surveyed area.

Hen Harrier Roost Surveys

Hen harrier roost surveys were undertaken in areas of suitable habitat within a 2km radius of the Application Site. These surveys aimed to identify active winter hen harrier roosts near or within the Application Site. Survey methodology followed Gilbert *et al.* (1998) and O'Donoghue (2019). Roost watches of 2-3 hours were conducted at a total of six hen harrier vantage point locations over the five winter seasons surveyed. Surveys were carried from dusk until last visible light during which all hen harrier observations were recorded and mapped.

Each hen harrier vantage point was surveyed once per month during the winter season between October and March inclusive (in winters 2020/2021, 2021/2022, 2022/2023, 2023/2024, 2024/2025). Survey effort is presented in Appendix 6-4, including full details of dates, times and weather conditions.

6.2.3.3.7 Invasive Species Survey

During the multidisciplinary walkover surveys and botanical surveys, a search for non-native invasive species was also undertaken. The survey focused on the identification of invasive species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (As Amended) (S.I. 477 of 2015).

6.2.3.3.8 **Survey Limitations**

Seasonal factors that affect distribution patterns and habits of species were taken into account when conducting the field surveys that were undertaken to establish the current ecology of the Application Site. The potential of the Application Site to support certain populations (in particular those of conservation importance that may not have been recorded during the field survey due to their seasonal absence or nocturnal/cryptic habits) was assessed.

The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines. The habitats and species on the Application Site were readily identifiable during the site visits and comprehensive assessments were made during the field visit and no limitations have been identified in this regard.

The description of the 1988 baseline below is based on a desk study involving a review of available literature and mapping, including existing habitat mapping of the Application Site provided by Bord na Móna. Aerial photography and information provided by Bord na Móna on the timelines of drainage, vegetation stripping, peat extraction and ancillary activities at the Application Site were also studied in detail. In addition, information gathered during field surveys of the Application Site undertaken by MKO between 2020 and 2025 has also been used. These surveys provided information on the nature of the habitats present in areas where peat extraction and ancillary activities had very recently ceased, in areas where peat extraction and ancillary activities had ceased for some time and in areas of remnant raised bog which had never been subject to peat extraction. Using this information, it is possible to infer what the ecological baseline at the Application Site was likely to have been in 1988. However, no detailed, site specific ecology and habitat surveys from that time are available to inform the description.

While many of the surveys described in this Chapter were undertaken to inform the EIAR for the proposed Lemanaghan Wind Farm, the study area for the proposed Lemanaghan Wind Farm and the Application Site overlap. The surveys undertaken comprehensively covered the Application Site and provide the information required to undertake a robust assessment of the likely significant effect of peat extraction and ancillary activities on biodiversity.

6.2.4 **Methodology for Assessment of Impacts and Effects**

6.2.4.1 **Identification of Target Receptors and Key Ecological Receptors**

The methodology for assessment followed a precautionary screening approach with regard to the identification of Key Ecological Receptors (KERs). Following the aforementioned comprehensive desk study, the initial site visits and stakeholder consultation (refer to Section 6.2.2 above for details of consultations undertaken); “Target receptors” likely to occur in the zone of influence (as defined in Section 6.1 above) of the Project were identified. The target receptors included habitats and species that were protected under the following legislation:

- Annexes of the EU Habitats Directive and EU Birds Directive;
- Qualifying Interests (QI) of Special Areas of Conservation (SAC) within the likely zone of influence;
- Species protected under the Wildlife Acts 1976-2021; and
- Species protected under the Flora Protection Order 2022.

6.2.4.2 **Determining Importance of Ecological Receptors**

The importance of the ecological features identified within the Application Site, and its vicinity was determined with reference to a defined geographical context. This was undertaken following a methodology that is set out in Chapter 3 of the TII Ecological Impact Assessment Guidelines (TII,

2009a). These guidelines set out the context for the determination of value on a geographic basis with a hierarchy assigned in relation to the importance of any particular receptor. The guidelines provide a basis for determination of whether any particular receptor is of importance on the following scales:

- International Importance;
- National Importance;
- County Importance;
- Local Importance (Higher Value); and
- Local Importance (Lower Value).

The TII guidelines clearly set out the criteria by which each geographic level of importance can be assigned. Locally Important (Lower Value) receptors contain habitats and species that are widespread and of low ecological significance and are of importance only in the local area. Internationally important sites are either designated for conservation as part of the Natura 2000 Network (SAC or SPA) or provide the best examples of habitats or internationally important populations of protected flora and fauna. Specific criteria for assigning each of the other levels of importance are set out in the guidelines (TII, 2009a) and have been followed in this assessment. Where appropriate, the geographic frame of reference set out above was adapted to suit local circumstances. In addition, and where appropriate, the conservation status of habitats and species is considered when determining the significance of ecological receptors.

Any ecological receptors that are determined to be of National or International, County or Local Importance (Higher Value) following the criteria set out in the guidelines (TII, 2009a) are considered to be Key Ecological Receptors (KERs) for the purposes of ecological impact assessment if there is a pathway for effects thereon. Any receptors that are determined to be of Local Importance (Lower Value) are not considered to be Key Ecological Receptors.

6.2.4.3 Characterisation of Impacts and Effects

Developments or projects can result in a number of impacts. The ecological effects of these impacts are characterised as per the CIEEM 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (2018). These guidelines are the industry standard for the completion of Ecological Impact Assessment in the UK and Ireland. The headings under which the impacts are characterised follow those listed in the CIEEM guidance document and are applied where relevant. A summary of the impact characteristics considered in the assessment is provided below:

- **Positive or Negative.** Assessment of whether a proposed development or project results in a positive or negative effect on the ecological receptor.
- **Extent.** Description of the spatial area over which the effect has the potential to occur.
- **Magnitude.** Refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.
- **Duration** is defined in relation to ecological characteristics (such as the lifecycle of a species) as well as human timeframes. For example, five years, which might seem short-term in the human context or that of other long-lived species, would span at least five generations of some invertebrate species.
- **Frequency and Timing.** This relates to the number of times that an impact occurs and its frequency. A small-scale impact can have a significant effect if it is repeated on numerous occasions over a long period.
- **Reversibility.** This is a consideration of whether an effect is reversible within a 'reasonable' timescale. What is considered to be a reasonable timescale can vary between receptors and is justified where appropriate in the impact assessment section of this report.

6.2.4.4 Determining the Significance of Effects

The ecological significance of the effects of the Project are determined following the precautionary principle and in accordance with the methodology set out in Section 5 of CIEEM (2018).

For the purpose of Ecological Impact Assessment (EcIA), 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local (CIEEM, 2018).

When determining significance, consideration is given to whether:

- Any processes or key characteristics of key ecological receptors will be removed or changed.
- There will be an effect on the nature, extent, structure and function of important ecological features.
- There is an effect on the average population size and viability of ecologically important species.
- There is an effect on the conservation status of important ecological habitats and species.

The EPA Guidelines on information to be included in Environmental Impact Assessment Reports (EPA, 2022) and the TII Ecological Impact Assessment Guidelines, (TII, 2009a) were also considered when determining significance.

As per TII (2009a) and CIEEM (2018) best practice guidelines, the following key elements should also be examined when determining the significance of effects:

- The likely effects on 'integrity' should be used as a measure to determine whether an impact on a site is likely to be significant (TII, 2009a).
- A 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives (CIEEM, 2018).

Integrity

In the context of EcIA, 'integrity' refers to the coherence of the ecological structure and function, across the entirety of a site, that enables it to sustain all of the ecological resources for which it has been valued (TII, 2009a). Impacts resulting in adverse changes to the nature, extent, structure and function of component habitats and effects on the average population size and viability of component species, would affect the integrity of a site, if it changes the condition of the ecosystem to unfavourable.

Conservation status

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status. According to CIEEM (2018) guidelines the definition for conservation status in relation to habitats and species are as follows:

- Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area.
- Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

As defined in the EU Habitats Directive 92/43/EEC, the conservation of a habitat is favourable when:

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

The conservation of a species is favourable when:

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

According to the TII/CIEEM methodology, if it is determined that the integrity and/or conservation status of an ecological feature will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (i.e. local, county, national, international).

6.2.4.5 Incorporation of Control Measures and Mitigation

Section 6.4 of this rEIAR assesses the likely significant effects of peat extraction and ancillary activities since July 1988 on sensitive ecological receptors and outlines the best practice and control measures, where applicable, that were/are in place during the Peat Extraction Phase and Current Phases. It also outlines mitigation measures which are to be in place during the implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan for the Application Site during the Remedial Phase. Since the year 2000 all operations at the Application Site have been licenced under IPC Licence (No. P0500-01) and have been subject to the conditions of that licence. It is currently proposed to implement a Draft Cutaway Bog Decommissioning and Rehabilitation Plan to fulfil the requirements of Condition 10 of the IPC licence. The objective of this plan is to stabilise and rehabilitate the peatland habitats within the Application Site. The implemented control measures and mitigation measures avoid or reduce or offset potential significant residual effects, post mitigation.

6.3 Establishing the Ecological Baseline

6.3.1 Desk Study

The following sections provide the results of a detailed desk study undertaken to collate information on the ecology of the Application Site and the surrounding area (refer to Section 6.2). As outlined in Chapter 1 of this rEIAR, the Project covers the period from July 1988, when the European Communities Environmental Impact Assessment (EIA) Directive was transposed into Irish law, until the present day. Therefore, the ecological baseline against which the assessment in this chapter is undertaken is taken to be July 1988. The sections below provide information gleaned from a desk study which help establish the ecological baseline conditions that are likely to have existed at the Application Site and surrounding area in 1988.

The Application Site is located within the 10km grid squares (hectads) N12 and N13. In addition to presenting desk study information on the ecological baseline of the Application Site, information on the ecology of the wider area (within hectads N12 and N13) is also included. This encompasses records of protected species (both historical and contemporary), information on Annex I habitats, and relevant water quality data. While historical information is presented where available, e.g. previous Bird Atlases, NPWS records, information on water quality, much of the information presented on the

surrounding area relates to recent records obtained from the National Biodiversity Data Centre (NBDC) and other sources

6.3.1.1 1988 Ecological Baseline

The Application Site was drained, milled peat extraction was underway, and railway infrastructure was in place. The main access point to the Application Site was off the Regional Road R436 to the south of the Application Site, into the Works area. The Lemanaghan Works, which comprised a canteen, storage sheds, and maintenance buildings, was located to the south outside of but adjacent to the Application Site, where it is still located in present day. The following ancillary infrastructure was established at the Application Site by July 1988:

- Railway infrastructure;
- Internal machine passes/tracks;
- Silt ponds and drains.

Aerial imagery indicates that by July 1988, approximately 968.7ha of the Application Site was subject to milled peat extraction. Thus, the main landcover type at this time was cutover peat. Drainage was already installed, predominantly in a northeast-southwest orientation. Railway infrastructure was laid in the bog (since the 1950s), terminating at the Works building located to the south, adjacent to the Application Site, just off the R436 Ballycumber road. The Works area housed a canteen and welfare facilities, waste storage areas, carparking facilities, Harvester Repair Bay (Planning Ref 81375), and a refuelling area. The Application Site included 9 no. artificial silt ponds, 9 no. surface water discharge points and 8 gravity flow surface water outflows which remain *in situ* today. These surface water outfall locations discharge to tributaries of the Boor and Brosna rivers. The topography of the Application Site is estimated to have been approximately 54-66mOD by 1988.

6.3.1.1.1 Description of Habitats at the Application Site – 1988 (Baseline)

6.3.1.1.2 Raised Bog Habitat

By 1988 the land use at the Application Site was well established as industrial peat extraction, with drainage in place in areas intended for extraction, milled peat extraction underway and railway infrastructure in place. In the absence of historical data for the Application Site, this description of the baseline ecology at the Application Site before the Project is informed by NPWS published accounts of bog habitats and *A Guide to Habitats in Ireland* (Fossitt, 2000). Prior to any drainage, the entire Application Site would have likely been covered by predominantly uncut raised bog, and associated habitats including bog woodland, fen and flush.

Raised bogs are accumulations of deep acid peat (3-12m in depth) that originate in shallow lake basins or topographical depressions. They have a typical elevated domed surface which grows upwards from the surface. The dome is primarily rainwater fed and isolated from the groundwater table giving rise to acid conditions which support distinctive specialised vegetation communities tolerant of such acid conditions.

Raised bogs vegetation communities are grouped into a series of community complexes which in turn are amalgamated into a series of ecotopes characterised by different physical characteristics.

The main ecotopes that community complexes are grouped into include:

- Central ecotope
- Sub-central ecotope
- Active flushes and soaks
- Sub-marginal ecotope
- Marginal ecotope

- Inactive flushes
- Face-bank ecotope

Actively accumulating peat conditions occur within the sub-central and central ecotope, which are the wettest on the bog and an indication of good quality active raised bog. Active raised bog is characterised by an actively growing upper layer known as the acrotelm (peat-forming layer of the bog) which is composed mainly of Sphagnum mosses. The surface of intact active raised bog is typically wet, acidic and deficient in plant nutrients with a complex microtopography of hummocks and hollows on the bog surface. Sphagnum mosses dominate the ground layer. Bogs are generally driest at the edges becoming wetter towards the centre where well-developed pool systems are common. Dry areas and hummocks typically support ling heather (*Calluna vulgaris*), deergrass (*Trichophorum germanicum*), hare's tail cottongrass (*Eriophorum vaginatum*), cross-leaved heath (*Erica tetralix*) and Sphagnum and other moss species. Wetter areas and pools are generally characterised by common cottongrass (*Eriophorum angustifolium*), bog asphodel (*Narthecium ossifragum*), white beak sedge (*Rhynchospora alba*), bogbean (*Menyanthes trifoliata*) and Sphagnum mosses (Fossitt, 2000). Active raised bog is a priority habitat listed under Annex I of the Habitats Directive and is described as a raised bog which is “still capable of peat formation, or if peat formation has temporarily ceased”. Active flushes and soaks are also dominated by Sphagnum mosses and typically have wet conditions. These features are associated with active raised bog and contribute to the overall diversity of the habitat. The adjacent surrounding marginal, sub-marginal, and face-bank bog areas typically have a supporting function for the central and sub-central communities but are not peat accumulating.

In 1988, predominantly smaller areas of uncut raised bog would have been present, mostly at the margins of the Application Site where peat extraction and ancillary activities would not have occurred. These areas of raised bog were small, fragmented and would have been degraded in nature due to the extensive drainage that had been inserted in the majority of the wider bog by this stage. Whilst drainage had been inserted in the bog to the north, vegetation at these locations was still intact and therefore these areas would also have comprised an area of degraded raised bog. Sphagnum moss cover was likely much reduced and ling heather more abundant in the area compared to an undrained intact raised bog, due to the lowered water table. It is unlikely, given the extensive drainage that had been inserted within and surrounding these sections of raised bog that any significant areas of active raised bog would have remained. This drained but uncut area was subject to peat extraction and ancillary activities by 1995 as evidenced by aerial imagery.

6.3.1.1.3 Cutover Bog

Based on the above, the vast majority of the Application Site in 1988 would have been classified as cutover bog (PB4). Cutover bog is a variable habitat, or complex of habitats, that can include mosaics of bare peat and revegetated areas with woodland, scrub, heath, fen and flush or grassland communities. The nature of the recolonising vegetation depends on numerous factors including the frequency and extent of disturbance, hydrology, the depth of peat remaining, and the nature of the peat and the underlying substratum (Smith and Crowley, 2020).

In 1988, the cutover bog habitat at the Application Site would have comprised predominantly of bare peat where large sections of the bogs had been drained and vegetation removed. Where peat extraction and ancillary activities ceased for some time during subsequent years, these areas would have begun to be colonised by vegetation communities typical of cutover bog habitats and similar to those present on parts of the Application Site today, i.e. a mosaic of birch dominated scrub and woodland with some willow, generally dry in nature, ling heather dominated secondary heath vegetation, pioneer poor fen dominated by common bog cotton and areas of dry and wet grassland.

6.3.1.1.4 Agricultural Land

A small plot of agricultural land associated with a mineral island is present near to the centre of the Application Site but located outside the Application Site boundary. In the present day comprises fields cut for silage categorised as dry meadows and grassy verges (GS2) separated by scrub and immature

woodland (WS1/WS2). It is likely that these lands in 1988 were of a similar status in terms of being subject to agricultural practice, with potential to conforming to agricultural grassland (GA1) depending on the management regime at the time. As evidenced by aerial imagery, scrub and immature woodland had not yet developed at that time and instead consisted of grassland with field boundaries likely comprising artificial borders or hedgerows (WL1).

6.3.1.2 Fauna at the Application Site – 1988 (Baseline)

The faunal species on the Application Site in 1988 would have comprised species typical of cutover bog habitats.

6.3.1.2.1 Typical Fauna of Raised Bog

Raised bogs are nutrient poor ecosystems and the acidic, waterlogged and exposed conditions mean they support a low faunal species diversity (NPWS 2016 SSCOs for Clara Bog, Mongan Bog and Raheenmore Bog which are considered good examples of raised bog habitat in Ireland).

The lack of suitable foraging and breeding places on raised bog habitats make raised bog largely unsuitable for many mammal species. Irish hare is the most commonly occurring mammal species on raised bogs. Other species recorded from marginal areas and watercourses surrounding bogs include otter (*Lutra lutra*), pygmy shrew (*Sorex minutus*), badger (*Meles meles*), pine marten (*Martes martes*) and fox (*Vulpes vulpes*) (NPWS 2016).

Common frog is the most common amphibian whilst common lizard may also be found.

18 no. species of birds have been reported breeding on raised bogs (Wilson 1990), however, many of these use the bog as nesting habitat only and are dependent of other habitats including open water bodies, callows and wet grassland for feeding. A few species, meadow pipit (*Anthus pratensis*), skylark (*Alauda arvensis*) and curlew (*Numenius arquata*) complete their full breeding cycle on raised bog and the first two species are the most commonly occurring species (Bracken *et al.* 2008). Red grouse is also considered a typical bog species occurring year-round as a resident. Other species that have been recorded breeding on raised bog include mallard, Greenland white-fronted goose, hen harrier, cuckoo, merlin, kestrel, snipe, golden plover and lapwing.

In terms of invertebrates, while information on invertebrate assemblages typical of raised bog is limited, two species of Lepidoptera have been identified as characteristic of raised bog habitat, i.e bordered grey (*Selidosema brunnearia*) and light knot grass (*Acronicta menyanthidis*). Marsh fritillary butterfly and large heath butterfly are also typically associated with peatland habitats.

Species mentioned above are not confined to active raised bog habitat and most, if not all, will use other areas of the bog and surrounding habitats, including cutover bog.

6.3.1.2.2 Typical Fauna of Cutover bog

By 1988 the majority of the Application Site was cutover bog with smaller areas of uncut raised bog remaining to the north as well as mostly around the margins of the other bogs within the Application Site. The Application Site, therefore, while it may have supported populations of some species typical of raised bog habitats in the remnant raised bog areas, is more likely to have supported faunal assemblages typical of cutover bog habitats and similar to the faunal assemblages present today which include skylark, meadow pipit, Irish hare, badger, otter.

6.3.1.3 Habitats Present at Lemanaghan Bog During Extraction Phase

The below sections set out the data on habitats and fauna gathered at the Application Site during the Extraction Phase.

6.3.1.3.1 *Bord na Móna Ecology Surveys and Habitat Mapping (2011)*

As detailed in Section 6.2.1, the Application Site was subject to detailed habitat surveys by Bord na Móna ecologists and detailed habitat maps were prepared during the extraction phase of the Application Site.

The January 2011 Ecological Report included as Appendix II of the Draft Cutaway Bog and Rehabilitation Plan included as Appendix 4-2 describes Lemanaghan Bog as a large bog spread out over four main sections, one large main bog with three smaller bogs separated by access roads. The main central section features two mineral islands, partially under private agricultural use and partially owned and leased by Bord na Móna. There is a rough access track through the Application Site to these islands.

The report outlined that peat extraction and ancillary activities was active across much of Lemanaghan Bog, particularly in the northeastern and eastern sections, where extensive milled peat production had replaced former sod-peat operations that began in 1960³. At the time of the survey in 2011, drainage works were ongoing in active production zones. Pumps and silt ponds were present to manage water levels, particularly around the central works area and riparian zones.

The Application Site contains a mosaic of active production fields (bare peat) and abandoned or regenerating cutaway areas, some with dry calcareous grassland, dry heath, pioneer poor fen, and Birch scrub. Peat depth and characteristics varied across the bog, with 'red' acidic peat dominating in younger production fields, and black fen peat exposed in cutaway areas. Some glacial gravel mounds were present and showed signs of colonisation by grassland and scrub vegetation.

Key Biodiversity Features of Interest

- In 2011, the majority of the main bog was under peat production but there were some establishing pioneer cutaway habitats at various developmental stages, particularly dry calcareous grassland, fen, and scrub.
- The Application Site margins support remnant raised bog, bog woodland, and hedgerows. These areas and the establishing cutaway habitats supported typical fauna species.

Habitats Present (in order of dominance)

The most common habitats present at the Application Site include:

- Bare peat
- Birch Scrub and Gorse scrub
- Pioneer dry heath (frequently in mosaic with bare peat and or Bog Cotton-dominated vegetation)
- Pioneer poor fen vegetation dominated by Bog Cotton, Soft Rush and/or Marsh Arrowgrass
- Dry grassland habitats
- Temporary open water
- Access routes (railways, tracks and associated habitats)

³ Although the 2011 Ecological Report states that sod-peat operations began in 1959, this is an error. Chapter 4 confirms that peat extraction at Lemanaghan Bog commenced in 1960.

- Riparian zones (drains, channelised streams and associated bank habitats)
- Works area
- Silt ponds

The most common habitats (Fossitt 2000) found around the margins of the Application Site include:

- Conifer plantation (WD4)
- Raised bog (PB1)
- Cutover bog (PB4)
- Dry heath (HH1)
- Improved grassland (GA1)
- Hedgerows (WL1)

6.3.1.4 Designated Sites within the Likely Zone of Influence of the Application Site

Special Areas of Conservation (SACs) and Special Protection Areas for Birds (SPAs) are designated under the EU Habitats Directive and EU Birds Directive, respectively and are collectively known as 'European Sites'. The likely significant effects and/or adverse impacts on the integrity of European Sites is fully assessed in the remedial Appropriate Assessment Screening Report and remedial Natura Impact Statement that accompanies the application for substitute consent. As per EPA Guidance 2022, "*a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement*" but should "*incorporate their key findings as available and appropriate*". Section 6.4.2 of this rEIAR provides a summary of the key assessment findings with regard to European Designated Sites.

Natural Heritage Areas (NHAs) are designated under Section 18 of the Wildlife (Amendment) Act 2000 and their management and protection is provided for by this legislation and planning policy. The likely significant effects of peat extraction and ancillary activities on these designated sites is fully considered in this assessment.

Proposed Natural Heritage Areas (pNHAs) were listed on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, the potential for effects on these sites is fully considered in this assessment.

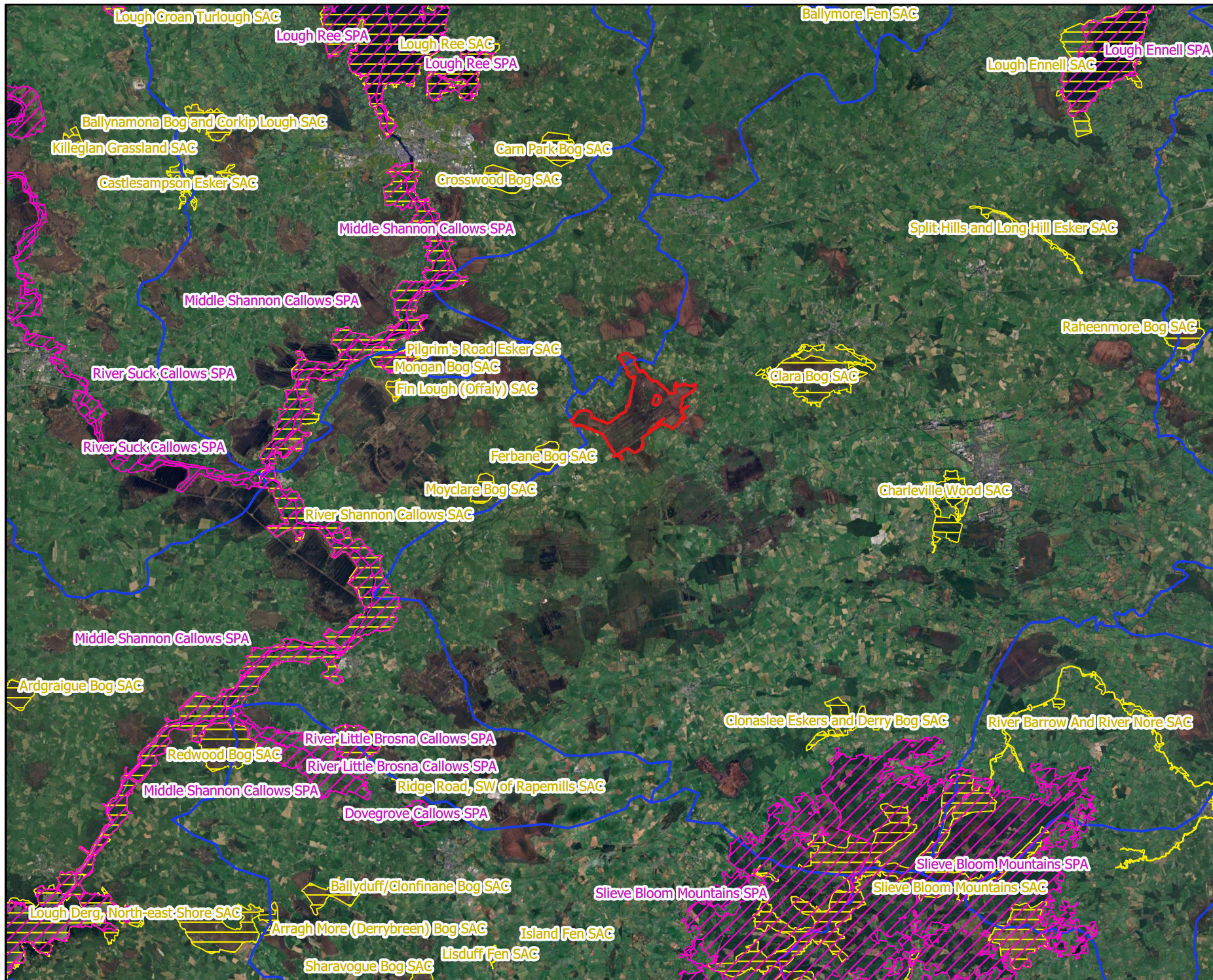
The following methodology was used to establish the designated sites that have the potential to be impacted by the peat extraction and ancillary activities:

- Initially the most up to date GIS spatial datasets for European and Nationally designated sites and water catchments were downloaded from the NPWS website(www.npws.ie)⁴ and the EPA website (www.epa.ie). The datasets were utilised to identify Designated Sites which could feasibly be affected by the peat extraction and ancillary activities.
- All European and Nationally Designated Sites that could potentially be affected were identified using a source-pathway-receptor model. To provide context for the assessment, Designated Sites surrounding the Application Site are shown on Figure 6-2 and Figure 6-3. Designated Sites that were further away from the Application Site were also considered and, in this case, no potential source-pathway-receptor chain for effect on any additional Designated Site was identified.
- Information on these Designates Sites with regard to the likely Zone of Influence is provided in Table 6-3.

