

6. BIODIVERSITY

6.1 Introduction

This chapter assesses the likely significant effects (both alone and cumulatively with other projects) of the peat extraction activities and all ancillary works that took place at Ballivor Bog Group (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 proposed rehabilitation plans for the Ballivor Bog Group, required under Condition 10 of its EPA Licence P0501-01, following the cessation of peat extraction 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 activities and all ancillary works is provided in Chapter 4 of this remedial EIAR (rEIAR).

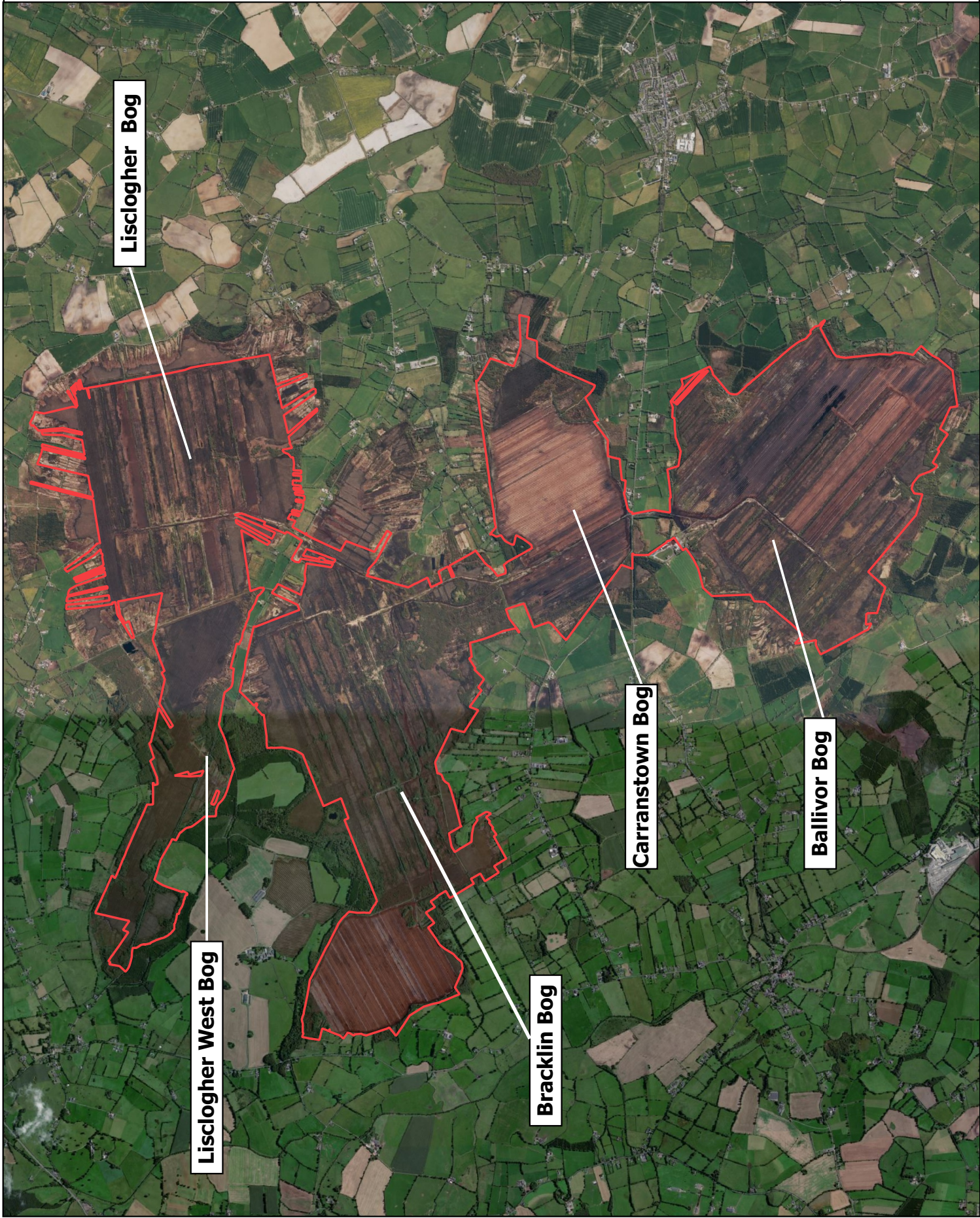
The chapter is structured as follows:

- 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 activities and all ancillary works 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 of this rEIAR:
 - **Peat Extraction Phase** - peat extraction activities and all ancillary works at the Application Site from July 1988 to the cessation of peat extraction in June of 2020 (July 1988 – June 2020). The Peat Extraction Phase is described in detail in Sections 4.4 to Section 4.7 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 4.8 of Chapter 4.
 - **Remedial Phase** - implementation of the proposed rehabilitation plans for the Ballivor Bog Group, required under Condition 10 of its EPA Licence P0501-01, following the cessation of peat extraction activities in 2020. The Remedial Phase is described in detail in Section 4.9 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 rEIAR, the entire Ballivor Bog Group is referred to as ‘the Application Site’ as shown in Figure 6-1.

- > The Project refers to all phases of this remedial EIAR, 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.



Map Legend



Application Site Boundary

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Drawing Title

Ballivor Bog Group Site

Project Title

Ballivor Substitute Consent

Application

Checked By

SM

Drawn By

PD

Project No.

191137-f

Drawing No.

6-1

Date

02/07/2024

Scale

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6.1.1 Statement of Authority

This report has been prepared by Sarah Mullen (B.Sc., M.Sc., Ph.D., ACIEEM) with input from Pádraig Desmond (B.Sc.) and Pat Roberts (B.Sc., MCIEEM). This report has been reviewed by Pat Roberts (B.Sc., M.Sc., MCIEEM).

Pat Roberts is Principal Ecologist at MKO with over 16 years' experience. He currently manages the ecological team within MKO. Pat holds B.Sc. (Hons) in Environmental Science. He has extensive experience of providing ecological consultancy on large scale industrial and civil engineering projects. He is highly experienced in the completion of ecological baseline surveys and impact assessment at the planning stage.

Sarah holds a B.Sc. (Hons) in Botany, an M.Sc. in Biodiversity and Conservation and a Ph.D. in Botany. Sarah has over 6 years' experience working in ecological consultancy and has extensive experience in undertaking habitat and species surveys and working on Ecological Impact Assessment and Appropriate Assessment.

Pádraig is a Project Ecologist within MKO and holds a B.Sc. (Hons) in Ecology and Environmental Biology. He has four years of ecology survey experience and has worked in consultancy for over three years, working on Ecological Impact Assessment and Appropriate Assessment for a wide range of projects.

The baseline ecological surveys were undertaken by Julie O'Sullivan (B.Sc., M.Sc.), Sarah Mullen (B.Sc., Ph.D., ACIEEM), Inga Reich (B.Sc., Ph.D.), Patrick Ellison (B.Sc., M.Sc., ACIEEM), Rachel Walsh (B.Sc.), Aoife Joyce (B.Sc., M.Sc.), Cathal Bergin (B.Sc.), Neil Campbell (B.Sc.) and Neansai O'Donovan (B.Sc.), Neill Campbell (B.Sc., M.Sc.), Rudraksh Gupta (B.Sc., M.Sc.), Tom Peters (B.Sc.), Mairead Kavanagh (B.Sc.), Pádraig Desmond (B.Sc.), Cora Twomey (B.Sc.), Ciara Hackett (B.Sc.) and Deepali Mooloo (B.Sc., M.Sc.) of MKO. All surveyors have the relevant skills and experience to undertake the required surveys.

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

6.1.2 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, 2009) (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, 2009). 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, updated 2022).
- 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 the EIAR.

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

- The International Convention on Wetlands of International Importance especially Waterfowl Habitat (Concluded at Ramsar, Iran on 2 February 1971).
- S.I. No. 327 of 2012 - European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2012; S.I. No. 386 of 2015 - European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2015; 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).
- Planning and Development Acts 2000 (as amended).

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).

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

- Meath County Development Plans 2021-2027, 2013-2019, 2007-2013.
- Westmeath County Development Plan 2021-2027, 2014-2020, 2008-2014, 2002-2008.
- Historic County Development Plans for County Meath and County Westmeath dated from 1981 onwards, along with the Ballivor Development Plan for 1993 (details of which are provided for in Section 2.3.4 in Chapter 2 of this rEIR).

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.
 - Ballivor Bog: Site surveyed and mapped December 2011, May 2012. Follow up visits between 2011 and 2021 and habitat maps updated where required.
 - Bracklin Bog: Site surveyed and mapped July 2012. Additional walkover surveys undertaken between 2015-2017 and habitat maps updated where required.
 - Lisclogher Bog: Site surveyed and mapped April 2010. Additional walkover surveys undertaken between 2010 and 2017 and habitat map updated where required.
 - Lisclogher West: Site surveyed and mapped July 2012. Additional site visits undertaken between 2012 and 2016 (visited winter 2016/2017) and habitat maps updated where required.

- Carranstown Bog: Site surveyed and mapped July 2012. Additional walkover surveys undertaken between 2012 and 2021 and habitat maps updated where required.
- Bord na Móna Cutaway Bog Decommissioning and Rehabilitation Plans for Ballivor Bog Group (included in **Appendix 4-2** of this EIAR)
 - Ballivor Bog 2024 Draft Cutaway Bog Decommissioning and Rehabilitation Plan.
 - Bracklin Bog 2024 Draft Cutaway Bog Decommissioning and Rehabilitation Plan.
 - Lisclogher-West 2023 Cutaway Bog Decommissioning and Rehabilitation Plan.
 - Lisclogher East 2024 Draft Cutaway Bog Decommissioning and Rehabilitation Plan.
 - Carranstown 2022 Cutaway Bog Decommissioning and Rehabilitation Plan.
- Aerial Maps from 1973 to 2020 (included in **Appendix 4-4** of the EIAR).
- Bird Atlases: (Sharrock, 1976; Lack, 1986; Gibbons et al., 1993; Balmer et al., 2013).
- National Parks and Wildlife Service (NPWS) (2016) Clara Bog SAC (site code 000572) - Conservation Objectives supporting document – raised bog habitats Version 1. June 2016.
- Bord na Móna Breeding and Wintering Bird Survey Reports (2012-2020) undertaken by Biosphere Environmental Services (BES).
- 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 (2021) and Fisheries report (2021) for Ballivor Wind Farm (ABP Case number ABP-316212-23) prepared by Triturus Environmental Ltd.

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.geohive.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 Meath County Development Plan 2021-2027, Meath County Development Plan 2013-2019, Meath County Development Plan 2007-2013, Westmeath County Development Plan 2021-2027, Westmeath County Development Plans 2014-202, 2008-2014 and 2002-2008, the National

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>, Accessed 15/04/2021.

Biodiversity Action Plan 2017-2021, County Westmeath Heritage Plan 2018-2023, and the All Ireland Pollinator Plan 2021-2025.

- Section 2.3.4 in Chapter 2 of this rEIAR also provides a summary of historic County Development Plans for County Meath and County Westmeath dated from 1981 onwards, along with the Ballivor Development Plan from 1993.
- 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.

Copies of all scoping responses are included in Appendix 2-1 of this EIAR. 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	None to date
2	Bat Conservation Ireland	None to date
3	Bird Watch Ireland	None to date
4	Butterfly Conservation Ireland (BCI)	None to date
6	Department of Agriculture, Food and the Marine (including forestry)	The Department has no observations at this time.
7	Department of the Environment, Climate and Communications	None to date
8	Department of Housing, Local Government and Heritage	<p>Nature</p> <ul style="list-style-type: none"> The department requests that NPWS be consulted in regard to any draft peatland rehabilitation plan being prepared for the proposed site Any draft plan should include specifically that all lands which have potential for re-establishing peat forming habitats (fen/raised bog) be remediated as such. Creation of large scale areas of open habitats should also be prioritised to replace those lost and provide for our red and amber-listed ground nesting birds. Public access should be restricted in such areas In relation to environmental assessment which may be required both in relation to applications for substitute consent and future proposed development, the Department notes that consideration must be given to potential impacts to European sites. As you will be aware the Planning and Development Act, 2000 (as amended) requires that screening for appropriate assessment and where required, appropriate assessment be undertaken for all development proposals. This is required in order to meet the obligations arising from the provisions of Article 6(3) of the Habitats Directive. These

No.	Consultee	Response
		<p>requirements are addressed in more detail below.</p> <ul style="list-style-type: none"> • In addition the Department draws your attention to the duties of public authorities in relation to nature conservation as set out in Regulation 27 of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended). Public authorities are obliged, when exercising their functions, to take appropriate steps to avoid in European sites the deterioration of natural habitats and the habitats of species, as well as disturbance of species for which a site has been designated insofar as this disturbance could be significant in relation to the objectives of the Habitats Directive. Public authorities, in the exercise of its functions, must also strive to avoid pollution or deterioration of habitats outside Special Protection Areas in accordance with Regulation 27(4) and Article 4(4) of the EU Birds Directive 1979. • The rEIA should describe baseline environmental conditions as they were on 1st February 1990. The description of the baseline environment needs to be sufficiently accurate to provide a reliable reference against which impacts can be assessed. As the bog units have been in Bord na Móna's ownership since the reference date, significant internal sources of information should be available. Sources of external historical baseline information include data from state agencies such as EPA monitoring data, including river and lake water quality monitoring, bird, mammal, butterfly and plant atlases, aerial photography and reports, including raised bog reports available from the National Parks and Wildlife Service on request. • As noted above the Department advises that screening for appropriate assessment and if required, appropriate assessment must be undertaken in respect of the peat extraction projects which are the subject of planning applications. • The peat harvesting activities associated with the Ballivor Bog Group have occurred upstream of, downstream of, and adjacent to European sites. Screening for appropriate assessment should focus on the likely significant effects of peat extraction and related activities on European sites noting that impacts to sites via air and water may occur over large distances. The Department is of the view that the preparation of a remedial Natura Impact Statement (rNIS) (see Section

No.	Consultee	Response
		<p>177G of the Planning & Development Act 2000 (as amended)) may be required in relation to the planning application.</p> <ul style="list-style-type: none"> It is noted that the scope of any rNIS should include the timeframe from the date of enactment of the European Communities (Natural Habitats) Regulations, 1997 (26th February 1997) to the present date. The rNIS should provide a full description of the development and each bog within the Ballivor Bog Group within the development. The rEIAR must contain a statement of the significant effects, if any, on the environment, which have occurred or which are occurring or which can reasonably be expected to occur because the development the subject of the application for substitute consent was carried out. Potential impacts should be identified using the source-pathway-receptor approach. Impacts should be assessed by analysing the effects of each impact on ecological receptors. The ecological significance of such effects should then be reported in relation to each receptor and appropriate mitigation and/or remediation proposed. The rEIAR must identify and describe adequately the direct and indirect significant effects on the environment of the development. Potential impacts which may be significant and which should be assessed include: <ul style="list-style-type: none"> Habitat loss Species loss Habitat fragmentation Hydrological and Hydrogeological impacts Nature conservation site impacts Emissions to air Impacts to climate Invasive species impacts Increase in predation of ground nesting birds due to afforestation & habitat degradation Ecological impacts of dumping Disturbance to habitats and species both from operations and other activities Fires
13	Environmental Protection Agency	<p>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:</p> <p>(i) address the matters raised in the responses received from the bodies detailed above;</p>

No.	Consultee	Response
		<p>(ii) have regard to the rehabilitation plan(s) required under Condition 10 of Licence Reg No. P0501 for any relevant bog areas;</p> <p>(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).</p> <p>(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.</p>
19	Inland Fisheries Ireland	None to date
20	Irish Peatland Conservation Council	None to date
21	Irish Red Grouse Association	None to date
22	Irish Raptor Study Group	None to date
23	Irish Water	None to date
24	Irish Wildlife Trust	None to date
25	Meath County Council - Planning Department	<ul style="list-style-type: none"> The scope of works proposed in the Biodiversity Section (5.2.4.6) should include reference to invasive species in accordance with European Communities (Birds and Natural Habitats) Regulations 2011 – Third Schedule (Regulations 49 and 50) Habitat Surveys should have regard to the extent of Annex I habitats on site – in particular – Annex I habitat Degraded raised bogs still capable of regeneration [code 7120] It is noted in section 4.2 - ‘In compliance with the IPC licence P0501-01, draft Rehabilitation Plans have been produced by Bord na Móna for all Bogs in the Ballivor Bog Group It is a requirement of Condition 10 of the aforementioned IPC Licence, however, that following decommissioning of use or involvement of all or part of the site in the licensed activity, Bord na Móna prepares (to the satisfaction of the EPA) and implements a final Cutaway Bog Rehabilitation Plan for the Ballivor Bog Group. The discharge of Condition 10 will facilitate the permanent rehabilitation of the Ballivor Bog Group in conjunction with any parallel future end-uses (wind energy infrastructure)’.
26	Office of Public Works	None to date
27	Eastern River Basin District	None to date

No.	Consultee	Response
33	Westmeath County Council - Planning Department	None to date

6.2.3 Field Surveys

A comprehensive survey of the biodiversity of Application Site was undertaken on various dates throughout 2020, 2021, 2022, 2023 and 2024 (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 Ballivor Wind Farm, the study area for both the proposed 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 activities and all ancillary works, both past and present, and the implementation of the proposed Cutaway Bog Decommissioning and Rehabilitation plans, 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
Multi-disciplinary walkover survey	23 rd April, 26 th May, 4 th June and 3 rd September 2020 26 th and 27 th May 2021, 8 th and 15 th July 2021, 27 th September 2021 26 th April 2022 16 th February and 14 th and 22 nd of August 2023 24 th April 2024 6 th June 2024
Detailed habitat and vegetation composition surveys	26 th and 27 th of May 2021, 27 th September 2021 Ground-truthed in 2023 and 2024
Otter surveys	26 th and 27 th of May 2021, 27 th September 2021 Ground-truthed in 2023 and 2024
Aquatic surveys	July 2021 Ground-truthed in 2023 and 2024
Bird surveys	Various dates between October 2019 – March 2023
Marsh Fritillary Surveys	3 rd September 2020 27 th September 2021 26 th September 2022

Survey	Dates
	22 nd of August 2023 24 th of April 2024 6 th of June 2024
Badger Surveys	26 th and 27 th of May 2021 8 th and 15 th July 2021 Ground-truthed in 2023 and 2024
Bat Surveys	23 rd and 24 th of April 2020 4 th and 5 th of June 2020 3 rd and 4 th of September 2020 26 th of April 2022 19 th of August 2022 20 th of October 2022

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 Multi-disciplinary Walkover Surveys (as per TII Guidelines, 2009) 2020 - 2024

Multidisciplinary walkover surveys of the Application Site were undertaken throughout 2020, 2021, 2022, 2023, and 2024 in order to ground-truth the habitat-mapping provided by Bord na Móna, based on their ecological surveys of the Application Site in 2011 and 2012.

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 multi-disciplinary 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, 2009).

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 except for woodland which were 10x10 metres. 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 rEIAR 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. & Crushe, 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 considered to be of ecological significance and in particular having the potential to correspond to those listed in Annex I of the EU Habitats Directive 92/43/EEC were identified and classified as Key Ecological Receptors (KERs).

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, incidental records of protected species recorded during multidisciplinary walkover surveys were used to inform the scope of targeted ecological surveys required.

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 (2009) (latrines, badger paths and setts). If encountered, setts would be classified as per the convention set out in TII (2009) (i.e. main, annexe, subsidiary, outlier).

The badger survey was conducted adhering to best practice guidance (TII, 2009) 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 26th and 27th May 2021 to determine whether the sett was in use. The camera traps were deployed for seven days. The locations of these are shown in Figure 6-2 in Appendix 6-4 (Confidential Information).

6.2.3.3.2 **Otter Survey**

Dedicated otter surveys were conducted on the watercourses within the Application Site which were identified as providing suitable habitat for otter. Additional otter surveys were undertaken by Ross Macklin of Triturus Environmental Ltd. during aquatic surveying of the watercourses within the vicinity of the Application Site in July 2021.

The otter survey was conducted as per TII (2009) 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 (2008) ‘*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 in 2020, 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 (2009) 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. In addition, habitat

suitability assessments were undertaken within areas of suitable habitat for the species following those developed by the NBDC. This involved an assessment of the vegetation characteristics at a requisite number of stops within the area of suitable habitat. Records of vegetation height, abundance of devil's bit scabious, presence of structured vegetation, low invading scrub and stock grazing were noted within the relevant recording sheets.

6.2.3.3.4 Bat Surveys

A detailed description of bat survey methodologies undertaken at the Application Site during 2022 is provided in the Bat Report Summary in Appendix 6-2 along with dates and details of all surveyors.

Surveys carried out in 2022 were in accordance with NatureScot, 2021, and form the core dataset for the assessment of effects on bats. 2022 results are supplemented by data collected during surveys undertaken on the Application Site in 2020 and designed in accordance with SNH, 2019 Guidelines. The surveys included bat walkover surveys to assess the suitability of the Application Site to support roosting, foraging and commuting bats and roost surveys, manual walked transects and ground-level static surveys in 2022.

Suitability of the Application Site to support bats was assessed according to Collins (2016) which provides a grading protocol for roosting habitats and for commuting and foraging areas. Suitability categories are divided into *High, Moderate, Low* and *Negligible*.

6.2.3.3.5 Aquatic surveys

Aquatic surveys of the watercourses draining the Application Site were conducted by Ross Macklin of Triturus Environmental Ltd. A total of 20 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 Ballivor 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 2020 and 2023. While the surveys were undertaken to inform the EIAR for the proposed Ballivor 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 activities and all ancillary works, both past and present, and the implementation of the proposed rehabilitation plans, on the Application Site. These field surveys were undertaken in compliance with SNH guidance (SNH 2017). The relevant survey methodologies and effort are described in full detail in Appendix 6-5 and relevant information summarised below.

6.2.3.3.7 **Breeding Walkover Surveys (O'Brien & Smith Survey)**

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 territories for bird species observed within the study area, i.e. Application Site and a 500m radius of the Application Site. The survey methodology followed the O'Brien & Smith method for lowland sites as outlined in Gilbert et al. (1998).

Transect routes were devised to ensure the required coverage of different habitat was achieved within the Application Site. Transects were selected to ensure all areas of suitable breeding/ foraging habitat were approached to within 100m of the Application Site boundary. Target species included waders, raptors, waterbirds, gulls and other birds of conservation concern. Along with target species, all additional species observed were recorded to inform the evaluation of supporting habitat.

Walkover surveys were carried out between daylight hours during the core breeding season months of April, May, June and July, within the Application Site being visited four to six days per month on each occasion. The timing of visits followed the recommendations of Calladine et al. (2009). 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.

6.2.3.3.8 **Breeding Raptor Surveys**

Breeding raptor surveys (i.e. birds of prey and owls) were undertaken within the Application Site and its immediate surroundings. Survey methodology was as outlined in Hardey et al. (2013). These surveys aimed to identify occupied territories and monitor their breeding success within the Application Site. Raptor surveys were undertaken to a 2km radius from the Application Site, in the form of short VP watches and walked transects within this Application Site. These surveys were undertaken monthly during the core breeding season period. Each round of surveys was undertaken over four days to survey the entirety of the Application Site.

6.2.3.3.9 **Breeding Woodcock Surveys**

Breeding woodcock surveys were undertaken in accordance with Gilbert et al. (1998). Surveys were undertaken in May and June, in areas of suitable habitat within the Application Site and 500m beyond the Application Site boundary. Surveys commenced one hour before sunset and continued for one hour after sunset or until it was too dark to see. Transects were slowly walked through areas of suitable woodland habitat onsite. All observations of woodcock (as well as the areas covered) were recorded. The aim of the survey was to record the presence of roding (displaying) male woodcock and thereby establish the distribution and abundance of the species in the Application Site. This survey method also allowed the observer to survey for owls, i.e. barn owls and long-eared owls.

6.2.3.3.10 **Winter Walkover Surveys**

Winter transect surveys were undertaken to record the presence of bird species of high conservation concern within areas of potentially suitable habitat in the Application Site. The study area extended 500m outside the Application Site.

The methodology was broadly based on methods described in Bibby et al. (2000) and adapted Brown and Shepherd surveys' (SNH, 2017). Target species were raptors, waterbirds, gulls and ground birds of conservation interest. Along with target species, all additional species observed were recorded to inform the evaluation of supporting habitat.

6.2.3.3.11 Invasive Species Survey

During the multi-disciplinary 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).

6.2.3.3.12 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 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 other associated 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 2024 was also used. These surveys provided information on the nature of the habitats present in areas where peat extraction had very recently ceased, in areas where peat cutting 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 Ballivor Wind Farm, the study area for the 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 activities and all ancillary works 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 impact.
- Species protected under the Wildlife Acts 1976-2021.

- Species protected under the Flora Protection Order 2015.

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 *'Guidelines for Assessment of Ecological Impacts of National Roads Schemes'* (TII, 2009). 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;
- National;
- County;
- 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, 2009) 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, 2009) 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, updated 2022). These guidelines are the industry standard for the completion of Ecological Impact Assessment in the UK and Ireland. This chapter has also been prepared in accordance with the corresponding EPA guidance (EPA 2022). 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 a proposed development or Project are determined following the precautionary principle and in accordance with the methodology set out in Section 5 of CIEEM (2018, updated 2022).

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, updated 2022).

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 Guidelines for assessment of Ecological Impacts of National Road Schemes, (NRA, 2009) were also considered when determining significance and the assessment is in accordance with those guidelines. The terminology used in the determination of significance follows the suggested language set out in the EPA Guidelines (2022) as shown in Table 6-3.

Table 6-3 Criteria for determining significance of effect, based on (EPA, 2022) guidelines

Effect Magnitude	Definition
No change	No discernible change in the ecology of the affected feature.
Imperceptible effect	An effect capable of measurement but without noticeable consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight effect	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate effect	An effect that alters the character of the environment that is consistent with existing and emerging trends.
Significant effect	An effect which, by its character, its magnitude, duration or intensity alters a sensitive aspect of the environment.

Effect Magnitude	Definition
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound effect	An effect which obliterates sensitive characteristics.

As per TII (2009) and CIEEM (2018, updated 2022) 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, 2009).
- A ‘significant effect’ is an effect that either supports or undermines biodiversity conservation objectives (CIEEM, 2018 updated 2022).

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, 2009). 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, updated 2022) 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 6.5 of this rEIAR assesses the likely significant effects of peat extraction activities and all ancillary works 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 proposed Cutaway Bog Decommissioning and Rehabilitation plans 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. P0501) and have been subject to the conditions of that licence. It is currently proposed to implement a 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, the timeframe for when the European Communities Environmental Impact Assessment (EIA) Directive was transposed into Irish Law, until 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) N55, N65, and N66. In addition to presenting information on the 1988 ecological baseline of the Application Site, information gathered during the desk study on the ecology of the wider area, (particularly the hectads N55, N65 and N66) is also presented. This includes records for protected species records (both historical and current), information on Annex I protected habitats in the area and information on water quality. 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 Site Location

The Application Site comprises five bogs known collectively as the Ballivor Bog Group located at the Westmeath-Meath County border. The bogs include Ballivor Bog at the southern extent of the Application Site, Carranstown and Bracklin Bogs towards the centre of the Application Site and Lisclogher and Lisclogher West Bogs to the north and comprises an overall Application Site area of 2,421 hectares (ha). The Application Site is located approximately 3.7km east of the village of Raharney, 4.5km south of Delvin town, Co. Westmeath and 2.5km west of Ballivor village, Co. Meath. The south of the Application Site is bisected by the R156 which joins the villages of Ballivor in the east to Raharney in the west. The information below pertaining to the individual bogs within the Application Site was gleaned from aerial imagery and information provided by Bord na Móna as well as the Bord na Móna Cutaway Bog Decommissioning and Rehabilitation Plans for the individual bogs comprising the Application Site.

6.3.1.2 1988 Ecological Baseline

As outlined in Chapter 4 of this rEIAR, by 1988, the land use at the Application Site was well established as industrial peat extraction. Apart from Lisclogher West, all bogs were fully drained, sod and milled peat extraction were underway in certain locations and railway infrastructure was in place. The main entrance points to the Application Site were located north and south off the Ballivor-Raharney (R156) road. Other access points included the machine pass/rail crossings between Bracklin and Lisclogher bog. The Ballivor Works, which comprised a peat processing plant, canteen, storage sheds, and maintenance buildings, was located in the north of Ballivor Bog, where it is still located in present day.

Ballivor Bog

Satellite imagery and annual reports indicate that by 3rd July 1988, Ballivor Bog was undergoing both sod and milled peat extraction. The associated drainage and rail infrastructure required for this activity was *in situ*. Aerial imagery, provided in Appendix 4-4, and records show the bog comprised a large area of cutover bog, dominated by large areas of bare peat. Small sections of remnant uncut raised bog were evident predominantly along the western and south-western boundaries. A small area of bog woodland was evident along the south-western boundary and areas of scrub/woodland were evident around the margins of the bog.

Drainage for both types of extraction was already inserted, predominantly in a northwest-southeast orientation and two pumps were in operation. Railway infrastructure was laid in the bog (since the 1950s), terminating at the Works building located in the north of the bog, just off the Ballivor-Raharney (R156) road. The Works area housed several peat processing buildings, canteen and welfare facilities, waste storage areas, carparking facilities and a refuelling area. The bog included 7 no. artificial silt ponds, and 7 no. surface water emission points which remain *in situ* today. The Clondalee More stream flows out from the southwest of the bog. The main access point to Ballivor Bog was off the Ballivor-Raharney (R156) road adjacent to the Works area. The topography of Ballivor Bog is estimated to have been approximately 74m – 82mOD by July 1988.

Carranstown Bog

Aerial imagery from 1988 (Appendix 4-4) indicates that extraction for milled peat was underway on in the western portion of Carranstown Bog. The eastern section was drained at the edges but vegetation removal and extraction had not commenced.

A review of aerial imagery shows that the western section of the bog comprised a large area of cutover bog dominated by bare peat. Smaller areas of bare peat were present in aerial imagery in the eastern section, but much of the bog although drained remained vegetated. Therefore, much of the eastern section would predominantly have comprised an area of remnant uncut but degraded (due to drainage) raised bog.

Two small mineral islands are present in Carranstown supporting oak-ash-hazel woodland with birch, hazel and small numbers of oak. These are evident from historical mapping and from aerial imagery of Carranstown from 1988. Areas of bog woodland and scrub are also evident around the periphery of Carranstown.

Carranstown Bog was linked to Ballivor Bog to the south and Bracklin Bog to the north via railway infrastructure. The bog included 5 no. artificial silt ponds, and 4 no. surface water emission points which remain *insitu* today. The Killaconnigan stream runs along the southern boundary of the bog. The main access point to the bog was off the Ballivor-Raharney (R156) road, directly opposite the entrance to Ballivor Bog and this still remains the main access point today. The topography of the bog is estimated to have been approximately 72 – 78mOD by July 1988.

Bracklin Bog

By 1988, peat extraction was underway in the main Bracklin Bog area and the southern portion of Bracklin West which at this point, was undergoing milled extraction. The northern section of Bracklin West was drained, however, vegetation had not yet been removed.

Aerial imagery provided by BnM (Appendix 4-4) shows that Bracklin comprised a large area of cutover bog comprising significant areas of bare peat in the central and southern-west sections, with evidence of linear vegetation visible in the central section, most likely comprised of birch-dominated scrub and/or linear strips of woodland as a present today. Pioneer vegetation communities of cutover bog, such as pioneer poor fen, heath and scrub, were likely beginning to establish on areas where peat production had ceased.

The northern section of Bracklin West, having been drained but not stripped of vegetation would have comprised an area of degraded (due to extensive drainage within and surrounding this section) and fragmented remnant raised bog. Several small areas of remnant uncut raised bog (totalling approx. 255 hectares), also remained intact, predominantly at the edges of the bog in the southern section of Bracklin but also at the north-eastern boundary.

The area around the old famine house would have comprised of areas of woodland as are evident today, comprising birch, sycamore and hazel, as well as areas of grassland.

The very southern section of Bracklin Bog, which was not in production comprised areas of uncut raised bog and was also vegetated at this time (refer to aerial photographs) with scrub and areas of grassland.

Drainage was already inserted, and railway infrastructure laid in 1950s and 1960s, connecting it to Carranstown and Lisclogher. The bog included 6 no. artificial silt ponds, and 5 no. surface water emission points which remain *in situ* today. The main access point to the bog is via a machine pass off a local road at the northeast close to Lisclogher or from the south through Carranstown bog. The topography of the bog is estimated to have been approximately 75m — 89mOD by July 1988.

Lisclogher

By 1988, the centre of the bog had been drained and sod peat extraction was underway. The bog comprised a large area of cutover bog dominated by bare peat. The extremities of the bogs were not under extraction and comprised smaller areas of fragmented uncut, but degraded due to drainage, remnant raised bog.

An area of birch dominated woodland was present at the south of the bog bordered by two small areas of remnant raised bog. A stream flows from north to south through the woodland.

Railway infrastructure was *in-situ*, connecting the bog to Bracklin to the west, across a local road. Access to the site was and remains via the local road to the west which separates it from Lisclogher-West or via the machine pass from Bracklin to the south. The topography of the bog is estimated to have been approximately 73 — 79mOD by July 1988.

Lisclogher-West

Drainage infrastructure was installed in Lisclogher West Bog during 1988 and subsequent years across an area of approximately 22ha, as deduced from available aerial imagery. This area was never subject to peat extraction. An area of 106ha of Lisclogher West Bog was never subject to drainage or peat extraction works. Therefore, this area, in 1988, comprised mainly of uncut and undrained raised bog and associated marginal habitats, including bog woodland (evident along parts of the southern boundary from aerial imagery) and likely areas of fen. The uncut, undrained area of raised bog would have once formed part of a more extensive raised bog system across the Ballivor Bog Group

(Application Site) and therefore would have been fragmented and isolated due to the large-scale drainage and peat extraction in the remaining areas of the Application Site.

The topography of the bog is estimated to have been approximately 77 – 82mOD by July 1988. As the bog was not brought into peat extraction it is assumed that the existing topography is representative of the topography in 1988. The Cartenstown stream flows in a west-to-east direction through the bog and the Bolandstown stream flows west-to-east along the southern boundary of the bog. Access to the bog was and remains via a local road which runs through the bog in an east-to-west direction or via a local road which separates Lisclogher-West from Lisclogher.

6.3.1.21 **Description of Habitats at the Application Site - 1988**

Raised Bog Habitat

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, acid 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 (Fossit, 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 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 Carrantown east and the northern section of Bracklin West, vegetation at these locations was still intact and therefore these areas would also have comprised larger areas of degraded raised bog. Sphagnum moss cover was likely much reduced and ling heather more abundant in these areas 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.

Drainage infrastructure was installed in Lisclogher West Bog during 1988 and subsequent years across an area of approximately 22ha, as deduced from available aerial imagery. This area was never subject to peat extraction. An area of 106ha of Lisclogher West Bog was never subject to drainage or peat extraction works. While this would have once formed part of the overall Ballivor Bog Group intact raised bog prior to drainage and peat extraction, in 1988 the areas of Lisclogher bog that remained undrained and uncut in 1998 formed an isolated section of remnant raised bog. However, it is possible that Lisclogher West would have contained some areas of degraded raised bog capable of natural regeneration and some micro-topographical features typical of an uncut raised bog such as hummocks, hollows and pools.

Cutover Bog

Taking the information provided in Section 6.3.1.2 above on the individual bogs within the Ballivor Bog Group, the vast majority of the Application Site in 1988 would have been classified as cutover bog. 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 had ceased for some time, 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.

Oak-ash-hazel woodland

Small areas of oak-ash-hazel woodland are present in Carrantown Bog on small mineral islands. A review of aerial imagery shows these areas of oak-ash-hazel woodland were present pre-1988. Today these areas comprise birch, hazel and some oak and are likely to have been similar in species composition in 1988.

6.3.1.2.2 Fauna at the Application Site - 1988

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

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 reptile 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.

Typical Fauna of Cutover bog

By 1988 the majority of the Application Site was cutover bog with smaller areas of uncut raised bog remaining at Lisclogher West 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 Current Habitats Present at Ballivor Bog Group

Bord na Móna Ecology Surveys and Habitat Mapping

As detailed in Section 6.2.1, the Application Site was subject to detailed habitat surveys by Bord na Móna ecologists between 2010 and 2012 and detailed habitat maps were prepared. The Application Site was initially surveyed and mapped December 2011, May 2012. Follow up visits were undertaken between 2001 and 2021 and habitat maps updated where required.

A review of the habitat maps prepared by Bord na Móna for Ballivor Bog Group shows that the Application Site comprises 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. Areas of remnant uncut raised bog are also present. The largest areas occur at Lisclogher West and the margins of Lisclogher and Bracklin Bogs. Smaller areas of remnant raised bog are also present at the margins of Ballivor and Carranstown Bogs. Small areas of conifer plantation are also present at Lisclogher West

and Carranstown. Areas of remnant bog have been damaged by fire including an area of remnant raised bog in Bracklin Bog as well as the area of remnant raised bog at the northern extent of Lisclogher.

Westmeath Wetland Survey 2020

Westmeath County Council commissioned a field survey of 12 wetland sites within Co. Westmeath in 2020 to gather baseline information on the type, extent and conditions of selected sites. One of the sites was Lisclogher/Bracklin Bog, located to the north of the Bracklin Bog boundary within the Application Site. The report describes the majority of the Application Site as degraded raised bog with a small lake in the center and a fringe of woodland. According to the report, a variety of vegetation encircles Bracklin Lough, in the center of the Application Site, the surrounds of which are mainly wooded. The outer, higher area of bog woodland is dominated by a canopy of Scot's pine with a well-developed ground layer of heather and bilberry. This transitions into a wetter type of bog woodland which was found to correspond to Annex I Bog Woodland (91D0) towards the lake. An area of transition mire was also recorded along the northern and western edges of the lake.

6.3.1.4 Designated Sites within the Likely Zone of Influence of Peat Extraction Activities from 1988 onwards

The potential for peat extraction activities and all ancillary works from 1988 onwards to impact on sites that are designated for nature conservation was considered in this section.

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 activities and all ancillary works on these designated sites is fully considered in this assessment.

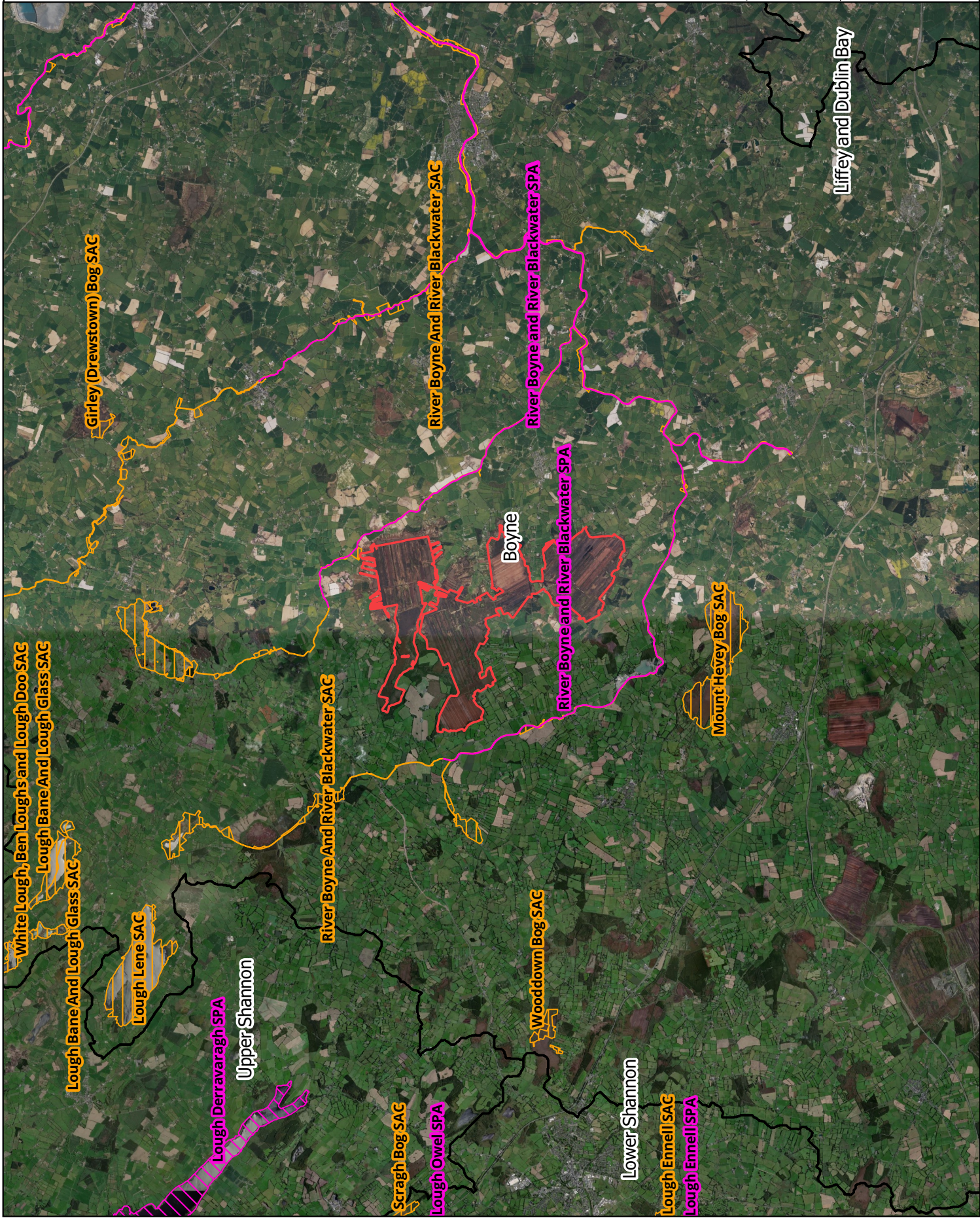
Proposed Natural Heritage Areas (pNHAs) were listed on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, the potential for effects on these sites is fully considered in this assessment.

The following methodology was used to establish which of the sites designated for nature conservation have the potential to be impacted by the peat extraction activities and all ancillary works:

- 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) and the EPA website (www.epa.ie) on the 04/07/2024. The datasets were utilised to identify Designated Sites which could feasibly be affected by the peat extraction activities and all ancillary works.
- 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 6-3 and Figure 6-4. 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 sites with regard to their conservation objectives is provided in Table 6-4.
- > 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 04/07/2024.
- > All European Designated Sites and the QIs/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 site is included within the Likely Zone of Impact and further assessment is required.