⁴ The following SAC, SPA, NHA and pNHA GIS boundary datasets are the most recently available at the time of writing: SAC_ITM_2024_12, SPA_ITM_2024_01, NHA_ITM_2019_06, pNHA_ITM_2015_11.

- The designation features of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of preparing this report.
- All European Designated Sites and the Qualifying Interests (QIs)/Special Conservation Interests (SCIs) for which they're designated, are fully described and assessed in the Screening for Appropriate Assessment and remedial Natura Impact Statement reports submitted as part of the Substitute Consent application.

Where potential pathways for Likely Significant Effects were identified, the Application Site is included within the Likely Zone of Influence and further assessment is required.



Map Legend

- Application Site Boundary
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- WFD Sub-catchments



Drawing Title

European Sites

Project Title

Extraction in Lemanaghan Bog,
Co. Offaly

Drawn By

SS

Checked By

RW

Project No.

200804-e

Drawing No.

Figure 6-2

Scale

1:254,400

Date

26.08.2025



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- Map Legend**
- Application Site Boundary
 - Proposed Natural Heritage Area (pNHA)
 - Natural Heritage Area (NHA)
 - WFD Sub-catchments



Drawing Title	
Nationally Designated Sites	
Project Title	
Extraction in Lemanaghan Bog, Co. Offaly	
Drawn By	Checked By
SS	RW
Project No.	Drawing No.
200804-e	Figure 6-3
Scale	Date
1:241,100	26.08.2025
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Table 6-3 Identification of European and Nationally designated sites within the Likely Zone of Influence

Designated Site	Distance from Application Site (km)	Likely Zone of Influence Determination
Special Area of Conservation		
Ferbane Bog SAC [000575]	1.2km	No pathway for direct effects was identified as this European Site lies entirely outside of the Application Site boundary. No hydrological or habitat connectivity was identified between the Application Site and these SACs. There is no surface water or habitat connectivity between the Application Site and these SACs. The majority of the Application Site lies within the Lower Shannon (25A) catchment, specifically the Brosna sub-catchment. This area is drained by several streams including the Lemanaghan Stream, Fortified House Castlearmstrong Stream, and Kilcolgan Beg Stream, all of which flow to the Brosna River. The Brosna River discharges into the River Shannon approximately 14.5 km southwest of the Application Site. Smaller areas of the Application Site are located in the Upper Shannon (26G) and Lower Shannon (25B) catchments. These areas are drained by the Ballynahown Stream (into the Boor River, which joins the River Shannon c. 11 km downstream) and the Holy Well of Clongawny Stream (into the Blackwater River, reaching the Shannon c. 13.5 km southwest of the Application Site). All surface waters from the Application Site ultimately discharge to the River Shannon. Given the absence of habitat and hydrological connectivity and the distance between the Application Site and these SACs, there is no potential for indirect effects on these European Sites. These SACs are therefore not within the likely zone of influence of the Project.
Clara Bog SAC [000572]	3.1km	
Moyclare Bog SAC [000581]	4.9km	
Pilgrim's Road Esker SAC [001776]	7.7km	
Mongan Bog SAC [000580]	8.4km	
Fin Lough (Offaly) SAC [000576]	8.5km	
River Shannon Callows SAC [000216]	8.7km	No pathway for direct effects was identified as this European Site lies entirely outside of and >8km from the Application Site boundary. There is hydrological connectivity between the Application Site and this SAC via drainage ditches and watercourses within the Application Site. The majority of the Application Site lies within the Lower Shannon (25A) catchment, specifically the Brosna sub-catchment. This area is drained by several streams including the Lemanaghan Stream, Fortified House Castlearmstrong Stream, and Kilcolgan Beg Stream, all of which flow to the Brosna River. The Brosna River discharges into the River Shannon approximately 14.5 km southwest of the Application Site. Smaller areas of the Application Site are located in the Upper Shannon (26G) and Lower Shannon (25B) catchments. These areas are drained by the Ballynahown Stream (into the Boor River, which joins the River Shannon c. 11 km downstream) and the Holy Well of Clongawny Stream (into the Blackwater River, reaching the Shannon c. 13.5 km southwest of the Application Site). All surface waters from the Application Site ultimately discharge to the River Shannon. The Brosna River and River

Designated Site	Distance from Application Site (km)	Likely Zone of Influence Determination
		Shannon form part of the River Shannon Callows SAC and Middle Shannon Callows SPA. A potential pathway for indirect effects on the aquatic QIs of this SAC as a result of peat extraction and ancillary activities during both the Peat Extraction Phase and Current Phase was identified. During these phases there would have been and currently is potential for deterioration in surface and ground water quality due to run off of pollutants, including silts and hydrocarbons, to watercourses within and downstream of the Application Site. Therefore, a potential pathway for indirect effects on the aquatic QIs of the SAC where they occur downstream of the Application Site was identified. A potential pathway for indirect effects on otter as a result of disturbance was also identified. This SAC is therefore within the Likely Zone of Influence and following the precautionary principle the potential for significant effect on the above QIs exists. Further assessment is required.
Crosswood Bog SAC [002337]	9.9km	No pathway for direct effects was identified as these European Sites lie entirely outside of and >9km from the Application Site boundary. No hydrological or habitat connectivity was identified between the Application Site and these SACs. There is no surface water or habitat connectivity between the Application Site and these SACs. The majority of the Application Site lies within the Lower Shannon (25A) catchment, specifically the Brosna sub-catchment. This area is drained by several streams including the Lemanaghan Stream, Fortified House Castlearmstrong Stream, and Kilcolgan Beg Stream, all of which flow to the Brosna River. The Brosna River discharges into the River Shannon approximately 14.5 km southwest of the Application Site. Smaller areas of the Application Site are located in the Upper Shannon (26G) and Lower Shannon (25B) catchments. These areas are drained by the Ballynahown Stream (into the Boor River, which joins the River Shannon c. 11 km downstream) and the Holy Well of Clongawny Stream (into the Blackwater River, reaching the Shannon c. 13.5 km southwest of the Application Site). All surface waters from the Application Site ultimately discharge to the River Shannon. Given the absence of habitat and hydrological connectivity and the distance between the Application Site and these SACs, there is no potential for indirect effects on these European Sites. These SACs are therefore not within the likely zone of influence of the Project.
Carn Park Bog SAC [002336]	10.1km	
Charleville Wood SAC [000571]	12.6km	
Lough Derg, North-east Shore SAC [002241]	33.6km	No pathway for direct effects was identified as this European Site lies entirely outside of and >33km from the Application Site.

Designated Site	Distance from Application Site (km)	Likely Zone of Influence Determination
		The potential for the Project to result in indirect effects on this European Site was considered. There is hydrological connectivity between the Application Site and this SPA via watercourses within and adjacent to the Application Site boundary which discharge to the River Shannon which eventually discharges to Lough Derg. The site is located >33km from the Application Site and a significant distance downstream of the Project. Given the significant distance between the Application Site and the SAC, and the attenuation properties of the intervening watercourses, no potential for significant indirect effects on the European was identified. There is no potential for significant effect on this European Site and it is not located within the Likely Zone of Influence and no further assessment is required
Special Protection Areas (SPA)		
Mongan Bog SPA [004017]	8.6km	No pathway for direct effects was identified as this European Site lies entirely outside of and >8km from the Application Site boundary. There is no hydrological connectivity between the Application Site and this SPA. Therefore, no potential for indirect effect on supporting wetland habitat for SCI bird species due to deterioration in water quality exists. The Application Site lies outside the core foraging distance of the SCI species Greenland white-fronted goose (core range of 5-8km) as per Scottish Natural Heritage Guidelines (SNH, 2016). Given the distance between the Application Site and the SPA, no potential for significant indirect disturbance or displacement effects on whooper swan or any other SCI species as a result of peat extraction and ancillary activities was identified. This SPA is therefore not within the Likely Zone of Influence.
Middle Shannon Callows SPA [004096]	8.7km	No pathway for direct effects was identified as this European Site lies entirely outside of and >8km from the Application Site boundary. There is hydrological connectivity between the Application Site and this SPA via watercourses within the Application Site which discharge to the Brosna River and the River Shannon, both of which are designated as part of the SPA. A potential pathway for indirect effects on SCI bird species as a result of peat extraction and ancillary activities during both the Peat Extraction Phase and Current Phase was identified. During these phases there would have been and currently is potential for deterioration in surface water quality due to run-off of pollutants, including silts and hydrocarbons, to watercourses within and downstream of the Application Site. This has potential to result in degradation of SCI supporting

Designated Site	Distance from Application Site (km)	Likely Zone of Influence Determination
		wetland habitat and negatively affect availability of food resources for SCI species. During the implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan for the Application Site there will likely be a requirement for small volumes of machinery and personnel on site for drain blocking works. Taking a precautionary approach a potential pathway for indirect effects on SCI bird species and wetlands during the Remedial Phase as a result of deterioration of water quality due to runoff of pollutants during such works was identified. A potential pathway for indirect effects on SCI species as a result of disturbance was also identified. On a precautionary basis, it is considered that SCI species potentially using the Application Site may be associated with Middle River Shannon SPA. Therefore, a potential pathway for disturbance during the Peat Extraction, Current Phase and Remedial Phase has been identified. This SPA is therefore within the Likely Zone of Influence and following the precautionary principle the potential for significant effect on SCI species was identified. Further assessment is required.
Lough Ree SPA [004064]	15.2km	No pathway for direct effects was identified as these European Sites lie entirely outside of and >15km from the Application Site boundary.
River Suck Callows SPA [004097]	15.7km	There is no hydrological connectivity between the Application Site and these SPAs. Therefore, no potential for indirect effect on supporting wetland habitat for SCI bird species due to deterioration in water quality exists. The Application Site lies outside the core foraging distance of the SCI species as per Scottish Natural Heritage Guidelines (SNH, 2016) or does not provide significant suitable habitat for the SCI species. Given the distance between the Application Site and the SPAs, no potential for significant indirect disturbance or displacement effects on whooper swan or any other SCI species as a result of peat extraction and ancillary activities was identified. These SPAs are therefore not within the Likely Zone of Influence.
Lough Derg (Shannon) SPA [004058]	33.6km	No pathway for direct effects was identified as this European Site lies entirely outside of and approximately 33.6km from the Application Site boundary. The potential for the Project to result in indirect effects on this European Site was considered. There is potential hydrological connectivity between the Application Site and this SPA via watercourses within and adjacent to the Application Site boundary which discharge to the River Shannon which eventually discharges to Lough Derg. Given the significant distance between the Project and the SPA, and the attenuation properties of the intervening watercourses, no

Designated Site	Distance from Application Site (km)	Likely Zone of Influence Determination
		potential for significant indirect effects on this European Site due to deterioration of water quality was identified. The Application Site either lies outside the core foraging range (SNH 2016) or does not provide significant suitable habitat for the SCI species associated with the SPA. Therefore, no potential for significant effects on the SPA as a result of disturbance or displacement of SCI species are anticipated. There is no potential for significant effect on this European Site. It is not located within the Likely Zone of Influence and no further assessment is required
Natural Heritage Areas (NHA)		
Clonydonnin Bog NHA [000565]	2.7km	No pathway for direct effects was identified as these designated sites lie entirely outside of the Application Site boundary. No habitat or surface water connectivity was identified between the Application Site and these designated sites. The majority of the Application Site lies within the Lower Shannon (25A) catchment, specifically the Brosna sub-catchment. This area is drained by several streams including the Lemanaghan Stream, Fortified House Castlearmstrong Stream, and Kilcolgan Beg Stream, all of which flow to the Brosna River. The Brosna River discharges into the River Shannon approximately 14.5 km southwest of the Application Site. Smaller areas of the Application Site are located in the Upper Shannon (26G) and Lower Shannon (25B) catchments. These areas are drained by the Ballynahown Stream (into the Boor River, which joins the River Shannon c. 11 km downstream) and the Holy Well of Clongawny Stream (into the Blackwater River, reaching the Shannon c. 13.5 km southwest of the Application Site). All surface waters from the Application Site ultimately discharge to the River Shannon. Given the absence of connectivity and the distance between the Application Site and these NHAs, no potential for indirect effects on these sites due to deterioration of water quality or habitat loss/degradation has been identified. No pathway for effect was identified and these sites are not within the Likely Zone of Influence.
Ballynagrenia And Ballinderry Bog NHA [000674]	10.4km	
Screggan Bog NHA [000921]	11.4km	
Carrickynaghtan Bog NHA [001623]	11.6km	
Proposed Natural Heritage Area (pNHA)		
Grand Canal [002104]	1km	No pathway for direct effects was identified as these designated sites lie entirely outside of the Application Site boundary.
Ferbane Bog [000575]	1.1km	
Clara Bog [000572]	3.1km	No habitat or surface water connectivity was identified between the Application Site and these designated sites. The majority of the Application Site lies within the Lower Shannon (25A) catchment, specifically the Brosna sub-catchment. This area is drained by several streams including the Lemanaghan Stream, Fortified House Castlearmstrong Stream, and Kilcolgan Beg Stream, all of which flow to the
Clonlough Glebe Bog [000893]	3.9km	
Doon Esker Wood [001830]	4.2km	

Designated Site	Distance from Application Site (km)	Likely Zone of Influence Determination
Moyclare Bog [000581]	4.8km	Brosna River. The Brosna River discharges into the River Shannon approximately 14.5 km southwest of the Application Site. Smaller areas of the Application Site are located in the Upper Shannon (26G) and Lower Shannon (25B) catchments. These areas are drained by the Ballynahown Stream (into the Boor River, which joins the River Shannon c. 11 km downstream) and the Holy Well of Clongawny Stream (into the Blackwater River, reaching the Shannon c. 13.5 km southwest of the Application Site). All surface waters from the Application Site ultimately discharge to the River Shannon. Given the absence of connectivity and the distance between the Application Site and these pNHAs, no potential for indirect effects on these sites due to deterioration of water quality or habitat loss/degradation has been identified. No pathway for effect was identified and these sites are not within the Likely Zone of Influence.
Lough Boora [001365]	6.4km	
Clonfinlough Esker [000892]	7.2km	
Ballyduff Esker [000885]	8.3km	
Mongan Bog [000580]	8.4km	
Pilgrim's Road Esker [001776]	8.4km	No pathway for effect was identified and these sites are not within the Likely Zone of Influence.
Fin Lough (Offaly) [000576]	8.5km	
River Shannon Callows [000216]	8.5km	No pathway for direct effects was identified as this designated site lies entirely outside of the Application Site boundary. There is hydrological connectivity between the Application Site and this designated site via drainage ditches and watercourses within the Application Site. The majority of the Application Site lies within the Lower Shannon (25A) catchment, specifically the Brosna sub-catchment. This area is drained by several streams including the Lemanaghan Stream, Fortified House Castlearnstrong Stream, and Kilcolgan Beg Stream, all of which flow to the Brosna River. The Brosna River discharges into the River Shannon approximately 14.5 km southwest of the Application Site. Smaller areas of the Application Site are located in the Upper Shannon (26G) and Lower Shannon (25B) catchments. These areas are drained by the Ballynahown Stream (into the Boor River, which joins the River Shannon c. 11 km downstream) and the Holy Well of Clongawny Stream (into the Blackwater River, reaching the Shannon c. 13.5 km southwest of the Application Site). All surface waters from the Application Site ultimately discharge to the River Shannon. The Brosna River and River Shannon form part of the River Shannon Callows pNHA. A potential pathway for indirect effects on this site via deterioration in water quality was identified This site is therefore within the Likely Zone of Influence and is assessed further.
Kilcormac Esker [000906]	8.9km	No pathway for direct effects was identified as these designated sites lie entirely outside of and >8km from the Application Site boundary.
Woodfield Bog [000586]	9km	
Ballynagarbry [001713]	9.1km	No hydrological connectivity has been identified between the Application Site and these pNHAs. In addition, given the significant separation in distance between the Application Site
Crosswood Bog [000678]	9.9km	

Designated Site	Distance from Application Site (km)	Likely Zone of Influence Determination
Carn Park Bog [000676]	10.1km	and these pNHAs, as well as the nature and scale of the peat extraction and ancillary activities a, no potential for any indirect effects on these sites has been identified. No pathway for effect was identified and these sites are not within the Likely Zone of Influence.
Pallas Lough [000916]	10.2km	
Lough Nanag Esker [000910]	11.7km	
Lough Coura [000909]	12.5km	
Ballyduff Wood [001777]	12.5km	
Charleville Wood [000571]	12.6km	
Clorhane Wood [000894]	12.9km	
Banagher (Domestic Dwelling, Occupied) [000567]	13km	No pathway for direct effects was identified as thi designated site lies entirely outside of and 13km from the Application Site boundary. This site is designated for a summer and possibly winter roost of the Brown Long-eared Bat (<i>Plecotus auritus</i>), however is located outside of the required survey distance from the Application Site.
Clonad Wood [000574]	14.5km	No pathway for direct effects was identified as these designated sites lie entirely outside of and >14km from the Application Site boundary. No hydrological connectivity has been identified between the Application Site and these pNHAs. In addition, given the significant separation in distance between the Application Site and these pNHAs, as well as the nature and scale of the peat extraction and ancillary activities, no potential for any indirect effects on these sites has been identified. No pathway for effect was identified and these sites are not within the Likely Zone of Influence
Clonaslee Eskers And Derry Bog [000859]	14.9km	
Waterstown Lake [001732]	14.9km	
Derrygolan Esker [000896]	14.9km	
Lough Derg [000011]	33.6km	No pathway for direct effects was identified as these designated sites lie entirely outside of and >33km from the Application Site boundary. The potential for the Project to result in indirect effects on this designated site was considered. There is hydrological connectivity between the Application Site and this pNHA via watercourses within and adjacent to the Application Site boundary which discharge to the River Shannon which eventually discharges to Lough Derg. The site is located >33km from the Application Site and a significant distance downstream of the Project. Given the significant distance between the Application Site and the SAC, and the attenuation properties of the intervening watercourses, no potential for significant indirect effects on this site was identified. There is no potential for significant effects on this designated site and it is not located within the Likely Zone of Influence and no further assessment is required

Surface water connectivity was identified between the Application Site and River Shannon Callows pNHA approximately 10.5km downstream. As this pNHA has also been designated as both a River Shannon Callows SAC and Middle Shannon Callows SPA, impacts on this designated site are fully considered under the European designation within the rNIS. This is further described in Section 6.4.2 of this Chapter. Hydrological Connectivity between the Application Site and the designated sites is shown in Figure 6-4.

The AA Screening that accompanies this application identifies the following European Sites as being within the Likely Zone of Influence:

- > River Shannon Callows SAC
- > Middle Shannon Callows SPA

6.3.1.5 Water Quality

Chapter 8 of this rEIA: Hydrology and Hydrogeology, provides a detailed description of the hydrological and hydrogeological baseline environment, along with the current environment. A summary of this baseline is provided below.

6.3.1.5.1 Water Framework Directive Surface Water Body Status - 1988 Baseline

The EU Water Framework Directive (2000/60/EC), as amended by Directives 2008/105/EC, 2013/39/EU and 2014/101/EU (“WFD”), was established to ensure the protection of the water environment. The Directive was transposed in Ireland by the European Communities (Water Policy) Regulations 2003 (S.I. No. 722/2003).

Given the timelines for the establishment and its transposition into Irish law, there is no WFD Information for Surface Water Bodies for 1988. As such the 2010-2015 WFD Status Reports have been used to infer the 1988 baseline, and the subsequent WFD reporting periods are included to provide context.

The impacts of the activities on the WFD status of downstream and underlying waterbodies are assessed in Chapter 8 of this rEIA. A summary of the Water Framework Directive (WFD) status and risk result of Surface Water Bodies (SWBs) in the vicinity and downstream of the Application Site is presented in Table 6-4 below. Drainage from the Application Site discharges through 8 no. gravity surface water outfalls (SW19, SW19A, SW19B, SW22, SW22A, SW22B, SW22C and SW22D).

Within the Shannon Lower_SC_010 sub-catchment, SW22D discharges to the EPA named Ballynahown Stream to the north of the Application Site (ITM X614848 Y731164). This stream forms part of the Boor_020 SWB which achieved ‘Good’ status in the latest WFD cycle (2016-2021). This was an improvement on the ‘Moderate’ status which this SWB achieved previously (WFD cycle 2010-2015 and 2013-18). Further downstream, the Boor_020 SWB discharges into the Shannon (Upper)_120 SWB. The Shannon (Upper)_120 and _130 SWBs achieved “Poor” and “Moderate” status respectively in the latest WFD cycle. Meanwhile, upstream of the Application Site, the Boor_010 SWB experienced a deterioration in WFD status from ‘Good’ status in the 1st cycle (2010-2015) to ‘Moderate’ status in the subsequent cycles (2013-18 and 2016-2021). Within this sub-catchment, the Boor_020 SWB is considered to be ‘not at risk’ of failing to meet its WFD objectives. No significant pressures have been identified to be impacting on this SWB. Further downstream, the Shannon (Upper)_120 SWB is deemed to be ‘at risk’ with hydromorphology listed as the significant pressure.

Within the Shannon Lower_SC_030 sub-catchment, the Blackwater(Shannonbridge)_010 and _020 SWBs downstream of the Application Site achieved “Poor” and “Moderate” status respectively in the latest WFD cycle. Both of these SWBs experienced a deterioration in WFD status from the ‘Good’ status which they were assigned in the 2nd WFD cycle (2013-2018). These SWBs are deemed to be ‘at risk’ of failing to meet their WFD objectives. Extractive industry (peat) has been listed by the EPA as being the significant pressure on these SWBs. Note that there is no surface water discharge from the Application Site within this sub-catchment.

Meanwhile, within the Brosna_SC_060 sub-catchment, SW22, SW22A, SW22B and SW22C discharge to the EPA named Fortified House Castlearmstrong Stream which forms part of the Brosna_100 SWB. SW19 and SW19A discharge to the Lemanaghan Stream_010 SWB whilst SW19B discharges to the EPA named Kilcolgan Beg Stream which forms part of the Brosna_110 SWB. These receiving SWBs all achieved ‘Moderate’ status in the latest WFD cycle. The Brosna_100 SWB achieved ‘Moderate’ status in all 3 no. WFD cycles, whilst the Lemanaghan Stream_010 SWB and the Brosna_110 SWBs experienced a deterioration in WFD status from the ‘Good’ status which they achieved in the 2nd WFD cycle (2013-2018). Further downstream the Brosna River (Brosna_120, 130 and 140 SWBs), the River Shannon (Shannon(Lower)_010, _020 and _030 SWBs) and Lough Derg all achieved ‘Moderate’ status

in the latest WFD cycle. Meanwhile, upstream of the Application Site, the Brosna_090 SWB achieved 'Good' status in all 3 no. WFD cycles.

With respect to risk status, the Brosna River in the vicinity and downstream of the Application Site is 'deemed to be at risk'. The risk status of the Lemanaghan Stream_010 SWB is currently 'under review'. Agriculture is listed as a significant pressure on the Brosna_100 and _110 SWBs in the vicinity of the Application Site. Hydromorphology is also listed as a significant pressure on the Brosna_110 SWB.

Table 6-4 Summary WFD Information for Surface Water Bodies

River Waterbody	Status 2010-2015	Status 2013-2018	Status 2016-2021	3 rd Cycle Risk Status	WFD Pressures
Shannon Lower_SC_010 sub-catchment					
Boor_010	Good	Moderate	Moderate	At risk	Anthropogenic
Boor_020	Moderate	Moderate	Good	Not at risk	None
Shannon(Upper)_120	Poor	Poor	Poor	At risk	Hydromorphology
Shannon(Upper)_130	Unassigned	Poor	Moderate	Under Review	None
Shannon Lower_SC_030 sub-catchment					
Blackwater(Shannonbridge)_010	Moderate	Good	Poor	At Risk	Extractive Industry
Blackwater(Shannonbridge)_020	Good	Good	Moderate	At Risk	Extractive Industry
Brosna_SC_060 sub-catchment					
Brosna_090	Good	Good	Good	Not at risk	None
Brosna_100	Moderate	Moderate	Moderate	At risk	Agriculture
Lemanaghan Stream_010	Unassigned	Good	Moderate	Under Review	None
Brosna_110	Good	Good	Moderate	At Risk	Agriculture & Hydromorphology
Brosna_120	High	Good	Moderate	At risk	Agriculture
Brosna_130	Good	Moderate	Moderate	At risk	Anthropogenic
Brosna_140	Moderate	Moderate	Moderate	At risk	Hydromorphology
Shannon(Lower)_010	Unassigned	Unassigned	Moderate	Under Review	None
Shannon(Lower)_020	Good	Moderate	Moderate	At risk	Anthropogenic
Shannon(Lower)_030	Unassigned	Moderate	Moderate	Under Review	None
Lough Derg	Poor	Moderate	Moderate	At risk	Agriculture, Hydromorphology & Invasive Species

6.3.1.5.2 Water Framework Directive Groundwater Body Status -1988 Baseline

Local Groundwater Body (GWB) status and risk results are available from (www.catchments.ie). This status is defined based on the quantitative status and chemical status of each GWB.

All GWBs underlying the Application Site achieved 'Good' status in all 3 no. WFD cycles (2010-2015, 2013-2018 and 2016-2021). These GWBs have been deemed to be "not at risk" of failing to meet their respective WFD objectives. No significant pressures have been identified to be impacting upon these GWBs.

6.3.1.5.3 EPA Biological Q-Rating Monitoring

1988 Baseline EPA Q-Ratings

Biological Q-rating data for the year 1988 is not available for all EPA monitoring locations in the vicinity of, and downstream from, the Application Site. This is to be expected as the EPA complete monitoring across intervals of several years, rather than on an annual basis. Therefore, for locations where no monitoring was completed in 1988, the Q-rating from the year which is the closest to 1988 was taken as the baseline Q-rating. These values are presented in Table 6-5.

Within the Shannon Lower_SC_010 sub-catchment, no EPA Q-monitoring was completed on the Ballynahown Stream. However, the Boor River was assigned a Q-rating of Q4 ('Good' status) upstream of its confluence with the Ballynahown Stream in 1988 (Station Code: RS26B071100). The closest downstream location for which a Q-rating for this period is available is located on the River Shannon at Clonmacnoise (Station Code: RS26S021800). Here, the River Shannon achieved a Q4 rating ('Good' status) in 1984.

Within the Shannon Lower_SC_030 sub-catchment, the Blackwater River has achieved 'High' (Q4-5) status at a bridge northeast of Derryharry (Station Code: RS25B270110) in 1988. Further downstream, the Blackwater River achieved 'Poor' status (Q3) at Blackwater Bridge in 1988 (Station Code: RS25B270200).

Within the Brosna_SC_060 sub-catchment, upstream of the Application Site, the Brosna River at Ballycumber Bridge (Station Code: RS25B090700) achieved a Q4-5 rating ('High' status) in 1987. Q-ratings on the Brosna River in the vicinity of the Application Site date from 1987, and range from Q4 ('Good' status) at a bridge northwest of Pollagh (Station Code: RS25B090760) to Q4-5 ('High' status) near Ferbane (Station Code: RS25B090950).