Map Legend

- Application Site Boundary
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- WFD Hydrological Catchments

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Drawing Title	
EU Designated Sites surrounding the application site	
Project Title	
Ballivor Substitute Consent Application	
Drawn By	PD
Checked By	SM
Project No.	191137-f
Drawing No.	6-3
Date	02/07/2024
Scale	1:175,000



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Map Legend

- Application Site Boundary
- Natural Heritage Area (NHA)
- Proposed Natural Heritage Area (pNHA)
- WFD Hydrological Catchments

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Drawing Title	National Designated Sites surrounding the application site		
Project Title	Ballivor Substitute Consent Application		
Drawn By	PD	Checked By	SM
Project No.	191137-f	Drawing No.	6-4
Scale	1:175,000	Date	02/07/2024



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Table 6-4 Identification of European and Nationally designated sites within the Likely Zone of Impact

Designated Site	Distance from Application Site (km)	Likely Zone of Impact Determination
Special Area of Conservation		
River Boyne and River Blackwater SAC [002299]	Located adjacent to the north-eastern boundary of the Application Site.	<p>Following a precautionary principle, a potential pathway for direct effects on otter where they occur outside the SAC, as a result of direct habitat loss was identified. Direct habitat loss could potentially occur during drain maintenance works if any otter resting or breeding sites are present on the Application Site.</p> <p>There is hydrological connectivity between the Application Site and this SAC via drainage ditches and watercourses within the Application Site which discharge to the Stonyford River approx. 248m to the east of the Application Site and the Deel (Raharney) River, approximately 767m to the west of the Application Site, both of which are designated as part of the SAC at this location and discharge to the River Boyne downstream of the Application Site. The Ballivor stream which drains Ballivor Bog at the south of the Application Site has connectivity with the River Boyne approximately 5.9km downstream of the Application Site.</p> <p>A potential pathway for indirect effects on the aquatic QIs of this SAC as a result of peat extraction activities and all ancillary works 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.</p> <p>For the Remedial Phase, during the implementation of the proposed rehabilitation plans for Ballivor Bog Group there will 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 the above listed QIs during the implementation of the proposed rehabilitation plans as a result of deterioration of water quality due to runoff of pollutants during such works was identified.</p>

Designated Site	Distance from Application Site (km)	Likely Zone of Impact Determination
		<p>A potential pathway for indirect effects on otter as a result of disturbance was also identified.</p> <p>Applying the precautionary principle, a potential pathway for indirect effects on the SAC via dust deposition was identified.</p> <p>This SAC is therefore within the likely zone of impact and following the precautionary principle the potential for significant effect on the above QIs exists. Further assessment is required.</p>
Mount Hevey Bog SAC [002342]	3.3 km South-West	<p>No hydrological or habitat connectivity was identified between the Application Site and these SACs.</p> <p>There is no surface water or habitat connectivity between the Application Site and these SACs. Surface water from the Application Site drains to the Deel (Raharney) River to the west and south of the site and to the Stonyford River to the east of the site, both of which discharge to the River Boyne which in turn flows east before discharging to the Irish Sea >70km downstream of the Application Site. These SACs are not designated for ground-water dependent habitats or species and therefore no potential for indirect effects via groundwater pathways was identified.</p> <p>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.</p> <p>These SACs are therefore not within the likely zone of influence of the Project.</p>
Girley (Drewstown) Bog SAC [002203]	9.9 km North-East	
Wooddown Bog SAC [002205]	10.3 km West	
Lough Lene SAC [002121]	10.6 km North-West	
Lough Bane and Lough Glass SAC [002120]	11.7 km North-West	
White Lough, Ben Loughs and Lough Doo SAC [001810]	13.4 km North-West	
Boyne Coast and Estuary SAC [001957]	48km North-East & >70km downstream	<p>No pathway for direct effects was identified as this European Site lies entirely outside of and approximately 48km from the Application Site.</p> <p>The potential for the Project to result in indirect effects on this European Site was considered. The site is located >70km downstream of the Project and designated for coastal habitats. 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 EU site was identified.</p>

Designated Site	Distance from Application Site (km)	Likely Zone of Impact Determination
		There is no potential for significant effect on this European Site and it is not located within the Zone of Likely Impact and no further assessment is required
Special Protection Areas (SPA)		
River Boyne and River Blackwater SPA [00232]	230m East of the Application Site boundary	<p>Taking a precautionary approach, a potential pathway for direct effects on Kingfisher, where they occur outside the SPA, as a result of direct habitat loss was identified. If Kingfisher nesting habitat is present within the Application Site, there is potential for loss of this habitat during drain maintenance works.</p> <p>There is hydrological connectivity between the Application Site and this SPA via watercourses within the Application Site which discharge to the Stonyford River to the east, the Deel (Raharney) River to the west and the River Boyne, all of which are designated as part of the SPA.</p> <p>A potential pathway for indirect effects on kingfisher as a result of peat extraction activities and all ancillary works 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 site. This has potential to result in habitat degradation for kingfisher and negatively affect availability of food resources for the SCI species kingfisher.</p> <p>For the Remedial Phase, during the implementation of the proposed rehabilitation plans for Ballivor Bog Group 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 kingfisher as a result of deterioration of water quality due to runoff of pollutants during such works was identified.</p> <p>Taking a precautionary approach a potential pathway for indirect effects on kingfisher during all phases of the Project, as a result of disturbance was also identified.</p> <p>This SPA is therefore within the likely zone of impact and following the precautionary principle the potential for significant effect on</p>

Designated Site	Distance from Application Site (km)	Likely Zone of Impact Determination
		the Kingfisher was identified. Further assessment is required.
Lough Derravaragh SPA [004030]	13.4km North-West	<p>There is no hydrological connectivity between the Application Site and the SPA which is located in a different hydrological sub-catchment to the Application Site. Therefore, no potential for indirect effect on supporting wetland habitat for SCI bird species due to deterioration in water quality exists.</p> <p>The Application Site lies outside the core foraging distance of the SCI species Whooper swan (core range of <5km) 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 activities and all ancillary works was identified.</p> <p>This SPA is therefore not within the Likely Zone of Impact.</p>
Boyne Estuary SPA [004080]	48km North-East & >70km downstream	<p>No pathway for direct effects was identified as this European Site lies entirely outside of and approximately 47.3km from the Application Site boundary.</p> <p>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 Stonyford River to the east and the Deel (Raharney) River to the south-west. These in turn discharge to the River Boyne which in turn discharges to the SPA. The site is located >70km downstream of the Application Site. Given the significant distance between the Project and the SPA, and the attenuation properties of the intervening watercourses, no potential for significant indirect effects on this European Site due to deterioration of water quality was identified.</p> <p>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.</p>

Designated Site	Distance from Application Site (km)	Likely Zone of Impact Determination
		There is no potential for significant effect on this European Site. It is not located within the Zone of Likely Impact and no further assessment is required
Natural Heritage Areas (NHA)		
Molerick Bog NHA [001582]	3.9km south	There will be no direct effects on these sites given that the Project is located entirely outside and >3km from any of these designated sites.
Girley Bog NHA [001580]	9.9km north-east	
Wooddown Bog NHA [000694]	10.3km west	No habitat or surface water connectivity was identified between the Application Site and these designated sites. Surface water from the Application Site drains to the Deel (Raharney) River to the west and south of the site and to the Stonyford River to the east of the Application Site, both of which discharge to the River Boyne which in turn flows east before discharging to the Irish Sea >70km downstream of the Application Site. 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.
Jamestown Bog NHA [001324]	12.4km north-east	
Lough Derravaragh NHA [000684]	13km north-west	
Milltownpass Bog NHA [002323]	13.1km south-west	
Proposed Natural Heritage Area (pNHA)		
Royal Canal pNHA [002103]	3.2km south	Direct effects on these pNHAs can be ruled out as the Application Site lies entirely outside the designated sites.
Lough Shesk pNHA [000556]	6.6km north	
Ballina Bog pNHA [000390]	10.1km south-east	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 activities and all ancillary works, 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 Impact.
Aghalasty Fen pNHA [001349]	12.8km north-west	
Lough Sheever Fen/Slevin's Lough Complex pNHA [000690]	13km west	
Trim pNHA [001357]	16km east	

Designated Site	Distance from Application Site (km)	Likely Zone of Impact Determination
Boyne Woods pNHA [001592]	26km north-east	These sites are located >20km downstream of the Application Site via the River Boyne which itself is located hydrologically downstream of the Application Site. Taking a precautionary approach a potential pathway for indirect effects on these sites via deterioration in water quality was identified. These sites are within the Likely Zone of Impact and are assessed further in Section 6.5 below.
Crewbane Marsh pNHA [000553]	35km north-east	
Rossnaree Riverbank pNHA [001589]	35km north-east	
Dowth Wetland pNHA [001861]	40km north-east	
Boyne River Islands pNHA [001862]	42km north-east	
Boyne Coast and Estuary SAC and pNHA [001957]	48km north-east	This coastal pNHA is located >70km downstream of the Application Site. Given the nature of the development and the distance downstream no potential for significant impact was identified.

6.3.1.5 Water Quality

Section 8.3 in Chapter 8 of this rEIAR: 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 for 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 Appendix 8-4 of this rEIAR. 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 are shown in Table 6-5 below.

The western section of Bracklin Bog is drained by the Deel (Raharney)_030 SWB. The status of this SWB has improved from “Moderate” in the 2013-2018 round to “Good” in the latest round (2016-2021). Further downstream the Deel (Raharney)_040 SWB achieved “Good” status in all 3 no. monitoring rounds while the Deel (Raharney)_050 SWB was assigned “Moderate” status. The Deel (Raharney)_060 SWB drains the western section of Ballivor Bog and its status has increased from “Moderate” in the 2010-2015 round to “Good” in the 2013-2018 round and has remained of “Good” status in the latest 2016-2021 round. Further downstream the Boyne_050 achieved “Good” status in all 3 no. WFD rounds.

The Boyne_060 SWB drains the eastern section of Ballivor Bog and Carranstown Bog. This SWB has also experienced an improved status from “Moderate” in 2010-2015 to “Good” in 2013-2018 and 2016-2021. The Stonyford River drains Lisclogher, Lisclogher West and Bracklin bogs. The Stonyford_030 has consistently deteriorated in status throughout each of the WFD rounds, having “Good” status in 2010-2015, to “Moderate” in 2013-2018, to “Poor” in 2016-2021. The Stonyford_040 however, received a deterioration in status from “Good” in 2010-2015 to “Moderate” in 2013-2018 and remained to be of “Moderate” status in 2016-2021. Further downstream the Boyne_070 and Boyne_080 both achieved “Moderate” status in the latest WFD round.

The majority of these SWBs have been deemed to be “At risk” of not meeting their WFD objectives. Hydromorphological changes have been deemed to be significant stressors on several of these SWBs. Hydromorphological pressures mean that the waterbody has experienced change to its physical habitat or natural functioning caused by, for example, channelisation and straightening of rivers or land drainage. Drainage of the Application Site to facilitate peat extraction activities and all ancillary works will likely have impacted the local hydrological regime by altering the natural flow volumes and has potentially contributed to increased sediment concentrations (which is not borne out by water quality monitoring data as demonstrated above) in waterbodies due to the increase in connectivity of drains within the Application Site to the surrounding river network.

Table 6-5 Summary WFD Information for Surface Water Bodies

River Waterbody	Status 2010-2015	Status 2013-2018	Status 2016-2021	3rd Cycle Risk Status
Deel (Raharney)_030	Good	Moderate	Good	At Risk
Deel (Raharney)_040	Good	Good	Good	Not at Risk
Deel (Raharney)_050	Moderate	Moderate	Moderate	At Risk
Deel (Raharney)_060	Moderate	Good	Good	Under Review
Boyne_050	Good	Good	Good	Not at Risk
Boyne_060	Moderate	Good	Good	At Risk
Stonyford_030	Good	Moderate	Poor	At Risk
Stonyford_040	Good	Moderate	Moderate	At Risk
Boyne_070	Good	Moderate	Moderate	At Risk
Boyne_080	Moderate	Moderate	Moderate	At Risk

6.3.1.5.2 Water Framework Directive Groundwater Body Status -1988 Baseline

Local Groundwater Body (GWB) and Surface water Body (SWB) status reports are available for download from (www.wfdireland.ie).

The Athboy GWB (IE_EA_G_001) underlies the Application Site. This GWB has been assigned ‘Good Status’ in both the 2010-2015, 2013-2018, and 2016-2021 monitoring rounds. This status is defined based

on the quantitative status and chemical status of the GWB. The Athboy GWB is deemed to be “At risk” of not meeting its WFD objectives, however, no significant pressures have been identified to be impacting this GWB.

6.3.1.5.3 EPA Biological Q-Rating Monitoring

1988 Baseline EPA Q-Ratings

The information in this section has been taken from Chapter 8 (Hydrology & Hydrogeology) of this rEIAR. As outlined in Chapter 8, no Biological Q-rating data is available for 1988 due to the fact that no EPA monitoring was completed during this calendar year. However, EPA Q-rating monitoring was completed on the Deel (Raharney), Stonyford and Boyne rivers in the vicinity and downstream of the Application Site in 1985 and 1986 and this data is used to infer the 1988 baseline

This historic data, listed in Table 6-6, shows that the Deel (Raharney), Stonyford and Boyne rivers downstream of the site were of ‘Good’ or ‘High’ Q-value status at 1988. Meanwhile upstream of the Application Site, the Deel (Raharney) River achieved ‘Moderate’ status upstream of Cumber Bridge (Station Code: RS07D010100). However, all 5 no. monitoring stations downstream of the Application Site on the Deel (Raharney) River achieved ‘High’ Q-value status (Station Code: RS07D010200 – RS07D010600). To the east and downstream of the Application Site, the Stonyford River was of ‘Good’ status (Station Code: RS07S020100 - RS07S020400). The Boyne River achieved ‘Good’ Q-value status downstream of its confluence with the Deel (Raharney) river (Station Code: RS07B040800) and ‘High’ Q-rating status downstream of its confluence with the Stonyford River (Station Code: RS07B041000).

Table 6-6 Baseline (1988) Q-ratings

River	Station ID	Location	EPA Q-Rating (Year)	Q-Value Status
Deel (Raharney)*	RS07D010100	Bridge upstream Cumber Bridge (upstream of site)	3.5 (1985)	Moderate
Deel (Raharney)	RS07D010200	Cumber Bridge	4.5 (1985)	High
Deel (Raharney)	RS07D010300	Raharney Bridge	4.5 (1985)	High
Deel (Raharney)	RS07D010400	Inan Bridge	5 (1985)	High
Deel (Raharney)	RS07D010500	Clondalee Bridge	4.5 (1985)	High
Deel (Raharney)	RS07D010600	Bridge upstream of Boyne River confluence	4.5 (1985)	High
Boyne	RS07B040800	Inchamore Bridge	4.5 (1986)	High
Boyne	RS07B040900	Scariff Bridge	5 (1986)	High
Stonyford	RS07S020100	Bridge upstream of Rathkenna Bridge	4 (1985)	Good
Stonyford	RS07S020200	Earl’s Bridge	4 (1985)	Good
Stonyford	RS07S020300	Shanco Bridge	4 (1985)	Good

River	Station ID	Location	EPA Q-Rating (Year)	Q-Value Status
Stonyford	RS07S020400	Stonyford Bridge	4 (1985)	Good
Boyne	RS07B041000	Derrinydaly Bridge	5 (1986)	High

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

EPA Q-rating monitoring has been completed at several dates and at multiple locations on the Deel (Raharney), Stonyford and Boyne rivers in the vicinity and downstream of the Application Site between 1988 and 2020 as outlined in Chapter 8 of this rEiAR and summarised below. Historic Q-values for the Deel (Raharney) River are shown in Table 6-7. Of the monitoring locations situated downstream of the Application Site, 'High' status was not achieved after 1990. The Deel (Raharney) River achieved 'High' status downstream of the Application Site and upstream of its confluence with the River Boyne in 1990 (Station Code: RS07D010600). The lowest Q-value assigned to the Deel (Raharney) River downstream of the Application Site occurred at Raharney Bridge in 2003 when it achieved 'Poor' status (Station Code: RS07D010300). Generally however the Q-ratings downstream of the Application Site have fluctuated between 'Moderate' and 'Good' Q status during the Peat Extraction Phase.

Table 6-7 Summary of Q-Ratings on the Deel (Raharney) River during the Peat Extraction Phase (1988 – 2020)

Station ID	Location Description	Easting	Northing	Available Data	EPA Q-Rating Range
RS07D010070	Bridge west of Mabestown (upstream of site)	255870	265493	1990 - 2020	3.5 – 4.5
RS07D010090	Bridge upstream of Lough Analla (upstream of site)	256495	262448	1990 – 2003	3 - 4
RS07D010100	Bridge upstream of Cummer Bridge (upstream of site)	257915.83	260230.25	1985 - 1990	3.5 – 4.5
RS07D010200	Cummer Bridge	258458	257621	1985 – 2020	3.5 – 4
RS07D010300	Raharney Bridge	260085	253021	1985 - 2020	3.5 – 4
RS07D010400	Inan Brodge	263452	250407	1985 - 2020	3.5 – 4
RS07D010600	Bridge upstream of confluence with Boyne River	269031	249313	1985 - 2020	3.5 - 4

Historic Q-values for the Stonyford River are shown in Table 6-8. The Stonyford River receives discharge from Lisclogher, Lisclogher West, Bracklin and Carranstown bogs. Of the monitoring locations situated downstream of the Application Site, 'High' status was not achieved at any date during the Peat Extraction Phase. The lowest Q-value assigned to the Stonyford River downstream of the Application Site at Stonyford Bridge (Station Code: RS07S020075) and at a bridge near Rathkenna (Station Code: RS07S020100) which both achieved 'Poor' status in 2020. Generally however the Q-ratings downstream of the Application Site have fluctuated between 'Moderate' and 'Good' Q status during the Peat Extraction Phase.

Table 6-8 Summary of Q-Ratings on the Stonyford River during the Peat Extraction Phase (1988 – 2020)

Station ID	Location Description	Easting	Northing	Available Data	EPA Q-Rating Range
RS07S020065	Bridge near Ballinlough (upstream of site)	262027	264264	2000 - 2020	3.5 – 4
RS07S020070	Bridge near Clonmaskill (upstream of site)	262103	262562	1990 - 1997	3.5

Station ID	Location Description	Easting	Northing	Available Data	EPA Q-Rating Range
RS07S020075	Stonestown Bridge (upstream of site)	263805	261681	2000 - 2020	3 – 4
RS07S020100	Upstream of Rathkenna Bridge	268303	257165	1981 - 1985	4
RS07S020090	Upstream of Rathkenna Bridge	267684	258139	1990 - 2003	3.5 – 4
RS07S020080	Lisclogher Bridge	265568	261131	1990 - 1997	3.5 – 4
RS07S020400	Stonyford Bridge	273148	253252	1990 - 2020	3.5 – 4.5
RS07S020300	Shanco Bridge	270561	254707	1990 - 2003	4
RS07S020200	Earl's Bridge	269403	256080	1990	4

Historic Q-values for the River Boyne are shown in Table 6-9. The Boyne River receives discharge from Carranstown and Ballivor Bogs and from the remainder of the Application Site via the Deel (Raharney) and Stonyford Rivers. Of the monitoring locations situated downstream of the site, 'High' status was achieved on 2 no. occasions at Inchamore Bridge (Station Code: RS07B040800). The lowest Q-rating status assigned to the Boyne River during the Peat Extraction Phase was 'Moderate' status. Generally the Q-ratings downstream of the Application Site have fluctuated between 'Moderate' and 'Good' Q status during this phase of the Project.

Table 6-9 Summary of Q-Ratings on the Boyne River during the Peat Extraction Phase (1988 – 2020)

Station ID	Location Description	Easting	Northing	Available Data	EPA Q-Rating Range
RS07B040600	Ashfield Bridge	268466	244868	1990 - 2020	3 – 3.5
RS07B040800	Inchamore Bridge	271093	249913	1990 - 2020	3.5 – 4.5
RS07B040900	Scariff Bridge	273392	252679	1990 - 2020	3.5 - 5
RS07B041000	Derrinydaly Bridge	276679	253937	1990 - 2020	3.5 – 5
RS07B041100	Downstream of Athboy confluence	278039	256559	1990 - 2020	3.5 - 4

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

No available EPA Biological Q-rating monitoring data post-dates 2020. The most recent Q-rating data for the Deel (Raharney), Stonyford and Boyne rivers is presented in Table 6-10 below. This data shows

that the Q-status of the Deel (Raharney), Stonyford and Boyne rivers downstream of the Application Site ranges from ‘Poor’ to ‘Good’ status.

Table 6-10 Most recent (2020) Q-ratings

River	Station ID	Location	EPA Q-Rating (Year)	Q-Value Status
Deel (Raharney)	RS07D010200	Cummer Bridge	4 (2020)	Good
Deel (Raharney)	RS07D010300	Raharney Bridge	4 (2020)	Good
Deel (Raharney)	RS07D010400	Inan Bridge	3-4 (2020)	Moderate
Deel (Raharney)	RS07D010600	Bridge upstream of Boyne River confluence	4 (2020)	Good
Boyne	RS07B040800	Inchamore Bridge	4 (2020)	Good
Boyne	RS07B040900	Scariff Bridge	4 (2020)	Good
Stonyford*	RS07S020075	Stonestown Bridge	3 (2020)	Poor
Stonyford	RS07S020100	Bridge upstream of Rathkenna Bridge	3 (2020)	Poor
Stonyford	RS07S020400	Stonyford Bridge	3-4 (2020)	Moderate
Boyne	RS07B041000	Derrinydaly Bridge	3-4 (2020)	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 N55, N65 and N66. Table 6-11 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 data for time periods before and after the 1988 Baseline are presented to provide context for breeding birds species over time:

Table 6-11 Breeding Bird Atlas Data (Hectads N55, N65 & N66)

Species Name	Breeding Atlas 68-72			Breeding Atlas 88-91 (1988 Baseline)			Breeding Atlas 07-11			Conservation Status
	N55	N65	N66	N55	N65	N66	N55	N65	N66	
Barn Owl (<i>Tyto alba</i>)	-	-	Prob	-	-	-	-	-	-	RL

Species Name	Breeding Atlas 68-72			Breeding Atlas 88-91 (1988 Baseline)			Breeding Atlas 07-11			Conservation Status
	N55	N65	N66	N55	N65	N66	N55	N65	N66	
Corncrake (<i>Crex crex</i>)	Prob	Prob	Conf	-	-	-	-	-	-	BD
Curlew (<i>Numenius arquata</i>)	Conf	Conf	-	Seen	Seen	Seen	-	-	-	RL
Grey Partridge (<i>Perdix perdix</i>)	Conf	-	-	-	-	-	-	-	-	RL
Grey Wagtail (<i>Motacilla cinerea</i>)	Conf	-	Conf	-	-	-	Poss	-	Poss	RL
Kestrel (<i>Falco tinnunculus</i>)	Conf	Poss	Prob	Seen	Seen	Seen	Prob	Poss	Poss	RL
Kingfisher (<i>Alcedo atthis</i>)	Conf	Conf	Prob	-	Seen	Seen	Poss	-	-	BD
Lapwing (<i>Vanellus vanellus</i>)	Conf	Poss	-	Bred	-	-	-	-	-	RL
Meadow Pipit (<i>Anthus pratensis</i>)	Conf	Conf	Conf	Seen	Bred	Bred	Conf	Conf	Prob	RL
Peregrine (<i>Falco peregrinus</i>)	-	-	-	-	-	-	Poss	-	Poss	BD
Red Grouse (<i>Lagopus lagopus</i>)	-	-	Conf	-	-	-	-	-	-	RL
Snipe (<i>Gallinago gallinago</i>)	Conf	Prob	Conf	Bred	Seen	Seen	-	Prob	Prob	RL
Stock Dove (<i>Columba oenas</i>)	Conf	-	Conf	-	Seen	Seen	-	Poss	-	RL
Swift (<i>Apus apus</i>)	Conf	Conf	Conf	Bred	-	Bred	Conf	Poss	Prob	RL
Whinchat (<i>Saxicola rubetra</i>)	Conf	-	-	-	-	Seen	Prob	-	-	RL
Woodcock (<i>Scolopax rusticola</i>)	Prob	Prob	-	-	-	-	-	-	-	RL
Yellowhammer (<i>Emberiza cintrinella</i>)	Conf	Conf	Conf	Seen	Bred	Seen	Prob	Prob	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, AL = BoCCI Amber Listed

Table 6-12 shows those species recorded in the relevant hectads (N55, N65 and N66) 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 6-12 Wintering Bird Atlas Data (Hectads N55, N65 & N66)

Species Name	Wintering Atlas 81-84			Wintering Atlas 07-11			Conservation Status
	N55	N65	N66	N55	N65	N66	
Barn Owl (<i>Tyto alba</i>)	-	-	Pres	-	-	-	RL
Bewick's Swan (<i>Cygnus columbianus</i>)	-	-	Pres	-	-	-	BD
Curlew (<i>Numenius arquata</i>)	-	-	-	Pres	Pres	Pres	RL
Golden Plover (<i>Pluvialis apricaria</i>)	Pres	Pres	-	-	-	-	BD

Species Name	Wintering Atlas 81-84			Wintering Atlas 07-11			Conservation Status
	N55	N65	N66	N55	N65	N66	
Grey Wagtail (<i>Motacilla cinerea</i>)	Pres	-	-	-	Pres	Pres	RL
Kestrel (<i>Falco tinnunculus</i>)	Pres	-	-	Pres	Pres	Pres	RL
Lapwing (<i>Vanellus vanellus</i>)	Pres	Pres	Pres	Pres	Pres	Pres	RL
Meadow Pipit (<i>Anthus pratensis</i>)	Pres	Pres	Pres	-	Pres	Pres	RL
Merlin (<i>Falco columarius</i>)	-	Pres	-	-	-	-	BD
Redwing (<i>Turdus iliacus</i>)	Pres	Pres	Pres	Pres	Pres	Pres	RL
Snipe (<i>Gallinago gallinago</i>)	Pres	Pres	-	Pres	Pres	Pres	RL
Stock Dove (<i>Columba oenas</i>)	Pres	Pres	Pres	Pres	Pres	-	RL
Whooper Swan (<i>Cygnus cygnus</i>)	-	-	-	Pres	-	Pres	BD
Woodcock (<i>Scolopax rusticola</i>)	Pres	-	-	-	Pres	-	RL
Yellowhammer (<i>Emberiza cintrinella</i>)	Pres	-	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 Ballivor Bog Group (Bord na Móna) – from 2013 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 2013, 2014, 2016 and 2019. The following 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) were recorded within the Application Site during the surveys. 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 6-13 Annex I and BoCCI red-listed bird species recorded on the Application Site during breeding bird surveys undertaken in 2019

Common Name	Scientific name	Year (Yes/No)				Designation
		2013	2014	2016	2019	
*Hen harrier	<i>Circus cyaneus</i>	Y	N	N	Y	Annex I
*Kestrel	<i>Falco tinnunculus</i>	Y	Y	Y	Y	BoCCI Redlist
Merlin	<i>Falco columbarius</i>	N	Y	Y	Y	Annex I
*Peregrine	<i>Falco peregrinus</i>	Y	Y	Y	Y	Annex I
Snipe	<i>Gallinago gallinago</i>	Y	Y	Y	Y	BoCCI Redlist
Woodcock	<i>Scolopax rusticola</i>	Y	Y	Y	Y	BoCCI Redlist
Meadow pipit	<i>Anthus pratensis</i>	Y	Y	Y	Y	BoCCI Redlist
*Swift	<i>Apus apus</i>	Y	Y	N	N	BoCCI Redlist
*Curlew	<i>Numenius arquata</i>	N	N	Y	N	BoCCI Redlist
*Whinchat	<i>Saxicola rubetra</i>	N	N	Y	N	BoCCI Redlist

* Non-breeding within the Application Site

Wintering Bird Surveys

Wintering bird surveys (October to March inclusive) were undertaken by BES on Ballivor Bog group in 2012/13, 2013/14, , 2015/2016, 2016/2017 and 2019/2020. Species recorded utilising the Application Site during wintering bird surveys are listed in Table 6-14 below.

Table 6-14 Bird species listed on Annex I of the EU Birds Directive or the BoCCI redlist recorded at the Application Site during wintering bird surveys 2019-2020

Common Name	Scientific Name	Year					Designation
		2012-2013	2013-2014	2015-2016	2016-2017	2019-2020	
Whooper Swan	<i>Cygnus cygnus</i>	Y	N		N	N	Annex I
Hen harrier	<i>Circus cyaneus</i>	Y	Y		Y	Y	Annex I
Kestrel	<i>Falco tinnunculus</i>	Y	Y		Y	Y	BoCCI Redlist
Red Grouse	<i>Lagopus lagopus hibernicus</i>	Y	N		N	N	BoCCI Redlist
Merlin	<i>Falco columbarius</i>	N	N		N	Y	Annex I
Peregrine	<i>Falco peregrinus</i>	N	Y		Y	Y	Annex I
Snipe	<i>Gallinago gallinago</i>	Y	Y		Y	Y	BoCCI Redlist
Golden plover	<i>Pluvialis apricaria</i>	Y	Y		Y	Y	Annex I, BoCCI Redlist
Lapwing	<i>Vanellus vanellus</i>	N	Y		Y	Y	BoCCI Redlist
Woodcock	<i>Scolopax rusticola</i>	Y	Y		Y	Y	BoCCI Redlist
Meadow pipit	<i>Anthus pratensis</i>	N	N		Y	Y	BoCCI Redlist
Curlew	<i>Numenius arquata</i>	N	Y		N	N	BoCCI Redlist

Annex I of EU Birds Directive, BoCCI = Birds of Conservation Concern Ireland

6.3.1.7 Other Protected Species & Habitats Records – 1988 Baseline

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 N55, N65 and N66 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 made 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 (N55, N65 and N66). Each hectad contains 100 whole one-kilometre squares containing terrestrial habitats. Species of conservation concern are listed in Table 6-15.

Table 6-15 Species listed designated under the Flora Protection Order or the Irish Red Data Book within Hectads N55, N65 and N66 – Pre 1970 - 1999

Common name	Scientific name	Designation	Date	Hectad
Marsh saxifrage	<i>Saxifraga hirculus</i>	Annex II, FPO, Near Threatened (NT)	Pre 1970	N65, N66
Shepherd's-needle	<i>Scandix pecten-veneris</i>	Regionally Extinct (RE)	Pre 1970	N55
Good-King-Henry	<i>Chenopodium bonus-henricus</i>	Vulnerable (VU)	Pre 1970	N55
Irish whitebeam	<i>Sorbus hibernica</i>	Vulnerable (VU)	1970-1986	N66
Upright brome	<i>Bromopsis erecta</i>	Near Threatened (NT)	1970-1986	N55
Smooth brome	<i>Bromus racemosus</i>	Near Threatened (NT)	1987-1999	N55
Dwarf spurge	<i>Euphorbia exigua</i>	Near Threatened (NT)	Pre 1970	N55
Autumn gentian	<i>Gentianella amarella</i>	Near Threatened (NT)	Pre 1970	N55
Common gromwell	<i>Lithospermum officinale</i>	Near Threatened (NT)	Pre 1970	N55
Tubular water-dropwort	<i>Oenanthe fistulosa</i>	Near Threatened (NT)	Pre 1970	N55
Black horehound	<i>Ballota nigra</i>	Near Threatened (NT)	Pre 1970 1970-1986	N55, N65
Greater knapweed	<i>Centaurea scabiosa</i>	Near Threatened (NT)	1987-1999 Pre 1970	N55, N65
Round-leaved wintergreen	<i>Pyrola rotundifolia</i> <i>subsp. rotundifolia</i>	Near Threatened (NT)	Pre 1970 1970-1986	N65, N66
Brown beak-sedge	<i>Rhynchospora fusca</i>	Near Threatened (NT)	Pre 1970	N65
Marsh fern	<i>Thelypteris palustris</i>	Near Threatened (NT)	Pre 1970	N65
Vervain	<i>Verbena officinalis</i>	Near Threatened (NT)	Pre 1970	N65
Bur chervil	<i>Anthriscus caucalis</i>	Near Threatened (NT)	1970-1986	N66
Frog orchid	<i>Coeloglossum viride</i>	Near Threatened (NT)	Pre 1970, 1970-1986	N55, N66
Least bur-reed	<i>Sparganium natans</i>	Near Threatened (NT)	1970-1986	N66

6.3.1.7.2 Bryophytes

A search of the NPWS online data map for bryophytes (NPWS, 2022) was also 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 (excluding birds) have been recorded from hectads N55, N65 and N66. An information request was also sent to the NPWS scientific data unit requesting records from the Rare and Protected Species Database on the 10th August 2020. A response was received on the 19th August 2020. Updated requests were sent on the 23rd August 2022 and the 21st of May 2024 with responses received on the 1st September 2022 and 23rd of May 2024, respectively. Table 6-16 lists rare and protected species records obtained from NPWS. Records are presented as pre-1988, 1988 baseline, and post 1988. The time periods before and after the 1988 Baseline are presented to provide context of the protected species over time.

Table 6-16 NPWS records for rare and protected species

Common name	Scientific name	Designation	Period	Hectad
N/a	<i>Cladonia ciliata</i> var. <i>tenuis</i>	Annex V	1988 baseline	N65
Reindeer Moss	<i>Cladonia portentosa</i>	Annex V	1988 baseline, post 1988	N55, N65
Hairy St John's-wort	<i>Hypericum hirsutum</i>	Annex II, FPO, RL	Post 1988	N55
Round-leaved Wintergreen	<i>Pyrola rotundifolia</i> subsp. <i>Rotundifolia</i>	RL	Pre 1988, Post 1988	N66
Marsh Saxifrage	<i>Saxifraga hirculus</i>	Annex II, IV, FPO, RL	Pre 1988	N66
Bur chervil	<i>Anthriscus caucalis</i>	RL	Pre 1988	N66
White-clawed Crayfish	<i>Austropotamobius pallipes</i>	Annex II, Annex V, WA	Pre 1988, Post 1988	N55, N65, N66
Common frog	<i>Rana temporaria</i>	Annex V, WA	Pre 1988, Post 1988	N55, N65, N66
Smooth Newt	<i>Lissotriton vulgaris</i>	WA	Post 1988	N65
West European Hedgehog	<i>Erinaceus europaeus</i>	WA	Pre 1988	N55
Irish Hare	<i>Lepus timidus</i> subsp. <i>Hibernicus</i>	Annex V, WA	Post 1988	N55, N65, N66
Badger	<i>Meles meles</i>	WA	Post 1988	N55
Otter	<i>Lutra lutra</i>	Annex II, Annex IV, WA	Pre 1988, Post 1988	N55, N65, N66

FPO = Flora Protection Order; RL = Red List, VU = Vulnerable, WA = Wildlife Act

6.3.1.7.4 National Biodiversity Data Centre (NBDC) Records

A search of the National Biodiversity Data Centre (NBDC) website was conducted on the 10/08/2020 and again on the 4th of November 2021 and 23rd of February 2023. An updated search was undertaken on the 28th of February 2024. Records of protected flora and fauna (excluding birds) recorded from hectad N55, N65 and N66 are provided in Table 6-17. Records are presented as pre-1988 and post 1988. The time periods before and after the 1988 Baseline are presented to provide context of the protected species over time.

Table 6-17 NBDC records for species of conservation interest in hectad N55, N65 and N66.

Common name	Scientific name	Designation	Period	Hectad
Large white-moss	<i>Leucobryum glaucum</i>	HD Annex IV	Pre 1988	N55, N65
Marsh fritillary	<i>Euphydryas aurinia</i>	HD Annex II	Post 1988	N55, N65
Freshwater White-clawed Crayfish	<i>Austropotamobius pallipes</i>	HD Annex II, V, WA	Post 1988	N55, N66
Common frog	<i>Rana temporaria</i>	HD Annex V, WA	Post 1988	N55, N65
Brown long-eared bat	<i>Plecotus auritus</i>	HD Annex IV, WA	Post 1988	N55, N65, N66
Common pipistrelle	<i>Pipistrelle (Pipistrellus pipistrellus sensu lato)</i>	HD Annex IV, WA	Post 1988	N55, N65
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	HD Annex IV, WA	Post 1988	N55, N66
Daubenton's Bat	<i>Myotis daubentonii</i>	HD Annex IV, WA	Post 1988	N55, N66
Lesser Noctule	<i>Nyctalus leisleri</i>	HD Annex IV, WA	Post 1988	N55, N66
Otter	<i>Lutra lutra</i>	HD Annex V, WA	Post 1988	N55, N65, N66
Pine Marten	<i>Martes martes</i>	HD Annex II, V, WA	Post 1988	N55, N65, N66
Common lizard	<i>Zootoca vivipara</i>	WA	Post 1988	N66
Eurasian badger	<i>Meles meles</i>	WA	Post 1988	N55, N65, N66
Eurasian Pygmy shrew	<i>Sorex minutus</i>	WA	Post 1988	N55
Eurasian red squirrel	<i>Sciurus vulgaris</i>	WA	Post 1988	N55, N66
Irish hare	<i>Lepus timidus subsp. hibernicus</i>	WA	Post 1988	N55, N65, N66
Irish stoat	<i>Mustela erminea subsp. hibernica</i>	WA	Post 1988	N55
West European hedgehog	<i>Erinaceus europaeus</i>	WA	Post 1988	N55, N65, N66

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

6.3.1.7.5 Bat Records

The National Bat Database of Ireland was searched for records of bat activity and roosts within a 1 km radius of the Application Site (IG Ref: E265605 N254031; last search (16/5/2024). The search yielded no results of roosts within a 1km radius of the Application Site. The search was extended to include a 10km radius including roosts, transects and ad-hoc observations. Five bat species were recorded within a 10km radius of the Application Site, Pipistrelle (*Pipistrellus pipistrellus*), Leisler's bat (*Nyctalus leisleri*), the Brown-eared Bat (*Plecotus auratus*), the Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Daubenton's Bat (*Myotis daubaentoni*). All bat records are from post 1988. Full details of the bat records are included in the Bat Report Summary in Appendix 6-2.

6.3.1.7.6 Freshwater Pearl Mussel (*Margaritifera margaritifera*)

The NPWS *Margaritifera* Sensitive Area map (Version 8, 2017) 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 site drains into the River Boyne. It is located predominantly within the Boyne_SC_050 sub-catchment, with the southernmost section being located partially within the Boyne_SC_040 sub-catchment and a small part of the westernmost section located in the Deel (Raharney)_SC_010 sub-catchment.

Fish stock assessments were undertaken by IFI in 2014, post the 1988 baseline, for the River Boyne close to the river's source, approximately 1.5km north of Edenderry. Brown trout, stone loach and 3-spined stickleback were the only species recorded in 2014, with brown trout the most commonly encountered species

Species recorded during previous surveys in 2010 and 2009 included Brown trout (*Salmo trutta*), European eel (*Anguilla Anguilla*), Lamprey spp (*Lampetra* sp.), Minnow (*Phoxinus phoxinus*), Stone Loach (*Barbatula barbatula*) (Inland Fisheries Ireland, 2014).

The River Boyne is listed in the first schedule of the 'European Communities (Quality of Salmonid Waters) Regulations, 1988' (S.I. No. 293) as a 'salmonid water'.

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 (*Euphydryas aurinia*)

There are NBDC records for marsh fritillary from the hectads N55 and N65 within which the Application Site is partially located. A number of records for this species are located within the Application Site at the southern end of Bracklin Bog, post the 1988 baseline. These records are dated from 2015. Records for marsh fritillary from the area surrounding the Application Site (hectads N55 and N65) range from pre-1970 to 2020.

In addition, NPWS Article 17 data also shows a number of records for marsh fritillary at the southern extent of Bracklin Bog which is located within the Application Site.

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).

An area mapped as Active raised bog (7110) is present in an area of uncut raised bog at the southern extent of Bracklin Bog.

An area mapped as Annex I Alkaline fen (7230), Cladium fen (7210) and Transition mire (7140) in the Article 17 Habitats dataset is present to the north of Bracklin Bog. The majority of the mapped area lies outside of the Application Site boundary, however approximately 6ha of the southern edge of this mapped area is located partially within the Application Site boundary.

An area mapped as Annex I Old Oak Woodland 91A is present to the south-west of the Application Site, adjacent to Ballivor Bog. Although the majority of the mapped area is located outside of the Application Site boundary, a small section (approx. 0.12 hectares) of the northern edge of woodland is within the Application Site boundary.

The locations of these Annex I mapped habitats are shown on Figure 6-5. No other Annex I habitats are mapped within or in close proximity to the Application Site boundary.



Map Legend

- Proposed Development Site
- Active Raised Bog (7110)
- Alkaline Fens (7230),
Calcareous Fens (7210),
Transition Mires (7140)
- Old Oak Woodlands (9A01)

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Drawing Title

Article 17 Mapped Habitats

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6.3.1.8 Invasive Species – 1988 Baseline

The NBDC database also contains records of invasive species identified within the relevant hectad. Records of ‘high impact’ invasive species for hectads N55, N65 and N66 are provided in Table 6-18. Whilst no records are identified in 1988, records from before and after the 1988 Baseline are presented to provide context of the invasive species over time.

Table 6-18 NBDC records for invasive species (hectads N55, N65 and N66)

Common Name	Scientific Name	Period	Hectad
Canadian waterweed	<i>Elodea canadensis</i>	Post 1988	N55
Nuttall's waterweed	<i>Elodea nuttallii</i>	Post 1988	N55
Japanese knotweed	<i>Fallopia japonica</i>	Post 1988	N65
Rhododendron	<i>Rhododendron ponticum</i>	Post 1988	N65
Brown Rat	<i>Rattus norvegicus</i>	Post 1988	N55
Eastern Grey Squirrel	<i>Sciurus carolinensis</i>	Post 1988	N55, N66
American Mink	<i>Mustela vison</i>	Pre 1988, Post 1988	N55, N65, N66
Fallow deer	<i>Dama dama</i>	Post 1988	N65

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 N55, N65 and N66 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 activities and all ancillary works and would have been dominated by bare peat at these locations. Where peat extraction 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 at Lisclogher West as well as mostly at the margins of the other bogs within 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 and large heath would have utilised parts of the Application Site.

Today, the habitats present within the Application Site comprise a mosaic of habitats which have recolonised the cutover bog including birch dominated woodland and scrub, ling heather dominated heath-type vegetation and pioneer open cutaway habitats including bog cotton dominated poor fen. Areas of remnant uncut raised bog are present, mostly at the bog margins. Conifer plantation, oak-ash-hazel woodland and areas of grassland also occur.

The Application Site drains into both the Deel (Raharney) to the west of the Application Site and the Stonyford River to the east, both of which in turn drain into the River Boyne downstream. All three watercourses are included within the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA designation. These European Sites are further considered in the Natura Impact Statement prepared for the assessment. There are a number of pNHAs located downstream of the Application Site via the River Boyne, however, these sites are located in excess of 20km (nearest site) downstream.

A review of Article 17 reporting identified a small area of mapped Annex I Active raised bog (7110) within the Application Site boundary. This is mapped within an area of uncut raised bog at the southern extent of Bracklin Bog. In addition, an area to the north of Bracklin Bog and outside the Application Site boundary was mapped as Annex I alkaline fen, cladium fen and transition mire. An area to the south-west of Ballivor Bog was mapped as old oak woodland and is located predominantly outside the Application Site boundary.

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, 2009²).

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.

²Marnell, 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.