Table 6-5 Baseline (1988) Q-ratings

River	Station ID	Location	EPA Q-Ratings
Brosna_SC_060 sub-catchment			
Brosna River	RS25B090700	Ballycumber Bridge	1987 – Q4-5 (High)
Brosna River	RS25B090760	0.5km NW of Pollagh	1987 – Q4 (Good)
Brosna River	RS25B090800	Brosna - Bridge near Kilcolgan	1987 – Q5 (High)
Brosna River	RS25B090950	Ferbane Bridge	1987 – Q4-5(High)
Brosna River	RS25B091000	Bellmount d/s Ferbane	1987 – Q4-5 (High)
Shannon Lower_SC_010 sub-catchment			
Boor_010	RS26B071100	Bridge N.W. of Kilbillaghan	1988 – Q4 (Good)
River Shannon	RS26S021800	Clonmacnoise: at Jetty	1984 – Q4 (Good)
Shannon Lower_SC_030 sub-catchment			
Blackwater River	RS25B270110	Bridge ENE of Derryharry	1988 – Q4-5 (High)
Blackwater River	RS25B270200	Blackwater Bridge	1988 – Q3 (Poor)

EPA Q-Ratings during the Peat Extraction Phase (1988-2020)

EPA Q-rating monitoring has been completed at several dates and at multiple locations on the Brosna, Boor, Shannon (Lower), Shannon (Upper) and Blackwater (Shannonbridge) rivers in the vicinity and downstream of the Application Site during the Peat Extraction Phase (July 1988 to June 2020). The Q-values over this period are summarised in Table 6-6.

Within the Shannon Lower_SC_010 sub-catchment, Q-ratings upstream and downstream of the Application Site portray a similar pattern. The Q-ratings on the Boor River upstream of the Application Site (Station Code: RS26B071100) were predominantly of 'Good' status (Q4). There was a slight deterioration to 'Moderate' status (Q3-4) in 2008, but the water quality recovered to 'Good' status in subsequent monitoring rounds completed in 2014, 2017 and 2020. A similar pattern was recorded downstream of the Application Site (i.e. downstream of the Ballynahown Stream) which was of 'Good' status from the earliest available Q-rating in 2002 to 2011. 'Moderate' status was achieved in 2014 and 2017 before a recovery to 'Good' status in 2020.

Within the Shannon Lower_SC_030 sub-catchment, the Q-ratings on the Blackwater River downstream of the Application Site at a bridge northeast of Derryharry (Station Code: RS25B270110) fluctuated between Q3-4 and Q4. High status (Q4-5/Q5) was not achieved during the Peat Extraction Phase but was the 1988 baseline. However, note that there are no surface water discharges within this sub-catchment.

Meanwhile, within the Brosna_SC_060 sub-catchment, the Q-ratings in the Brosna River upstream of the Application Site experienced a deterioration in comparison with the baseline rating of Q4-5 at Ballycumber Bridge (Station Code: RS25B090700). The Brosna River at this monitoring location fluctuated, achieving a Q3-rating ('Poor' status) in 1996 and a Q3-4 rating ('Moderate' status) in 1993, 1999 and 2002. The status improved to Q4 ('Good' status) for 4 no. monitoring rounds completed between 2005 and 2017. The Q-ratings of the Brosna River in the vicinity of the Application Site portray a similar pattern. At a bridge near Kilcolgan (Station Code: RS25B090800), the location experienced an initial deterioration in comparison with the baseline rating of Q5 which was assigned based on the 1987 monitoring round. The Brosna River at this location was found to be of 'Poor' status in 1993 and 1999 and 'Moderate' status in 1996 and 2002. The status improved to 'High' status in 2005 and remained at 'Good' status from 2011 to 2017.

Table 6-6 Summary of Q-Ratings during the Peat Extraction Phase (1988 – 2020)

River	Station ID	Location	EPA Q-Rating (Years)	Q-Value Status Range	
Brosna_SC_060 sub-catchment					
Brosna River	RS25B090700	Ballycumber Bridge	3 – 4 (1993 – 2017)	Poor	Good
Brosna River	RS25B090760	0.5km NW of Pollagh	3.5 – 4 (1993 – 2017)	Moderate	Good
Brosna River	RS25B090800	Brosna - Bridge near Kilcolgan	3 – 4.5 (1989 – 2017)	Poor	High
Brosna River	RS25B090950	Ferbane Bridge	4 – 4.5 (1989 – 2017)	Good	High
Brosna River	RS25B091000	Bellmount d/s Ferbane	3 – 4.5 (1989 – 2017)	Poor	High
Shannon Lower_SC_010 sub-catchment					
Boor River	RS26B071100	Bridge N.W. of Kilbillaghan	3.5 – 4 (1988 – 2020)	Moderate	Good
Boor River	RS26B071200	Boor - Bridge NW of Ballynahownwood	3.5 – 4 (2002 – 2020)	Moderate	Good
River Shannon	RS26S021800	Clonmacnoise: at Jetty	3 – 4 (1996 – 2020)	Poor	Good
Shannon Lower_SC_030 sub-catchment					
Blackwater River	RS25B270110	Br ENE of Derryharry	3.5 – 4.5 (1988 – 2017)	Moderate	High
Blackwater River	RS25B270200	Blackwater Br	3 – 4 (1988 – 2017)	Poor	Good

EPA Q-Ratings During the Current Phase (2020 – Present)

The most recent Q-rating data for EPA monitoring points on the Brosna, Blackwater and Boor rivers are shown in Table 6-7 below. The data presented reflect the latest available EPA Q-ratings recorded at each monitoring station during the Current Phase (2020–present), with monitoring years ranging from 2021 to 2024.

Within the Shannon Lower_SC_010 sub-catchment, the Boor River achieved a Q3-4 rating upstream (Station Code: RS26B071100) and downstream (Station Code: RS26B071200) of the Application Site in 2023.

Within the Shannon Lower_SC_030 sub-catchment, the Blackwater River achieved a Q3 rating downstream of the Application Site at a bridge northeast of Derryharry (Station Code: RS25B270110) and at Blackwater Bridge (Station Code: RS25B270200).

Within the Brosna_SC_060 sub-catchment, upstream of the Application Site at Ballycumber, the Brosna River achieved ‘Good’ status in 2021 (RS25B090700). The Brosna River achieved ‘Moderate’ status in 2023 at Pollagh, upstream of its confluence with the Lemanaghan Stream. Further downstream the Brosna River was assigned a Q4 rating in 2023 near Kilcolgan and Ferbane (RS25B090800 and RS25B090950). Further downstream at Bellmount downstream of Ferbane, the Brosna River has been assigned a Q-rating of Q3-4 in 2023 (RS25B091000).

Table 6-7 Most recent (2020) Q-ratings

River	Station ID	Location	EPA Q-Rating (Year)	Q-Value Status
Shannon Lower_SC_010 sub-catchment				
Boor River	RS26B071100	Bridge NW of Kilbillaghan	2024	Q3-4 (Moderate)
Boor River	RS26B071200	Bridge NW of Ballynahownwood	2023	Q3-4 (Moderate)
River Shannon	RS26S021800	Clonmacnoise: at Jetty	2024	Q3 (Poor)
Shannon Lower_SC_030 sub-catchment				
Blackwater River	RS25B270110	Bridge ENE of Derryharry	2023	Q3 (Poor)
Blackwater River	RS25B270200	Blackwater Bridge	2023	Q3 (Poor)
Brosna_SC_060 sub-catchment				
Brosna River	RS25B090700	Ballycumber Bridge (upstream of the site)	2021	Q4 (Good)
Brosna River	RS25B090760	0.5km NW of Pollagh	2023	Q3-4 (Moderate)
Brosna River	RS25B090800	Bridge near Kilcolgan	2023	Q4 (Good)
Brosna River	RS25B090950	Ferbane Bridge	2023	Q4 (Good)
Brosna River	RS25B091000	Bellmount downstream of Ferbane	2023	Q3-4 (Moderate)

6.3.1.6 Bird Records

6.3.1.6.1 Bird Atlases – 1988 Baseline

Bird Atlas 2007-11: The breeding and wintering birds of Britain and Ireland’ (Balmer *et al.*, 2013) is the most recent comprehensive work on wintering and breeding birds in Ireland.

Previous Bird Atlases have been the primary source of information on the distribution and abundance of British and Irish birds prior to Bird Atlas 2007–11. The three previously published atlases were:

- Sharrock, J.T.R. (1976) The atlas of breeding birds in Britain and Ireland.
- Lack, P.C. (1986) The atlas of wintering birds in Britain and Ireland.
- Gibbons, D.W., Reid, J.B. & Chapman, R.A. (1993) The new atlas of breeding birds in Britain and Ireland: 1988-1991.

The Application Site lies within hectads N12 and N13. Table 6-8 presents a list of bird species of conservation interest recorded from the relevant hectads for the periods 1968-1972, 1988-1991 (1988 Baseline) and 2007 – 2011, the latter period coinciding with the Peat Extraction Phase. The data for time periods before and after the 1988 Baseline are presented to provide context for breeding birds species over time:

Table 6-8 Breeding Bird Atlas Data (Hectads N12 and N13)

Species Name	Breeding Atlas 68-72		Breeding Atlas 88-91 (1988 Baseline)		Breeding Atlas 07-11		Conservation Status
	N12	N13	N12	N13	N12	N13	
Barn Owl (<i>Tyto alba</i>)	Conf	Prob	Bred	-	Poss	-	RL
Corncrake (<i>Crex crex</i>)	Prob	Prob	-	-	-	-	BD
Curlew (<i>Numenius arquata</i>)	Conf	Conf	Seen	Seen	Prob	-	RL
Grey Partridge (<i>Perdix perdix</i>)	Conf	-	Bred	-	Conf	-	RL
Grey Wagtail (<i>Motacilla cinerea</i>)	Conf	Conf	Bred	Bred	Poss	-	RL
Hen Harrier (<i>Circus cyaneus</i>)	Prob	-	-	-	-	-	BD
Kestrel (<i>Falco tinnunculus</i>)	Prob	Prob	-	Seen	Conf	Poss	RL
Kingfisher (<i>Alcedo atthis</i>)	Conf	Prob	-	-	Poss	Poss	BD
Lapwing (<i>Vanellus vanellus</i>)	Conf	Conf	Bred	Seen	Conf	Prob	RL
Meadow Pipit (<i>Anthus pratensis</i>)	Conf	Conf	Bred	Bred	Prob	Prob	RL
Red Grouse (<i>Lagopus lagopus</i>)	Conf	Prob	-	-	-	-	RL
Redshank (<i>Tringa totanus</i>)	-	-	-	-	Conf	-	RL
Snipe (<i>Gallinago gallinago</i>)	Conf	Conf	Bred	Bred	Prob	-	RL
Stock Dove (<i>Columba oenas</i>)	Conf	Conf	Seen	Seen	-	-	RL
Swift (<i>Apus apus</i>)	Prob	Conf	Bred	Bred	-	Conf	RL
Whinchat (<i>Saxicola rubetra</i>)	-	Prob	-	-	-	-	RL
Woodcock (<i>Scolopax rusticola</i>)	-	Prob	-	Bred	Prob	-	RL
Yellowhammer (<i>Emberiza cintrinella</i>)	Conf	Conf	Bred	Bred	Poss	-	RL

Seen = recorded; Poss = possible breeding; Prob = probable breeding; Conf = confirmed breeding; - = not-recorded; Non-B = Non-Breeding Record; Bred = Breeding Record. Conservation Status: BD = Annex I of the Birds Directive, RL = BoCCI Red Listed

Table 6-9 shows those species recorded in the relevant hectads (N12 and N13) in the wintering birds' atlases that are also protected under the EU Birds Directive or mentioned on the Birds of Conservation Concern in Ireland (BoCCI) red list for the periods 1981-1984 (1988 Baseline) and 2007 – 2011. The time periods after the 1988 Baseline are presented to provide context of the wintering birds species over time:

Table 6-9 Wintering Bird Atlas Data (Hectads N12 and N13)

Species Name	Wintering Atlas 81-84		Wintering Atlas 07-11		Conservation Status
	N12	N13	N12	N13	
Barn Owl (<i>Tyto alba</i>)	-	-	Pres	-	RL
Curlew (<i>Numenius arquata</i>)	-	Pres	Pres	-	RL
Golden Plover (<i>Pluvialis apricaria</i>)	Pres	-	Pres	-	BD, RL
Grey Partridge	Pres	-	Pres	-	RL
Grey Wagtail (<i>Motacilla cinerea</i>)	-	Pres	-	Pres	RL
Hen Harrier	-	-	Pres	-	BD
Kestrel (<i>Falco tinnunculus</i>)	Pres	Pres	Pres	Pres	RL
Kingfisher (<i>Alcedo atthis</i>)	-	-	Pres	Pres	BD
Lapwing (<i>Vanellus vanellus</i>)	Pres	Pres	Pres	Pres	RL
Meadow Pipit (<i>Anthus pratensis</i>)	Pres	Pres	Pres	-	RL
Merlin (<i>Falco columarius</i>)	-	-	Pres	-	BD
Pochard (<i>Aythya farina</i>)	-	-	Pres	-	RL
Redwing (<i>Turdus iliacus</i>)	Pres	Pres	Pres	Pres	RL
Shoveler (<i>Anas clypeata</i>)	-	-	Pres	-	RL
Snipe (<i>Gallinago gallinago</i>)	Pres	Pres	Pres	Pres	RL
Stock Dove (<i>Columba oenas</i>)	Pres	Pres	Pres	-	RL
Whooper Swan (<i>Cygnus cygnus</i>)	-	-	Pres	-	BD
Woodcock (<i>Scolopax rusticola</i>)	Pres	-	Pres	Pres	RL
Yellowhammer (<i>Emberiza cintrinella</i>)	Pres	Pres	-	-	RL

Pres = present in hectad; - = not recorded. Conservation Status: BD = Annex I of the Birds Directive, RL = BoCCI Red Listed

6.3.1.6.2 Bird Surveys of Lemanaghan Bog (Bord na Mona) – 2016 to 2020 (Peat Extraction Phase)

Breeding Bird Surveys

Biosphere Environmental Services (BES) undertook breeding bird surveys (April to September inclusive) of the Application Site on behalf of Bord na Móna in 2016, 2017, 2018, 2019 and 2020. The bird species of conservation concern i.e. listed either on Annex I of the EU Birds Directive or on the Birds of Conservation Concern Ireland (BoCCI) recorded within the Application Site during the surveys are shown in Table 6-10. Species marked with an asterisk were not recorded breeding within the Application Site, whereas those without an asterisk were classified as breeding (possible, probable or confirmed according to the breeding status codes of the Bird Atlas 2007-2011).

Table 6-10 Annex I and BoCCI red-listed bird species recorded on the Application Site during breeding bird surveys undertaken in 2016-2020

Common Name	Scientific name	Year (Yes/No)					Designation
		2016	2017	2018	2019	2020	
*Hen harrier	<i>Circus cyaneus</i>	N	N	N	Y	N	Annex I

*Kestrel	<i>Falco tinnunculus</i>	Y	Y	Y	Y	N	BoCCI Redlist
*Merlin	<i>Falco columbarius</i>	Y	Y	Y	N	Y	Annex I
*Peregrine	<i>Falco peregrinus</i>	N	N	Y	Y	Y	Annex I
Snipe	<i>Gallinago gallinago</i>	Y	Y	Y	Y	Y	BoCCI Redlist
Meadow pipit	<i>Anthus pratensis</i>	Y	Y	Y	Y	Y	BoCCI Redlist
*Golden Plover	<i>Pluvialis apricaria</i>	N	Y	Y	Y	N	Annex I, BoCCI Redlist

* Non-breeding within the Application Site

Wintering Bird Surveys

Wintering bird surveys (October to March inclusive) were undertaken by BES on Lemanaghan Bog in 2014/2015, 2015/2016, 2016/2017, 2017/2018, 2018/2019 and 2019/2020. Species recorded utilising the Application Site during wintering bird surveys are listed in Table 6-11 below.

Table 6-11 Bird species listed on Annex I of the EU Birds Directive or the BoCCI red list recorded at the Application Site during wintering bird surveys

Common Name	Scientific Name	Year						Designation
		2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Whooper Swan	<i>Cygnus cygnus</i>	Y	Y	Y	Y	N	N	Annex I
Hen harrier	<i>Circus cyaneus</i>	Y	Y	Y	Y	Y	Y	Annex I
Kestrel	<i>Falco tinnunculus</i>	Y	Y	Y	Y	Y	Y	BoCCI Redlist
Merlin	<i>Falco columbarius</i>	Y	Y	Y	Y	Y	Y	Annex I
Peregrine	<i>Falco peregrinus</i>	Y	Y	Y	Y	Y	Y	Annex I
Snipe	<i>Gallinago gallinago</i>	Y	Y	Y	Y	Y	Y	BoCCI Redlist
Golden plover	<i>Pluvialis apricaria</i>	Y	Y	Y	Y	Y	Y	Annex I, BoCCI Redlist
Lapwing	<i>Vanellus vanellus</i>	Y	Y	Y	Y	Y	Y	BoCCI Redlist
Woodcock	<i>Scolopax rusticola</i>	Y	N	Y	Y	Y	Y	BoCCI Redlist
Meadow pipit	<i>Anthus pratensis</i>	Y	Y	Y	Y	Y	Y	BoCCI Redlist

Redwing	<i>Turdus iliacus</i>	N	N	Y	Y	Y	Y	BoCCI Redlist
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Annex I of EU Birds Directive, BoCCI = Birds of Conservation Concern Ireland

6.3.1.7 Other Protected Species and Habitats Records

The following sections present the results of a search for records (historical and current) of protected species from the area surrounding the Application Site, with a focus on hectads N12 and N13 within which the Application Site is located. The desk study aims to provide a baseline of the Application Site for 1988, but records before and after 1988 are also included to provide a temporal understanding of the Application Site.

6.3.1.7.1 Vascular plants

A search was conducted in the New Atlas of the British and Irish Flora (Preston et al, 2002) to investigate whether any rare or unusual plant species listed under Annex II of the EU Habitats Directive, The Irish Red Data Book - 1 Vascular Plants (Curtis, 1988 and Wyse Jackson *et al.* 2016) or the Flora (Protection) Order (1999, as amended 2022) had been recorded in the relevant 10km squares in which the Application Site is situated (N12 and N13). Each hectad contains 100 whole one-kilometre squares containing terrestrial habitats. Species of conservation concern are listed in Table 6-12. The dates shown in Table 6-12 reflect the recording periods used in the New Atlas of the British and Irish Flora, indicating when species were observed in the field.

Table 6-12 Species listed designated under the Flora Protection Order or the Irish Red Data Book within Hectads N12 and N13– Pre 1970 - 1999

Common name	Scientific name	Designation	Date	Hectad
Upright brome	<i>Bromopsis erecta</i>	Near Threatened (NT)	Pre 1970	N12
Smooth brome	<i>Bromus racemosus</i>	Near Threatened (NT)	1987-1999	N13
Autumn gentian	<i>Gentianella amarella</i>	Near Threatened (NT)	Pre 1970	N13
Field gentian	<i>Gentianella campestris</i>	Near Threatened (NT)	Pre-1970	N13
Greater knapweed	<i>Centaurea scabiosa</i>	Near Threatened (NT)	1987-1999, 1970-1986	N12, N13
Frog orchid	<i>Coeloglossum viride</i>	Near Threatened (NT)	1970-1986	N13
Least bur-reed	<i>Sparganium natans</i>	Near Threatened (NT)	Pre 1970	N13
Green-winged orchid	<i>Orchis morio</i>	Vulnerable (VU)	Pre 1970	N12
Slender tufted-sedge	<i>Carex acuta</i>	Near Threatened (NT)	Pre-1970	N13

6.3.1.7.2 Bryophytes

A search of the NPWS online data map for bryophytes (NPWS, 2022) was undertaken to establish whether there are records for protected bryophytes within and in the vicinity of the Application Site. The online map shows no records for protected bryophytes within or adjacent to the Application Site.

6.3.1.7.3 NPWS Protected Species Records

National Parks and Wildlife Service (NPWS) online records were searched to see if any rare or protected species of flora or fauna have been recorded from hectads N12 and N13. An information request was also sent to the NPWS scientific data unit requesting records from the Rare and Protected Species Database on the 11th of October 2021. A response was received on the 14th of October 2021. Table 6-13 lists rare and protected species records obtained from NPWS. A request for an updated data search was sent on the 15th of October 2024 with no response received to date.

Table 6-13 NPWS records for rare and protected species

Common name	Scientific name	Designation	Hectad
Common frog	<i>Rana temporaria</i>	HD Annex V, WA	N12, N13
Otter	<i>Lutra lutra</i>	HD Annex II, IV, WA	N12, N13
Pine marten	<i>Martes martes</i>	HD Annex V, WA	N12
Freshwater white-clawed Crayfish	<i>Austropotamobius pallipes</i>	HD Annex II, WA	N12, N13
Reindeer moss	<i>Cladonia rangiferina</i>	HD Annex V	N12, N13
Badger	<i>Meles meles</i>	WA	N12, N13
Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	Annex V, WA	N12
Irish Stoat	<i>Mustela erminea subsp. hibernica</i>	WA	N12
Hedgehog	<i>Erinaceus europaeus</i>	WA	N12, N13
Spiked Sedge	<i>Carex spicata</i>	RL (NT)	N12
Autumn Gentian	<i>Gentianella amarella subsp. hibernica</i>	RL (NT)	N12
<i>Cladonia ciliata</i>	<i>Cladonia ciliata</i>	Annex V	N13
Mallard	<i>Anas platyrhynchos</i>	BoCCI Amber List	N13

FPO = Flora Protection Order; RL = Red List, VU = Vulnerable, BoCCI= Birds of Conservation Concern WA = Wildlife Acts (Ireland).

6.3.1.7.4 National Biodiversity Data Centre (NBDC) Records

A search of the National Biodiversity Data Centre (NBDC) website was conducted in April 2025. Records of protected flora and fauna (excluding birds) recorded from hectads N12 and N13 are provided in Table 6-14. The time periods before and after the 1988 Baseline are presented to provide context of the protected species over time.

Table 6-14 NBDC records for species of conservation interest in hectads N12 and N13

Common name	Scientific name	Designation	Year	Hectad
Large white-moss	<i>Leucobryum glaucum</i>	HD Annex IV	1979, 2009	N13, N12
Marsh fritillary	<i>Euphydryas aurinia</i>	HD Annex II	1995-1999, 2017, 2019	N13, N12
Freshwater White-clawed Crayfish	<i>Austropotamobius pallipes</i>	HD Annex II, V, WA	1999, 2017, 2020	N12, N13
Common frog	<i>Rana temporaria</i>	HD Annex V, WA	1999, 2003	N13, N12
Smooth Newt	<i>Lissotriton vulgaris</i>	WA	2010	N12
European eel	<i>Anguilla anguilla</i>		2012	N12
Brown long-eared bat	<i>Plecotus auritus</i>	HD Annex IV, WA	2017	N12
Common pipistrelle	<i>Pipistrelle (Pipistrellus pipistrellus sensu lato)</i>	HD Annex IV, WA	2013, 2017	N13, N12
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	HD Annex IV, WA	2007, 2009	N13, N12
Daubenton's Bat	<i>Myotis daubentonii</i>	HD Annex IV, WA	2004	N12
Leisler's bat	<i>Nyctalus leisleri</i>	HD Annex IV, WA	2017, 2018	N12, N13
Otter	<i>Lutra lutra</i>	HD Annex V, WA	1980, 2011, 2018	N12, N13
Pine Marten	<i>Martes martes</i>	HD Annex II, V, WA	2007, 2013	N12, N13
Eurasian badger	<i>Meles meles</i>	WA	1981, 1990	N12
Eurasian Pygmy shrew	<i>Sorex minutus</i>	WA	2013	N13, N12
Eurasian red squirrel	<i>Sciurus vulgaris</i>	WA	2012, 2013	N12, N13
Irish hare	<i>Lepus timidus subsp. hibernicus</i>	WA	1982, 1991	N12, N13
Irish stoat	<i>Mustela erminea subsp. hibernica</i>	WA	1982	N12
West European hedgehog	<i>Erinaceus europaeus</i>	WA	1979, 2007	N12, N13

HD = EU Habitats Directive; WA = Wildlife Acts (Ireland).

6.3.1.7.5 Bat Records

Records from the National Bat Database of Ireland and National Biodiversity Data Centre (NBDC) were reviewed for the 10km grid squares N12 and N13. These identified historical records for five bat species in the area: common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*P. pygmaeus*), Leisler's bat (*Nyctalus leisleri*), brown long-eared bat (*Plecotus auritus*), and Daubenton's bat (*Myotis daubentonii*).

The Application Site is within the known national range of all Irish bat species except for lesser horseshoe bat (*Rhinolophus hipposideros*) and whiskered bat (*Myotis mystacinus*), which are currently considered to occur outside or at the margins of this area. No designated sites for the conservation of bats were identified within 10km of the Application Site.

Landscape and habitat suitability assessments indicated that the Application Site comprises predominantly cutover bog, with limited structural diversity or roosting features. No natural or manmade subterranean features (e.g., caves or souterrains) were identified within 10km based on a review of geological and archaeological databases. According to NBDC habitat modelling, the Application Site falls within a low to moderate bat habitat suitability index range, reflecting the limited availability of high-quality roosting and foraging habitat within the bog landscape.

6.3.1.7.6 **Freshwater Pearl Mussel (*Margaritifera margaritifera*)**

The NPWS *Margaritifera* Sensitive Area map (Version 8, 2017 and Version 10, 2020) was consulted during the desk study. There is no surface water connectivity between the Application Site and any *Margaritifera* sensitive catchments shown on the *Margaritifera* Sensitive Area map.

6.3.1.7.7 **Inland Fisheries Ireland Data**

The IFI online database was reviewed for fish species records within the catchments downstream of the Application Site. The Application Site drains into the Brosna River. It is located predominantly within the Brosna_SC_060 sub-catchment, with a small part of the easternmost section being located within the Shannon[Lower]_SC_030 sub-catchment and a small part of the northernmost section located in the Shannon[Lower]_SC_010 sub-catchment.

Fish stock assessments were undertaken by IFI in 2014, post the 1988 baseline, for the Brosna River, at a site approximately 2km from the Application Site. Brown trout (*Salmo trutta*), gudgeon (*Gobio gobio*), lamprey sp. (*Lampetra* sp.), minnow (*Phoxinus Phoxinus*), perch (*Perca fluviatilis*), pike (*Esox lucius*), roach (*Rutilus rutilus*), stone loach (*Barbatula barbatula*) and three-spined stickleback (*Gasterosteus aculeatus*) were the only species recorded in 2014. Species recorded here during previous surveys in 2008 included European eel (*Anguilla Anguilla*), gudgeon, minnow, perch, pike and roach.

Fish stock assessments undertaken by IFI in 2008 in the Brosna River further downstream towards the River Shannon in recorded bream (*Abramis brama*), brown trout, European eel, gudgeon, minnow, perch, pike, roach, salmon (*Salmo salar*) and stone loach.

European eel (*Anguilla anguilla*) is classified as ‘critically endangered’ in ‘Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish’ (King *et al.*, 2011). Lamprey (*Lampetra* sp.) are classified as ‘near threatened’ in ‘Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish’ (King *et al.*, 2011). All three species of Ireland’s lamprey are protected under Annex II of the EU habitats directive, with River Lamprey classified under Annex II and Annex V. Salmon (in freshwater) is listed on Annexes II and V of the EU Habitats Directive, and is listed as “Vulnerable,” on King *et al.*’s Red list (2011).