6.3.2 Ecological Walkover Survey Results: 2011-2023

6.3.2.1 Description of Habitats and Flora within the Ecological Survey Area

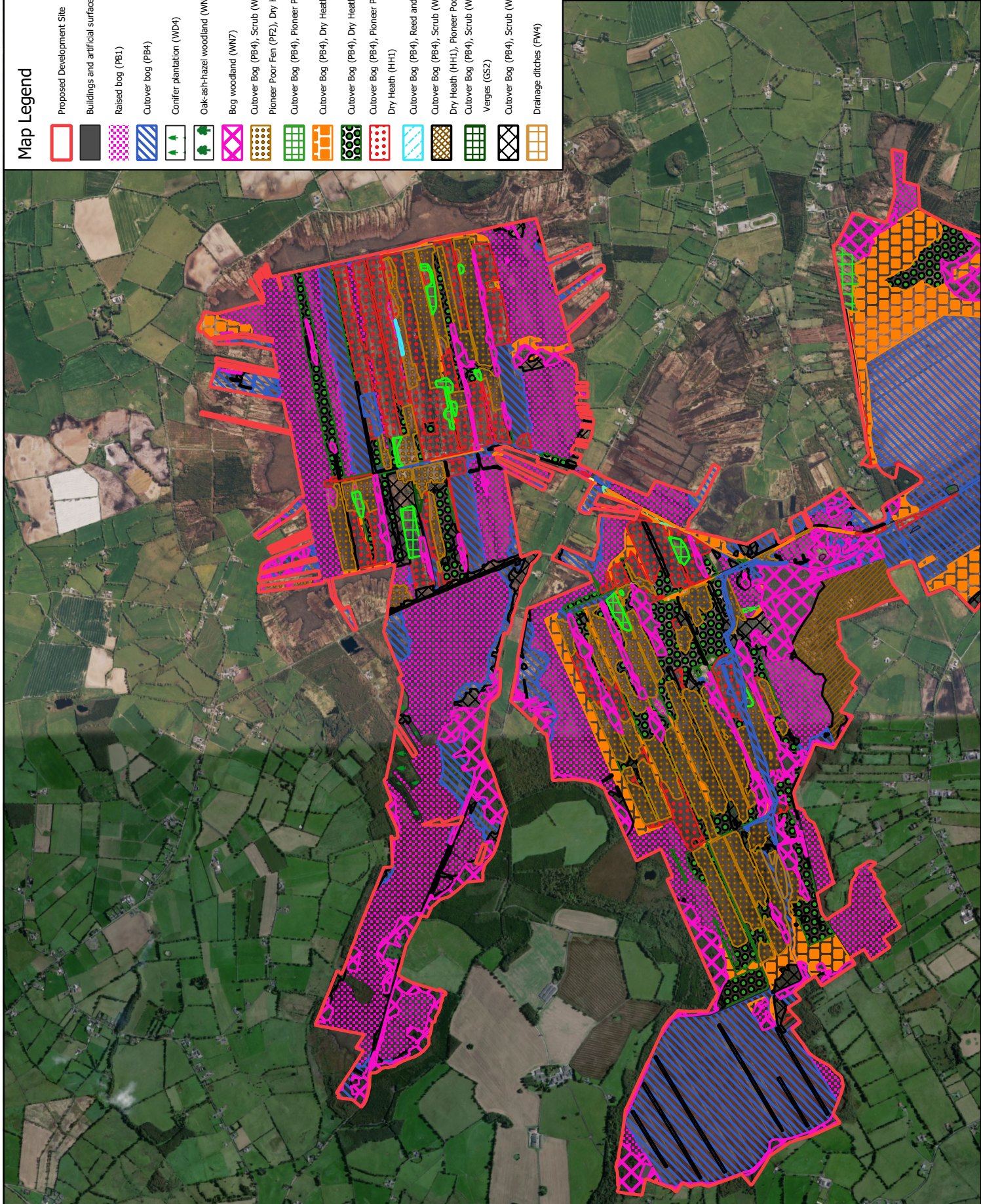
As outlined in Section 6.2.1, the habitats at the Application Site were the subject of a detailed survey and assessment by Bord na Móna ecologists between 2011 and 2012 and a detailed habitat map was produced of the Application Site. This habitat mapping and assessment was undertaken following the Bord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

Between 2020 and 2024, MKO ecologists visited the Application Site to ground-truth the results of the Bord na Móna habitat surveys and mapping 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 in 2021, 2022, 2023 and 2024.

The Application Site comprises four large cutover raised bogs classified as **Cutover Bog (PB4)** and one bog where drainage was installed but which was never subject to peat extraction (Lisclogher West) . Large areas of the cutover bog have been undergoing peat extraction until relatively recently (up to 2020) and are characterised by bare peat. Where peat extraction ceased on areas of the cutover bog for a significant period of time, i.e. since the late 80s and early 90s, these areas have since largely revegetated, primarily by dry heath type vegetation dominated by ling heather (*Calluna vulgaris*), birch (*Betula pubescens*) dominated scrub and woodland, pioneer poor fen communities characterised by common cottongrass (*Eriophorum angustifolium*) and small areas of grassland which occur mostly along the existing railway tracks traversing the Application Site. In some areas, particularly lower lying areas where drainage is impeded, embryonic bog communities dominated by common cottongrass and with a rich Sphagnum component have begun to form. The habitats described above occur in intimate mosaics within the Application Site as shown in the Habitat Maps in Figure 6-6a and Figure 6-6b, which show the location and relative cover of the habitats recorded within the Application Site at a high level. The habitats are described in greater details in the sections below.

In addition to the habitats of the cutover bog, there are also a number of small areas of remnant uncut raised bog at various locations throughout the Application Site, predominantly but not exclusively at the edges of the Application Site.

Waterbodies within the Application Site include a network of drainage ditches, small streams/watercourses classified as lowland depositing rivers, small areas of standing open water and artificial silt ponds. The watercourses including streams and drainage ditches provide hydrological connectivity with downstream EU and Nationally designated sites and are described in more detail below.



Map Legend

- Proposed Development Site
- Buildings and artificial surfaces (BL3)
- Raised bog (PB1)
- Cutover bog (PB4)
- Conifer plantation (WD4)
- Oak-ash-hazel woodland (WN2)
- Bog woodland (WN7)
- Cutover Bog (PB4), Scrub (WS1), Pioneer Poor Fen (PF2), Dry Heath (HH1)
- Cutover Bog (PB4), Pioneer Poor Fen (PF2)
- Cutover Bog (PB4), Dry Heath (HH1)
- Cutover Bog (PB4), Dry Heath (HH1), Scrub (WS1)
- Cutover Bog (PB4), Pioneer Poor Fen (PF2), Dry Heath (HH1)
- Cutover Bog (PB4), Reed and Large Sedge Swamp (FS1)
- Cutover Bog (PB4), Scrub (WS1), Bog Woodland (WN7), Dry Heath (HH1), Pioneer Poor Fen (PF2)
- Cutover Bog (PB4), Scrub (WS1), Dry Meadows and Grassy Verges (GS2)
- Cutover Bog (PB4), Scrub (WS1)
- Drainage ditches (FW4)



Habitat Map

Project Title	
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Figure 6-6 a	DATE
Scale	1:35000
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Cutover Bog (PB4)

The vast majority of the Application Site, with the exception of Lisclogher West and small remnant sections of raised bog mainly around the peripheries of the Application Site, comprise of cutover raised bog or cutaway peat classified as **Cutover Bog (PB4)**. Where peat extraction recently ceased on large areas of the Application Site, e.g., Carranstown, the western extent of Bracklin Bog and much of Ballivor Bog, these areas are dominated by bare peat with little growth of vegetation (Plate 6-1). Where vegetation has begun to colonise relatively recently, areas consist of mosaics of bare peat and pioneer open cutaway communities, including pioneer ling heather (*Calluna vulgaris*) dominated Dry heath (HH1) vegetation and pioneer common cottongrass (*Eriophorum angustifolium*) dominated poor fen (PF2) or a mosaic of both.

Where peat extraction has ceased for some time, e.g. much of Bracklin Bog as well as southern extent of Ballivor Bog and Lisclogher, mosaics of well-established secondary dry heath and poor fen type communities as well as birch (*Betula pubescens*) dominated Scrub (WS1) and dry Bog woodland (WN7) are present.

A small number of areas of cutover bog within the Application Site, particularly those in low lying areas with impeded drainage, are relatively wet with some standing water and an abundant Sphagnum component in comparison to drier cutover habitats. These areas have been mapped as embryonic bog vegetation in Bord na Móna habitat surveys in 2011 and 2012 and often occur in associated with areas of standing water and poor fen and flush communities with abundant common cottongrass.

The following sub-sections provide a description of the secondary habitats that have begun to form on the cutover bog following cessation of peat extraction.



Plate 6-1 Cutover bog characterised predominantly by bare peat

Bog Woodland (WN7)

Birch dominated **Bog Woodland (WN7)** is common throughout the Application Site (Plate 6-2), most notably in Bracklin Bog where it occurs alongside birch dominated Scrub as one of the dominant habitats of the cutover bog. A large area of bog woodland is also present at the south-eastern section of Carranstown and smaller areas are present at various locations throughout Lislogher and Ballivor Bogs.

Bog woodland within the Application Site is generally dominated by downy birch (*Betula pubescens*) with some willows (*Salix* sp.), and occasional lodgepole pine (*Pinus contorta*), rowan (*Sorbus aucuparia*) and sitka spruce (*Picea sitchensis*). The shrub layer is mostly dominated by brambles (*Rubus fruticosus* agg.) with ivy (*Hedera helix*) and bracken (*Pteridium aquilinum*) also occurring frequently and bilberry (*Vaccinium myrtillus*) occasionally. Ground flora frequently included wild strawberry (*Fragaria vesca*) and occasionally field woodrush (*Luzula sylvatica*), purple moor grass (*Molinia caerulea*), soft rush (*Juncus effusus*) and hart's tongue fern (*Asplenium scolopendrium*). The areas of bog woodland were mostly dry underfoot with little to no Sphagnum cover and did not conform to Annex I Bog Woodland (91DO). Bryophytes recorded typically included *Thuidium tamariscinum* and *Hypnum jutlandicum*. Areas of bog woodland within the Application Site are generally small in size, often comprising wide linear strips running parallel to drainage ditches, however larger more extensive areas of bog woodland are present in some areas, including at the southern and northern ends of Bracklin Bog, at the southern end of Ballivor Bog and at the eastern extent of Carranstown Bog. The Annex I Bog Woodland habitat (91DO) was not recorded on the Application Site during the Bord na Móna habitat surveys in 2011 and 2012 or during the detailed habitat surveys undertaken by MKO.



Plate 6-2 Area of birch dominated bog woodland at Bracklin Bog

Scrub (WS1)

Birch dominated **Scrub (WS1)** is also common throughout the Application Site, where it has developed on drier areas of the cutover bog (Plate 6-3). Scrub is generally dominated by downy birch, along with willow species. The ground flora is generally comprised of ling heather (*Calluna vulgaris*), purple moor grass (*Molinia caerulea*) and common cottongrass (*Eriophorum angustifolium*). Scrub habitat within the Application Site often forms mosaics with heath-type vegetation described below. Where scrub was greater than 4 metres in height, it was classified as Bog Woodland (as per Fossitt, 2000).



Plate 6-3 Example of birch dominated scrub in the background

Cutover bog supporting Secondary dry heath (HH1) type communities

This habitat type covers a broad range of conditions from bare peat and dry but vegetated peat to much wetter areas that grade into poor fen (Plate 6-4 – Plate 6-7). The habitat frequently occurred in a mosaic alongside other habitats including scrub and pioneer poor fen habitat.

Secondary dry heath (HH1) type communities throughout the Application Site are largely dominated by ling heather (*Calluna vulgaris*) along with common cottongrass (*Eriophorum angustifolium*) on dry peats with little to no Sphagnum present. Areas of bare peat are common, particularly where the cutover bog has begun to revegetate more recently. Cross-leaved heath (*Erica tetralix*), hare's tail cottongrass (*Eriophorum vaginatum*) and purple moor grass are also frequent components of the vegetation of these communities and occasional birch and self-seeded lodgepole pine and/or larch saplings are also common.

Wetter areas are characterised by a greater abundance of common cottongrass and also supported occasional deergrass (*Trichophorum germanicum*) and bog asphodel (*Narthecium ossifragum*). These areas occasionally graded into poor fen.

According to Smith and Crowley (2020) cutover bogs should only rarely be considered examples of dry siliceous heath (HH1) or wet heath (HH3). These habitats are defined by peat depths of <0.5m which rarely occur on cutover bog. *Only where a habitat is underlain by shallow peat and good indicators of heath are present, such as Carex binervis, Galium saxatile and Juncus squarrosus, should heath habitats be considered for cutover bog.* The vast majority of heath and heath mosaic habitat within the Application Site occurs on peat with a depth of >0.5m and none of these heath indicator species were recorded within heath habitat during the field surveys undertaken. Therefore, the secondary heath type communities within the Application Site 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.



Plate 6-4 Dry heath type vegetation with areas of bare peat and encroaching scrub at Lisclogher Bog



Plate 6-5 Example of dry heath type vegetation on cutover bog characterised predominantly by ling heather with common cottongrass and areas of bare peat



Plate 6-6 Dry ling heather dominated dry heath type vegetation in the foreground grading into wetter common cottongrass dominated vegetation in the background at Ballivor Bog.



Plate 6-7 Mosaic of ling heather dominated dry heath and scrub at Bracklin Bog

Poor Fen (PF2)

This habitat occurs within the Application Site predominantly as pioneer poor fen vegetation with established poor fen and flush being less common within the Application Site.

Many sections of the Application Site supported cutaway bog characterised by pioneer common cottongrass dominated Poor fen (PF2) communities, most notably Lisclogher and Bracklin Bogs. This is one of the first vegetation communities to colonise bare peat following cessation of peat extraction. The habitat was widespread but highly variable mostly occurring as a habitat mosaic along with bare peat, dry heath type vegetation and scrub (Plate 6-8).

Wetter sections of the cutover bog associated with areas of standing water and with a more established poor fen vegetation are also present throughout the Application Site. These areas are dominated by common cottongrass with soft rush (*Juncus effusus*) and *Sphagnum cuspidatum* also present (Plate 6-9) These areas also supported abundant purple moor grass and hummocks of the moss *Polytrichum commune*, whilst the wettest areas with pools of standing water were characterised by bottle sedge (*Carex rostrata*) alongside marsh pennywort (*Hydrocotyle vulgaris*), heath bedstraw (*Galium saxatile*), cuckoo flower (*Cardamine pratensis*) and occasional willow (*Salix* sp.) saplings (Plate 6-10).



Plate 6-8 Pioneer common cottongrass dominated poor fen vegetation forming a mosaic with scrub and heath type vegetation at Lisclogher Bog



Plate 6-9 Area of common cottongrass dominated poor fen at Bracklin Bog



Plate 6-10 Example of poor fen with bottle sedge at Lisclogher Bog

6.3.2.1.2 Open water

No significant areas of permanent open water are present within the Application Site.

Numerous smaller areas of open water are present in the wettest and lower lying areas of the Application Site, often associated with poor fen and flush communities (Plate 6-11). These areas have previously been subject to peat extraction and are often revegetating with bottle sedge (*Carex rostrata*) and common cottongrass. Areas of standing water were also recorded in association with low lying regenerating areas of cutaway bog where embryonic Sphagnum communities were beginning to establish comprising abundant *Sphagnum cuspidatum* and common cottongrass.



Plate 6-11 Small area of open water associated with poor fen and flush vegetation

Other Artificial Lakes and Ponds

Silt ponds are present at various locations throughout the Application Site and have been classified as Other Artificial lakes and Ponds (FL8). Drainage ditches throughout the Application Site are directed to these silt ponds prior to discharge from the Application Site.

Drainage Channels (FW4)

The Application Site is extensively drained with channels that run through the Application Site. Drainage ditches ranged from approximately 0.3m in width to approximately 3m in width. Whilst many of the drains within the Application Site have a poor structure and were devoid of vegetation, common components of vegetated drains included bulrush (*Typha latifolia*), horsetails (*Equisetum* sp.), willowherbs (*Epilobium* sp.), hard rush (*Juncus effusus*), and occasionally floating vegetation such as pondweeds. Substrates were predominantly silt/peat. In the areas where the drains are surrounded by heath, scrub and woodland the vegetation within them is sparse and the substrate comprises of bare silt (Plate 6-12 - Plate 6-13).



Plate 6-12 Drainage ditch through an area of birch woodland



Plate 6-13 Example of typical drainage ditch within the Application Site

Lowland depositing streams (FW2)

The Application Site is drained by a number of watercourses within and surrounding the Application Site including the Cartenstown stream, Stonestown river, Ballinn stream, Bolandstown river, Woodtown West stream, Stonyford river, Carranstown Little river, Killaconnigan stream, Kilballivor stream, Ballivor river and two unnamed tributaries, Graffanstown stream, Ballynaskeagh Stream, Mucklin Stream, River Deel, Craddanstown stream and Clondalee More stream.

The Deel (Raharney) river is located approximately 800m to the west of the Application Site and the Stonyford River is located approximately 450m to the east of the Application Site. Both rivers are designated as the River Boyne and River Blackwater SAC. A number of the streams within and adjacent to the Application Site discharge to these rivers which in turn discharge to the River Boyne downstream of the Application Site.

6.3.2.13 Grasslands Habitats

Dry calcareous and neutral grassland (GS1) and Dry meadows and grassy verges (GS2)

Small areas of dry grassland are present within the Application Site, along the sides of the railway lines and existing track verges as well as in areas where underlying glacial till has been exposed (Plate 6-14). The majority of grassland areas are classified as Dry Meadows and Grassy Verges (GS2) with grass species including Yorkshire fog (*Holcus lanatus*), cocks foot (*Dactylis glomerata*), sweet vernal grass (*Anthoxanthum odoratum*) and false oat grass (*Arrhenatherum elatius*). Encroaching scrub was common comprising bramble (*Rubus fruticosus* agg.) and bilberry (*Vaccinium myrtillus*). Other species recorded include bird's foot trefoil (*Lotus corniculatus*), knapweed (*Centaurea nigra*), meadowsweet (*Filipendula ulmaria*), tormentil (*Potentilla erecta*), ribwort plantain (*Plantago lanceolata*), silverweed (*Potentilla anserina*), germander speedwell (*Veronica chamaedrys*) and occasional devil's bit scabious (*Succisa pratensis*). Smaller areas of Dry calcareous and neutral grassland (GS1) were also present throughout the Application Site.

A number of orchid species were recorded in grassy verges along the existing railway lines including twayblade (*Listera ovata*), heath spotted orchid (*Dactylorhiza maculata*), common spotted orchid (*Dactylorhiza fuchsii*) and butterfly orchid (*Platanthera* sp.). Marsh helleborine (*Epipactis palustris*) is also known to occur at the Application Site in small pockets of calcareous grassland.

Other areas grassland habitats comprised of a mix of species typical of both calcareous and peatland habitats. This diversity in species recorded has resulted from the importing of stone for the construction of railway tracks throughout the peatland.



Plate 6-14 Example of dry grassland adjacent to the railway line within the Application Site

Grassland Habitats: Improved agricultural grassland (GA1), Wet grassland (GS4), Amenity Grassland (GA2)

The Application Site is surrounded by agricultural fields classified as Improved agricultural grassland (GA1) and Wet grassland (GS4). Small areas of Improved agricultural grassland are present in the Application Site boundary, close to the entrance to Ballivor Bog at its northern extent and at the southern extent of Lisclogher. The fields are characterised by species including perennial rye grass (*Lolium perenne*), cocksfoot (*Dactylis glomerata*), Yorkshire fog (*Holcus lanatus*), creeping buttercup (*Ranunculus repens*), common sorrel (*Rumex acetosa*), broadleaved dock (*Rumex obtusifolius*), and dandelion (*Taraxacum officinale*).

Wet grassland occurs mainly around the edges of the Application Site associated with wetter agricultural fields with abundant soft rush (*Juncus effusus*). Small areas of wet grassland dominated by purple moor grass are also present throughout the Application Site on cutover bog, however, these areas occur predominantly as a habitat mosaic alongside scrub and dry heath type communities.

A small area of Amenity grassland (GA2) is present at the northern extent of Ballivor Bog in the built area around Ballivor Works (adjacent to the Application Site boundary).

6.3.2.1.4 Oak-ash-hazel woodland (WN2)

Two small mineral islands are located on the Carranstown Bog site; these areas contain woodland that is dominated by Hazel (*Corylus avellana*), downy birch and ash (*Fraxinus excelsior*) with smaller amounts of young oak (*Quercus robur*) and are classified as Oak-ash-hazel woodland.

A small woodland copse area with elements of oak-ash-hazel woodland is also present at Bracklin Bog where it has developed on a mound close to the remains of an old Famine House (Plate 6-15). There are several mature Sycamore (*Acer pseudoplatanus*) trees around the house forming the woodland copse. Other species present include hazel (*Coryllus avelana*), holly (*Ilex aquifolium*), hawthorn (*Crataegus monogyna*) and ash (*Fraxinus excelsior*).



Plate 6-15 Oak-ash-hazel woodland close to the remnants of the Famine House at Bracklin Bog

6.3.2.1.5 Uncut raised bog

There are a number of areas of remnant uncut raised bog habitats within the Application Site boundary (Plate 6-16 and Plate 6-17). These are classified as **Raised Bog (PB1)**.

Whilst many areas of remnant raised bog recorded within the Application Site are typically small in area and are very dry with little to no Sphagnum cover, others are in relatively good condition, slightly wetter and support a more diverse raised bog vegetation with a greater abundance and cover of *Sphagnum* species.

Some areas of remnant raised bog had been subject to previous extensive drainage measures, with several parallel drainage channels throughout, but never put into peat extraction and as a result these areas are extremely dry e.g. large areas of Lisclogher West and the norther and southern sections of Lisclogher East. Other sections of remnant raised bog at Lisclogher Bog and Bracklin Bog had also been burned in recent years, see Chapter 4 for details, and, although recovering, still remained relatively dry and degraded.

The driest, drained areas of remnant raised bog within the Application Site are generally dominated almost exclusively by ling heather. Other species recorded in the drier raised bog remnants include *Cladonia* sp., cross leaved heath (*Erica tetralix*), cottongrasses and deergrass (*Trichophorum germanicum*). These dry areas were characterised by very low and in some cases no *Sphagnum* cover and variable areas of bare ground.

The wettest areas of remnant raised bog support bog asphodel (*Narthecium ossifragum*), areas of white beak sedge (*Rhychospora alba*) and a greater abundance and cover of *Sphagnum* species. However, in general, *Sphagnum* cover did not exceed 30% cover and was more typically < 10% cover. These wetter areas were not characterised by standing water/pools and were not associated with lawns of *Sphagnum*.

According to the Article 17 report referred to in Section 6.3.1.7.9, Active Raised Bog (ARB) ‘is characterised by the presence of an acrotelm, which is defined as the living, actively growing upper layer of a raised bog, the surface of which is composed mainly of living bog mosses (*Sphagnum* species)’. In addition, as outlined in Smith and Crowley (2020), previous raised bog research in Ireland indicated that ARB, at least in the midlands, generally supports cover of *Sphagnum* greater than 40% (Fernandez Valverde et al. 2005, 2012). The raised bog remnants within the Application Site generally lacked a diverse or abundant *Sphagnum* component. *Sphagnum* cover was generally <40% or in the driest areas absent. In raised bog remnants with >40% *Sphagnum* cover, typical Raised bog microtopography, including hummocks, bog pools and *Sphagnum* lawns were absent from these habitats. The areas of remnant raised bog within the Application Site, given their highly degraded and fragmented nature, and absence of typical raised bog micro-topography, do not conform to the Annex I habitat Active Raised Bog [7110].

According to the above Article 17 report, Degraded Raised Bog (DRB) is characterised by the complete absence, or at best the presence of only a patchy thin cover of an ‘acrotelm’ layer. According to the report, while previously all the vegetated areas of high bog which were not delineated as Active Raised Bog (ARB) were classified as DRB, on the assumption that most of it could be restored to active peat-forming condition after implementation of comprehensive restoration works, the results of recent research show that only those areas with the right combination of physical conditions (including surface shape, slope and drainage patterns) ultimately capable of supporting ARB are now considered DRB. To qualify as DRB, these areas must still be capable of natural regeneration to active bog within 30 years if their hydrology is repaired (usually after restoration works, particularly blocking of drains).

The conditions outlined in the Article 17 report as being suitable for supporting DRB include:

‘a) sites over 30ha of high bog with typical bog vegetation which were part of a larger bog and contain drains which could be blocked and b) smaller sites (< 30 ha) which are part of small basins with drains present which could be blocked.....The occurrence of DRB is ruled out from those sites where the high bog area is below 30ha, which were once part of a much larger site and are now surrounded by facebanks and without drains to be blocked.’

The majority of raised bog remnants within the Application Site are <30ha in size. However, those >30ha in size and which support >40% *Sphagnum* cover, e.g. the area of uncut remnant raised bog at Lisclogher West, are considered to conform to the Annex I habitat Degraded Raised Bog still capable of Natural Regeneration (7120).



Plate 6-16 Example of uncut but drained and dry raised bog at Bracklin Bog



Plate 6-17 Example of uncut remnant raised bog within the Application Site

6.3.2.1.6 **Conifer Plantation**

Small areas of conifer plantation (WD4) are present at the very northern extent of Ballivor Bog within the Application Site. A larger area of conifer plantation is also present along the northern boundary of Lisclogher West Bog within the Application Site.

6.3.2.1.7 **Spoil and bare ground (ED2) and Recolonising bare ground (ED3)**

Existing unpaved access tracks throughout the Application Site (Plate 6-21) are classified as Spoil and bare ground (ED2). Areas of spoil and bare ground and recolonising bare ground are also present in works areas associated with the Bord na Móna buildings at the northern extent of Ballivor Bog.



Plate 6-18 Access track at Bracklin Bog classified as Spoil and bare ground

6.3.2.1.8 **Buildings and Artificial Surfaces (BL3)**

There are some areas classified as buildings and artificial surfaces (BL3) within the Application Site. The majority of the artificial surfaces are associated with the Ballivor Works (adjacent to the Application Site), and the railway infrastructure (Plate 6-14) and existing local roads throughout the Application Site.

6.3.2.1.9 **Protected Flora**

No botanical species protected under the Flora (protection) Order (1999, as amended 2015) were recorded during the surveys undertaken.

6.3.2.1.10 Invasive 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 during the walkover 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 oak-ash-hazel woodland. 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 provided below for the current habitats within the Application Site would have been the same.

Current habitats

Ecological evaluation follows a methodology that is set out in Chapter 3 of the ‘*Guidelines for Assessment of Ecological Impacts of National Roads Schemes*’ (TII, 2009). The habitats within and adjacent to the Application Site were evaluated in accordance with the criteria developed by the TII (2009b), 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 remnant raised bog habitat, as shown in the habitat maps in Figure 6-6a and Figure 6-6b, have been assigned **County significance** 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, particularly at Lisclogher West, have potential to correspond to the Annex I habitat ‘*Degraded raised bog still capable of natural regeneration*’. These areas are only a 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 activities and all ancillary works. Large sections of remnant raised bog within the Application Site have been subject to drainage, including those areas of raised bog at the northern extents of Lisclogher and Bracklin Bogs as well as Lisclogher West. Other large areas of remnant bog have been damaged by fire including an area of remnant raised bog in Bracklin Bog as well as the area of remnant raised bog at the northern extent of Lisclogher. 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, however, there are wetter areas of remnant raised bog at locations throughout the site and Lisclogher West is comprised predominantly of uncut, remnant raised bog.

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)**.

No botanical species protected under the Flora (protection) Order (1999, as amended 2015), 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 in the Existing Environment

Dedicated faunal walkover surveys were undertaken throughout 2020, 2021, 2022, 2023, and 2024.

6.3.2.3.1 Badger

Two badger setts were recorded within the Application Site during surveys undertaken. One, located in an area of woodland at the north-eastern extent of Bracklin Bog within the Application Site, comprised of a single entrance sett. A camera trap was deployed at the sett entrance for a period of 7 days from the 8th July 2021 to the 15th July 2021. No evidence of badger entering or exiting the sett was recorded.

A second sett was recorded at Carranstown Bog within the Application Site in an area of woodland/scrub (Plate 6-19). This comprised a main sett with 5 entrances and a single entrance located approximately 200m to the north of the main sett, considered to be an outlier sett (as per Smal, (1995)³) all of which showed signs of recent use by badger including badger hairs, foraging evidence and paths.

The locations of the setts are shown in Figure 6-2, included in confidential Appendix 6-4.

³ Smal, C. (1995) *The Badger and Habitat Survey of Ireland. Unpublished Report to the Department of Agriculture and the National Parks & Wildlife Service.*



Plate 6-19 Badger sett entrance at Carranstown Bog

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.

Otter spraints were recorded within the Application Site in proximity to a drainage ditch in Lisclogher Bog during the multi-disciplinary walkover surveys undertaken in May 2020. Otter prints were recorded within the Application Site in Lisclogher Bog, in proximity to a wide drainage ditch during dedicated otter surveys undertaken in May 2021. No other signs of this species were recorded.

Signs of otter (spraints and/or prints) were recorded outside of and downstream of the Application Site in the Craddanstown stream to the west of Ballivor Bog and in the Ballivor river to the east of Ballivor Bog during the aquatic surveys of these watercourses undertaken by Triturus Environmental Ltd.

The majority of the drainage ditches within the Application Site are small and are thus not suitable for otter given their small size and highly modified channels of low fisheries value, however it is possible that otter utilise some of the larger drains for foraging and commuting. The main watercourse/larger artificial drainage channels were assessed as providing suitable commuting and foraging habitat for the species.

6.3.2.3.3 Bats

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

Roost surveys

No bat roosts were identified within the Application Site during the surveys undertaken in 2020 and 2022.

Manual transects

Manual transects were undertaken in Spring, Summer, and Autumn 2022. Bat activity was recorded on all surveys. Bat activity was recorded on all surveys, a total of 108 bat passes were recorded. In general, Common pipistrelle was recorded most frequently (n=96), followed by Leisler's bat (8) and Soprano pipistrelle (n=4). Low activity was recorded across the Application Site. Species composition and activity levels did not vary significantly between surveys.

Species composition and activity levels varied significantly between surveys. Transect survey results were calculated as bat passes per km surveyed (to account for differences in survey effort).

Ground-level Static Surveys

In total, 44,101 bat passes were recorded across all deployments during 2022. In general, Common pipistrelle (n=24,670) occurred most frequently, followed by Soprano pipistrelle (n=11,871) and Leisler's bat (n=6,711). Instances of *Myotis* spp. (n=645), Brown long-eared bat (n=192) were significantly less and Nathusius' pipistrelle (n=12) were rare.

Bat activity was calculated as total bat passes per hour (bp/h) per season to account for any bias in survey effort, resulting from varying night lengths between seasons. Species composition was similar across seasons, however relative activity was high in Summer, low in Spring and very low in Autumn. No instances of Nathusius' pipistrelle were recorded in Autumn, and activity by all other species declined relative to Spring and Summer. In terms of total passes, Brown long-eared bat activity remained constant between Summer and Autumn, and *Myotis* spp. activity slightly increased between seasons through the year.

Spring activity was dominated by Leisler's bats at most detectors, with activity overall being low for all species (<10bp/h), with a few exceptions. All detectors presented low median activity in spring (<10bp/h).

Summer activity was largely dominated by Common pipistrelles at most detectors, with some detectors (refer to bat report in Appendix 6-2) presenting slightly higher Leisler's bat activity, with low bp/h recorded.

In Autumn, median bat activity was low at all detectors and for all species recorded. Species composition was more variable in Autumn at detectors.

6.3.2.3.4 Birds

A comprehensive list of all bird species recorded during bird surveys undertaken at the Application Site by MKO from 2020 to 2023 is included in Appendix 6-5. The species recorded within the Application Site were predominantly species typical of the cutover bog and surrounding habitats in the wider area. Woodcock was recorded breeding within the Application Site. While golden plover and curlew were recorded within the Application Site these species were not using the Application Site for

breeding. Kingfisher was observed flying through the site on a number of occasions and red grouse was observed on one occasion. Full details of the results of the bird surveys are included in Appendix 6-5.

6.3.2.3.5 Reptiles and Amphibians

Common frog (*Rana temporaria*) was recorded on a number of occasions throughout the Application Site. The species is likely to breed in small wetland areas within the Application Site. Smooth newt (*Lissotriton vulgaris*) was recorded during aquatic surveys on the Woodtown stream, downstream of the site boundary at Lisclogher. 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 in Appendix 6-3.

In summary, the majority of watercourses in the vicinity of the Application Site were of local importance (higher value) in terms of their aquatic ecology. Watercourses included the Cartenstown Stream (EPA code: 07C60), Stonestown River (07S11), Ballinn Stream (07B47), Bolandstown River (07B45), Woodtown West Stream (07W06), Carranstown Little River (07C87), Killaconnigan Stream (07K34), Kilballivor Stream (07B35), Ballivor River (07B52) and two unnamed tributaries, Graffanstown Stream (07G10), Ballynaskeagh Stream (07B24), Mucklin Stream (07M13), Craddanstown Stream (07C550) and Clondalee More Stream (07C77). Typically, larger watercourses with higher flow rates are better able to buffer against any impacts associated with the historical drainage and ongoing peat escapement, and these proved the better-quality aquatic habitat, i.e. Stonyford River, River Deel, River Boyne which are located outside and downstream of the Application Site. With the exception of survey sites on these three watercourses, biological water quality was of $\leq Q3$ (poor status) across all survey sites sampled and this contributed to the reduction in habitat quality for salmonids, macro-invertebrates (including white-clawed crayfish) and other aquatic species and habitats of conservation value. The Stonyford River, River Deel and the River Boyne all of which are located downstream of the site provide suitable habitat for a range of aquatic species including salmonids, freshwater crayfish and European eel.

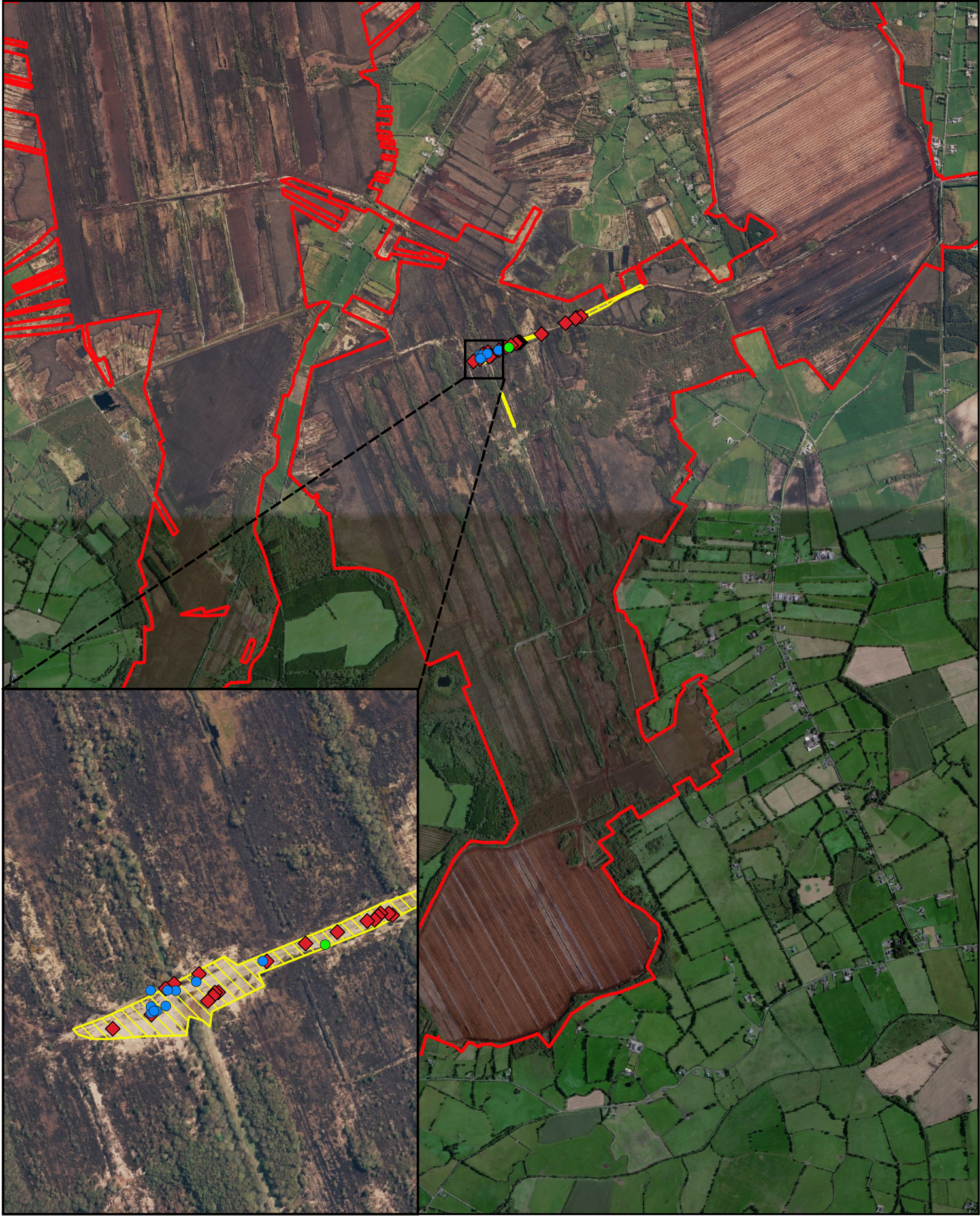
Drainage ditches within the Application Site itself generally had a poor structure and silty substrate and did not provide suitable spawning habitat for protected fish species, salmonids, European eel, lamprey or white-clawed crayfish.

6.3.2.3.7 Marsh Fritillary

The desk study identified that marsh fritillary is known to occur within the Application Site and the wider area. Adult marsh fritillary were identified during the Application Site walkover survey in May 2020.

Three larval webs were recorded during dedicated marsh fritillary larval web surveys undertaken in August 2023. These were recorded in the eastern section of Bracklin Bog, within areas previously identified as providing potential suitable habitat for this species (refer to Figure 6-7).

Additionally, during targeted surveys undertaken in April and June 2024, marsh fritillary caterpillars (later instar stages), adults, and eggs were recorded in the same area within the Application Site (Figure 6-7).



Map Legend

- Application Site
- Identified Suitable Habitat
- Adult
- Caterpillar
- Eggs



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Ireland/Government of Ireland

Marsh Frithary Survey Results

Project Title	Ballivor Substitute Consent Application		
Drawn By	PD	Checked By	PR
Project No.	191137-f	Drawing No.	PR
Scale	1:30,000	Figure 6-7	
Date	08/07/2024		

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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. As signs of fox were regularly recorded throughout the Application Site, the distribution of the species has not been mapped. The species was also caught on the camera trap deployed at the badger sett entrance at Bracklin Bog.
- Hare (*Lepus timidus hibernicus*) was frequently recorded throughout the Application Site along with its droppings and footprints. The species is widespread throughout the habitats present and no dedicated survey for the species was required.
- Mustelid scat that was likely to be that of pine marten (*Martes martes*) was recorded infrequently throughout the Application Site. No dens were recorded and no requirement for additional survey was identified.
- Deer prints were recorded regularly throughout the entire Application Site.
- Pygmy shrew (*Sorex minutus*) was recorded at Bracklin Bog 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*) but also larger mammals such as stoat (*Mustela erminea*) 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 invertebrates 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*)
- Four spotted chaser (*Libellula quadrimaculata*)
- Large red damselfly (*Pyrthosoma nymphula*)
- Common carder bee (*Bombus pascuorum*)
- Buff-tailed bumblebee (*Bombus terrestris*)
- Red-tailed bumblebee (*Bombus lapidarius*)
- Heath bumble bee (*Bombus jonellus*)
- Small copper butterfly (*Lycaena phlaeas*)
- Common blue butterfly (*Polyommatus icarus*)
- Green hairstreak butterfly (*Callophrys rubi*)
- Peacock butterfly (*Inachis io*)
- Green tiger beetle (*Cicindela campestris*)
- Narrow-bordered bee hawkmoth (*Hemaris tityus*)
- Small heath butterfly (*Coenonympha pamphilus*)
- Meadow brown butterfly (*Maniola jurtina*)
- Speckled wood butterfly (*Pararge aegeria*)

6.3.3 Identification of Key Ecological Receptors (KERs)

The preceding sections, which have provided data on the ecology of Application Site through desk studies and field surveys, have helped inform the 1988 baseline of the site, as well as the ecology of the Application Site during each phase of the Project. Using the 1988 baseline and the additional

information data above, Table 6-20 identifies all receptors from all three phases of the Project (Peat extraction, Current, and Remedial) and assigns them an ecological importance in accordance with the Guidelines for Assessment of Ecological Impacts of National Road Schemes (TII, 2009). This table also provides the rationale for this determination and identifies the habitats that are Key Ecological Receptors. These likely significant effects on ecological receptors identified as KERs is considered in Section 6.5 of this report.

Table 6-19 Key Ecological Receptors identified during the assessment

Ecological feature or species	Reason for inclusion as a KER	KER
Designated sites	<p>Nationally Designated Sites</p> <p>The following pNHAs are located downstream (in excess of 20km) of the Application Site via the River Boyne. These sites have been assessed as of National importance in line with TII (2009) guidelines as they are proposed as Natural Heritage Areas (NHAs).</p> <ul style="list-style-type: none"> > Trim pNHA > Boyne Woods pNHA > Crewbane Marsh pNHA > Rossnaree Riverbank pNHA > Dowth Wetland pNHA > Boyne River Islands pNHA > Boyne Coast and Estuary pNHA <p>Taking a precautionary approach, the above listed downstream pNHAs were identified in Table 6-4 above as occurring within the Zone of Influence and are included as a KER.</p>	Yes
	<p>European Designated Sites</p> <p>The following Special Area of Conservation (SAC) and Special Protection Area (SPA) are identified in the AA Screening as being within the Likely Zone of Impact and are assessed fully in the rNIS that accompanies this Substitute Consent application:</p> <ul style="list-style-type: none"> > River Boyne and River Blackwater SAC > River Boyne and River Blackwater SPA <p>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 rAASR submitted as part of this substitute consent application for full details. These European Sites were not designated until 2003 and 2010, respectively, and therefore would not have been assessed as Internationally Important at the 1988 baseline.</p>	Yes
Aquatic Habitats and related species	<p>Drainage Ditches</p> <p>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.</p> <p>These drains are assigned Local Importance (Lower Value).</p>	No

Ecological feature or species	Reason for inclusion as a KER	KER
	<p>Rivers and Streams</p> <p>The Deel (Raharney) river is located approximately 800m to the west of the Application Site and the Stonyford River is located approximately 450m to the east of the site. Both rivers, along with the River Boyne downstream, are designated as part of the River Boyne and River Blackwater SAC and have been assigned International Importance, as they form part of this European Site.</p> <p>In addition, a number of natural or slightly modified watercourses are located either within or at the perimeter of the Application Site. These watercourses include:</p> <ul style="list-style-type: none"> • Cartenstown Stream (EPA code: 07C60), Stonestown River (07S11), Ballinn Stream (07B47), Bolandstown River (07B45), Woodtown West Stream (07W06), Carranstown Little River (07C87), Killaconnigan Stream (07K34), Kilballivor Stream (07B35), Ballivor River (07B52) and two unnamed tributaries, Graffanstown Stream (07G10), Ballynaskeagh Stream (07B24), Mucklin Stream (07M13), Craddanstown Stream (07C550) and Clondalee More Stream (07C77). <p>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 SACs of international importance.</p>	Yes
	<p>Aquatic and Fisheries Species</p> <p>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.</p>	Yes
Uncut Raised Bog	<p>Areas of remnant uncut raised bog that are located throughout the Application Site, including Lisclogher West and smaller, more fragmented remnants within the Application Site, 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, however, areas of this habitat are also present within the inner extents of Bracklin Bog and Lisclogher East Bog.</p>	Yes
Cutover bog and associated secondary habitats	<p>Bare peat habitats</p> <p>The bare peat habitats are of low ecological importance in their current state and have been assigned Local Importance (Lower Value).</p>	No