6.3.1.7.8 **Marsh Fritillary**

Records from the National Biodiversity Data Centre (NBDC) indicate that Marsh Fritillary (*Euphydryas aurinia*) has been recorded in hectads N12 and N13 from 1995-1999, 2017, and 2019 (during Peat Extraction Phase) with the most recent records on the database dating from 2021 (Current Phase). The Bord na Móna Biodiversity Action Plan 2016-2021 states that marsh fritillary, listed in Annex II of the EU Habitats Directive, are known to occur on ‘marginal areas of regenerating cutaway’ of Clongawny bog, which is also part of the Boora Bog Group and approximately 12km southwest of the Application Site (Bord na Móna, 2016).

6.3.1.7.9 NPWS Article 17 Reporting

The most recent National Parks and Wildlife Service (NPWS, 2019) data on the recorded distribution of EU Habitats Directive Annex I listed habitats was reviewed in relation to the Application Site. This data is available in the form of the NPWS (2019) Article 17 reporting, and associated GIS data, on ‘*The Status of EU Protected Habitats and Species in Ireland*’ (NPWS, 2019).

None of the NPWS GIS datasets contain polygon or point data within the Application Site. The nearest mapped Annex I habitat is Orchid-rich calcareous grassland (6210), located approximately 400m east of the northern section of the Application Site. Areas mapped as Active raised bog (7110) are present approximately 2km west, 3km north-west and 4.4km east of the Application Site. An area mapped as Annex I Alkaline fen (7230) is present approximately 7.7km south-east of the Application Site.

6.3.1.8 Invasive Species

The NBDC database contains records of invasive species identified within the relevant hectad. Records of ‘high impact’ invasive species for hectads N12 and N13 are provided in Table 6-15. Whilst no records were identified in 1988 or before 1991, records from after the 1988 baseline are presented to provide context of the invasive species over time.

Table 6-15 NBDC records for invasive species (hectads N12 and N13)

Common Name	Scientific Name	Year	Hectad
Canadian waterweed	<i>Elodea canadensis</i>	2014	N12
Nuttall's waterweed	<i>Elodea nuttallii</i>	2014	N12
Japanese knotweed	<i>Fallopia japonica</i>	2013	N13
Rhododendron	<i>Rhododendron ponticum</i>	2003	N13
Cherry laurel	<i>Prunus laurocerasus</i>	2005	N13
Three-cornered Garlic	<i>Allium triquetrum</i>	2024	N13
Brown Rat	<i>Rattus norvegicus</i>	2013	N12
American Mink	<i>Mustela vison</i>	1991, 2011	N13, N12
Grey Squirrel	<i>Sciurus carolinensis</i>	2012	N13
Fallow deer	<i>Dama dama</i>	2009	N12
Common Carp	<i>Cyprinus carpio</i>	2012	N12
Roach	<i>Rutilus rutilus</i>	2012	N12
Zebra Mussel	<i>Dreissena polymorpha</i>	2003	N12

Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) include legislative measures to deal with the introduction, dispersal, dealing in and keeping of non-native species. Japanese knotweed (*fallopian japonica*), Rhododendron (*rhododendron ponticum*), Brown Rat (*Rattus norvegicus*) American Mink (*Mustela vison*) and Fallow Deer (*Dama dama*) are species subject to restrictions under Regulations 49 and 50 and are included in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011).

6.3.1.9 Conclusions of the Desktop Study

The desktop study has provided information on the ecological baseline at the Application Site both as it was in 1988 and as it exists in the present day, using information gleaned from a variety of sources. It has also provided information on the ecology of the surrounding area with a focus on the Hectads N12 and N13 within which the Application Site is located. Both historical and current records and information have been provided to assist in providing a comprehensive description of the ecology of the area.

In 1988, the majority of the Application Site had been drained, was undergoing peat extraction and ancillary activities and would have been dominated by bare peat at these locations. Where peat extraction and ancillary activities had ceased for some time, the habitats would have comprised scrub, heath type vegetation, woodland and pioneer open cutaway habitats. Small areas of remnant uncut raised bog would have been present primarily at the margins but also in the centre of the Application Site. The Application Site was likely utilised by bird species typical of cutover bog and associated habitats including meadow pipit and skylark. Faunal diversity in raised bog habitats is generally poor and therefore the Application Site in 1988 is unlikely to have supported a rich faunal diversity. However, it is likely that hare, badger, fox, otter, common frog and a range of invertebrates including marsh fritillary would have utilised parts of the Application Site.

During the Peat Extraction Phase, it is reported that peat extraction and ancillary activities was active across much of Lemanaghan Bog, particularly in the northeastern and eastern sections. At the time of the survey in 2011, drainage works were ongoing in active production zones. Pumps and silt ponds were present to manage water levels, particularly around the central works area and riparian zones. Therefore, the Application Site contained a mosaic of active production fields (bare peat) and abandoned or regenerating cutaway areas, some with dry calcareous grassland, dry heath, pioneer poor fen, and Birch scrub. Peat depth and characteristics varied across the bog, with 'red' acidic peat dominating in younger production fields, and black fen peat exposed in cutaway areas. Some glacial gravel mounds were present and showed signs of colonisation by grassland and scrub vegetation.

In the current phase, the habitats present within the Application Site comprise a mosaic of cutover bog habitats including areas of bare peat, scrub, bog woodland, secondary heath type vegetation, pioneer open cutaway habitats, fen and grassland. Fragmented areas of remnant uncut raised bog are present, mostly at the bog margins.

A review of Article 17 reporting identified no Annex I habitats within the Application Site, the nearest Annex I habitat is Orchid-rich calcareous grassland (6210), located approximately 400m east of the northern section of the Application Site.

The Application Site drains into a number of watercourses including Lemanaghan Stream, Fortified House Castlearmstrong Stream, and Kilcolgan Beg Stream, all of which flow to the Brosna River. All surface waters from the Application Site discharge into the River Shannon. The Brosna River and River Shannon are included within the River Shannon Callows SAC and Middle Shannon Callows SPA. These European Sites are further considered in the Natura Impact Statement prepared for the assessment. River Shannon Callows pNHA is also located downstream of the Application Site.

The desk study identified that a variety of protected faunal species are known to occur within and in the wider area surrounding the Application Site including bats, marsh fritillary, otter, badger and bird species. The mammal species records identified during the desk study informed the survey methodologies undertaken during the site visits. The mammal species recorded within the relevant hectads have widespread range and distributions in Ireland and are likely to be recorded frequently throughout Ireland (Marnell *et al*, 2009⁵).

⁵Marnell, F., Kingston, N. & Looney, D. (2009) Ireland Red List No. 3: Terrestrial Mammals, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

The Application Site is not located within a freshwater pearl mussel 'sensitive area'.

A number of bird species listed on Annex I of the EU Birds Directive and the BoCCI redlist have been recorded within the Application Site and surrounding area.

The desk study also provided useful information to inform the ecological surveys undertaken on the Application Site as well as the identification of pathways for potential impact on sensitive ecological receptors.

6.3.2 Ecological Walkover Survey Results: 2011-2025

6.3.2.1 Description of Habitats and Flora within the Application Site

As outlined in Section 6.2.1, the habitats at the Application Site were the subject of a detailed survey and assessment by Bord na Móna ecologists between 2011 and 2012 and a detailed habitat map was produced of the Application Site. This habitat mapping and assessment was undertaken following the Bord na Móna habitat classification scheme and was cross referenced with '*A Guide to Habitats in Ireland*' (Fossitt, 2000).

Between 2021 and 2025, MKO ecologists visited the Application Site to ground-truth the results of the Bord na Móna habitat surveys and mapping (refer to Section 6.3.1.3.1) and to undertake detailed habitat and botanical surveys. The habitat descriptions in this section are based on the walkover surveys and detailed vegetation surveys undertaken by MKO between 2021 and 2025.

The Application Site comprises primarily cutover raised bog. Some areas of the Application Site have been out of commercial peat production by Bord na Móna for a significant period of time and thus vegetation, dominated primarily by birch scrub, common cottongrass and marsh arrowgrass, has colonised much of these areas. A habitat map is provided in Figure 6-4. Small areas/remnant of uncut raised bog occur at various locations at edges of the Application Site.

The main habitat types on the Application Site included bare peat communities, cutover bog habitats with a vegetative composition that is similar to degraded dry heath type communities (dominated by Ling heather), woodlands and scrub (dominated by birch), poor fen and small areas of grasslands (occurring alongside railway tracks). These habitats occur in intimate mosaics throughout the Application Site. Areas of open water occur where peat extraction and ancillary activities has ceased and water has accumulated in localised areas. The largest area of open water and reed swamp occurs within the southern central part of the Application Site, which is a linear standing water feature.



Map Legend

- Application Site Boundary
- BL3
- FL8
- FL8/WS1
- FW2
- GA1
- GS1
- GS2
- GS2/WS1
- HD1
- HH1
- HH1/WS1
- PB1
- PB4
- PB4/WS1
- PF2
- WD4
- WS1
- WS2
- GS4
- WL1
- WL2
- WN7



Drawing Title

Habitat Map

Project Title

Extraction in Lemanaghan Bog,
Co. Offaly

Drawn By

SS

Checked By

RW

Project No.

200804-e

Drawing No.

Figure 6-5

Scale

1:30,510

Date

26.08.2025



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6.3.2.1.1 Cutover Bog (PB4)

The vast majority of the Application Site, with the exception of small remnant sections of raised bog around the peripheries of the Application Site, comprises of cutaway peat. These areas are dominated by bare peat with little growth of vegetation, see Plate 6-1. Where peat extraction and ancillary activities has ceased for some time, these areas have begun to revegetate, predominantly by poor fen and birch dominated scrub/woodland. The following subsections provide a description of the secondary habitats that have begun to form on the cutover bog following cessation of milled peat extraction.



Plate 6-1 Open cutaway bog with sparse vegetation

Bog Woodland/Scrub (WN7/WS1)

The habitats on the Application Site have developed as birch dominated scrub and woodland in the areas where the peat extraction and ancillary activities has ceased for the longest periods, along unmaintained drainage channels and where the cutaway is relatively dry. A mosaic of these habitats dominates large sections of the western and central area of the Application Site, and provide areas of separation, cover and shelter throughout the Application Site. In general, the woodlands and scrub are relatively recently colonized and have a poorly developed layer structure and ground flora. Typically, they are dominated by birch (*Betula pubescens*) with some willows (*Salix spp.*). Occasional Sitka spruce (*Picea sitchensis*) and Lodgepole pines (*Pinus contorta*) had started to establish as a result of natural seed dispersal. The ground flora was commonly dominated by brambles (*Rubus fruticosus agg.*). In more established areas, ivy (*Hedera hibernica*) dominate the understory with bracken (*Pteridium aquilinum*) and other fern species also a regular component of the ground flora. In some areas where the woodlands and scrub were colonizing the cutover bog, the ground flora was often dominated by ling (*Calluna vulgaris*) heather and in places purple moor grass (*Molinia caerulea*). Both birch scrub and birch dominated woodland occur throughout much of the Application Site where peat extraction and ancillary activities has ceased. Where scrub was greater than 4 metres in height, it was classified as Bog Woodland (as per Fossitt, 2000). The Annex I habitat Bog Woodland (91DO) was not

recorded on the Application Site during the habitat surveys, as the woodlands were predominantly very dry and none of the woodland areas had developed on *Sphagnum* rich substrates associated with this Annex I type. Plate 6-2 shows a typical area of birch dominated bog woodland within the Application Site with small trees and low structural diversity.



Plate 6-2 Typical Bog Woodland found throughout the Application Site

Poor Fen (PF2)

Many sections of the Application Site supported cutaway bog that was dominated by common cottongrass and was wet underfoot (though with little open water except after prolonged wet weather) or dry. Species frequently recorded included purple moor grass, soft rush (*Juncus effusus*), marsh arrowgrass (*Triglochin palustris*) and hummocks of the moss *Polytrichum commune*. This habitat was quite variable but was widespread within the Application Site. It formed mosaics with heath and woodland habitats and was classified as Poor Fen.

There are also small areas with Poor fen vegetation associated with open water pools within the Application Site. These areas are dominated by common cottongrass, although also containing species such as marsh arrowgrass, reedmace (*Typha latifolia*), horsetail (*Equisetum arvense*), water mint (*Mentha aquatica*), soft rush (*Juncus effusus*) and bulbous rush (*Juncus bulbosus*).

Cutover Bog (PB4) (also supporting secondary heath type communities)

Secondary heath type communities were dominated by tall ling heather (*Calluna vulgaris*), some cross-leaved heath (*Erica tetralix*), purple moor grass (*Molinia caerulea*) and common cottongrass (*Eriophorum angustifolium*) on dry peats with no *Sphagnum* present. It is likely that the dry heath areas would, if left undisturbed, colonize to form bog woodland (Dry Birch Woodland – Non-Annex I). The wetter heath communities supported higher abundance of purple moor grasses and common cottongrass. This habitat type covers a broad range of conditions from bare peat and dry but vegetated to much wetter areas that grade into poor fen. In more vegetated areas, dominated by cotton grasses,

orchid species were present including; heath spotted orchid (*Dactylorhiza maculata*), twayblade (*Listera ovata*) and marsh helleborine (*Epipactis palustris*). This was mostly associated with areas of revegetated bare peat occurring within the western portion boundary of the Application Site. The species composition, hydrological and geomorphological characteristics of the heath type habitat on site was assessed with reference to best practice guidance^{2,6,7} and professional judgement, and was found not to conform to the EU Habitats Directive Annex I listed habitat European Dry Heaths [4030].

The cutover bog habitats on the Application Site do not correspond to either Active Raised Bog (7110) or Degraded Raised Bog still capable of Natural Regeneration (7120). The NPWS Article 17 Report from 2013, states:

The actual definition of the habitat (still capable of regeneration), indicates that the habitat can be restored to Active Raised Bog habitat (7110). In the Irish context, the habitat does not include secondary degraded raised bog which relates to highly drained high bog devoid of vegetation, cutover, and cutover bog.

The NPWS Article 17 Reporting for 2019 has been published and states:

In an Irish context, ARB (which is currently defined as occurring only on the high bog) encompasses active peat --forming ecotopes (central and sub-central) as defined by Kelly (1993) and Kelly & Schouten (2002), and actively peat --forming flushes

In addition, the definition of Degraded Raised Bog has also been changed in the 2019 Article 17 Reporting. Whilst previously (from the 2013 Reporting), the habitat pertained to all vegetated areas of uncut Raised Bog that did not meet the criteria to be classified as Active Raised Bog, it is now recognised that the extent is much narrower and dependant on specific hydrological conditions. This habitat still does not occur on cutover bog in the Irish context and is more limited in its extent on uncut bogs.

These habitats do not occur on the cutover habitats in the Application Site.

They do not conform to Annex I heath habitats. They are secondary, cutover raised bog habitats that are located on deep peat and level ground. They do not conform to Annex I Wet Heath habitat as defined by the Irish Wildlife Manual (Perrin et.al. 2014). Neither do they conform to Annex I Raised Bog habitats or any other Annex I habitat.

Grasslands (GA1, GS2 and GS1)

The grasslands that are present within the Application Site are primarily limited to the sides of old trackways and railway lines. Many of the verge areas are classified as Dry Meadows and Grassy Verges with rank grasses including false oat grass (*Arrhenatherum elatius*), Yorkshire fog (*Holcus lanatus*), cocks foot (*Dactylis glomerata*) and encroaching scrub with nettle (*Urtica dioica*), bramble and rosebay (*Epilobium angustifolium*). Other areas are less dominated by tall, coarse grasses and support more calcareous grasslands with species such as knapweed (*Centaurea nigra*), sweet vernal grass (*Anthoxanthum odoratum*), lady's bedstraw (*Galium verum*), dandelion (*Taraxacum officinalis* agg.), common bird's foot trefoil (*Lotus corniculatus*), common centaury (*Centaureum erythraea*), occasional yellow rattle (*Rhinanthus minor*) and orchids such as common spotted orchid (*Dactylorhiza fuchsii* subsp. *fuchsii*). Areas of improved species-poor pasture within bordering farmland were categorised as Improved agricultural grassland (GA1). Other areas of grassland habitats comprised of a mix of species typical of both calcareous and peatland habitats. This diversity in species recorded has resulted from

⁶ Perrin, P.M., Barron, S.J., Roche, J.R. & O'Hanrahan, B. (2014). Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland. Version 2.0. Irish Wildlife Manuals, No. 79. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland

⁷ Smith, G.F. & Crowley, W. (2020) The habitats of cutover raised bog. Irish Wildlife Manuals, No. 128. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

the importing of stone for the construction of railway tracks throughout the peatland or from the exposure of underlying calcareous subsoil due to the level of peat extraction had taken place.



Plate 6-3 Example of rank grassland habitat within the Application Site

Open Waterbodies

A number of standing water areas were present within the Application Site. These were classified as Other artificial lakes and ponds (FL8) (Plate 6-4).



Plate 6-4 Standing water on bare peat within the Application Site

Drainage Channels (FW4)

The Application Site is extensively drained with deep channels that run through the Application Site. The majority of the drains within the Application Site, subject to the most recent industrial harvesting, are devoid of vegetation and have a poor structure. In the areas where the drains are surrounded by dense woodland and scrub, the vegetation within them is sparse and the substrate comprises of bare silt. In the areas where there is less cover of trees, many of the drains support dense macrophytes including reedmace, horsetails (*Equisetum spp.*). In other areas, the drains are large and hold deep water with floating vegetation such as Pondweeds (*Potamogeton spp.*) and water mint.

6.3.2.1.2 Lowland Depositing Streams (FW2)

The Application Site is drained by a number of watercourses that surround the Application Site. As described in Chapter 8, the Application Site spans three surface water catchments within the Shannon River Basin District: the Lower Shannon (Hydrometric Areas 25A and 25B) and the Upper Shannon (Hydrometric Area 26G). All surface waters from the Application Site ultimately discharge to the River Shannon, which flows southwest of the Application Site before eventually reaching Lough Derg.

The majority of the Application Site (c. 1,043 ha) lies within the Lower Shannon (25A) catchment, specifically the Brosna sub-catchment. This area is drained by several streams including the Lemanaghan Stream, Fortified House Castlearmstrong Stream, and Kilcolgan Beg Stream, all of which flow to the Brosna River. The Brosna River discharges into the River Shannon approximately 14.5 km southwest of the Application Site.

Smaller portions of the Application Site (c. 25.7 ha and 40.6 ha) are located in the Upper Shannon (26G) and Lower Shannon (25B) catchments, respectively. These areas are drained by the Ballynahown Stream (into the Boor River, which joins the River Shannon c. 11 km downstream) and the Holy Well of Clongawny Stream (into the Blackwater River, reaching the Shannon c. 13.5 km southwest of the Application Site).

The Lemanaghan Stream has been highly modified where it runs through the Application Site. The stream within the Application Site represents a peat drainage channel that had been extensively straightened and deepened historically. The channel has a deep U-shaped profile with 4m high banks. The flow profile was of very slow moving deep glide and pool. The bed comprised of extensive soft peat. The channel supported no macrophytes given deep peat stained water (Plate 6-5).



Plate 6-5 The Lemanaghan Stream within the Application Site

6.3.2.1.3 Remnant Uncut Raised Bog

There are some remnant uncut raised bog habitats at the Application Site, see Figure 6-4. The areas of raised bog recorded within the Application Site are typically small in area, have been historically drained, are relatively dry and in some areas, subject to ongoing peat extraction and ancillary activities at the facebank. The vegetation comprises predominantly of tall ling heather with some purple moor grass and cottongrasses. Some wetter areas were also found to contain cross-leaved heath (*Erica tetralix*) and bog asphodel (*Narthecium ossifragum*). In general, the bog remnants did not contain significant areas of *Sphagnum* mosses. This is likely due to the historic draining of these small, fragmented remnant areas of raised bog.



Plate 6-6 Example of intact raised bog recorded within the Application Site.

6.3.2.1.4 Buildings and Artificial Surfaces

There are some areas of buildings and artificial surfaces (BL3) within the Application Site. The majority of the artificial surfaces are associated with access roads, a works office and storage buildings within the south-western part of the Application Site. Other small areas of hardcore occur within the Application Site that are used for informal parking in close proximity to access roads.

6.3.2.1.5 Invasive Species and Protected Flora Species

No invasive species, listed on the Third Schedule of the S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011, were recorded within the Application Site. The only non-native invasive species recorded on site include butterfly bush (*Buddleja davidii*) and bearberry (*Cotoneaster dammeri*). Although invasive species, these are not listed on the Third Schedule.

No botanical species protected under the Flora (protection) Order (1999, as amended 2022) were recorded during the surveys.

6.3.2.2 Evaluation of Habitats

1988 Baseline

As much of the Application Site would have been drained by the 1988 baseline and characterised by dominant cutover bog, the habitats present then would have been similar to those present today, predominantly cutover bog with sections of remnant raised bog and scrub. The cutover bog habitat at the Application Site would have comprised predominantly of bare peat where large sections of the bogs had been drained and vegetation removed. The ecological evaluations of the habitats within the Application Site would have been the same as those provided below for the Current Phase habitats.

Peat Extraction Phase Habitats

During the Peat Extraction Phase, the Application Site was actively managed for industrial peat production. The habitats present at that time were similar to those currently present, consisting predominantly of cutover bog and early successional habitats subject to ongoing disturbance, with small areas of remnant raised bog. As such, the ecological evaluations of the habitats during this phase would align with those provided below for the Current Phase.

Current Phase Habitats

Ecological evaluation follows a methodology that is set out in Chapter 3 of the TII Ecological Impact Assessment Guidelines (TII, 2009a). The habitats within and adjacent to the Application Site were evaluated in accordance with the criteria developed by TII (2009a), which classifies sites in terms of their ecological importance, *i.e.* 'International Importance', 'National Importance', 'County Importance', 'Local Importance (Higher Value)' or 'Local Importance (Lower Value)'.

Following the extensive surveys that were undertaken, it is concluded that the habitats of highest ecological significance within the Application Site are those that are most closely associated with the remnant fragmented areas of raised bog habitat. The areas of marginal remnant raised bog habitat have been assigned **County Importance** as they contain the only remaining examples of Raised Bog habitat in the area and although predominantly degraded and dry, some areas of remnant raised bog have potential to correspond to the Annex I habitat '*Degraded raised bog still capable of natural regeneration*'. These areas are small remnant of the entire area of raised bog that would have

dominated the Application Site. Uncut raised bog habitat would have dominated the entire Application Site prior to the commencement of the peat extraction and ancillary activities. Large sections of remnant raised bog within the Application Site have been subject to drainage. The vast majority of the areas of remnant bog within the Application Site are small in size, degraded, largely dry underfoot and with little to no Sphagnum cover.

Cutover bog and the secondary habitats recorded on the cutaway sections of the Application Site including bog woodland and scrub, mosaics of dry heath type vegetation and poor fen with some open water habitats and embryonic Sphagnum communities are assigned **Local Importance (Higher Value)**. This is on the basis that they consist of a large area of semi-natural habitats with a high biodiversity value in the local context but do not correspond to habitats that are listed on Annex I of the EU Habitats Directive. The bog woodland within the Application Site is generally dry underfoot with little to no Sphagnum cover and does not correspond to the Annex I habitat Bog woodland (91D0). In Ireland there is currently no recognition or definition of Annex I Active Raised Bog (7110) on cutover raised bog. NPWS (2019) states '*Although ARB is currently described as confined to the high bog, surveys in recent years have indicated the occurrence of peat-forming vegetation on cutover areas at some sites. These areas occasionally correspond to regenerating ombrotrophic vegetation characterised by Sphagnum cover greater than 40–50%, but they generally lack the diversity and abundance of Sphagnum species, micro-topographical features and good quality indicators associated with ARB. These cutover areas have the capacity to develop into embryonic ARB but longer time periods (50-100 years) are likely to be required for high quality ARB to develop*'. The majority of the cutover habitats within the Application Site generally did not support high Sphagnum cover (40% or more) and where Sphagnum was abundant on cutover habitats, the habitats lacked other indicator species and microtopographical features associated with active raised bog.

The bare peat habitats and drainage ditches throughout the Application Site are of low ecological significance in their current state and have been assigned **Local Importance (Lower Value)**. However, following cessation of peat extraction, the bare peat habitats will inevitably revegetate in a similar manner to the rest of the Application Site. Small natural watercourses, including streams and rivers draining the Application Site have been assigned **Local Importance (Higher Value)** in line with the Aquatic Survey report (Appendix 6-3).

No botanical species protected under the Flora (protection) Order (1999, as amended 2022), listed in the EU Habitats Directive (92/43/EEC), or listed in the Irish Red Data Books were recorded on the Application Site and no suitable habitat occurs within the Application Site. All species recorded are common in the Irish landscape.

6.3.2.3 Fauna Species in the Existing Environment

6.3.2.3.1 Badger

Dedicated surveys for this species were undertaken between 2021 and 2024, in addition to incidental records recorded during other species-specific surveys. One sett was recorded within the Application Site. During dedicated badger surveys of the Application Site, signs of badger i.e. badger foraging signs, latrines etc. were predominantly restricted to the margins of the Application Site. Due to the nature of the cutover peatland habitats recorded within the Application Site, these habitats do not provide optimal foraging habitat for badger. A badger sett was recorded within the south of the Application Site within dry scrub/woodland habitat and showed signs of commuting trails to the agricultural grasslands that surround the Application Site. Such habitat provides suitable foraging habitat for the species surrounding the Application Site.

6.3.2.3.2 Otter

No otter resting or breeding sites were recorded within the Application Site during dedicated otter surveys undertaken by MKO. Neither were any otter resting or breeding sites recorded during the

aquatic surveys of the watercourses downstream of the Application Site undertaken by Triturus Environmental Ltd.

Surveys undertaken by Triturus Environmental Ltd. in 2021 and updated in 2024 found no direct evidence of otters (*Lutra lutra*) such as holts, couches, spraint, or tracks at any of the aquatic or pond sites surveyed within or adjacent to the Application Site. Despite this, otter is known to occur within the wider area, with records available for several nearby watercourses including the Boor River, Blackwater River, River Shannon, and the Grand Canal.

6.3.2.3.3 Bats

The results of bat desk study and surveys undertaken at the Application Site are described in full in the Bat Report in Appendix 6-2 and summarised below.

Roost Surveys

No bat roosts were identified within the Application Site boundary during surveys undertaken in 2021 and 2024. Three structures located adjacent to the northern boundary of the Application Site were inspected and subject to dusk emergence surveys. Structure 1 (a stone house) was assessed as having moderate roosting potential but showed no evidence of roosting bats on inspection. Structure 2 (a stone shed) and Structure 3 (a steel and concrete block agricultural shed) were assessed as having low and negligible roosting potential respectively, and no evidence of bats was found in either. No trees with significant roosting potential were identified within the Application Site.

Manual Activity Surveys

Manual activity surveys were undertaken in Spring, Summer, and Autumn 2024. Although no evidence of roosting bats was recorded during inspection of any structures, eight bats were observed emerging from Structure 1 during the August 2024 dusk emergence survey, including seven soprano pipistrelles and one suspected brown long-eared bat, confirming the presence of a roost outside the Application Site.

Bat activity was recorded during all transect surveys, with commuting and feeding noted around the Application Site during all seasons. Common pipistrelle was the most frequently recorded species (n=156), followed by soprano pipistrelle (n=44) and Leisler's bat (n=9). *Myotis* spp. and brown long-eared bats were rarely recorded. Spring surveys recorded the highest number of bat passes per kilometre, and pipistrelle species were the most frequently recorded across all seasons.

Ground-level Static Surveys

In total, 67,296 bat passes were recorded across all 12 static detector deployments during 2024. Common pipistrelle was the most frequently recorded species (n=44,344), followed by soprano pipistrelle (n=12,647) and Leisler's bat (n=8,829). *Myotis* spp. (n=826), brown long-eared bat (n=579), and Nathusius' pipistrelle (n=71) were recorded in significantly lower numbers.

Bat activity was calculated as total bat passes per hour (bp/h) per season to account for any bias in survey effort. Bat activity was highest in Summer, lower in Spring, and significantly lower in Autumn. Common pipistrelle was the dominant species across all seasons. Leisler's bat was more active in Spring but declined as the year progressed, while soprano pipistrelle and *Myotis* spp. activity increased slightly through Autumn. Nathusius' pipistrelle was rarely recorded and remained <1% of all bat passes.

Although the Application Site supports regular bat activity, no roosts were found within its boundaries. The habitats present, primarily cutover bog with areas of scrub and developing woodland, provide suitable commuting and foraging habitat for bats of local ecological importance. The Application Site is

considered to be of Local Importance (Higher Value) for bats, though roosting opportunities remain limited.

6.3.2.3.4 *Birds*

A comprehensive list of all bird species recorded during bird surveys undertaken at the Application Site from 2020 to 2025 is included in Appendix 6-4. The species recorded were predominantly typical of cutover bog and surrounding habitats. Woodcock were observed regularly during dedicated woodcock surveys and were confirmed to be breeding in all suitable habitats within the survey area. Snipe were regularly recorded commuting or being flushed, with seven probable territories identified in 2023. In 2024 there were five probable snipe territories identified within the Application Site. Hen harrier were recorded commuting over the Application Site, but there was no evidence of the species using habitats within the Application Site. Golden plover were observed commuting over the Application Site and roosting on two occasions. Merlin were recorded commuting over the Application Site, with one instance of a merlin mobbing a kestrel, indicating probable breeding in the area. Kestrel were the most frequently observed raptor, with probable and confirmed breeding territories identified across multiple years.

Peregrine falcon were recorded commuting and hunting across the bog, with one pair observed on the northwestern part of the bog in 2022 indicating probable breeding in the area. Whooper swan roosts of up to 71 individuals were identified and used regularly throughout the 2022/2023 winter season and were also recorded roosting in smaller numbers in 2023/2024 and 2024/2025. Barn owl were recorded calling on-site, with successful breeding confirmed during the 2021 breeding season only in a shed at the Bord na Móna Works, on the margin of the Application Site. Lapwing were observed roosting, commuting, and calling, with confirmed breeding success in 2023 and probable breeding in 2024.

Curlew were recorded on one occasion with a flock of five birds commuting to the south of the Application Site. Little egret were observed foraging within and travelling over the bog. There were observations of kingfisher calling, flying and commuting along drains, with an active nest confirmed within the bog in May 2023.

Buzzard were regularly observed commuting, hunting, or soaring above the Application Site. In 2025, two probable breeding territories were identified on, or adjacent to, the bog. In 2024, there were three confirmed territories identified on, or adjacent to, the bog. In 2023, there were eight probable breeding territories identified on the bog. In 2022, there were four probable breeding territories identified, mostly adjacent to the bog. There was one breeding territory confirmed 800m from the main bog in 2022. In 2021, there were eight probable territories and two confirmed territories within and adjacent to the bog.

Sparrowhawk was also recorded, primarily commuting or soaring. In 2025, there were two probable breeding territories identified within the bog. In 2024, there were four confirmed breeding territories on, or adjacent to the bog. In 2023 and 2021 there were two separate breeding territories confirmed on the outskirts of the bog. In 2021, there was one probable breeding territory on the southeastern part of the bog.

The BoCCI Red-listed passerine species including meadow pipit, redwing, stock dove, swift, and yellowhammer were recorded during the surveys. Meadow pipit was the most frequently recorded, observed on 692 occasions with up to 49 birds recorded. Redwing was recorded on 25 occasions, with a maximum count of 36 birds, and swift was recorded on 14 occasions with up to 15 individuals.

Full details of the results of the bird surveys are included in Appendix 6-4.

6.3.2.3.5 *Reptiles and Amphibians*

Common frog (*Rana temporaria*) was recorded in Lemanaghan Stream during both the 2022 and 2024 aquatic surveys. The species is likely to breed in small wetland areas within the Application Site.

Smooth newt (*Lissotriton vulgaris*) was not observed visually during the 2022 or 2024 surveys. However, in 2024, its presence was confirmed at pond site P3 via environmental DNA (eDNA) analysis, a method that detects genetic material left behind in water by species through skin cells, mucus, or waste. This indicates that the species is present but likely occurs at low densities or in habitats with limited visibility, making direct observation difficult. Common lizard (*Zootoca vivipara*), while not recorded during the site visits, are likely to occur within the Application Site.

6.3.2.3.6 Fisheries and Aquatic Fauna

The results of aquatic surveys undertaken by Triturus Environmental Ltd. are described in full in the Aquatic Report included in Appendix 6-3. These surveys, completed in August 2021 and updated in September 2024, assessed watercourses and ponds within and downstream of the Application Site to evaluate fisheries potential, biological water quality, and the presence of aquatic species and habitats of conservation interest.

Watercourses surveyed included the Ballynahown Stream (26B17), Fortified House Castlearmstrong Stream (25F69), Lemanaghan Stream (25L04), Brosna River (25B09), Kilcolgan Beg Stream (25Q21), and Ferbane Stream (25F31), all located within the Brosna_SC_060 and Shannon [Lower]_SC_010 sub-catchments. A total of 13 riverine and 3 pond sites were assessed in 2024.

The majority of watercourses were of Local Importance (Higher Value) in terms of their aquatic ecology, primarily due to the presence of brown trout, lamprey, white-clawed crayfish (*Austropotamobius pallipes*), and the Red-listed duck mussel (*Anodonta anatina*). However, water quality was generally poor across the surveyed sites, with most riverine locations recording biological water quality of Q3 (poor status) in both 2021 and 2024.

Brown trout were recorded at multiple sites in both years, with juvenile populations observed at sites A2 and B7 in 2024. Lamprey ammocoetes were recorded at several sites, with moderate densities observed at site B3. European eel was detected via eDNA at pond site P1 but was not captured during electrofishing surveys. White-clawed crayfish were physically recorded at site A1 in both years and detected via eDNA at site A2 in 2024, confirming their continued presence in the Ballynahown Stream. The Red-listed duck mussel was recorded at sites B3 and B5 in both surveys. No freshwater pearl mussels or signs of crayfish plague were detected during either survey.

Pond sites P1–P3 supported three-spined stickleback and brown trout populations, with eDNA confirming the presence of brown trout in all three ponds and European eel in one pond (P1). These ponds were classified as being of local ecological importance (higher value).

Overall, drainage ditches and smaller streams within the Application Site were generally unsuitable for salmonid spawning, lamprey, or crayfish, due to silt-dominated substrates, poor hydromorphological structure, low flows and historical drainage. The Brosna River and certain tributary sections retain some capacity to support fish of conservation interest and serve as ecological corridors.

6.3.2.3.7 Marsh Fritillary

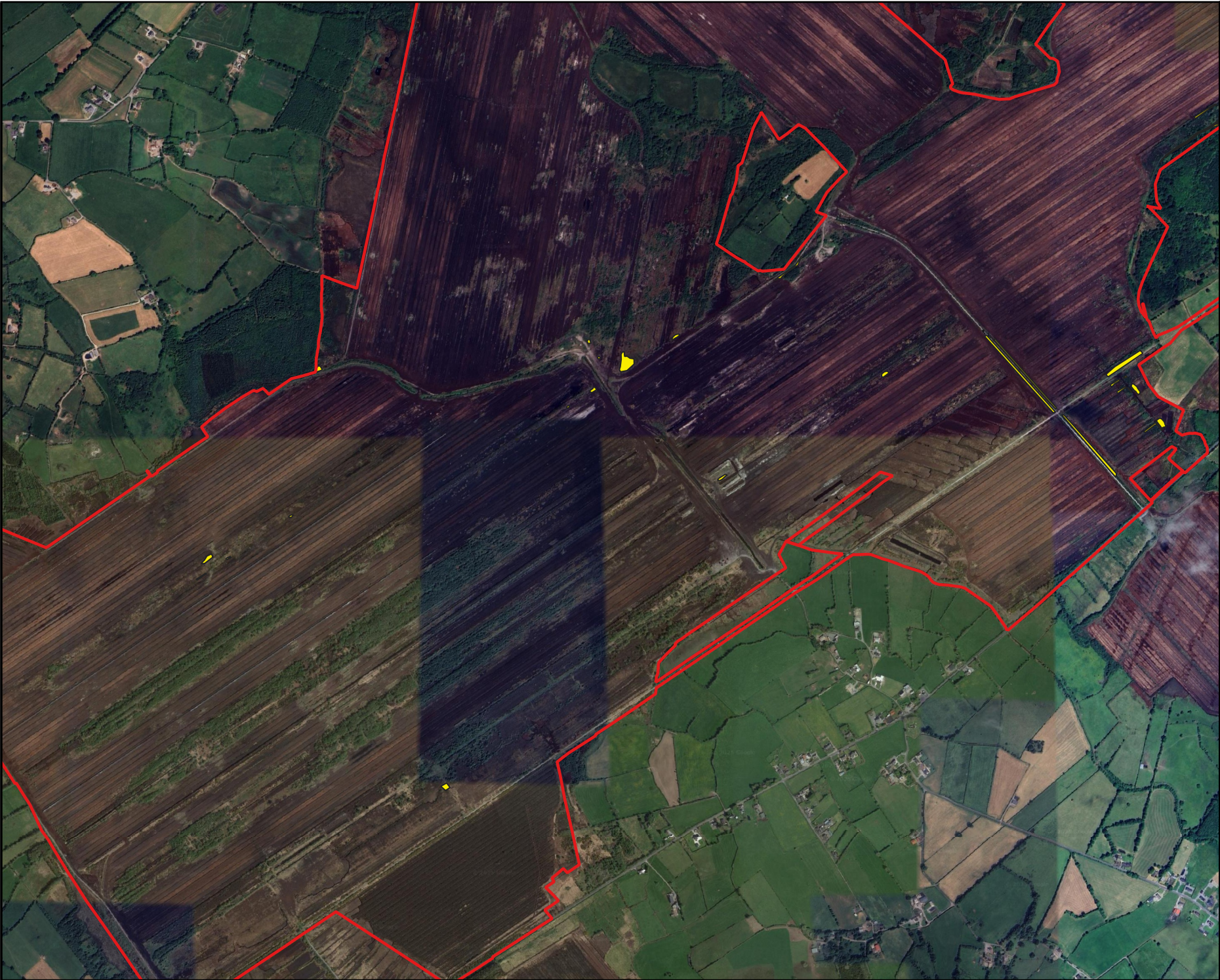
The desk study identified that marsh fritillary is known to occur in the wider area surrounding the Application Site.

Dedicated surveys were undertaken within the Application Site to identify areas of suitable marsh fritillary habitat. Suitable habitat was recorded in small areas scattered throughout the Application Site as shown in Figure 6-5. Suitable habitat was mainly associated with areas where stone material has been brought into the Application Site for the construction of railway tracks, construction of access roads etc. and was located in greatest densities on access road verges.

During dedicated larval web surveys of the Application Site, no active larval webs were found.



Plate 6-7 Area of devil's bit scabious within the Application Site providing suitable marsh fritillary habitat.



Map Legend

-  Application Site Boundary
-  Marsh Fritillary Habitat



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Drawing Title	
Marsh Fritillary Habitat	
Project Title	
Extraction in Lemanaghan Bog, Co. Offaly	
Drawn By	Checked By
SS	RW
Project No.	Drawing No.
200804-e	Figure 6-6
Scale	Date
1:16,990	26.08.2025
 MKO Planning and Environmental Consultants Tuam Road, Galway Ireland, H91 VW84 +353 (0) 91 735611 email: info@mkofireland.ie Website: ww.mkofireland.ie	

6.3.2.3.8 Other species

During the walkover survey and/or deployment of camera traps, signs of the following mammal species were recorded:

- Fox (*Vulpes vulpes*) scat was recorded at various locations throughout the Application Site.
- Hare (*Lepus timidus hibernicus*) was occasionally recorded throughout the Application Site. The species is widespread throughout the habitats present and no dedicated survey for the species was required.
- Irish Stoat (*Mustela erminea hibernica*) was recorded on camera trap footage within the south of the Application Site. However, no dens were recorded within the Application Site.

In addition to the above mammal species (or signs thereof) that were recorded, it is likely that other species also occur on or around the Application Site but were not recorded during the site surveys that were undertaken. These include small mammal species such as wood mouse (*Apodemus sylvaticus*) and mink (*Mustela vison*). No signs of any of these species were recorded during the walkover surveys and no requirement for dedicated surveys was identified.

No records of common lizard were recorded within the Application Site. However, the species is likely to occur in the area.

Incidental records of invertebrate were recorded during the walkover surveys of the Application Site. In addition to the aquatic invertebrates identified during kick samples of the watercourses on site, the following include the species commonly recorded within the Application Site:

- Common hawker dragonfly (*Aeshna juncea*)
- Common darter damselfly (*Sympetrum striolatum*)
- Peacock butterfly (*Inachis io*)
- Speckled wood butterfly (*Pararge aegeria*)
- Green veined white (*Pieris napi*)
- Common blue damselfly (*Polyommatus icarus*)
- Small copper butterfly (*Lycaena phlaeas*)
- Painted lady butterfly (*Cynthia cardui*)
- Small tortoiseshell butterfly (*Aglais urticae*)
- Cinnabar moth (*Tyria jacobaeae*)
- Garden tiger moth (*Arctia caja*)
- Common carder bee (*Bombus pascuorum*)
- Buff-tailed bumblebee (*Bombus terrestris*)
- Garden spider (*Araneus diadematus*)
- Field grasshopper (*Chorthippus brunneus*)
- Common green grasshopper (*Omocestus viridulus*)

6.3.3 Identification of Key Ecological Receptors (KERs)

The preceding sections, have provided data on the ecology of Application Site through desk studies and field surveys, which have helped inform the 1988 baseline, as well as the current ecology baseline of the Application Site Using the 1988 baseline and the additional information data above, Table 6-16 identifies all receptors from all three phases of the Project (Peat Extraction Phase, Current Phase, and Remedial Phase) and assigns them an ecological importance in accordance with the TII Ecological Impact Assessment Guidelines (TII, 2009a). This table also provides the rationale for this determination and identifies the habitats and species that are Key Ecological Receptors (KERs). These likely significant effects on receptors identified as KERs is considered in Section 6.4 of this report.

Table 6-16 Key Ecological Receptors identified during the assessment

Ecological feature or species	Reason for inclusion as a KER	KER	Phase (s) During Which Feature is a KER
Designated Sites	Nationally Designated Sites The following pNHA is located downstream of the Application Site via watercourses draining the Application Site that ultimately discharge to the River Shannon. This site has been assessed as of National Importance in line with TII (2009a) guidelines as it is proposed as Natural Heritage Area (NHA). ➤ River Shannon Callows pNHA Taking a precautionary approach, the above listed downstream pNHA was identified in Table 6-3 above as occurring within the Zone of Influence and is included as a KER.	Yes	Peat Extraction Phase Current Phase Remedial Phase
	European Designated Sites The following Special Area of Conservation (SAC) and Special Protection Area (SPA) are located downstream of the Application Site via watercourses draining the Application Site that ultimately discharge to the River Shannon. They are identified in the AA Screening as being within the Likely Zone of influence and are assessed fully in the rNIS that accompanies this Substitute Consent application: ➤ River Shannon Callows SAC (designated in 2002) ➤ Middle Shannon Callows SPA (designated in 1996) These sites are assigned International Importance and included as a KER as a potential pathway for indirect effects on these sites via water pollution and disturbance of relevant QI/SCI species was identified. Refer to the rNIS submitted as part of this Substitute Consent application for full details. These European Sites were designated in 1996 and 2002 and therefore would not have been assessed as Internationally Important at the 1988 baseline.	Yes	Peat Extraction Phase Current Phase Remedial Phase
Aquatic Habitats and Related Species	Drainage Ditches The Application Site is drained by numerous drainage ditches. These are small man-made channels that are often devoid of vegetation and regularly maintained or choked with vegetation and are slow flowing. These drains are assigned Local Importance (Lower Value).	No	N/A
	Rivers and Streams The Brosna River is located adjacent to the Application Site and flows downstream into the River Shannon. The Lemanaghan Stream is located within the Application Site and feeds into the Brosna River. The Brosna River is of International Importance as it forms part of the River Shannon Callows SAC and Middle Shannon Callows SPA. A number of natural or slightly modified watercourses are located either within or at the perimeter of the Application Site. These watercourses include:	Yes	Peat Extraction Phase Current Phase Remedial Phase

Ecological feature or species	Reason for inclusion as a KER	KER	Phase (s) During Which Feature is a KER
	➤ Lemanaghan Stream (25L04), Ballynahown Stream (26B17), Fortified House Castlearmstrong Stream (25F69), Derrynagun Stream (25D94), Kilcolgan Beg Stream (25Q21) and Ferbane Stream (25F31). These smaller rivers and streams have been assigned Local Importance (Higher Value) in that whilst many are highly modified where they adjoin the Application Site, they are conduits to waterbodies with a high biodiversity value in the local area. They also provide a conduit to downstream European Sites of international importance.		
	Aquatic and Fisheries Species The aquatic species that are associated with the rivers and streams located within and surrounding the Application Site are assigned Local Importance (Higher Value) in that they have a high biodiversity value in the local context. There is potential for indirect effect on these receptors in the form of water pollution. These species include salmonid and coarse fish, lamprey species, white clawed crayfish (<i>Austropotamobius pallipes</i>), European eel (<i>Anguila anguila</i>), aquatic invertebrates and other aquatic species.	Yes	Peat Extraction Phase Current Phase Remedial Phase
Uncut Raised Bog	Areas of remnant uncut raised bog that are located as fragmented remnants at the peripheries of the Application Site (totalling c. 7.2 ha), are assigned County Importance. This is because the larger areas of this habitat, i.e. those >30ha in size which contain drains which could be blocked and which support typical bog vegetation, are considered to conform to the Annex I Habitat 'Degraded Raised Bog still Capable of Natural Regeneration (7120)'. Areas of remnant uncut raised bog are mostly present at the edges of the Application Site.	Yes	Peat Extraction Phase Current Phase Remedial Phase
Cutover Bog and Associated Secondary Habitats	Bare Peat Habitats The bare peat habitats are of low ecological importance in their current state and have been assigned Local Importance (Lower Value).	No	N/A
	Bog Woodland and Pioneering Scrub These habitats are assigned Local Importance (Higher Value). This is on the basis that they consist of semi-natural (although artificial) habitats with a high biodiversity value in the local area but do not correspond to habitats that are listed on Annex I of the EU Habitats Directive. Note: The bog woodland does not correspond to the Annex I Habitat Bog Woodland (91D0).	Yes	Peat Extraction Phase Current Phase Remedial Phase
	Poor Fen This habitat is assigned Local Importance (Higher Value). This is on the basis that it consists of semi-natural (although artificial) habitats with a high biodiversity value in the local area but do not correspond to habitats that are listed on Annex I of the EU Habitats Directive.	Yes	Peat Extraction Phase Current Phase Remedial Phase

Ecological feature or species	Reason for inclusion as a KER	KER	Phase (s) During Which Feature is a KER
	Heath Type Communities This habitat is assigned Local Importance (Higher Value) . This is on the basis that it consists of semi-natural (although artificial) habitats with a high biodiversity value in the local area but does not correspond to habitats that are listed on Annex I of the EU Habitats Directive.	Yes	Peat Extraction Phase Current Phase Remedial Phase
	Open Water No large oligotrophic lakes were recorded within the Application Site. Whilst wetter areas of the Application Site contained areas of open water, these are not permanent waterbodies. Given the absence of significant areas of open water habitat within or in close proximity to the Application Site this habitat is not included as a KER.	No	N/A
Grassland Habitats	Dry Meadows and Grassy Verges (GS2) and Dry Calcareous and Neutral Grassland (GS1) These habitats have been assessed as of Local Importance (Higher Value) due to their role in supporting local biodiversity and contributing to habitat diversity within the Application Site. These habitats are largely associated with artificial site access tracks, are common and widespread in the wider area and are unlikely to be significantly impacted. For this reason, they have not been identified for further assessment and are not a KER.	No	N/A
Spoil and Bare Ground (ED2), Recolonising Bare Ground (ED3) & Buildings and Artificial Surfaces (BL3)	These habitats are common and widespread in the wider area. The habitats have been assessed as of Local Importance (Lower Value) as they are largely associated with artificial site access tracks and are of low biodiversity value. For this reason, they have not been identified for further assessment and are not a KER.	No	N/A
Otter	In July 1988 the Application Site would likely have supported similar populations of otter as it does today. There is likely to be a regularly occurring population utilising the watercourses within and downstream of the Application Site. While no evidence of otter was recorded during any surveys of the Application Site, otters can utilise extensive territories, (approximately $7.5 \pm 1.5\text{km}$ for females and $13.2 \pm 5.3\text{km}$ for males (Ó'Neill, 2008)). On a precautionary basis, it is considered that otters potentially using watercourses within or downstream of the Application Site may be associated with River Shannon Callows SAC. They are therefore assessed as being of International Importance . Peat extraction and ancillary activities at the Application Site are likely to have had indirect effects on otter as a result of deterioration in water quality (supporting habitat) or disturbance/displacement during peat extraction and ancillary activities. Therefore, otter is included as a KER.	Yes	Peat Extraction Phase Current Phase Remedial Phase
Badger	Although a badger sett was recorded within the Application Site, the Application Site in its unmodified state, as an active raised bog prior to peat extraction and ancillary activities, is unlikely to have supported significant woodland and scrub habitat suitable for badger habitat.	No	N/A

Ecological feature or species	Reason for inclusion as a KER	KER	Phase (s) During Which Feature is a KER
	Badger has been assessed as of Local Importance (Higher Value) due to its legal protection status and the confirmed presence of a sett within the Application Site. Whilst some limited potential badger habitat may have been present in 1988, there is unlikely to have been any significant loss of badger habitat as a result of peat extraction and ancillary activities since 1988 as the most suitable habitat would have occurred in areas of woodland at bog margins. It is likely that the dry bog woodland which has since regenerated on many areas of the cutover bog provides more suitable badger habitat than would have existed had peat extraction and ancillary activities not been undertaken prior to 1988. The implementation of the rehabilitation plan for Lemanaghan Bog is unlikely to have a significant effect on this species. While there will be rewetting in areas, other parts of the bog will remain dry and continue to develop as woodland and scrub. Badger is not included as a KER.		
Marsh Fritillary	The Application Site contains suitable marsh fritillary habitat in areas, particularly within the grassy verges running parallel to tracks. During the targeted marsh fritillary surveys, no active larval webs were recorded in any suitable habitat within the Application Site. Marsh fritillary has been assessed as being of Local Importance (Higher Value) due to the presence of suitable, though limited, habitat and the conservation status of the species. Peat extraction and ancillary activities are unlikely to have resulted in loss of marsh fritillary habitat within the Application Site. The Application Site in its unmodified state, i.e. active raised bog, prior to peat extraction, is unlikely to have supported significant habitat for this species. On the contrary, the construction of infrastructure associated with peat extraction and ancillary activities, particularly the removal of raised bog habitat and creation railway lines, resulted in the creation of areas of cutover bog habitat and grassland. These habitats, where they support Devil's bit scabious (the larval food plant for marsh fritillary) provide suitable habitat for this species. The majority of the works which would have resulted in the creation of grassland and cutover bog habitat within the Application Site occurred prior to 1988. Therefore, significant impacts, neither positive nor negative, on this receptor are unlikely to have occurred during the Peat Extraction Phase and Current Phase. The implementation of the rehabilitation plan for Lemanaghan Bog during the Remedial Phase is unlikely to have a significant effect on this species, neither positive nor negative. While there will be rewetting in sections of the Application Site, as part of the Remedial Phase, the majority of the identified marsh fritillary habitat was recorded along tracks and as small fragmented islands on bare peat. Given that suitable habitat is predominantly found adjacent to roads, the works are unlikely to impact the habitat. Therefore, this species is not included as a KER.	No	N/A
Bats	Bat species have been assessed as of Local Importance (Higher Value) as they represent a resident or regularly occurring populations assessed to be important at the Local level and are listed in Annex IV of the EU	No	N/A

Ecological feature or species	Reason for inclusion as a KER	KER	Phase (s) During Which Feature is a KER
	Habitats Directive. Similarly to badger, significant suitable habitat for bat species is unlikely to have existed at the Application Site in its unmodified state. The linear landscape features currently present within the Application Site as secondary habitats of cutover bog, including woodland and scrub habitat, have come about as a result of natural revegetation of the cutover bog following cessation of peat extraction. These areas of woodland and scrub provide foraging and commuting habitat for bats species would have been largely absent in remnant uncut raised bog and large areas of bare peat that would have existed in the July 1988 baseline environment. As no significant roosting habitat for bats was recorded on the Application Site and as the rehabilitation plans for the Application Site are unlikely to result in significant impacts on bat species, bats are not included as a KER. Additionally, whilst the Application Site may have provided some sub-optimal foraging or commuting habitat for bats in the form of raised bog, the majority of this habitat was removed prior to the 1988 baseline.		
Bird Species	In July 1988 the Application Site would likely have supported populations of bird species similar to those present today and typical of cutover bog habitats. Based on the bird species assemblages from the Bird Atlases and recorded utilising the Application Site during breeding and wintering bird surveys undertaken by MKO in 2020-2025, birds have been assigned County Importance. Peat extraction and ancillary activities are likely to have had a negative effect on bird species utilising the cutover habitats of the Application Site (including any areas of remnant raised bog that have subsequently been subject to peat extraction and ancillary activities) as a result of habitat loss, disturbance and direct mortality. Therefore, birds are included as a KER.	Yes	Peat Extraction Phase Current Phase Remedial Phase
Reptiles and Amphibians	In July 1988 the Application Site would likely have supported populations of reptiles and amphibians similar to those present today and typical of cutover bog habitats. No evidence of populations of amphibians being significant at more than a local level was recorded. No likely significant effects on these species are anticipated as suitable habitat is present in the wider area. Based on the low number of amphibian records for the Application Site amphibians and reptiles have been assessed as of Local Importance (Lower Value).	No	N/A
Additional Fauna Species (e.g. Irish hare, fox etc).	The recorded evidence suggests that the Application Site is not utilised by populations of higher than local significance and no potential for significant effects have been identified at the population level. The Application Site surveys did not identify any other protected faunal species populations with the potential to be significantly affected by peat extraction and ancillary activities at the population level. Other faunal species are not considered further in this rELAR. Significant effects are not anticipated.	No	N/A

6.4 Ecological Impact Assessment

6.4.1 'Do-Nothing' Effect

As outlined in the EPA Guidelines (2022), the description of 'Do-Nothing Effects' relates to the environment as it would be in the future should the project not be carried out. Peat extraction was underway at the Application Site prior to the required date for the transposition of the EIA Directive in 1988. If peat extraction and ancillary activities had ceased from 1988 onwards, then consequently there would have been no further peat extraction and ancillary activities from the Application Site and therefore no impact on ecological receptors.

Those areas of bog in 1988 that had been subject to the installation of drainage in preparation for peat extraction and ancillary activities but not peat extraction itself, it is assumed in the 'do-nothing' scenario that drainage would have remained in situ. Maintenance works to keep established drainage channels clear would have ceased as of 1988 in the 'do-nothing' scenario. It is likely that these areas would have been subject to natural recolonisation of the bog surface.