Ecological feature or species	Reason for inclusion as a KER	KER
	Bog Woodland, Oak-ash-hazel 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 (see Appendix 6-4). Note: The bog woodland does not correspond to the Annex I Habitat Bog Woodland 91D0.	Yes
	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
	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 do not correspond to habitats that are listed on Annex I of the EU Habitats Directive.	Yes
	Open water No large oligotrophic lakes were recorded within the 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 site this habitat is not included as a KER.	No
Grassland Habitats	Dry meadows and grassy verges (GS2) and Dry calcareous and neutral grassland (GS1) 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
	Improved agricultural grassland (GS1), Wet grassland (GS4), Amenity grassland (GA1) These areas are predominantly associated with agricultural fields and amenity areas close to the BnM works area at the Application Site. Although they contain small areas of semi-natural habitat that are of some local importance for wildlife, they are common and widespread in the local and wider landscape. These habitats are not included as KERs.	No
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

Ecological feature or species	Reason for inclusion as a KER	KER
Otter	In July 1988 the Application Site would likely have supported similar populations of otter as it does today. Otter is assigned Local Importance (Higher Value) as there is likely to be a regularly occurring population of local importance utilising the watercourses within and downstream of the Application Site. No evidence of a more ecologically important population was recorded during any surveys of the Application Site surveys undertaken. Peat extraction activities and all ancillary works 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 activities and all ancillary works. Therefore, otter is included as a KER.	Yes
Badger	<p>Although a number of badger setts were recorded within the Application Site, the site in its unmodified state, as an active raised bog prior to peat extraction activities, is unlikely to have supported significant woodland and scrub habitat suitable for badger habitat.</p> <p>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 activities and all ancillary works 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 activities and all ancillary works not been undertaken prior to 1988.</p> <p>The implementation of the rehabilitation plan for Ballivor Bog Group 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.</p>	No
Marsh fritillary	<p>There are records for marsh fritillary in Bracklin Bog and the Application Site contains suitable marsh fritillary habitat in areas, particularly within the grassy verges running parallel to the railway tracks. During the 2023 and 2024 targeted marsh fritillary surveys, larval webs, caterpillars, adults and eggs were recorded in the eastern section of Bracklin Bog. The species has been assessed as of County importance as it is listed under Annex II of the EU Habitats Directive.</p> <p>Peat extraction activities and all ancillary works 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 activities, is unlikely to have supported significant habitat for this species. On the contrary, the construction of infrastructure associated with peat extraction activities and all ancillary works, particularly the creation of the raised railway lines and the removal of raised bog habitat, 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.</p> <p>The implementation of the rehabilitation plan for Ballivor Bog Group during the Remedial Phase is unlikely to have a significant effect on this</p>	No

Ecological feature or species	Reason for inclusion as a KER	KER
	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 on raised embankments along the existing railway infrastructure. Given that these grassland habitats are in an elevated position relative to the peat extraction and associated activities, neither rewetting nor drying out of these habitats is likely to occur. Therefore, this species is not included as a KER.	
Bats	<p>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 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.</p> <p>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.</p>	No
Bird species	<p>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 site during breeding and wintering bird surveys undertaken by MKO in 2019 and 2021, birds have been assigned County Importance.</p> <p>Peat extraction activities and all ancillary works 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 activities and all ancillary works) as a result of habitat loss, disturbance and direct mortality. Therefore, birds are included as a KER.</p>	Yes
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
Additional fauna (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 significantly effects have been identified at the population level. The site surveys did not identify any other protected faunal species populations with the potential to be significantly affected by peat extraction activities and all ancillary works at the population level. Other faunal species are not considered further in this rEIAR. Significant effects are not anticipated.	No

6.4 Ecological Impact Assessment

6.4.1 ‘Do-Nothing’ Effect

As outlined in the EPA Guidelines (May 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. As discussed in Section 3.2.1 in Chapter 3, the assessment period of this rEiAR commenced in 1988, a time at which peat extraction was already well-established at the Application Site. In the context of this rEiAR, the Project has been ongoing since the baseline assessment year of 1988. As outlined in Section 3.2.1 in Chapter 3, peat extraction activities commenced at the Application Site in 1948 with the installation of drainage.

The ‘Do-Nothing’ option is defined as the Project (as described in Section 4.2 of Chapter 4) having ceased at the Application Site in 1988.

In the event of the cessation of the Project at the Application Site in 1988, it is assumed that those lands which by that point had not been subject to the installation of drainage and peat extraction would have remained as a relatively intact raised bog with varying raised bog habitats (such as bog woodland, fen, sphagnum mosses).

Subsequently, other land-use practices may also have taken place on the Application Site such as agricultural or commercial forestry, or other commercial or non-commercial uses. Alternative land uses are discussed in Chapter 3 – Alternatives. Under this ‘Do-Nothing’ option, the IPC licence and associated ongoing decommissioning and planned rehabilitation would not have occurred.

For those lands which as of 1988 had been subject to the installation of drainage in preparation for peat extraction 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. Minor third party turbary activities likely would have occurred along the intact bog edges as was common practise at sites such as the Application Site.

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 related activities ceased from 1988 onwards, then the various residual effects, described throughout this rEiAR, would not have occurred.

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 all ancillary works have occurred at the Application Site from July 1988 onwards. A decision to cease peat extraction 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 the rEiAR.

In the event that Substitute Consent is not granted in effect, the ‘Do-Nothing’ option represents the current situation as at the date of the application for Substitute Consent. As part of Bord na Móna’s statutory obligations under IPC licence requirements, Cutaway Bog Decommissioning and Rehabilitation Plans will continue to be implemented for the Application Site separate to, and

independent of, the Substitute Consent application. The implementation of the plans is included in the impact assessment below.

The role of cutaway/cutover peatlands such as the Application Site as a significant potential resource for amenity, tourism, biodiversity enhancement and conservation, improvement in air quality, climate mitigation, renewable energy development and education are part of Bord na Móna's vision for the Application Site. The regularisation of the planning status of the Application Site is a significant facilitator in ensuring the sustainable use and management of these peatlands. If this does not occur, the opportunity to continue employment and alternative use of the Application Site for the potential resources and activities mentioned above will be significantly restricted.

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 activities and all ancillary works 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 in June 2020.

By 1988, peat extraction activities and all ancillary works was well established at Lisclogher, Bracklin and Ballivor Bogs and was underway in the western section of Carranstown. All bogs had been subject to drainage and railway infrastructure had also been laid on all bogs with the exception of Lisclogher West. Carranstown East and the northern section of Bracklin West would have been drained but vegetation removal or peat extraction had not yet commenced. Lisclogher West was drained for milled peat production by 1995, however the bog was never brought into production.

The main activities on the Application Site between July 1988 and June 2020 included peat extraction, drainage (Lisclogher West), vegetation removal from areas drained but not yet cleared of vegetation (Carranstown East and the northern section of Bracklin West), creation and removal of stockpiles, peat transportation and maintenance of drains, machinery and pumps.

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

The table below describes the likely significant effects of peat extraction activities and all ancillary works during the Peat Extraction Phase (July 1988 to June 2020) on the remnant uncut raised bog and associated cutaway bog habitats at the Application Site.

Table 6-20 Likely significant effects on raised bog habitat

Description of Effect	<p>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 1948 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.</p> <p>The mosaic of habitats that currently exists on the Application Site predominantly includes the following habitats:</p> <ul style="list-style-type: none"> > Bare peat > Poor fen > Bog woodland > Scrub > Dry heath > Areas of wet and dry grassland > Remnant uncut raised bog
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	<p>➤ Conifer plantation</p> <p>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 at Carranstown East and the southern section of Bracklin West. These areas, which comprise approx. 218ha, had been drained by 1988 but vegetation removal did not commence until post 1988.</p> <p>The drainage of Lisclogher West by 1995 would also have resulted in the degradation of approximately 238ha of remnant undrained and uncut raised bog.</p>
Assessment of Significance prior to control measures	<p>Following the initial cutting and drainage that occurred at the Application Site primarily between 1948 and the 1980s, the ongoing peat extraction activities and all ancillary works 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 activities. This has been assessed as a Long term Slight Negative Effect and no Significant Effects are expected to have occurred.</p> <p>With respect to Lisclogher West, the installation of further drainage of this area of remnant raised bog up until 1995 is likely to have resulted in a Significant Negative Effect on the habitat at that location.</p>
Control Measures	<p>No control measures were in place between July 1988 and June 2020 to mitigate against or compensate for the loss of raised bog and habitats of cutover raised bog.</p>

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 6-21 Likely significant effects on Watercourses and Sensitive Aquatic Species

Description of Effect	<p>The Application Site is drained by a number of small streams and rivers which in turn drain to the Deel (Raharney) to the west of the Application Site and the Stonyford River to the east. These rivers are designated as part of the River Boyne and River Blackwater SAC designation and have connectivity with the River Boyne further downstream. The effects on water quality are fully described in Chapter 8 'Hydrology & Hydrogeology' of this rEiAR and are described here in relation specifically to ecology.</p> <p>Suspended Solids</p> <p>Taking 1988 as the baseline, peat extraction activities and all ancillary works 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 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. 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 including 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</p>
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	<p>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.</p> <p>Within the Application Site, the first silt ponds were constructed at the Application Site in 1983/1984. Improved sediment control measures were installed at the Application Site in the late 1990's and early 2000's. Since 2000, the Application Site has been regulated by the EPA under IPC Licence Registration No. P0501 and has been subject to the conditions of that licence which include emission limit values for suspended solids and other nutrients.</p> <p>Accidental Leakages and Spillage of Hydrocarbons</p> <p>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.</p> <p>Discharges from wastewater systems (septic tanks) at office buildings, and at productions centres and workshops could potentially also have caused surface and groundwater contamination.</p> <p>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 & Hydrogeology).</p> <p>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 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.</p>
Assessment of Significance prior to control measures	<p>In the absence of mitigation and regulation of activities under IPC licence, the indirect effect of water pollution on aquatic receptors during peat extraction activities and all ancillary works is likely to have been a Long-term Indirect Negative Effect. Although the majority of water quality impacts are likely to have occurred pre-1988, the magnitude of the impact from July 1988 onwards in the absence of any mitigation is likely to have been Significant given the scale of peat extraction activities and all ancillary works.</p> <p>Since regulation under IPC licence in 2000, quarterly monitoring only recorded 3 no. exceedances of the suspended solids threshold and 5 no. exceedances above the IPC Licence trigger limit for ammonia during the monitoring period (2000–2020). The results show water quality impacts have not been significant since this time.</p> <p>Peat extraction activities and all ancillary works between July 1988 and June 2020 in the absence of any mitigation or regulation under IPC licence is likely to have had a Long-Term Significant Negative Effect on water quality.</p>
Control Measures	<p>Suspended Solids</p> <p><u>Pre-IPC Licence</u></p> <p>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. These measures</p>

primarily relate to the concentrations of suspended sediments in discharge from the bogs 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 desludged twice per annum.

Post IPC Licence:

The Application Site has been regulated by the EPA under IPC Licence Registration No. P0501 since 2000. The Application Site also has a Surface Water Environmental and Operation Control Procedures (Appendix 4-11 of this rEiAR) which defines how compliance with the Licence is achieved. The drainage system in place at the bogs comprising field drains, main drains, piped drains and 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. Quarterly monitoring only recorded 3 no. exceedances of this threshold during the monitoring period (2000–2020).

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 providing attenuation limited runoff during periods of intense rainfall.
- 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 4.3.5:

- All machinery were stored at the Ballivor 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 Ballivor Works;
- In the event that on-site refuelling was required, it was done with a mobile fuelling unit;

	<ul style="list-style-type: none"> ➤ In the event of an emergency spill, the following procedures were in place: <ul style="list-style-type: none"> ○ 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 Ballivor Works. <p><u>Post IPC Licence:</u></p> <p>The refuelling procedures and mitigation 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. P0501 since 2000. The bogs also have Surface Water Management Plan⁴ which define 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:</p> <ul style="list-style-type: none"> ➤ Effective spill/leak management of mobile fuelling units was undertaken; ➤ Replacement (and remediation where necessary) of all underground fuel tanks was undertaken; ➤ There was 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;
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⁴ Current versions: SWMP 0501 Derrygreenagh 31.01.2020.pdf

	<ul style="list-style-type: none"> > An inspection for leaks on all flanges and valves on over-ground pipes used to transport materials other than water was carried out weekly; > Bord na Móna 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, > Bord na Móna 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 activities and all ancillary works are 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 activities and all ancillary works 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. Dry bog woodland and scrub which has since regenerated on areas of cutover bog is likely to have resulted in creation of some suitable supporting for habitat for badger, and badger setts were recorded within these habitats within Application Site during site surveys in 2021 in these habitats.

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 an active raised bog.

Marsh fritillary is known to occur at the Application Site. This species is dependent on the presence of the larval food plant devil's bit scabious. Areas of suitable habitat for marsh fritillary within the Application Site currently occur in grassland habitats, including those running parallel to the railway tracks within the Application Site and areas of cutover bog with devil's bit scabious, habitats which have come about as a result of peat extraction activities and all ancillary works. Therefore, the peat extraction activities and all ancillary works at the Application Site is unlikely to have resulted in significant negative effects on marsh fritillary.

The peat extraction activities and all ancillary works that took place at the Application Site during the Peat Extraction Phase are unlikely to have resulted in significant negative effects on any other protected faunal 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 6-22 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 activities and all ancillary works 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 6-21 above 'Potential for impact on Watercourses and Sensitive Aquatic Species'
	Disturbance There would also have been potential for disturbance of otter where they occurred within and adjacent to the Application Site during peat extraction activities and all ancillary works. Potential for effects on otter has been considered with regard to NPWS 'Threat Response Plan' ⁵ (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 6-21 above 'Potential for impact on Watercourses and Sensitive Aquatic Species'
	Disturbance Otter are predominantly crepuscular in nature and most peat extraction activities and all ancillary works would have been confined to daytime hours, thus minimising potential disturbance related impacts to the species. Channin P (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 et al. 1991; Bailey & Rochford, 2006). Indirect impacts on otter as a result of disturbance during peat extraction activities and all ancillary works is likely to have been a Slight, Long-Term, Negative Effect. 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 likely to have occurred during the Peat Extraction Phase of the Project, as a result of disturbance.

⁵ NPWS (2009) Threat Response Plan: Otter (2009-2011). National Parks & Wildlife Service, Department of the Environment, Heritage & Local Government, Dublin.

Control Measures	Habitat Loss/Degradation Mitigation to prevent indirect impacts on water quality is as per Table 6-21 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

The peat extraction activities and all ancillary works are likely to have had an indirect effect on wetland bird species, including kingfisher, 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 6-21 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 the table below.

Table 6-23 Assessment of likely significant effects on birds

Description of Effect	Habitat Loss/Degradation The main impact of peat extraction activities and all ancillary 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 had ceased for some time, e.g. parts of Bracklin and Lisclogher Bogs, the habitats present have recovered and revegetated at different rates throughout the Application Site. As the habitats on site recovered and 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, snipe, skylark. With respect to Lisclogher West, the installation of further drainage of this area of remnant raised bog up until 1995 is likely to have been some loss of habitat for species typical of raised bog including red grouse, curlew etc.
	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. skylark, 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. Where vegetation removal had not yet occurred by 1988, i.e. parts of Carranstown and Bracklin West, there would likely have been some disturbance and direct mortality of nesting birds when vegetation was being removed during the Peat Extraction Phase.

Assessment of Significance prior to control measures	Habitat Loss/Degradation The peat extraction activities and all ancillary works at the Application Site during the Peat Extraction Phase was confined largely to the area already affected by the original cutting and drainage. The ongoing effects with regard to habitat loss for bird species was likely to have been a Slight, Negative Effect. 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. No Significant Effects on birds are likely to have occurred during the Peat Extraction Phase of the Project, as a result of habitat loss/degradation.
	Disturbance/Displacement The peat extraction activities and all ancillary works at the Application Site during the Peat Extraction Phase was largely confined to the area already affected by the original cutting and drainage. The ongoing effects with regard to disturbance and/or mortality for bird species was likely to have been a Slight, Negative Effect. No Significant Effects on birds are likely to have occurred during the Peat Extraction Phase of the Project, as a result of disturbance.
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 development, individually or in combination with other plans and projects, would be likely to have a significant effect on the following sites:

- River Boyne and River Blackwater SAC
- River Boyne and River Blackwater SPA

As a result, an Appropriate Assessment is required, and a remedial Natura Impact Statement has been prepared in respect of the Development in order to assess whether the Development is likely to have and will adversely impact the integrity of these European Sites’.

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 discharge to the Stoneyford River and Deel (Raharney). These rivers are designated under the River Boyne and River Blackwater SAC and SPA. Impacts could potentially have occurred during the construction of drainage channels, removal of surface vegetation and during peat extraction activities and all ancillary works. The likely significant effects on these European Sites are described in detail within the rNIS prepared for the application.

The Application Site has been regulated by the EPA under IPC Licence Registration No. P0501 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 6-21 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 pNHAs were identified in Table 6-4 above as being within the likely Zone of Influence of the Project:

- Trim pNHA
- Boyne Woods pNHA
- Crewbane Marsh pNHA
- Rossnaree Riverbank pNHA
- Dowth Wetland pNHA
- Boyne River Islands pNHA

Prior to the regulation of activities at the Application Site by the EPA which commenced in 2000, the Applicant were implementing several control measures to protect surface water quality in downstream waterbodies, as detailed in Table 6-21. With these control measures in place, it was unlikely that significant effects on any of the above National Sites 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 at the Application Site in June 2020 to the present day. From mid-2020 to mid-2021 the operations at the Application Site reduced to transferring stockpiled peat to the Ballivor Works for processing prior to transportation to Kilberry Horticulture Works in Co. Kildare, the Edenderry Power Plant and Derrinlough Briquette Factory, both in Co. Offaly. The Ballivor Works ceased operation mid-2021. From mid-2021, stockpiles of peat were removed from across the Application Site, transferred to a conveyor via tipple trucks and subsequent transport to either Kilberry Horticulture Works, Edenderry Power Plant, and/or the Derrinlough Briquette Factory. Final stockpiles at Ballivor Bog were removed in June 2022 and the last of the stockpiles at Bracklin, Lisclogher and Carranstown bogs were removed by the end of 2023.

In addition to these works, rehabilitation works at the Application Site under the Peatland Climate Action Scheme (PCAS) have been commenced in areas that are identified as suitable for the prescribed enhancement measures and are currently ongoing. These include enhanced measures which are designed to exceed the standard stabilisation requirements as defined by the IPC Licence and to enhance the ecosystem services of areas of the Application Site. These include:

- Deep Peat measures including field re-profiling, bunding and drain-blocking, resulting in banded wetlands suitable for Sphagnum inoculation, on deeper peat;

- Intensive drain blocking around shallow peat areas / modelled depressions on little or no peat to create/promote the spread of wetland habitats
- Modifying outfalls, and management of water levels with overflow pipes and blocking of internal outfalls
- Regular drain blocking on dry cutaway along with the blocking of outfalls and management of water levels
- Intensive drain blocking in areas to develop wetlands in areas of shallow peat. Measures include the blocking of outfalls, management of water levels and transplanting reeds and other rhizomes
- Berms and field re-profiling (45m x 60m cell) in deep peat areas, along with blocking outfalls and managing overflows with a controlled weir outfall, includes drainage channels for excess water and Sphagnum inoculation
- Targeted fertiliser applications to accelerate vegetation establishment on areas of bare peat on headlands and high fields, and within certain areas of dry cutaway. Areas where vegetation has established do not need fertiliser application.
- Seeding of vegetation and inoculation of Sphagnum will be undertaken where required.

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

Table 6-24 describes the likely significant effects on Habitats during the Current Phase (June 2020 to Present).

Table 6-24 Likely significant effects on Habitats

Description of Effect	Since the cessation of peat extraction 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 from the Application Site as well as rehabilitation works under the PCAS. 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 access to existing stockpiles on the Application Site is confined to areas already subject to peat extraction activities and all ancillary works. No additional drainage, vegetation removal, peat harvesting has been undertaken. No Significant Effects on habitats are likely to have occurred during the Current Phase of the Project, as a result of habitat loss/degradation, or fragmentation.
Control Measures	No control measures

6.4.2.2.2 **Effects on Water Quality and Aquatic Fauna**

Table 6-25 describes the likely significant effects on Water Quality and Aquatic Fauna during the Current Phase (June 2020 to Present).

Table 6-25 Likely Significant Effects on Water Quality

Description of Effect	Since the cessation of peat extraction at the Application Site in June 2020, there was less potential for release of suspended sediments and pollution of water quality including watercourses and groundwater. There was also less potential for accidental spillage of pollutants due to the reduced machinery operating on site. During the Current Phase the site drainage still operated under the same drainage systems as during the Peat Extraction Phase i.e. field drains, main
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	<p>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</p> <p>Despite the cessation of peat extraction at the Application Site, there is still some very limited activity at the Application Site involving machinery and plant with which there is always a risk of accidental spillage of hydrocarbons. Similarly, the office buildings at the Ballivor Works 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 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.</p> <p>Note: Whilst this impact assessment is in the 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.</p>
Assessment of Significance prior to control measures	In the absence of control measures and regulation of activities at the Application Site under IPC licence, there is potential for the Current Phase of the Project to have had a Long-Term Moderate Negative Effect on 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 6-22 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 supporting aquatic 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 likely significant effects on water quality and supporting habitat for aquatic species are as per Table 6-25 above and of a much lesser scale than during the Peat Extraction Phase due to the lower volumes of plant, machinery and workers operating at the Application Site during the Current Phase.

The likely significant effects on fauna, including birds and otter, due to disturbance and displacement are as per Tables 6-22 and 6-23 above, however, to a lesser extent due to the reduced volumes of plant, machinery and workers at the Application Site. Access to existing peat stockpiles in the Application Site is via existing machine passes and therefore no vegetation removal and therefore no significant loss of supporting habitat for faunal species would have occurred.

6.4.2.2.4 Effects on Designated Sites

Despite the cessation of peat extraction at the Application Site in June 2020 there is still some very limited activity at the site involving machinery and plant (removal of peat stockpiles), the maintenance of the existing drainage network and environmental monitoring. The Application Site is hydrologically linked with the River Boyne and River Blackwater SAC/SPA. 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.