However, consideration must be given to the following:

- The legislative mandate given to Bord na Móna in the form of the Turf Development Act 1946 (as amended) to acquire and develop peatlands; and
- The uncertainty with respect to the planning status of the activity did not arise until 2019 and was not evident in 1988.

Therefore, this 'Do-Nothing' option was not the chosen option. Peat extraction and ancillary activities have occurred at the Application Site from July 1988 onwards. A decision to cease peat extraction and ancillary activities at the Application Site was taken in 2020 and the Application Site needs to be considered in the context of regularising (without prejudice) the planning status of the lands to facilitate future development (subject to planning consent as required). The Application Site has and will continue to revegetate, and there will be a change from areas of cutover peatland to revegetated peatland. These are described in the individual chapters of this rEIAR.

As part of Bord na Móna's statutory obligations under IPC licence requirements, a Draft Cutaway Bog Decommissioning and Rehabilitation Plan will continue to be implemented for the Application Site separate to, and independent of, the Substitute Consent application. The implementation of this plan is included in the impact assessment below.

6.4.2 Likely Significant Effects

6.4.2.1 Peat Extraction Phase: July 1988 – June 2020

The following sections describe the likely significant effects of peat extraction and ancillary activities at the Application Site on Key Ecological Receptors (KERS) during the Peat Extraction Phase which includes all works undertaken from July 1988 to the cessation of peat extraction and ancillary activities in June 2020.

By 1988, peat extraction and ancillary activities were well established at the Application Site. Drainage was installed and railway infrastructure was laid as required.

Milled peat extraction, under the same processes described in Section 4.2.2.2.2 of this rEIAR, continued at the Application Site from 1988 until June 2020 when peat extraction and ancillary activities ceased across the Application Site. Improvements and modernisation of machinery occurred between 1988 and June 2020 which increased the efficiency and speed of operations over this time period. There were significant developments in diesel-powered engines which would have resulted in

the use of more fuel-efficient tractors on the bogs with significantly cleaner exhaust emissions compared to the baseline year of 1988 or pre-1988.

Peat extraction maps for the years 1988, 1995, 2004 and 2020 are shown in Figure 4-6 through to Figure 4-9 in Chapter 4 of this rEIA and illustrate the activity on the Application Site and the increasing area which was no longer subject to peat extraction and ancillary activities over time.

6.4.2.1.1 **Effects on Habitats (Habitat Loss, Fragmentation, Degradation)**

Table 6-17 below describes the likely significant effects of peat extraction and ancillary activities during the Peat Extraction Phase (July 1988 to June 2020) on the remnant uncut raised bog and cutover bog and associated secondary habitats at the Application Site.

Table 6-17 Likely significant effects on uncut raised bog and cutover bog and associated secondary habitats

Description of Effect	Since 1988, the main activities at the Application Site have included peat extraction, drainage and vegetation clearance/stripping. These activities have been largely confined to the area already affected by the original cutting and drainage which took place between 1950 and the 1980s. The impact of such activities was primarily the impediment and retardation of natural vegetation succession of the cutover bog and bare peat habitats present within the Application Site through continued operation. The mosaic of habitats that existed on the Application Site predominantly includes the following: ➤ Cutover bog ➤ Poor fen ➤ Bog woodland ➤ Dry meadows and grassy verges; ➤ Scrub and immature woodland; ➤ Dry heath; ➤ Artificial borders or hedgerows; ➤ Areas of agricultural grassland ➤ Remnant uncut raised bog In addition to the retardation of natural vegetation succession across the cutaway bog, there would also have been loss of areas of highly degraded, drained but uncut raised bog in the north and east of the Application Site. These areas, which comprise approximately 68ha, had been drained by 1988. An additional area measuring approximately 1.2 ha, located between the drained but uncut raised bog in the north and the peat extraction area, was neither drained nor subject to peat extraction. However, this area included a road that was present in 1988 and was adjacent to actively managed areas. As such, any undrained remnant bog that may have been present in this fragmented area would have been highly degraded.
Assessment of Significance prior to control measures	Following the initial cutting and drainage that occurred at the Application Site primarily between 1950 and the 1980s, the ongoing peat extraction and ancillary activities since 1988 are unlikely to have resulted in significant effects on the remaining bog habitats, which were highly modified from their natural state and in general of lower biodiversity value than the intact raised bog habitats that would have been on site prior to peat extraction and ancillary activities. It is considered that there would have been a long-term, negative effect, not significant at any geographic scale.
Control Measures	No control measures were in place between July 1988 and June 2020 to mitigate against or compensate for the loss of uncut raised bog and cutover bog and associated secondary habitats

6.4.2.1.2 Effects on Water Quality and Aquatic Fauna

This section assesses the potential for likely significant effects on water quality and aquatic receptors including aquatic habitats (i.e. watercourses) and species including salmonids, lamprey, coarse fish, white-clawed crayfish, European eel, aquatic invertebrates, molluscs and other aquatic species identified as occurring within or likely to occur downstream of the Application Site.

Table 6-18 Likely significant effects on Aquatic Habitats and Related Species

Description of Effect	The Application Site is drained by a number of small streams and rivers, all of which ultimately discharge to the River Shannon This river is designated as part of River Shannon Callows SAC and Middle Shannon Callows SPA. The effects on water quality are fully described in Chapter 8 Hydrology and Hydrogeology of this rEiAR and are described here in relation specifically to ecology. Suspended Solids Taking 1988 as the baseline, peat extraction and ancillary activities which were undertaken at different times and at different levels of intensity throughout the Application Site, from July 1988 until the cessation of peat extraction in June 2020, are likely to have resulted in indirect effects on aquatic receptors within and downstream of the Application Site in the form of water pollution in particularly suspended solids. During this time there would have been potential for indirect effects on aquatic receptors in the form of deterioration of water quality of the watercourses within and downstream of the Application Site (and therefore degradation of supporting habitat for aquatic fauna) due to the release of pollutants such as suspended solids. This would have occurred primarily during the construction of drainage channels, removal of surface vegetation and during peat extraction itself. During the Peat Extraction Phase, there was also an ongoing risk of elevated concentrations of suspended solids making their way into downstream surface watercourses from the erosion of peat sediment via the bog drainage network. In addition, the release of dissolved nutrients, principally ammonia, resulting from the rapid breakdown of organic matter within peat once exposed to air, could also have resulted in deterioration of water quality of watercourses within and downstream of the Application Site. Within the Application Site, the first silt ponds were constructed prior to 1988. Some improved sediment control measures were installed at the Application Site in the late 1990s and early 2000s. Since 2000, the Application Site has been regulated by the EPA under IPC Licence Registration No. P0500-01 and has been subject to the conditions of that licence which include emission limit values for suspended solids and other nutrients. Accidental Leakages and Spillage of Hydrocarbons During the Peat Extraction Phase there would also have been potential for pollution of surface water bodies and groundwater due to the accidental spillage of hydrocarbons during refuelling of machinery and plant. Discharges from wastewater systems (septic tanks) at office buildings, and at production centres and workshops could potentially also have caused surface and groundwater contamination. A review of available AERs (Annual Environmental Reports submitted to the EPA under the IPC licences included as Appendix 4-3 of this rEiAR) reports that no significant pollution events/spills to surface or groundwater have occurred since 2000 (refer to Chapter 8 Hydrology and Hydrogeology). Note: Whilst this impact assessment is in the aquatic habitats section, it also assesses the impact of the activities on aquatic species including salmonids, lamprey, coarse fish, white-clawed crayfish, European eel, aquatic invertebrates and other aquatic species. The
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	activities would have had no direct impact on the aquatic habitat of these species and there is no potential for disturbance. The only pathway for effect to occur is as a result of water pollution and this is discussed in this section in relation to habitats and species.
Assessment of Significance prior to control measures	In the absence of mitigation and regulation of activities under the IPC licence, the indirect effect of water pollution on aquatic receptors during peat extraction and ancillary activities is likely to have been a significant, long-term, negative and indirect effect. These effects are considered to have arisen primarily from increased suspended solids and nutrients associated with bog drainage and peat extraction and ancillary activities. The greatest effects would have occurred in the receiving streams closer to the Application Site, with the significance of effects decreasing progressively downstream along each waterbody. There was also potential for pollution of surface water and groundwater due to accidental spillages of hydrocarbons during refuelling of machinery and discharges from wastewater systems at site facilities. The effect of such spillages is considered to have been a significant, long-term, negative, indirect and unlikely effect on surface water quality and downstream aquatic ecosystems.
Control Measures	Suspended Solids <u>Pre-IPC Licence</u> Prior to the regulation of activities at the Boora Bog Group by the EPA which commenced in 2000, the Applicant was implementing several control measures to protect surface water quality in downstream waterbodies. These measures primarily relate to the concentrations of suspended sediments in discharge from the bog and are summarised below: ➤ Internal drains cleaned on a regular basis in suitable weather. This was completed to remove sludge from the bottom of ditches, allowing them to retain full functionality. The sludge was disposed of by spreading it on the adjacent production fields where it was dried and harvested; ➤ Drain maintenance was carried out using draglines and excavators, ensuring that these drains were fit for purpose; ➤ Drain maintenance was carried out mainly prior to and post the harvesting season. ➤ Silt ponds were utilised to control the amount of sediment being discharged at outfalls. At this time, silt ponds were designed for an upper limit of 100mg/l suspended sediment; ➤ Silt ponds were upgraded in the 1990s to cater for the settling of sufficient amount of silt. This often included the construction of a second silt pond adjacent to the first, which was used as a backup and to facilitate desludging of the primary pond; and, ➤ Silt ponds were deslugged twice per annum. <u>Active IPC Licence:</u> The Application Site has been regulated by the EPA under IPC Licence Registration No. P0500-01 since 2000. The bog group also has a Surface Water Management Plan⁸ which defines how compliance with the Licences is achieved. The drainage system in place at the bog comprises field drains, main drains, piped drains, silt ponds upstream of outfall locations, is designed to prevent the release of elevated concentrations of suspended sediments into nearby surface waterbodies. As part of the IPC Licence, there is a limit of 35mg/l for suspended solids. Monitoring only recorded 4 no. exceedances at the Application Site from a total of 57 no. samples from 2000 to 2024).

⁸ Current version: SWMP 0500 Boora 31.01.2020.pdf

Existing control measures which were implemented under the IPC licence are also designed to limit runoff rates from the bog units. These include:

- Silt ponds to attenuate surface water and limit runoff during periods of intense rainfall; and,
- Continuous mitigation included maintaining the schedule of cleaning the silt ponds at a minimum of twice per year.

Accidental Leaks and Spillages

Pre IPC Licence

Prior to the regulation of activities at the Application Site by the EPA which commenced in 2000, the Applicant was implementing several control measures to reduce the risk of contamination by spills and leakages. These measures primarily relate to the storage of peat harvesting machinery, refuelling procedures and waste management. These measures are summarised below and outlined in full in Chapter 4 at Section 4.3:

- All machinery were stored at the Lemanaghan Works at the end of each workday;
- All machinery were regularly inspected, serviced and cleaned. Cleaning was completed at a wash bay which drained towards an interceptor tank and associated soak pit;
- Where possible all refuelling was completed at the Lemanaghan Works;
- In the event that on-site refuelling was required, it was done with a mobile fuelling unit;
- In the event of an emergency spill, the following procedures were in place:
 - The General Manager (GM) was immediately informed of the incident.
 - The spill was assessed by the GM to assess the potential for environmental and/or health consequences.
 - The spill would have been sourced, isolated and contained with polystyrene booms or dry peat.
 - Every effort would have been made to prevent the spill from entering the nearest drain or outfall.
 - Once the spill was contained, a suitable absorbent (typically dry peat) was used to soak the spillage.
 - Follow up measures were taken to prevent such a spillage recurring in the future.
 - In the event of a spillage the GM notified the local authority.
- All waste oil and break fluids drained from machinery were collected in drums and emptied into a waste oil storage tank which were transported off-site by a licenced disposal contractor;
- All used oil and fuel filters and used batteries were collected by licenced disposal and battery collection contractors respectively; and,
- All washing from the self-contained machine parts washer was collected within a sludge tank at the Lemanaghan Works.

Active IPC Licence:

The refuelling procedures and control measures implemented by the Applicant were upgraded and enhanced in order to comply with IPC licence conditions with the Application Site being regulated by the EPA under IPC Licence Registration No. P0500-01 since 2000. The bog also has a Surface Water

	Management Plan⁹ which defines how compliance with the Licence is achieved. No additional control measures, other than compliance with the control measures regulated by the EPA, are considered necessary in terms of protecting groundwater quality. The list below outlines control measures conditioned under the IPC licencing regime, as regulated by the EPA: ➤ Effective spill/leak management of mobile fuelling units was undertaken; ➤ Replacement (and remediation where necessary) of all underground fuel tanks was undertaken; ➤ There were no other emissions to water of environmental significance; ➤ All tank and drum storage areas were rendered impervious to the materials stored therein. In addition, tank and drum storage areas was bunded; ➤ Drainage from bunded areas was diverted for collection and safe disposal; ➤ The integrity and water tightness of all the bunding structures and their resistance to penetration by water or other materials stored therein was tested and demonstrated by the licensee to the satisfaction of the Agency and shall be reported to the Agency within eighteen months from the date of grant of this licence and every two years thereafter; ➤ The loading and unloading of fuel oils was carried out in designated areas protected against spillage and leachate run-off; ➤ While awaiting disposal, all materials were collected and stored in designated areas protected against spillage and leachate run-off; ➤ Except for roof water, all surface water discharges from workshop areas were fitted with oil interceptors; ➤ An inspection for leaks on all flanges and valves on over-ground pipes used to transport materials other than water was carried out weekly; ➤ The Applicant undertook a programme of testing and inspection of underground fuel pipelines to ensure that all underground fuel lines were tested at least every three years; and, ➤ The Applicant maintained (in storage) an adequate supply of containment booms and/or suitable absorbent material to contain and absorb any spillage.
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6.4.2.1.3 Effects on Fauna

Peat extraction and ancillary activities were likely to have resulted in some habitat loss and disturbance impacts for a number of faunal species including otter, aquatic fauna and bird species. The potential effects on these species are assessed in the tables below.

With the exception of the above species, it is unlikely that peat extraction and ancillary activities would have resulted in significant negative effects on any other protected faunal species. The habitats present at the Application Site at the time i.e. bare peat, cutover bog, raised bog remnants are unlikely to have provided significant supporting habitat for populations of mammal, reptile/amphibian species of greater than local importance.

While one badger sett was recorded within the Application Site during site surveys in 2021-2024, the suitable supporting habitat such as dry bog woodland and scrub regenerated since the cessation of peat extraction and ancillary activities and would not have been present during this phase. Similarly, the linear landscape features currently present within the Application Site as secondary habitats of cutover bog, including woodland and scrub habitat, have come about as a result of natural revegetation of the cutover bog following cessation of peat extraction and ancillary activities and therefore would not have provided foraging and commuting habitat for bat species during the Peat Extraction Phase.

Marsh fritillary is known to occur in the wider area surrounding the Application Site. This species is dependent on the presence of the larval food plant devil's bit scabious. Small areas of suitable habitat are scattered throughout the Application Site, primarily associated with locations where stone material

⁹ Current versions: SWMP 0501 Derrygreenagh 31.01.2020.pdf

was imported for the construction of railway tracks, access roads, and related infrastructure, and these habitats were most frequently found along the verges of access roads. These suitable habitats have come about as a result of peat extraction and ancillary activities. Therefore, peat extraction and ancillary activities at the Application Site are unlikely to have resulted in significant negative effects on marsh fritillary.

The peat extraction and ancillary activities that took place at the Application Site during the Peat Extraction Phase are unlikely to have resulted in significant negative effects on any additional fauna species other than otter and bird species.

The potential for significant effects on aquatic species is restricted to indirect effects on their habitat resulting from water pollution. This has been assessed in Section 6.4.2.1.2 above and is not repeated below.

Assessment of Potential Effects on Otter

Table 6-19 Assessment of likely significant effects on otter

Description of Effect	Habitat Loss/Degradation The potential for impacts on otter as a result of peat extraction and ancillary activities would mainly have been in the form of indirect impacts on otter habitat as a result of deterioration of water quality. This is assessed in Table 6-18 above 'Potential for impact on Watercourses and Sensitive Aquatic Species'
	Disturbance There would have been potential for disturbance of otter where they occurred within and adjacent to the Application Site during peat extraction and ancillary activities. Potential for effects on otter has been considered with regard to NPWS 'Threat Response Plan' ¹⁰ (TRP) which identifies four significant threats facing otter in an Irish context: habitat destruction, water pollution, disturbance (recreational sources) and accidental death/persecution.
Assessment of Significance prior to control measures	Habitat Loss/Degradation The likely effects due to deterioration in water quality are assessed in Table 6-18 above 'Potential for impact on Watercourses and Sensitive Aquatic Species'
	Disturbance Otter are predominantly crepuscular in nature and most peat extraction and ancillary activities would have been confined to daytime hours, thus minimising potential disturbance related impacts to the species. Channin (2003) provides a literary review with regard to anthropogenic disturbance and refers to several reports which have found that disturbance is not detrimental to otters (Jefferies, 1987; Durbin, 1993; Green & Green 1997). Irish Wildlife Manual No 76 (National Otter Survey of Ireland 2010/2012) notes that the occurrence of otter was unaffected by perceived levels of disturbance at the survey sites. It also notes that there is little published evidence demonstrating any consistent relationship between otter occurrence

¹⁰ NPWS (2009) Threat Response Plan: Otter (2009-2011). National Parks & Wildlife Service, Department of the Environment, Heritage & Local Government, Dublin.

	and human disturbance (Mason & Macdonald, 1986; Delibes <i>et al.</i> 1991; Bailey & Rochford, 2006). Although a small number of streams and rivers drain the Application Site, the majority of these are located near its peripheries and the vast majority of watercourses within the Application Site are artificial drainage channels with low suitability for otter, and indirect impacts on otter as a result of disturbance during peat extraction and ancillary activities works are not likely to have been significant. Therefore, effects on otter were negative, short-term, and unlikely to have occurred, given the limited suitability of habitats and daytime nature of works, and not considered significant at any geographic scale.
Control Measures	Habitat Loss/Degradation Mitigation to prevent indirect impacts on water quality is as per Table 6-18 above 'Potential for impact on Watercourses and Sensitive Aquatic Species'
	Disturbance No control measures would have been required during the Peat Extraction Phase.

Assessment of Potential Effects on Bird Species

Peat extraction and ancillary activities are likely to have had an indirect effect on wetland bird species where they occurred within and downstream of the Application Site, as a result of habitat degradation due to deterioration on water quality. The potential impacts on water quality, and therefore on supporting wetland habitat for bird species, is as described in Table 6-18 above 'Potential for impact on Watercourses and Sensitive Aquatic Species'.

An assessment of the likely potential effects on bird species during the Peat Extraction Phase is provided in Table 6-20 below.

Table 6-20 Assessment of likely significant effects on birds

Description of Effect	Habitat Loss/Degradation The main impact of peat extraction and ancillary activities works during the Peat Extraction Phase was primarily the impediment and retardation of natural vegetation and habitat succession throughout the Application Site through continued operation. Where peat extraction and ancillary activities had ceased for some time, the habitats present have revegetated at different rates throughout the Application Site. As the habitats on site revegetated to form the current mosaic of cutover habitats, including scrub and heath habitat, this would have created suitable habitat for a variety of other bird species including meadow pipit and snipe.
	Disturbance/Displacement Any disturbance related effects on birds would have been predominantly restricted to species typical of the cutover bog habitats in the Application Site, e.g. snipe, meadow pipit. There are likely to have been some levels of disturbance to these species from activities including the ongoing use of peat harvesting machinery and construction of the railway tracks and works areas.

Assessment of Significance prior to control measures	Habitat Loss/Degradation Peat extraction and ancillary activities at the Application Site during the Peat Extraction Phase was confined largely to the area already affected by the original cutting and drainage. There are unlikely to have been significant effects on birds as a result of habitat loss during this time given the highly modified nature (from their original state) of the majority of the habitats on site by 1988. Therefore, effects are considered to be negative, long-term and unlikely, given the low suitability of affected habitats, their previously modified condition, and the limited geographic extent of works. As such, the effect is assessed as not significant at any geographic scale
	Disturbance/Displacement Peat extraction and ancillary activities at the Application Site during the Peat Extraction Phase was largely confined to the area already affected by the original cutting and drainage and ongoing effects with regard to disturbance was unlikely to have been significant. Therefore, effects are considered to be negative, short-term and unlikely, given the low suitability of affected habitats, their previously modified condition, and the limited geographic extent of works. As such, the effect is assessed as not significant at any geographic scale
Control Measures	No known control measures were in place during the Peat Extraction Phase to mitigate against or compensate for the loss of raised bog and habitats of cutover raised bog.

6.4.2.1.4 Effects on Designated Sites

The Application Site is not located within the boundaries of any Nationally or European designated sites. Therefore, there were no direct effects on any designated sites during the Peat Extraction Phase.

In relation to European sites, an Appropriate Assessment Screening Report and remedial Natura Impact Statement (rNIS) have been prepared to provide the competent authorities with the information necessary to complete an Appropriate Assessment in compliance with Article 6(3) of the Habitats Directive.

As per EPA Guidance (2022), “a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement” but should “incorporate their key findings as available and appropriate”. This section provides a summary of the key assessment findings with regard to Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

The Screening for Appropriate Assessment concluded as follows:

‘it cannot be excluded beyond reasonable scientific doubt, in view of best scientific knowledge, on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the above described peat extraction activities and ancillary works, individually or in combination with other plans and projects, would be likely to have or have had a significant effect on the following sites:

- River Shannon Callows SAC
- Middle Shannon Callows SPA

As a result, an Appropriate Assessment is required, and a remedial Natura Impact Statement shall be prepared in respect of the above-described peat extraction activities and all ancillary works in order to assess whether they have had the potential to adversely impact the integrity of these European Sites or have the potential to do so in the future.'

During the Peat Extraction Phase, there would likely have been indirect effects on the aquatic QIs of these European Sites as a result of deterioration of water quality in the watercourses within and downstream of the Application Site which ultimately discharge to the River Shannon. The River Shannon is designated as part of the River Shannon Callows SAC and Middle Shannon Callows SPA. Impacts could potentially have occurred during the construction of drainage channels, removal of surface vegetation and during peat extraction and ancillary activities. The likely significant effects on these European Sites are described in detail within the rNIS prepared for this Substitute Consent application. The rNIS concluded that, taking into account the control measures implemented prior to and after 2000, the Project has not resulted in significant adverse effects on the integrity of any European Sites.

The Application Site has been regulated by the EPA under IPC Licence Registration No. P0500-01 since 2000. In addition, the drainage system has been designed to limit runoff from the Application Site via low-gradient field drains, mains drains, and silt ponds. Control measures relating to the protection of water quality are outlined in Table 6-18 above. Given the control measures that have been in place since regulation of the Application Site under IPC licence, no potential for significant adverse effects on these European Sites was identified.

The following pNHA was identified in Table 6-3 above as being within the likely Zone of Influence of the Project:

➤ River Shannon Callows pNHA

Prior to the regulation of activities at the Application Site by the EPA which commenced in 2000, the Applicant was implementing several control measures to protect surface water quality in downstream waterbodies, as detailed in Table 6-18. With these control measures in place, it was unlikely that significant effects on the above National Site occurred, as a result of the Peat Extraction Phase of the Project.

6.4.2.2 Current Phase June 2020 - Present

The Current Phase of the Project encompasses the period of time between the cessation of peat extraction and ancillary activities at the Application Site in June 2020 to the present day. Since the cessation of peat extraction in June 2020, all commercial milled peat production ceased and subsequent activity has been minimal. To date, the only decommissioning undertaken at the Application Site has been the removal of the remaining peat stockpiles from the bog, which was completed by 2024. Maintenance of surface water management infrastructure, including drainage outfalls and silt traps, is ongoing to ensure appropriate control of runoff and local hydrology. The peat surface across much of the Application Site remains exposed, with some areas showing early stages of natural colonisation by vegetation. Routine inspections and environmental monitoring have been conducted to assess site stability, vegetation development, and water quality. The Application Site currently remains in a transitional state, reflecting the end of industrial use and the onset of passive ecological recovery.

6.4.2.2.1 Effects on Habitats (Habitat Loss, Fragmentation, Degradation)

Table 6-21 describes the likely significant effects on Habitats during the Current Phase (June 2020 to Present).

Table 6-21 Likely significant effects on uncut raised bog and cutover bog and associated secondary habitats

Description of Effect	Since the cessation of peat extraction and ancillary activities at the Application Site in June 2020, there has been no additional loss or drainage of any of the cutover or remnant raised bog habitats within the Application Site. Activities have been confined solely to removal of stockpiled peat at the Application Site. Access to these areas is via existing machinery tracks.
Assessment of Significance prior to control measures	There has been no additional loss, degradation or fragmentation of habitat as a result of removal of peat stockpiles. Machinery accessing the stockpiles on the Application Site was confined to areas already subject to peat extraction and ancillary activities. No additional drainage, vegetation removal, peat harvesting has been undertaken. No significant effects on uncut raised bog and cutover bog and associated secondary habitats are likely to have occurred during the Current Phase of the Project, as a result of habitat loss/degradation, or fragmentation, at any geographic scale.
Control Measures	No control measures

6.4.2.2.2 Effects on Water Quality and Aquatic Fauna

Table 6-22 describes the likely significant effects on Water Quality and Aquatic Fauna during the Current Phase (June 2020 to Present).

Table 6-22 Likely Significant Effects on Aquatic Habitats and Related Species

Description of Effect	Since the cessation of peat extraction and ancillary activities at the Application Site in June 2020, there was less potential for release of suspended sediments and pollution of water quality. There was also less potential for accidental spillage of pollutants due to the reduced machinery operating on site. During the Current Phase the Application Site drainage still operated under the same drainage systems as during the Peat Extraction Phase i.e. field drains, main drains, silt ponds and discharge outlets etc. Therefore, discharge volumes from the Application Site to nearby surface watercourses will be comparable to surface water discharges during the Peat Extraction Phase Despite the cessation of peat extraction and ancillary activities at the Application Site, there is limited activity at the Application Site involving machinery and plant, with which there is always a risk of accidental spillage of hydrocarbons.. These risks are the same as those outlined in Section 6.4.2.1.2 above but to a lesser extent due to the lower volumes of plant, machinery and workers operating at the Application Site during the Current Phase. Note: Whilst this impact assessment is in the aquatic habitats section, it also assesses the impact of the Project on aquatic species including salmonids, lamprey, coarse fish, white-clawed crayfish, European eel, aquatic invertebrates and other aquatic species. The Project had no direct impact on the aquatic habitat of these species and therefore there was no potential for disturbance. The only pathway for effect to occur is as a result of water pollution and this is discussed in this section in relation to habitats and species.
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Assessment of Significance prior to control measures	Even in the absence of control measures there are no significant effects on downstream watercourses due to the restricted nature of the works completed in this phase. However, in the absence of control measures relating to hydrocarbons, the effect would be negative, short-term, indirect, unlikely effect on surface water quality.
Control Measures	During the Current Phase the Application Site continued to operate under IPC licensing requirements with respect to surface water discharge quality and quantity. Control measures are as outlined in Table 6-18 above.

6.4.2.2.3 **Effects on Fauna**

Effects on fauna as a result of the Current Phase would have been limited to the potential for degradation of water quality affecting aquatic habitats and related species, as well as disturbance of otter and bird Species due to the operation of plant and machinery.

The likely significant effects on water quality and supporting habitat for aquatic species are as described in Table 6-22 above but at a reduced scale and intensity during the Current Phase compared to the Peat Extraction Phase due to the lower volumes of plant, machinery, and workers present on site. As a result, these effects are assessed to be not significant.

The likely significant effects on otter and bird species, due to disturbance and displacement are as per Tables 6-19 and 6-20 above, however, at a reduced scale and intensity during the Current Phase compared to the Peat Extraction Phase due to the lower volumes of plant, machinery, and workers present on site. Accessing peat stockpiles in the Application Site was via existing machine passes and therefore no vegetation removal and therefore no significant loss of supporting habitat for faunal species would have occurred. These effects are therefore assessed to be not significant.

6.4.2.2.4 **Effects on Designated Sites**

Despite the cessation of peat extraction and ancillary activities at the Application Site, there was still some limited activity at the Application Site involving machinery and plant (removal of stockpiles ceased in 2024), the maintenance of the existing drainage network and environmental monitoring.

The Application Site is hydrologically linked with the Middle Shannon Callows SPA and the River Shannon Callows SAC/pNHA. The risks to the receiving waters (in terms of water quantity and water quality) are the same as those outlined in Section 6.4.2.1.2 but to a much lesser extent due to the lower intensity of works being completed at the Application Site. Less activity on-site has decreased the likelihood of pollution incidents or exceedances of discharge limits occurring. The risk is much reduced in comparison to the Peat-Extraction Phase of the Project and these effects are assessed to be not significant

Where decommissioning works are ongoing at the Application Site as part of the condition 10 of the IPC licence, as described in Section 6.4.2.2 above, these works operate within the constraints of the relevant IPC licence (EPA IPC Licence - Ref. P0500-01). There will be no deterioration of water quality and thus, no impacts on any National or European Sites.

6.4.2.3 **Remedial Phase**

Under Condition 10.2 of the IPC Licence (Ref. P0500-01), a Draft Cutaway Bog Decommissioning and Rehabilitation Plan must be prepared for the permanent rehabilitation of the boglands within the licensed area. The Applicant has produced a Draft Cutaway Bog Decommissioning and Rehabilitation Plan for Lemanaghan Bog (the Application Site), and it is the intention of the Applicant to rehabilitate the bog in a phased approach under IPC licence. The Draft Cutaway Bog Decommissioning and

Rehabilitation Plan is included in Appendix 4-2 of this rEIAR and the details of the plan are summarised in Chapter 4. The Remedial Phase involves the implementation of the rehabilitation plan.

Natural colonisation will form the basis for the environmental stabilisation of the bare peat areas. Re-wetting of the cutaway, where possible, will also be a rehabilitation strategy and will be undertaken via passive measures such as drain blocking using peat dams, and modification or removal of outfalls, as described in Chapter 4 of the rEIAR. In some cases, overflow pipes will be installed to manage water levels. Prior to the finalisation and submission of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan to the EPA, a baseline ecology survey was carried out to determine the status of natural colonisation, the potential for targeted revegetation and/or rewetting, and the future development of the Application Site to ensure stabilisation of the former cutaway.

The main target will be to maintain water levels close to the peat surface and to avoid the creation of large waterbodies. Re-wetting and water levels close to the peat surface accelerate the re-vegetation process, the development of vegetation cover, and therefore environmental stabilisation.

According to the Draft Cutaway Bog Decommissioning and Rehabilitation Plan for Lemanaghan Bog (the Application Site), it is not expected that the majority of the Application Site has the potential to develop active raised bog analogous to the priority EU Habitats Directive Annex I habitat within the foreseeable future (c. 50 years). Furthermore, only a small proportion of the bog has potential to develop Sphagnum-rich habitats in this timeframe. Nevertheless, re-wetting across the entire bog will improve overall habitat conditions. Other peatland and wetland habitats will develop in a wider mosaic that reflects the underlying conditions and hydrology of the Application Site.

Rehabilitating the former cutaway bog will also, in the longer term, support other ecosystem services such as the development of new habitats to support biodiversity and the local attenuation of water flows from the bog.

6.4.2.3.1 **Effects on Habitats (Habitat Loss, Fragmentation, Degradation)**

Table 6-23 describes the likely significant effects on Habitats during the Remedial Phase.

Table 6-23 Likely significant effects on uncut raised bog and cutover bog and associated secondary habitats

Description of Effect	
	The implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan at the Application Site will involve a combination of rehabilitation measures and natural colonisation (as well as continued vegetational succession) of cutaway/cutover habitats within the Application Site. Natural colonisation will form the basis for the environmental stabilisation of the bare peat areas. Re-wetting of the cutaway, where possible, is a general rehabilitation strategy. The main target will be to maintain water-levels close to the peat surface, and to avoid the creation of large-water bodies. Re-wetting and water levels close to the peat surface accelerates the re-vegetation processes, the development of vegetation cover and therefore environmental stabilisation. A widespread drain-blocking programme will be implemented across the cutaway, where possible. In general, field drains will be blocked where possible to re-wet cutaway and re-wet to the optimum water-level. More intensive measures will be targeted towards the bare peat. Less intensive measures (targeted drain-blocking) will be used in areas where habitats have already established. Wetland measures including blocking outfalls and managing water levels with overflow pipes will also be undertaken.

	Given the nature of the rehabilitation works, i.e. drain blocking and natural recolonisation, there is no potential for significant loss of any peatland habitat as a result of the works and/or machinery required onsite during the implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan. There is potential for the Draft Cutaway Bog Decommissioning and Rehabilitation Plan to have a positive effect on the habitats present at the Application Site. Natural vegetation succession within the existing cutover habitats and areas of bare peat will result in an increase in habitat diversity within the Application Site. Whilst it is not anticipated that the majority of the Application Site has the potential to develop active raised bog analogous to the priority EU Habitats Directive Annex I habitat within the foreseeable future (c.50 years), rewetting will nonetheless result in an overall improvement in the condition of the peatland habitats within the Application Site.
Assessment of Significance prior to mitigation	According to the Draft Cutaway Bog Decommissioning and Rehabilitation Plan it is not anticipated that the Application Site has the potential to develop active raised bog analogous to the priority EU Habitats Directive Annex I habitat in the foreseeable future (c. 50 years). Nevertheless, re-wetting, where this will be implemented, has potential to improve habitat conditions of the bogs, however it will take some time for stable naturally functioning ecosystems to develop. In addition, the continuation of natural vegetation succession will result in the revegetation of bare peat areas and therefore an increase in the habitat diversity within the Application Site. The implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan has the potential to result in an increase in biodiversity and habitat diversity and well as an improvement to the condition of the peatland habitats on site through re-wetting. It is anticipated that there will be long-term positive effects on habitats within the Application Site as a result of the Remedial Phase of the Project, significant at the local to county scale.
Mitigation	Whilst no loss or degradation of habitat is anticipated as a result of the works/machinery required on the Application Site to implement the Draft Cutaway Bog Decommissioning and Rehabilitation Plan the following best practice measures will be implemented. ➤ Bog restoration/rehabilitation measures will be restricted to within the footprint of the proposed rehabilitation area as outlined in the Draft Cutaway Bog Decommissioning and Rehabilitation Plan. ➤ Measures will be carried out using a suitably sized machine and, in all circumstances, excavation depths and volumes will be minimised where possible.

6.4.2.3.2 Effects on Aquatic Habitats and Related Species

Table 6-24 describes the likely significant effects on Aquatic Habitats and Related Species during the Remedial Phase.

Table 6-24 Likely significant effects on Aquatic Habitats and Related Species

Description of Effect	The implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan at the Application Site aims to stabilise the former peat extraction areas via drain blocking, reprofiling of peat fields and seeding of vegetation. Natural colonisation and targeted re-wetting will encourage revegetation of the former bare peat areas which in turn will stabilise substrates reducing the potential for elevation concentrations of suspended solids in runoff from the Application Site. This will also have benefits for aquatic fauna in terms of improved water quality and therefore habitat quality. Silt ponds will continue to operate during the early stages of the rehabilitation process and will only be decommissioned when the Application Site is deemed to be on a trajectory of environmental stability and/or rehabilitation has been completed. The water quality improvements associated with rehabilitated peatlands are not limited to reduced suspended solid concentrations. International studies have shown a long-term reduction in pollutant concentrations, including nitrate and ammonia, following rewetting in comparison to drained peatlands (Pschenyckj. C. <i>et al.</i> 2021). While several studies have shown that the magnitude of these positive effects depends on site-specific factors such as the degree of degradation and local peat characteristics, all studies have shown an overall long-term decrease in pollutant concentrations (Negassa <i>et al.</i>, 2020). During the implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan there will be some small-scale activity at the Application Site involving machinery and plant with which there is always a risk of accidental spillage of hydrocarbons. Similarly, the buildings remain occupied and discharges from wastewater systems (septic tanks) etc. have the potential to cause surface water and groundwater contamination. These risks are the same as those outlined in Table 6-18 above and of a much-reduced nature to those during the Peat Extraction Phase due to the lower volumes of plant, machinery and workers operating at the Application Site during the Remedial Phase.
Assessment of Significance prior to mitigation	In the absence of mitigation there is potential for the operations at the Application Site during the implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan to have a significant, negative, indirect, short-term, unlikely effect on water quality due to potential leakages and spillages. Following the implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan the bogs will be wetter, they will retain more water, they will recolonise with vegetation slowly, and they will eventually become naturally functioning peatlands with much-reduced silt and nutrient output. The outcome of the implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan has potential to have a positive, moderate, indirect, long-term, likely effect on downstream surface water quality/quantity. Overall, in the long term, the remedial phase is assessed as having a positive, moderate, indirect, long-term, likely effect following implementation.
Mitigation	As outlined in Chapter 8 Hydrology and Hydrogeology, the existing drainage systems and silt control measures will continue to operate during the early stages of the rehabilitation plans when there is the potential for the entrainment of suspended solids in surface waters during drain blocking. During this time no remedial works will be completed during periods of prolonged rainfall. Silt ponds will continue to be in use and will be regularly inspected and maintained as per IPC licence requirements.

	As outlined in Chapter 8, following implementation of the rehabilitation measures a programme of aftercare and maintenance, designed in accordance to meet the Conditions of the IPC Licence, will be completed at the Application Site. This will comprise of initial quarterly monitoring, with the number of site visits reducing after 2 years to bi-annually and then after 5 years to annual visits. A water quality monitoring program will be established to monitor the impact of rehabilitation on water quality discharge from the Application Site. The monitoring results will be reported on each year to the EPA with the parameters to be included as follows: monthly monitoring for pH, Suspended Solids, Total Solids, Total Phosphorus, Total Ammonia, Colour, and COD and DOC. In addition: ➤ All machinery will be regularly checked and maintained prior to arrival at the Application Site; ➤ Fuelling and lubrication of equipment will only be completed in designated areas and away from surface water features; ➤ Vehicles will never be left unattended during refuelling; ➤ All refuelling will occur in mobile fuel bowers; ➤ Only dedicated, trained and competent personnel will complete refuelling operations; ➤ Fuel bowers will be banded to 100% capacity to prevent any spills; ➤ Storage tanks for bowers and generators will be double-skinned; ➤ Waste oils and fluids will be collected in leak proof containers and removed from the Application Site for disposal; ➤ Spill kits will be kept on site; and, ➤ All activities will be completed in accordance with current 'best practice' procedures.
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6.4.2.3.3 Effects on Fauna

Natural recolonisation of the bogs will form the basis for the Draft Cutaway Bog Decommissioning and Rehabilitation Plan. The habitats which have developed on the cutaway bogs to date following cessation of peat extraction and ancillary activities include heath, scrub and woodland habitats and it is likely these habitats will also establish with time on drier areas of the cutover bog where natural vegetation colonisation is allowed to proceed. These habitats provide cover and nesting habitat for a range of bird species. They also provide areas of linear habitat with connectivity to the wider landscape and therefore provide suitable foraging and commuting habitat for bat species and other small mammals. Woodland and scrub also provide areas of potential badger habitat within the Application Site.

Potential for impacts in species identified as KERs in Table 6-16 above are discussed below.

Assessment of Potential Effects on Otter

Table 6-25 describes the potential significant effects on Otter during the Remedial Phase.

Table 6-25 Assessment of potential significant effects on otter during the Remedial Phase

Description of Effect	Habitat
	Implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan at the Application Site aims to stabilise the former peat extraction areas. Natural colonisation and targeted re-wetting will encourage revegetation of the former bare peat areas which in turn will stabilise substrates reducing the potential for elevation concentrations of suspended solids in runoff from the Application Site. This will also have benefits for aquatic fauna, including otter, in terms of improved water quality and therefore habitat quality. This is fully assessed in Table 6-24 Water Quality above.

	The implementation of the rehabilitation plans will involve targeted drain blocking and rewetting in the Application Site. Although otter may utilise drains within the Application Site for foraging and commuting, these habitats provide sub-optimal habitat for this species, with the stream around the peripheries of the Application Site providing more suitable otter habitat than artificial drains. The blocking of drains within the Application Site is unlikely to have a significant impact on otter in terms of habitat loss.
	Disturbance Drain blocking and re-wetting, which will form an element of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan will involve the presence of small-scale machinery and personnel on site which creates potential for disturbance of otter utilising the Application Site. However, volumes of machinery on site will be much reduced compared to volumes that would have operated on site during the Peat Extraction Phase. While there will be some potential for disturbance of otter during the Remedial Phase, this will be of a much-reduced nature when compared to the Peat Extraction Phase.
Assessment of Significance prior to mitigation	Habitat The likely effects due to improvements in water quality are assessed in Table 6-24 above 'Likely significant effects on Aquatic Habitats and Related Species'
	Disturbance Otter are predominantly crepuscular in nature and most Remedial Phase activities would have been confined to daytime hours, thus minimizing potential disturbance related impacts to the species. Channin (2003) provides a literary review with regard to anthropogenic disturbance and refers to several reports which have found that disturbance is not detrimental to otters (Jefferies, 1987; Durbin, 1993; Green & Green, 1997). Irish Wildlife Manual No 76 (National Otter Survey of Ireland 2010/2012) notes that the occurrence of otter was unaffected by perceived levels of disturbance at the survey sites. It also notes that there is little published evidence demonstrating any consistent relationship between otter occurrence and human disturbance (Mason & Macdonald, 1986; Delibes <i>et al.</i> 1991; Bailey & Rochford, 2006). The requirement for machinery and personnel on site during rehabilitation activities will be short term and the volumes of machinery and personnel will be much reduced in comparison to the Peat Extraction Phase. There is potential for temporary impacts on otter due to disturbance during the Remedial Phase. However, it is unlikely that the implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan will have any significant effect on otter. Although a small number of streams and rivers drain the Application Site, the majority of these are located towards the peripheries of the Application Site and the vast majority of watercourses within the Application Site are artificial drainage channels with low suitability for otter. No significant effects on otter are anticipated as a result of disturbance, during the Remedial Phase of the Project, at any geographic scale.
Mitigation	Habitat Loss/Degradation Mitigation to prevent indirect impacts on water quality is as per Table 6-24 above 'Potential for impact on Watercourses and Sensitive Aquatic Species'
	Disturbance

	> 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 Application 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 Remedial Phase activities will be restricted to daylight hours and there will be no requirement for artificial lighting.
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Assessment of Potential Effects on Birds

Table 6-26 describes the potential significant effects on Birds during the Remedial Phase.

Table 6-26 Assessment of potential significant effects on birds during the Remedial Phase

Description of Effect	Habitat Creation Natural recolonisation of the bogs will form the basis for the Draft Cutaway Bog Decommissioning and Rehabilitation Plan. This is likely to create a diversity of habitats for bird species. The habitats which have developed on the Application Site during the Current Phase (and in some areas of the Application Site during the Peat Extraction Phase) following cessation of peat extraction and ancillary activities include heath, scrub and woodland habitats and it is likely these habitats will also establish with time on drier areas of the cutover bog where natural vegetation colonisation is allowed to proceed. These habitats provide cover and nesting habitat for a range of bird species including meadow pipit, snipe and skylark. Targeted rewetting of areas also has potential to create areas of wetland habitat within the Application Site which will benefit wetland bird species and enhance habitat diversity within the Application Site.
	Disturbance Drain blocking and re-wetting, which will form an element of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan will involve the presence of small-scale machinery and personnel on site which creates potential for disturbance of bird species utilising the Application Site. However, volumes of machinery on site will be much reduced compared to volumes that would have operated on site during the Peat Extraction Phase. While there will be some potential for disturbance of bird species during the Remedial Phase, this will be of a much-reduced nature when compared to the Peat Extraction Phase.
Assessment of Significance prior to mitigation	Habitat The implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan that is required to comply with Condition 10 of the IPC licence will result in a positive impact on the habitats that exist on the Application Site at present, following cessation of the peat extraction and ancillary activities at the Application Site. This has potential for positive impacts on bird species, significant at the local to county scale, through the creation of new habitat.

	Disturbance The requirement for machinery and personnel on the Application Site during rehabilitation activities will be short term and the volumes of machinery and personnel will be much reduced in comparison to the Peat Extraction Phase. While there is some potential for disturbance to bird species using the Application Site it is unlikely that to result in any significant impacts on bird species. Implementation of the Remedial Phase is unlikely to have any significant effect on bird species within the Application Site as a result of disturbance, at any geographic scale.
Mitigation	➤ 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 Application 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.

6.4.2.3.4 *Effects on Designated Sites*

There are several National and European Sites downstream of the Application Site, as per Section 6.4.2.1.4 above, and there would likely have been indirect effects on the aquatic receptors of these Sites as a result of deterioration of water quality in the watercourses within and downstream of the Application Site which ultimately discharge to the River Shannon.

The implementation of the rehabilitation plans for the Application Site aims to stabilise the former peat extraction areas. Natural colonisation and targeted re-wetting will encourage revegetation of the former bare peat areas which in turn will stabilise substrates reducing the potential for elevation concentrations of suspended solids in runoff from the Application Site.

Given the reduced and small-scale nature of the operations anticipated at the Application Site during the works required for the implementation of the rehabilitation plans no significant negative effects on water quality, and thus, downstream Designated Sites, are likely to occur in the absence of mitigation.

6.5 **Residual Effects**

6.5.1 **Peat Extraction Phase: July 1988 – June 2020**

6.5.1.1 **Uncut Raised Bog and Cutover Bog and Associated Secondary Habitats**

The peat extraction and ancillary activities undertaken between July 1988 and June 2020 are considered to have resulted in a negative residual effect at the Application Site level on the majority of the bog habitats within the Application Site. These habitats had already been extensively modified from their original state, and although further degradation occurred during this period, no habitats of high ecological value were significantly affected. The residual effect on habitats is therefore considered to be negative, long-term, certain to have occurred and not significant at the any geographic scale.

6.5.1.2 Aquatic Habitats and Related Species

All activities pre-dating 2000 were unlicensed and no records exist regarding the quality of discharges to nearby surface watercourses. However, by 1988 peat extraction and ancillary activities were already well established at the Application Site and while EPA Q-values throughout this phase of the Project fluctuate, there is no clear negative trend in terms of surface water quality between 1988 and 2020. Some improved sediment control measures were installed at the Application Site in the late 1990s and early 2000s and water quality discharge licence limits have been in place since 2000 in accordance with IPC licensing. The available monitoring data indicate that improvements in downstream water quality have not been significant. This is because there are other activities in the catchment that affect water quality and because the baseline water quality was reasonably good and has not changed significantly during the Peat Extraction Phase.

The residual effect of bog drainage is considered to be a moderate long-term, negative and indirect likely effect on downstream surface water quality and quantity.

From a review of the available AERs included as Appendix 4-3 of this rEIA, no significant fuel spills or wastewater discharges have occurred since 2000. In addition, extensive control measures have been implemented since 2000 as part of the IPC licence which mitigates against the possibility of any surface or groundwater contamination. Prior to IPC regulation, there are no records, but there does not appear to be any record of significant issues with hydrocarbons or wastewater discharges to surface or groundwater resulting from the peat extraction and ancillary activities.

The residual effects on water quality as a result of accidental leakages and spillages is considered to be long-term, negative, indirect, unlikely impact on local surface water quality and downstream aquatic ecosystems and is considered not significant at any geographic scale.

6.5.1.3 Fauna

Otter

Regarding habitat loss/degradation for otter, this is confined to indirect impact on supporting habitat as a result of the deterioration of water quality, which is assessed in Table 6-18. The residual effects on water quality as a result of the Peat Extraction Phase are provided in Section 6.5.1.2 above.

The residual effect on otter from disturbance during this phase is considered to be negative, short-term, and unlikely to have occurred, given the limited suitability of habitats and daytime nature of works, and not significant at any geographic scale.

Bird Species

The residual effect on bird species from habitat loss, degradation, or disturbance during this phase is considered to be negative, short-term (for disturbance) to long-term (for habitat loss and degradation), and unlikely, given the low suitability of affected habitats, their previously modified condition, and the limited geographic extent of works. As such, the effect is assessed as not significant at any geographic scale.

6.5.1.4 Designated Sites

The potential for the peat extraction and ancillary activities to impact the hydrology of the River Shannon Callows SAC/pNHA and the Middle Shannon Callows SPA has been reduced as the bog drainage regime was already in place at the time of the SAC and SPA designation. Proven and effective control measures have also been implemented to limit the runoff from the Application Site to

original greenfield runoff rates. The Application Site has also been operating under IPC licence conditions since April 2000.

Given the control measures that were in place prior to the regulation of activities at the Application Site by the EPA which commenced in 2000, it was unlikely that significant effects on any of the above National or European Sites occurred, as a result of the Peat Extraction Phase of the Project. The rNIS concluded that, taking into account the control measures implemented prior to and after 2000, the Project has not resulted in significant adverse effects on the integrity of any European Sites.

The residual effect is considered to be a long-term, negative, indirect likely effect on the hydrology (flows and water quality) of the Shannon Callows SAC/pNHA and the Middle Shannon Callows SPA that is not significant at any geographic scale.

6.5.2 **Current Phase: June 2020 to present day**

6.5.2.1 **Uncut Raised Bog and Cutover Bog and Associated Secondary Habitats**

There has been no additional loss, degradation or fragmentation of habitat as a result of the Current Phase of the Project and therefore, the residual effect on habitats is considered to be neutral, unlikely to have occurred or occur and not significant at any geographic scale.

6.5.2.2 **Aquatic Habitats and Related Species**

No significant effects on downstream surface water hydrology will have occurred from the cessation of peat extraction in June 2020 to the present day (refer to Chapter 8 Hydrology and Hydrogeology). There has been a slight decrease in Q-values in downstream surface watercourses in recent EPA monitoring rounds. This would likely be related to other pressures in the catchment as the cessation of peat extraction and ancillary activities would not negatively affect water quality. However, a perceptible positive trend in Q-values, associated with the cessation of peat extraction, would not have been expected given the relatively short time period since peat extraction and ancillary activities ceased (approximately 5 years). Therefore, the residual effect is a neutral, short-term, indirect, unlikely effect on downstream surface water hydrology and is considered to be not significant at any geographic scale.

6.5.2.3 **Fauna – Otter and Bird Species**

Effects on fauna as a result of the Current Phase would have been limited to the potential for degradation of supporting habitat for aquatic species including otter, salmonids, lamprey, eel etc. where they occur within and/or downstream of the Application Site, as well as disturbance of faunal species including otter and bird species due to the operation of plant and machinery. The residual effect is considered to be negative, short-term, and unlikely to occur. As such, residual effects on fauna are considered to be not significant at any geographic scale.

6.5.2.4 **Designated Sites**

Whilst there is some limited activity at the Application Site involving machinery and plant for decommissioning and the maintenance of the existing drainage network and environmental monitoring is still on going, these works are much reduced in comparison to the Peat Extraction Phase of the Project, and therefore, no significant residual effects are likely to have occurred during this period.

No significant change in the hydrology of the River Shannon Callows SAC/pNHA or the Middle River Shannon Callows SPA will have occurred following the cessation of peat extraction. The residual effect is a neutral, short-term, indirect, unlikely effect on water quantity and water quality flowing from the

Application Site towards the River Shannon Callows SAC/pNHA or the Middle River Shannon Callows SPA and is considered not significant at any geographic scale.

6.5.3 Remedial Phase

6.5.3.1 Uncut Raised Bog and Cutover Bog and Associated Secondary Habitats

The implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan will improve habitat quality and diversity, therefore the residual effect is considered to be positive, long-term, likely to occur and significant at the local to county scale.

6.5.3.2 Aquatic Habitats and Related Species

Following the implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan the Application Site will be wetter, will retain more water, will recolonise with vegetation slowly, and will eventually become a naturally functioning wet land with much-reduced silt and nutrient output. As such, the residual effect of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan is considered to be a positive, indirect, long-term effect on downstream surface water hydrology and water quality, significant at the local scale.

The use and storage of hydrocarbons and small volumes of chemicals is a standard risk associated with storage of such material. Proven and effective measures to mitigate the risk of spills and leaks will be implemented throughout the Remedial Phase of the Project. Therefore, the residual effect is negative, direct, short-term, unlikely effect on surface water quality that is considered not significant at any geographic scale.

6.5.3.3 Fauna

Otter

Effects on otter as a result of the Remedial Phase of the Project are limited to the potential for degradation of supporting habitat for aquatic species including otter, salmonids, lamprey, eel etc. where they occur within and/or downstream of the Application Site, which is assessed in Table 6-24 and Section 6.5.3.2. The residual effect due to degradation of water quality with mitigation measures in place is considered to be negative, short-term, unlikely to occur, and not significant at any geographic scale. A long-term, positive, indirect, likely effect following implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan is considered to be significant at the local to county scale.

Bird Species

The implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan is expected to result in a positive effect on habitats for bird species due to the targeted rewetting and revegetation of the former peat production areas. Targeted rewetting of areas has potential to create areas of wetland habitat within the Application Site which will benefit wetland bird species and enhance habitat diversity within the Application Site. The residual effect is therefore considered to be positive, long-term, likely to occur, and significant at the local to county scale.

6.5.3.4 Designated Sites

With the implementation of the Remedial Phase of the Project, no significant residual effects are likely to occur.

6.6 Significance of Effects

6.6.1 Peat Extraction Phase: July 1988 – June 2020

6.6.1.1 Uncut Raised Bog and Cutover Bog and Associated Secondary Habitats

Based on the assessment in Section 6.5 above there was no significant effect on the uncut raised bog and cutover bog and associated secondary habitats as a result of the Peat Extraction Phase of the Project.

6.6.1.2 Aquatic Habitats and Related Species

It is considered that the Peat Extraction Phase had a moderate effect on downstream surface water quality and the aquatic fauna they support at the local scale.

The effects on water quality as a result of accidental leakages and spillages is considered to be long-term, negative, indirect, unlikely impact on local surface water quality and downstream aquatic ecosystems, and is not considered to be significant at any geographic scale.

6.6.1.3 Fauna

Otter

Assessment of significant effects on otter as a result of habitat loss/degradation during the Peat Extraction Phase of the Project was limited to indirect effects on water quality. This is assessed in Table 6-18 above and it is considered that effects on otter due to degradation of water quality were not significant at any scale.

No significant effects on otter as a result of disturbance is likely to have occurred during the Peat Extraction Phase of the Project.

Bird Species

No significant effects on birds as a result of disturbance are likely to have occurred during the Peat Extraction Phase of the Project.

6.6.1.4 Designated Sites

Assessment of potential significant impacts on European Sites are presented in rNIS which accompanies this application for Substitute Consent. Based on the assessments above, no significant effects on National Sites are likely to have occurred during the Peat Extraction Phase of the Project.

6.6.2 Current Phase: June 2020 to present day

6.6.2.1 Uncut Raised Bog and Cutover Bog and Associated Secondary Habitats

No significant effects on habitats are likely to have occurred as a result of the Current Phase of the Project.

6.6.2.2 Aquatic Habitats and Related Species

For the reasons outlined above and with the implementation of the IPC Licence conditions it is considered that no significant effects on downgradient surface waterbodies has occurred during the Current Phase of the Project.

6.6.2.3 Fauna – Otter and Bird Species

The likely significant effects on water quality and supporting habitat for aquatic species are as per Table 6-22 above. No significant effects on fauna are likely to have occurred as a result of the Current Phase of the Project.

6.6.2.4 Designated Sites

Assessment of potential significant impacts on European Sites are presented in rNIS which accompanies this application for Substitute Consent. Based on the assessments above, no significant effects on National Sites are likely to have occurred as a result of the Current Phase of the Project.

6.6.3 Remedial Phase

6.6.3.1 Uncut Raised Bog and Cutover Bog and Associated Secondary Habitats

There is potential for significant positive effects on the habitats within the Application Site during the Remedial Phase of the Project.

6.6.3.2 Aquatic Habitats and Related Species

There is no potential for significant negative effects on water quality at any geographic scale. There is potential for significant positive effects on water quality at a local scale within and downstream of the Application Site during the Remedial Phase of the Project.

6.6.3.3 Fauna

Otter

No significant effects on otter, or any other fauna, are anticipated as a result of disturbance, during the Remedial Phase of the Project. There is potential for significant positive effects on supporting aquatic habitats within and downstream of the Application Site as a result of the implementation of the Cutaway Bog Rehabilitation Plan.

Bird Species

There is potential for significant positive effects on bird species through the creation of new habitat, as a result of the Remedial Phase of the Project. No significant effects on birds as a result of disturbance is anticipated.

6.6.3.4 Designated Sites

Assessment of potential significant impacts on European Sites are presented in rNIS which accompanies this application for Substitute Consent. Based on the assessments above, no significant effects on National Sites are likely to occur as a result of the Remedial Phase of the Project.

6.7

Cumulative and In- Combination Effects

The peat extraction and ancillary activities at the Application Site were considered in combination with other plans and projects in the area that could result in cumulative impacts on the Key Ecological Receptors (KERs) identified in Section 6.3.3 of this report, including European Sites and Nationally designated sites. This included a review of online Planning Registers and served to identify past, present and future plans and projects, their activities and their predicted environmental effects. The projects considered are detailed in Section 2.3 in Chapter 2 and listed in Appendix 2-2 of the rEIAR.

6.7.1

Assessment of Plans

Available County Development Plans were reviewed, including partial versions of earlier plans where full documents were not accessible. The following plans have been taken into consideration as part of this assessment:

- > Offaly County Development Plan 2021 – 2027
- > Offaly County Development Plan 2014 – 2020
- > Offaly County Development Plan 2009 – 2015
- > Offaly County Development Plan 2003 – 2009
- > Offaly County Development Plan 1995
- > Offaly County Development Plan 1987
- > Offaly County Development Plan 1967
- > National Biodiversity Action Plan 2007-2013
- > National Biodiversity Action Plan 2023-2030.

The review focused on policies and objectives that relate to designated sites for nature conservation, biodiversity and protected species. Policies and objectives relating to the conservation of peatlands and sustainable land use were also reviewed, particularly where the policies relate to the preservation of surface water quality. An overview of the search results with regard to plans is provided in Table 6-27.

Table 6-27 Assessment of Plans

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites and Biodiversity
Offaly County Development Plan 2021 - 2027	The Strategic Vision of the Development Plan has been identified: <i>“To create a sustainable and competitive county that supports the health and wellbeing of our people and places, from urban to rural, with access to employment opportunities supported by high quality housing and physical, social and community infrastructure for all, in a climate resilient manner and with respect for our biodiversity.”</i> The policies concerning peatlands in the Offaly County Development Plan 2021-2027 are as follows: ➤ CAEP-16 It is Council policy to support the preparation of a comprehensive after use framework plan for the industrial peatlands and associated workshops, office buildings and industrial sites in the midlands and adjacent parts of the north west and southern regions, which meets the environmental, economic and social needs of communities in these areas, and also demonstrating leadership in climate change mitigation and land stewardship. The Council recognises that the industrial peatlands in the midlands are a significant resource will transition to after uses ranging from amenity, tourism, biodiversity services, ‘wild areas’, flood management, climate mitigation, energy development, industry, education, conservation and many more. ➤ CAEP-17 It is Council policy to investigate the potential for a Green Energy Hub on peatlands in the county and facilitate it if possible. ➤ CAEP-18 It is Council policy to investigate the feasibility of an energy park with educational and amenity facilities relating to any future development of renewable energy projects of significant scale that comes forward over the lifetime of this Plan. Any development of renewable energy on cutaway bog will be required to provide increased opportunities for amenity access and educational facilities. ➤ CAEP-19 It is Council policy that planning applications for development on or immediately adjacent to peatlands shall be accompanied by assessments considering the following issues where relevant; peatland stability, hydrology, carbon emissions balance and ecological impact assessment. ➤ CAEP-20 It is Council policy to support the implementation of any relevant recommendations contained in the National Peatlands Strategy 2015 and any subsequent revisions.	The Development Plans were comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity and Designated Sites. Peat extraction and ancillary activities during the Peat Extraction Phase and Current Phase are unlikely to have resulted in a significant effect on biodiversity and designated sites and are therefore not considered to be in contravention of the policies and objectives within the Development Plans. The implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan for the Application Site will have a significant positive effect on biodiversity, which is in compliance with the policies and objectives outlined within the plans.

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites and Biodiversity
	➤ CAEO-06 It is an objective of the Council to source E.U. and national funding to support projects which assist the transition of the industrial peatlands to sustainable after uses. ➤ CAEO-07 It is an objective of the Council to ensure that renewable energy projects located on peatlands or in close proximity to peatlands do not negatively impact on any rehabilitation measures including enhanced rehabilitation measures (i.e. drain blocking and rewetting). The policies concerning biodiversity and designated sites in the Offaly County Development Plan 2021-2027 are as follows: ➤ BLP-01 It is Council policy to protect, conserve, and seek to enhance the county's biodiversity and ecological connectivity. ➤ BLP-02 It is Council policy to conserve and protect habitats and species listed in the Annexes of the EU Habitats Directive (92/43/EEC) (as amended) and the Birds Directive (2009/147/EC), the Wildlife Acts 1976 (as amended) and the Flora Protection Orders. ➤ BLP-03 It is Council policy to support and co-operate with statutory authorities and others in support of measures taken to manage proposed or designated sites in order to achieve their conservation objectives. ➤ BLP-04 It is Council policy to protect and maintain the conservation value of all existing and future Natural Heritage Areas, proposed Natural Heritage Areas, Nature Reserves, Ramsar Sites, Wildfowl Sanctuaries and Biogenetic Reserves in the county. ➤ BLP-05 It is Council policy to ensure that development does not have a significant adverse impact, incapable of satisfactory avoidance or mitigation, on plant, animal or bird species protected by law. ➤ BLP-06 It is Council policy to consult with the National Parks and Wildlife Service, and take account of any licensing requirements, when undertaking, approving or authorising development which is likely to affect plant, animal or bird species protected by law. ➤ BLP-07 It is Council policy to support the implementation of the National Biodiversity Action Plan 2017- 2021 and the Offaly Heritage Plan Key Actions 2017-2021 and future editions in partnership with relevant stakeholders subject to available resources. ➤ BLP-08 It is Council policy to work with all state agencies to promote the development of all aspects of park management in the Slieve Bloom Mountains.	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites and Biodiversity
Offaly County Development Plan 2014-2020	A number of policies and objectives relative to the historical use of the Lemanaghan Bog Group are outlined below. ➤ Chapter 2: Economic and Enterprise Strategy ‘It is Council policy to actively encourage the redevelopment of brownfield sites for enterprise and employment creation throughout the county, in particular, sites with antecedent uses or disused sites which were formerly ESB plants and Bord na Móna work’ (Entp-07). It is Council Policy to encourage expansion and employment in industries such as agriculture, horticulture, peatlands, food, craft, tourism and energy’ (RDP-11). The County Development Plan also recognises the potential of cutaway bog sites for wind energy development. ➤ Chapter 3: Energy Strategy ‘The characteristics of cutaway bog appear to be particularly suitable for wind development. The individual sites on cutaway bogs are large and generally uninterrupted by hedgerows, streams, or other natural features. Many are already connected to each other via corridors i.e. bog railway routes, which will allow for transmission infrastructure and roadways to be built between sites, avoiding impacts on the public road in terms of traffic or visual impact. The areas where peatlands occur have a low density road network and are traditionally sparsely populated, and while they have not completely avoided sporadic urban generated one-off housing, they are the least densely populated areas of the county’	
Offaly County Development Plan 2009-2015	The Offaly County Development Plan 2008-2015 was adopted on January 19th 2009, replacing the Offaly County Development Plan 2003-2009. Policies related to the historical activities at Lemanaghan are noted below. At the time of the writing of the 2009-2025 CDP, ‘after use’ of cut away bogs and alternative development of cutaway bogs are being considered in the future planning and sustainable development of the county.	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites and Biodiversity
	➤ Chapter 3: Overall Strategy <i>‘The Council intends to facilitate proposals for employment generation and services improvement in this part of the county. One important action in this regard is to work closely with Bord na Móna to investigate and facilitate (were appropriate on planning grounds) the re-use and alternative development of cutaway bogs within its ownership for development which will give an employment and economic boost to the county.’</i> ➤ Chapter 6: Employment, Economy & Enterprise The 32,400 ha of peatlands within the ownership of Bord na Móna are highlighted and identified as potential sites for industrial/business type generation, in particular wind/biomass energy generation. Section 6.4 acknowledges and is in favour of re-development of disused sites such as former ESB power stations and Bord na Móna works. P06-11 states: <i>It is Council policy to actively encourage the redevelopment of brownfield sites for enterprise and employment creation throughout the county, in particular, disused sites which were formerly ESB plants and Bord na Móna works.</i> ➤ Chapter 10 Rural Development <i>P10-15: It is Council policy to support the development of the peatlands within the county for appropriate alternative uses, subject to environmental considerations and nature designations.</i> ➤ Chapter 12: Environment The CDP recognises the commitment to the National Climate Change Strategy and seeks to facilitate measures which reduce emissions of greenhouse gases in accordance with the Kyoto Agreement. The CDP also commits to implementing ‘relevant EU and Irish Legislation pertaining to the environment’ (P12-08). <i>The CDP also commits to co-operating with the EPA in regard to any licencing arrangements for scheduled industries in County Offaly in accordance with the provisions of the Environmental Protection Agency Act 1992 (P12-09).</i> ➤ Chapter 15: Natural Heritage The CDP notes that peatlands comprise the main topographical feature of the landscape in Offaly and the heritage value associated with them. As such the CDP commits to protecting areas of bogland in line with existing designations. As such the CDP sets an objective to prepare a	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites and Biodiversity
	biodiversity management strategy for Offaly's peatlands in co-operation with Bord na Móna and other relevant authorities. ➤ Chapter 16 Landscape and Amenities The preservation of landscape, views and amenities as well as places of natural beauty within the county is set out as a role of the Local Authority. To that effect the Local Authority will ensure that development respects and enhances the appearance and character of existing local landscape. The Landscape Character assessment identifies cut away bog as a moderately sensitive landscape. Lough Boora has been developed as a 'prototype' parkland area and the CDP reiterates the need to plan for the future use of large areas of cut-away bog within County Offaly. Table 16.4 states that some cut away bog landscapes may be appropriate for sensitively designed and located development including renewable energy and/or industrial use.	
Offaly County Development Plan 2003-2009	<i>The CDP recognises boglands as a major natural and archaeological resource. The development of this resource and its critical role in employment is also noted. The Council aimed to continue to promote and facilitate the conservation of a representative sample of peatlands and looked to co-operate with Dúchas and the Irish Peatland Conservation Council to have a Bog Conservation Study undertaken the remaining peat resources of County Offaly.</i> Plan for After-use of Industrial Peatlands (Cutaway Bogs) <i>'The Council will seek the formulation of a comprehensive integrated landuse plan for the future development and utilisation of the large areas of cutaway bog, which now exists in the county. In addition, the plan should cater for development of further areas of cutaway bog, which will arise over the next thirty years as turf/peat production comes to an end of the county's industrial boglands. There are 32,000 hectares (80,000) of peatland in Bord na Móna ownership in County Offaly. Because of the significant area of land involved, it is important to avoid piecemeal or unco-ordinated use/development of this major resource.'</i> Renewable Energy <i>In general,</i>	

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	a) <i>Wind Farms will not be permitted in NHAs, SACs or in areas above the 400-foot contour, or in areas of special control.</i>	
Offaly County Development Plan 1995	The Offaly County Development Plan of 1995 recognised the importance of the raised boglands as a major natural resource within the county. The importance of peatlands for employment is clear. The CDP notes a major change in employment over the previous 10 years, owing to job losses at Bord na Móna. The Council state that it is an aim of the CDP to continue to support the development of peatlands for peat production. <i>‘The development of the County’s peat resources will be promoted and facilitated.’</i> However, the CDP also recognises the importance of the conservation and preservation of peatland habitats along with the potential for other peatland uses, such as tourism, amenity, educational and research purposes. The Council set a goal to secure at least 4% of the county’s original peatland area for conservation. While the continued industrialisation of peatland was supported, the Council acknowledged the need to develop a plan for the county’s peatland when turf/ peat production comes to an end. The 1995 CDP states: <i>‘The council will seek the formulation of a comprehensive integrated land use plan for the future development and utilization of the large areas of cutaway bog which now exist in the county. In addition, the plan should cater for development of the further areas of cutaway bog which will arise over the next 30 years as turf/peat production comes to an end on the County’s industrial boglands. There are 32,400 hectares (80,000 acres) of peatland in Bord na Móna ownership in County Offaly. Because of the significant area of land involved; it is important to avoid piecemeal or uncoordinated use/ development of this major resource.’</i>	
Offaly County Development Plan 1987	The Offaly County Development Plan of 1987 recognized the significance of peatlands and peat production as an employment opportunity County Offaly. At the time of publication, over 50% of the	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites and Biodiversity
	industrial jobs in the county were provided by the joint activities of Bord na Mona and the ESB as follows: <i>“Over half the industrial jobs in County Offaly are provided by the joint activities of Bord na Mona and the E.S.B. total 2,800 jobs provided by the two, 2,200 are provided in the seven Bord na Mona works and 600 in the three E.S.B Stations. This does not include Bord na Mona seasonal work which amounts Many of the rural Of the to approximately 800 jobs every year, communities in the County are heavily dependent on peat-based employment. On a county-wide basis it is estimated that approximately 12,000, or one-fifth of the total population are directly dependent on this type of employment.”</i> The CDP 1987 also recognized the heavy dependence on the peat industry and that “peat resources are running out will be major causes for concern in the coming years”. With this in mind, it was anticipated that the Council would need to cooperate with other agencies to identify new initiatives and an overall employment strategy for the County. Objectives relevant to biodiversity are outlined below 11.5 Areas of Scientific Interest in County Offaly: Offaly County Council recognises the importance of sites of scientific interest in The County. These sites have been identified and classified by An Foras Forbartha and the Department of Fisheries and Forestry. Some of these items are considered to be of international importance. It shall be an objective of the Council to use its powers to ensure the protection and conservation of those areas. The Wildlife Act of 1976 makes provision for the protection of certain plant species and their habitats. County Offaly contains 4 such sites (S.I. no. 338 of 1980). It is an offence to disturb those plants or the habitats in which they grow. The following are the sites concerned: (a) Grand Canal at Tullamore (N340 250). (b) Grand Canal at Kilbeggan (N35 35). (c) Shannonharbour near Bullock Island (N020 178). (d) Camus Callows, Clonmacnoise (N02 31). The Minister for Fisheries and Forestry intends to confirm an Order under the Wildlife Act for Lough Roe (Clara Bog).	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites and Biodiversity
	11.6 Trees and Woodlands: Offaly County Council intends to uphold the amenity, educational and scientific value of trees and woodlands. To this end a number of woods have been listed in “Areas of Scientific Interest in County Offaly”. In addition, the Council has made a number of specific Tree Preservation Orders under the Local Government (Planning and Development) Acts, 1963 to 1983 and details of these are contained in Table 33 (Appendix A). In particular, the following groups of trees are considered to make important contributions to amenity: Trees West of Tullamore centring on Charleville Castle and the Gold Links. Trees along the Ballinagar to Ballina Cross Roads. Trees at Durrow Demesne. Trees at Rahan College. It is the intention of the Council to preserve important groups of trees at these and other locations.	
Offaly County Development Plan 1967	The Offaly County Development Plan of 1967 details the significance of peatlands and peat production to the County Offaly. At the time of publication, the peatlands of County Offaly, accounted for 60% of the total production of Bord na Móna. The Boora bog group, of which the Application Site is a part of, was identified as the largest, at approximately 20,000 acres and an annual production of 1,000,000 tons of milled peat and 40,000 tons of sod peat. The supply of milled peat from the Boora bog group fuelled the ESB power station at Ferbane supplied the briquette factory at Derrinlough. The sod production at Lemanaghan fields is noted as being for private sale. The importance of the industrial employment associated with Bord na Móna and peat production is highlighted. The 1967 CDP states: <i>‘Turf production, since the event of the Turf Development Board Ltd. in 1934 and its successor, Bord na Móna, in 1946, has become of vital importance. In fact it can be regarded as second only to agriculture in the county’s employment structure.’</i> Records within the CDP show that, at the time, there was a total of 1,791 people working in the turf production industry, which represented 9.1% of total employment in the county.	

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	While there is a clear optimism for the continued expansion of peat production operations and employment growth in the county, the CDP sounds a note of caution. The 1967 CDP estimated that the bogs of Offaly would be nearing the end of their commercial peat production lives by the turn of the century. The CDP expresses the need to expand research into the potential future uses of peatlands, in particular, future uses which would provide alternative employment opportunities, especially to the towns of Ferbane, Kilcormac, Rhode, and Shannonbridge.	
4th National Biodiversity Action Plan 2023-2030	The purpose of the 4th National Biodiversity Action Plan is to set out the approach to governance and conservation of biodiversity through a series of targeted actions within the Plan. This is underpinned by five strategic objectives aimed at ensuring that Irelands' biodiversity and ecosystems 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. The strategic objectives are: ➤ Objective 1: Adopt a Whole-of Government, Whole of Society Approach to Biodiversity ➤ Objective 2: Meet Urgent Conservation and Restoration Needs ➤ Objective 3: Secure Nature's Contribution to People ➤ Objective 4: Enhance the Evidence Base for Action on Biodiversity ➤ Objective 5: Strengthen Ireland's Contribution to International Biodiversity Initiatives	The Plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity and Designated Sites. The peat extraction and ancillary activities had the potential to result in significant negative effects on biodiversity which would have been in contravention of the policies and objectives within the plan. The peat extraction and ancillary activities during the Peat Extraction Phase and Current Phase are unlikely to have resulted in a significant effect on biodiversity and are therefore not considered to be in contravention of the policies and objectives within the plan. The implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan for the Application Site will have a significant positive effect on biodiversity and is in compliance with the policies and objectives outlined within the plan.

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National Biodiversity Action Plan 2017-2021	Target 6.2 - Sufficiency, coherence, connectivity and resilience of the protected areas network substantially enhanced by 2020.	The Plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity and Designated Sites. The peat extraction and ancillary activities during the Peat Extraction Phase and Current Phase are unlikely to have resulted in a significant effect on biodiversity and are therefore not considered to be in contravention of the policies and objectives within the plan. The implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan for the Application Site will have a significant positive effect on biodiversity and is in compliance with the policies and objectives outlined within the plan.

6.7.2 Projects

As described in Section 2.3 in Chapter 2 of the rEIAR, a search was conducted using data from Offaly and Westmeath County Councils and An Coimisiún Pleanála's planning portals to search for all planned and/or permitted planning applications within 5km of the Application Site boundary. Applications considered within this boundary include all extant permissions between 1988 (commencement of peat extraction) to 2025 available on the various online portals mentioned above. This distance was chosen as it is considered that cumulative impacts would not exist with any applications made greater than 5km from the Application Site boundary.

The majority of planning applications granted permission by the relevant planning authorities during the Peat Extraction Phase mainly relate to one-off rural dwelling houses, residential development (i.e. modification and/or re-development of existing dwellings) and agricultural development, including new entrances, sheds and ancillary plant and infrastructure. It should be noted that the commencement of peat extraction and ancillary activities within the Application Site generally pre-dates the current built environment, and consequently, potential impacts (e.g. traffic movements) arising from the activities associated with the Peat Extraction Phase would have been considered by the planning authorities in their assessment of said applications. A list of all planning applications considered across all cumulative impact assessments is included in Appendix 2-2.

With regard to planning applications lodged during the Current Phase (June 2020 to present day) (Appendix 2-2), peat extraction and ancillary activities within the Application Site was already permanently ceased and removal of peat stockpiles and licence compliance activities were ongoing without any discernible effects on the environment.

Lemanaghan Wind Farm DAC, a joint venture between SSE Renewables and Bord na Móna (i.e the Applicant) are proposing a wind energy development consisting of 15 turbines with an overall blade to tip height of 220m at the Application Site. The overall footprint of the infrastructure associated with the wind farm is approximately 3% of the total area of the Application Site. The Draft Cutaway Bog Decommissioning and Rehabilitation Plan for the Application Site will be updated as required to incorporate the proposed Lemanaghan Wind Farm infrastructure, with the key objectives of the rehabilitation plan, i.e. rewetting and revegetation, occurring between and surrounding the proposed Lemanaghan Wind Farm. A separate EIAR and accompanying NIS are being undertaken for the proposed Lemanaghan Wind Farm development. At the time of writing, the planning application for this development has not yet been submitted to An Coimisiún Pleanála.

6.7.3 Assessment of Cumulative Effects

6.7.3.1 Peat Extraction Phase (1988-2020)

With regards to historical cumulative impacts, the original drainage and cutting of the acrotelm at the Application Site from 1950 to July 1988 is likely to have resulted in a profound negative effect on the raised bog habitat (and associated marginal habitats such as fen and bog woodland) that was present, particularly in the earlier years when the majority of the drainage of the Application Site was undertaken.

The impact assessment provided in Section 6.4 above in relation to raised bog habitat (and associated habitats and fauna) and potential impacts thereon due to peat extraction and ancillary activities within the Application Site from July 1988 to June 2020 (the Peat Extraction Phase) concluded that ongoing operations during this time period are unlikely to have had a significant residual effect on the remaining uncut raised bog habitats at the Application Site, which were highly modified from their natural state and generally of lower biodiversity value than the intact raised bog habitats that would have been on site prior to peat extraction and ancillary activities.

Considering the profound loss of raised bog prior to July 1988, continued activity between July 1988 and June 2020 is likely to have had a slight negative effect on biodiversity, when compared to impacts prior to July 1988 (i.e. prior to the Project). Therefore, it is considered that there was no potential for peat extraction and ancillary activities during the Peat Extraction Phase of the Project to have contributed to any likely significant negative cumulative effects on biodiversity.

6.7.3.2 Current Phase (2020-Present)

With regard to projects during the Current Phase, peat extraction and ancillary activities within the Application Site had ceased permanently, and activities on site were limited to peat stockpile removal and licence compliance measures. These activities were ongoing without any discernible effects on the environment.

In the review of the projects that was undertaken, no connection that could potentially result in additional or negative cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the Project.

6.7.3.3 Remedial Phase

The proposed Lemanaghan Wind Farm development, located within the Application Site, will occupy approximately 3% of the total site area, with the remainder of the Application Site continuing to support peatland rehabilitation. Potential cumulative impacts on biodiversity are considered minimal due to the limited development footprint, extensive mitigation measures, and integration with ongoing rewetting and revegetation works.

The proposed Lemanaghan Wind Farm EIAR and NIS will include a suite of best-practice mitigation measures to ensure protection of water quality and biodiversity during construction, operation, and decommissioning. As such, when considered in combination with ongoing rehabilitation activities, the proposed Lemanaghan Wind Farm development is not expected to result in significant cumulative effects on biodiversity.

The implementation of the Draft Cutaway Bog Decommissioning and Rehabilitation Plan will have a long-term, significant positive effect on the raised bog habitats within the Application Site as well as on downstream water quality, and therefore will not contribute to any negative effects on biodiversity when considered cumulatively with other projects and plans.

The Peatland Climate Action Scheme (PCAS) is a programme of enhanced peatland rehabilitation measures, applied in addition to the IPC licence decommissioning and rehabilitation requirement. PCAS is being implemented at specific locations across the Bord na Móna landbank identified as suitable for the prescribed enhancement measures.

Whilst no PCAS works are proposed within the Application Site, the Applicant is planning to rehabilitate two bogs to the south of the R436: Curraghalassa Bog (high-drained bog) and Derrynagun Bog (cutaway bog). These bogs, which drain to the same watercourses as the Application Site, will be subject to enhanced restoration, including targeted rewetting measures. The implementation of PCAS measures at these sites will provide greater surface water attenuation and water quality benefits both in and downstream of the restoration areas. These PCAS measures, in combination with the standard remedial measures being implemented across the Application Site, will have a positive cumulative effect on biodiversity.

6.7.3.4 Cumulative Assessment Conclusion

Following the assessment provided in the preceding sections, it is concluded that the Project has not resulted in any likely significant negative effects on biodiversity either within the Application Site or outside it. Having considered other projects in the area as listed in Appendix 2-2 of the rEIAR and in

Section 6.7.2, no potential for the Project to contribute to any likely significant negative cumulative effects on biodiversity was identified when considered in-combination with other plans and projects.

6.8

Conclusion

By 1988, peat extraction and ancillary activities at the Application Site were well established and the Application Site consisted predominantly of a large area of cutover bog, comprising bare peat and smaller areas of revegetating scrub, woodland and pioneer habitats of open cutaway bog.

The Peat Extraction Phase between 1988 and June 2020 was unlikely to have had a significant negative effect on the habitats, flora and fauna that occurred at the site as these were by 1988 highly modified from their original state, due to either drainage, fragmentation, removal of the acrotelm or peat extraction and in the case of bird species due to loss of habitat.

The Current Phase of the Project encompasses the period of time between the cessation of peat extraction and ancillary activities at the Application Site in June 2020 to the present day. The activities during the Current Phase have not given rise to additional loss, degradation or fragmentation of habitats, or flora and fauna. The Application Site has been licenced under IPC Licence (No. P0500-01) and has been subject to the conditions of that Licence. The Licence conditions, relating to operation and monitoring, emissions to water and air, water protection, waste management and bog rehabilitation, are intended for the protection, and where possible, the improvement of the environment. With the implementation of the conditions of the IPC Licence, and the much-reduced activity within the Application Site during this time, no significant effects on biodiversity are expected to have occurred during the Current Phase of the Project.

The Remedial Phase of the Project, which includes proposed rehabilitation plans for the Application Site which have also been assessed in this chapter, will generally involve the rewetting and revegetation of the bogs through natural succession. These plans will have a significant positive effect on the habitats and biodiversity within the Application Site.