Where PCAS works are ongoing at the Application Site as part of the rehabilitation plan, as described in Section 6.4.2.2 above, these works operate within the constraints of the relevant IPC licence (EPA IPC Licence - Ref. P0501-01). 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. P0501-01), a Cutaway Bog Decommissioning and Rehabilitation plan must be prepared for the permanent rehabilitation of the boglands within the licenced area. The Applicant has produced a Cutaway Bog Decommissioning and Rehabilitation Plan for all 5 no. bogs of the Ballivor Bog Group (the Application Site), and it is the intention of the Applicant to rehabilitate the bogs in a phased approach under IPC licence. The Cutaway Bog Decommissioning and Rehabilitation Plans are included in Appendix 4-2 of this rEiAR and the details of the plans are summarised in Chapter 4. The Remedial Phase involves the implementation of the rehabilitation plans.

The overall aim of the Cutaway Bog Decommissioning and Rehabilitation plans is environmental stabilisation of the former peat production areas, putting the bogs comprising the site on a trajectory towards becoming naturally functioning peatland systems. It is anticipated that the combination of rehabilitation measures and natural colonisation will result in environmental stabilisation. Nevertheless, according to the Cutaway Bog Decommissioning and Rehabilitation plans it will still take, in most cases, some time (30-50 years) for naturally functioning wetland and peatland ecosystems to fully re-establish.

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 drain blocking and cell bunding as described in Chapter 4 of the rEiAR. Prior to the finalisation of and submission of the Cutaway Bog Decommissioning and Rehabilitation plans to the EPA, a baseline ecology survey is carried out to determine the status of natural colonisation, the potential for targeted revegetation and/or rewetting and the future development at the site to ensure stabilisation of the future cutaway.

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.

According to the Cutaway Bog Decommissioning and Rehabilitation Plans for Ballivor Bog Group (the Application Site), it is not expected, with the exception of Lisclogher West, that the majority of the Application Site has the potential to develop active raised bog (ARB) analogous to the priority EU Habitats Directive Annex I habitat within the foreseeable future (c.50 years). Furthermore, only a 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 of the whole bog. Other peatland habitats will develop in a wider mosaic that reflects underlying conditions.

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

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

Table 6-26 describes the likely significant effects on Habitats during the Remedial Phase.

Table 6-26 Likely significant effects on habitats during the Remedial Phase

<p>Description of Effect</p>	<p>The implementation of the Rehabilitation Plans for Ballivor Bog Group will involve a combination of rehabilitation measures and natural colonisation (as well as continued vegetational succession) of cutaway/cutover habitats within the Application Site.</p> <p>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.</p> <p>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.</p> <p>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 proposed rehabilitation plans.</p> <p>There is potential for the proposed rehabilitation plans 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 (ARB) 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.</p>
<p>Assessment of Significance prior to mitigation</p>	<p>According to the rehabilitation plans, with the exception of parts of Lisclogher West, it is not anticipated that the Application Site has the potential to develop active raised bog (ARB) 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 site. The implementation of the proposed rehabilitation plans has the potential to result in a Permanent Significant Positive Effect on the habitats that exist on the Application Site at present.</p>

	<p>The proposed implementation of the 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.</p> <p>Significant Positive Effects on habitats within the Application Site are anticipated as a result of the Remedial Phase of the Project.</p>
Mitigation	<p>Whilst no loss or degradation of habitat is anticipated as a result of the works/machinery required on the Application Site to implement the proposed rehabilitation plans, the following best practice measures will be implemented.</p> <ul style="list-style-type: none"> ➤ Bog restoration/rehabilitation measures will be restricted to within the footprint of the proposed rehabilitation area as outlined in the rehabilitation plans. ➤ 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 Water Quality and Aquatic Fauna

Table 6-27 describes the likely significant effects on Water Quality and Aquatic Fauna during the Remedial Phase.

Table 6-27 Likely significant effects on water quality

Description of Effect	<p>The implementation of the rehabilitation plans for Ballivor Bog Group (the Application Site) aims to stabilise the former peat extraction areas via drain blocking, reprofiling of peat fields, fertilizer application 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.</p> <p>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.</p> <p>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. et al. 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).</p> <p>During the implementation of the rehabilitation plans, 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 at Ballivor Works 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 6-26 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.</p>
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<p>Assessment of Significance prior to mitigation</p>	<p>In the absence of mitigation there is potential for the operations at the Application Site during the implementation of the proposed rehabilitation plans to have a Long-Term Moderate Negative Effect on water quality.</p> <p>Following the implementation of the proposed 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 proposed rehabilitation plans has potential to have a Long-Term Moderate Positive Effect.</p> <p>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 are likely to occur in the absence of mitigation.</p>
<p>Mitigation</p>	<p>As outlined in Chapter 8 Hydrology & 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.</p> <p>As outlined in Chapter 8, following implementation of the rehabilitation measures a programme of aftercare and maintenance, designed in accord 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.</p> <p>In addition:</p> <ul style="list-style-type: none"> ➤ During periods of heavy precipitation and run-off, activities will be halted. ➤ All machines will be regularly checked and maintained prior to arrival at the Application Site to prevent hydrocarbon leakage. ➤ Fuelling and lubrication of equipment shall only be carried out in designated areas away from surface water drainage features and ecologically sensitive areas. ➤ Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling. ➤ Vehicles will never be left unattended during refuelling. ➤ No direct discharges to waters will be made. No washings from vehicles, plant or equipment will be carried out onsite. ➤ All plant refuelling will take place using mobile fuel bowsters. Only dedicated trained and competent personnel will carry out refuelling operations. ➤ Mobile storage such as fuel bowsters will be banded to 110% capacity to prevent spills. Tanks for bowsters and generators shall be double skinned. When not in use, all valves and fuel trigger guns from fuel storage containers will be locked. All pumps using fuel or containing oil will be locally and securely banded where there is the possibility of discharge to waters. ➤ Potential impacts caused by spillages etc. during rehabilitation will be reduced by keeping spill kits and other appropriate equipment on-site. ➤ Fertiliser will not be applied on land which is waterlogged, flooded, likely to flood, frozen or covered with snow; ➤ No fertiliser will be applied when heavy rain is forecast within the succeeding 48 hours;

	<ul style="list-style-type: none"> > No fertiliser will be applied on steeply sloping ground or where there is a risk of water pollution (i.e. the presence of drains); and, > No fertiliser will be spread on land within 2m of a surface watercourse.
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6.4.2.3.3 Effects on Fauna

Natural recolonisation of the bogs will form the basis for the proposed rehabilitation plans. The habitats which have developed on the cutaway bogs to date following cessation of peat extraction 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 6-19 above are discussed below.

Assessment of Potential Effects on Otter

Table 6-28 describes the potential significant effects on Otter during the Remedial Phase.

Table 6-28 Assessment of potential significant effects on otter during the remedial phase

Description of Effect	Habitat Implementation of the rehabilitation plans for Ballivor Bog Group (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 6-27 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 proposed rehabilitation plans, 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 6-21 above 'Potential for impact on Watercourses and Sensitive Aquatic Species'

	<p>Disturbance</p> <p>Otter are predominantly crepuscular in nature and most project activity would have been confined to daytime hours, thus minimizing potential disturbance related impacts to the species. Channin P (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 et al. 1991; Bailey & Rochford, 2006).</p> <p>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 a temporary Slight, Negative Effect on otter due to disturbance during the Remedial Phase. However, it is unlikely that the implementation of the 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.</p> <p>No Significant Effects on otter are anticipated as a result of disturbance, during the Remedial Phase of the Project.</p>
Mitigation	<p>Habitat Loss/Degradation</p> <p>Mitigation to prevent indirect impacts on water quality is as per Table 6-21 above ‘Potential for impact on Watercourses and Sensitive Aquatic Species’</p>
	<p>Disturbance</p> <ul style="list-style-type: none"> ➤ 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.

Assessment of Potential Effects on Birds

Table 6-29 describes the potential significant effects on Birds during the Remedial Phase.

Table 6-29 Assessment of potential significant effects on birds during the Remedial Phase

Description of Effect	<p>Habitat Creation</p> <p>Natural recolonisation of the bogs will form the basis for the proposed rehabilitation plans. 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 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</p>
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	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.
	<p>Disturbance</p> <p>Drain blocking and re-wetting, which will form an element of the proposed rehabilitation plans, 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.</p>
Assessment of Significance prior to mitigation	<p>Habitat</p> <p>The implementation of the rehabilitation plan that is required to comply with Condition 10 of the IPC licence will result in a Permanent Significant Positive Effect on the habitats that exist on the Application Site at present, following cessation of the peat extraction activities at the Application Site. This is potential for a Permanent Significant Positive Effect on bird species through the creation of new habitat.</p>
	<p>Disturbance</p> <p>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. There is potential for a Temporary Slight, Negative Effect on bird species using the Application Site due to disturbance during the Remedial Phase.</p> <p>The implementation of the Remedial Phase is unlikely to have any Significant Effect on bird species within the Application Site as a result of disturbance.</p>
Mitigation	<ul style="list-style-type: none"> ➤ 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 which, as per Section 6.4.2.1.4 above, 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 discharge to the Stoneyford River and Deel (Raharney).

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 Habitats (Habitat Loss, Fragmentation and Degradation)

The ongoing peat extraction activities and all ancillary works from July 1988 to June 2020 are considered to have had a Slight Negative Residual Effect on the vast majority of the remaining bog habitats at the Application Site, which were highly modified from their natural state.

The ongoing effects of peat extraction activities and all ancillary works with regard to habitat loss, degradation and fragmentation were a Moderate, Negative Residual Effect on areas of remnant raised bog. The effect was considered moderate as, although the habitats were degraded and fragmented through drainage and peat extraction in the surrounding area, the original bog surface was in place.

With respect to Lisclogher West, the installation of further drainage of this area of remnant raised bog up until 1995 is likely to have resulted in a Significant Negative Residual Effect on the habitat at that location.

6.5.1.2 Water Quality and Aquatic Fauna

All activities that took place from July 1988 to 2000 were unlicensed and no records exist regarding the quality of discharges to nearby surface watercourses. However, by July 1988 peat extraction activities and all ancillary works were already well established at the Application Site and while EPA Q-values throughout the Peat Extraction Phase fluctuate, there is no clear negative trend in terms of surface water quality between July 1988 and June 2020. Some improved sediment control measures were installed at the site in the late 1990's and early 2000's 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, and this is because there are other activities in the catchment that effect water quality and also that the baseline water quality was reasonably good and has not changed significantly during the Peat Extraction Phase.

With the implementation of the control measures outlined above, it is considered that there has been a Long-Term Moderate Negative Effect on downstream surface water quality as a result of release of suspended solids during the Peat Extraction Phase.

From a review of the available Annual Environmental Report (AER) reports included as Appendix 4-3 of this rEIAR, 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 records of significant issues with hydrocarbons or wastewater discharges to surface or groundwater resulting from the peat extraction activities and all ancillary works.

The residual effects on water quality as a result of accidental leakages and spillages is not considered to be significant.

6.5.1.3 Fauna

Otter

Regards 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 6-22. The residual impacts on water quality as a result of the Peat Extraction Phase are provided in Section 6.5.1.2 above.

With regards to indirect impacts as a result of disturbance to otter during the Peat Extraction Phase, no Significant Residual Effects are expected to have occurred.

Birds

It is unlikely that Significant Residual Effects on bird species occurred during the Peat Extraction Phase of the Project, as a result of habitat loss, disturbance, or direct mortality.

6.5.1.4 Designated Sites

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.

6.5.2 Current Phase: June 2020 to present day

6.5.2.1 Habitats (Habitat Loss, Fragmentation or Degradation)

There has been no additional loss, degradation or fragmentation of habitat as a result of the Current Phase of the Project and therefore, there are no residual Significant Effects on any habitat are likely to have occurred during this period.

6.5.2.2 Water Quality and Aquatic Fauna

There has been no discernible trend (positive or negative) in Q-values in downstream surface watercourses since the cessation of peat extraction June in 2020 (refer to Chapter 8 Hydrology & Hydrogeology). Additionally, a review of the available AER reports included in Appendix 4-3, indicates that there has been no significant fuel spills or wastewater discharges. No Significant Residual Effects are likely to have occurred during this period.

6.5.2.3 Fauna

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.

As no Significant Effects on Fauna are likely to have occurred during the Current Phase of the Project, no Significant Residual Effects are likely to have occurred during this period.

6.5.2.4 Designated Sites

Whilst some limited activity at the site involving machinery and plant (removal of peat stockpiles), 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.

6.5.3 Remedial Phase

6.5.3.1 Habitats (Habitat Loss, Fragmentation or Degradation)

The implementation of the Cutaway Bog Decommissioning and Rehabilitation plans will have a Permanent Significant Positive Residual Effect on the habitats present within the Application Site.

6.5.3.2 Water Quality and Aquatic Fauna

Following the implementation of the 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. As such the residual effects of the implementation of the rehabilitation plans for the Remedial Phase is considered to be a Long-Term Moderate, Positive, Indirect Effect on downstream surface water hydrology and water quality and aquatic fauna.

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 6-28 and Section 6.5.3.2. No residual Significant Effects are anticipated.

Birds

The residual effect on habitats for birds species following the implementation of the Cutaway Bog Decommissioning and Rehabilitation plans is a Long Term, Significant Positive Effect as the remaining habitats on the bog will be managed specifically to stabilise and revegetate. 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.

There is potential for a Long-Term Significant Positive Residual Effect on bird species.

6.5.3.4 Designated Sites

With the implementation of the Remedial Phase of the Project, there is potential for Long-Term Slight Positive Effects on Designated Sites.

6.6 Significance of Effects

6.6.1 Peat Extraction Phase: July 1988 – June 2020

6.6.1.1 Habitats (Habitat Loss, Fragmentation and Degradation)

Based on the assessment in Section 6.4 above there no significant effect on the cutaway peatland habitats as a result of the Peat Extraction Phase of the Project.

With respect to Lisclogher West, it is considered that the Peat Extraction Phase had a Long-Term Permanent Significant Negative Effect on remnant raised bog.

No Significant Effects on any other habitats are likely to have occurred.

6.6.1.2 **Water Quality and Aquatic Fauna**

Based on the assessment in Section 6.4 above it is considered that the Peat Extraction Phase had a significant effect on water quality of downstream watercourses and the aquatic fauna they supporting

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 6-22 above and it is considered that the Peat Extraction Phase had a significant effect on water quality

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

Birds

No significant impacts 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 unlikely 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 **Habitats (Habitat Loss, Fragmentation and Degradation)**

No significant effects on habitats have occurred due to removal of stockpiles of peat from the Application Site during the Current Phase of the Project.

6.6.2.2 **Water Quality and Aquatic Fauna**

No significant effects on water quality or aquatic fauna have occurred due to removal of stockpiles of peat from the Application Site during the Current Phase of the Project.

6.6.2.3 **Fauna**

The likely significant effects on water quality and supporting habitat for aquatic species are as per Table 6-26 above. No significant effects on fauna are likely 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 have occurred as a result of the Current Phase of the Project.

6.6.3 Remedial Phase

6.6.3.1 Habitats (Habitat Loss, Fragmentation and Degradation)

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 Water Quality and Aquatic Fauna

There is potential for Significant Positive Effect on water quality 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 Effect on supporting aquatic habitats within and downstream of the Application Site

Birds

There is potential for Significant Positive Effect 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

There is potential for Significant Positive Effects on water quality as a result of the Remedial Phase of the Project. Therefore, as there are multiple Designated Sites downstream of the Application Site, there is potential for Long-Term Slight Positive Effects on National and European Sites, via increased surface water quality as a result of the Remedial Phase of the Project.

6.7

Cumulative and In- Combination Effects

The peat extraction activities and all ancillary works 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 listed in Appendix 2-1 of the rEiAR.

Additionally, this assessment considers historical cumulative impacts with regard to peat extraction activities and all ancillary works within the Application Site prior to 1988. It assesses the cumulative impacts on biodiversity within the Application Site from the commencement of Bord na Móna peat extraction activities and associated works in 1948, up to July 1988 together with the Peat Extraction Phase of the Project (i.e July 1988 to June 2020).

6.7.1

Assessment of Plans

The following development plans have been reviewed and taken into consideration as part of this assessment:

- > Westmeath County Development Plan 2021 – 2027
- > Westmeath County Development Plan 2014 – 2020
- > Westmeath County Development Plan 2008 – 2014
- > Westmeath County Development Plan 2002 – 2008
- > Meath County Development Plan 2021-2027
- > Meath County Development Plan 2021-2027
- > Meath County Development Plan 2013-2019
- > National Biodiversity Action Plan 2007-2013

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 6-30 Assessment of Plans.

Table 6-30 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
Westmeath County Development Plan 2021-2027	<p>The overall objective of the Development Plan has been identified:</p> <p><i>Continue to protect and enhance the County's natural heritage and biodiversity and ensure that networks of green infrastructure are identified, created, protected and enhanced to provide a wide range of environmental, social and economic benefits to communities.</i></p> <p>Policies: Natural Heritage</p> <p>It is the policy of the Council to:</p> <p>CPO 12.1</p> <ul style="list-style-type: none"> Contribute as appropriate towards the protection of designated sites in compliance with relevant EU Directives and applicable national legislation <p>CPO 12.2</p> <ul style="list-style-type: none"> Support the implementation of any relevant recommendations contained in the National Biodiversity Plan, the All-Ireland Pollinator Plan and the National Peatlands Strategy. <p>Policies: Natura 2000</p> <p>It is a policy of the Council to:</p> <p>CPO 12.4</p> <ul style="list-style-type: none"> Protect and conserve Special Areas of Conservation, candidate Special Areas of Conservation, Special Protection Areas and candidate Special Protection Areas, designated under the EU Birds and Habitats Directives respectively. 	<p>The Development Plans were comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity and Designated Sites.</p> <p>The peat extraction activities and all ancillary works, which were undertaken at different times and at different levels of intensity throughout the bog between 1988 and 2020, are unlikely to have resulted in a significant effect on biodiversity (with the exception of Lisclogher West) and designated sites and are therefore not considered to be in contravention of the policies and objectives within the development plans.</p> <p>The implementation of the Cutaway Bog Decommissioning and Rehabilitation plan for the Application Site will have a significant positive effect on biodiversity, including the uncut but drained peatland habitat at Lisclogher West. There is also potential for positive effects on Designated Sites which are hydrologically connected to the Application Site via improvements in water quality which is in compliance with the policies and objectives outlined within the plan.</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
	<p>CPO 12.5</p> <ul style="list-style-type: none"> Ensure that no plans, programmes, etc. or projects giving rise to significant cumulative, direct, indirect or secondary impacts on European Sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan (either individually or in combination with other plans, programmes, etc. or projects).* <p>CPO 12.6</p> <ul style="list-style-type: none"> Ensure that any plan or project that could have a significant adverse impact (either by themselves or in combination with other plans and projects) upon the conservation objectives of any Natura 2000 Site or would result in the deterioration of any habitat or any species reliant on that habitat will not be permitted.* <p><i>* Except as provided for in Article 6(4) of the Habitats Directive, viz. There must be a) no alternative solution available, b) imperative reasons of overriding public interest for the project to proceed; and c) Adequate compensatory measures in place.</i></p> <p>Policies: Rare and Protected Sites</p> <p>It is a policy of the Council to:</p> <p>CPO 12.13</p> <ul style="list-style-type: none"> Protect, manage, and enhance the natural heritage, biodiversity, landscape and environment of County Westmeath, in recognition of its importance as both a non-renewable resource and a natural asset. <p>CPO 12.18</p>	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
	<ul style="list-style-type: none"> Consult with the National Parks and Wildlife Service (NPWS) in regard to any developments (those requiring permission and those not requiring planning permission) which the Council proposes to carry out within pNHAs, NHAs, SACs, SPAs, and other important ecological sites. <p>Policies: Invasive species</p> <p>It is a policy of the Council to:</p> <p>CPO 12.27</p> <ul style="list-style-type: none"> Prevent the spread of invasive species within the plan area, including requiring landowners and developers to adhere to best practice guidance in relation to the control of invasive species <p>CPO 12.29</p> <ul style="list-style-type: none"> Support, as appropriate, the National Parks and Wildlife Service's efforts to seek to control and manage the spread of non-native invasive species on land and water. Where the presence of non-native invasive species is identified at the site of any proposed development or where the proposed activity has an elevated risk of resulting in the presence of these species, details of how these species will be managed and controlled will be required. 	
Meath County Development Plan 2021-2027	<p>Policies and Objectives: Biodiversity</p> <p>HER POL 27</p> <ul style="list-style-type: none"> To protect, conserve and enhance the County's biodiversity where appropriate <p>HER POL 28</p> <ul style="list-style-type: none"> To integrate in the development management process the protection and enhancement of biodiversity and landscape features wherever possible, by minimising adverse impacts on 	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
	<p>existing habitats (whether designated or not) and by including mitigation and/or compensation measures, as appropriate.</p> <p>HER POL 29</p> <ul style="list-style-type: none"> To raise public awareness and understanding of the County's natural heritage and biodiversity <p>HER POL 30</p> <ul style="list-style-type: none"> To promote increased public participation in biodiversity conservation by supporting and encouraging community-led initiatives. <p>HER POL 31</p> <ul style="list-style-type: none"> To ensure that the ecological impact of all development proposals on habitats and species are appropriately assessed by suitably qualified professional(s) in accordance with best practice guidelines – e.g. the preparation of an Ecological Impact Assessment (EcIA), Screening Statement for Appropriate Assessment, Environmental Impact Assessment, Natura Impact Statement (NIS), species surveys etc. (as appropriate). <p>HER OBJ 30</p> <ul style="list-style-type: none"> To implement, in partnership with the Department of Culture, Heritage and the Gaeltacht, relevant stakeholders and the community, the objectives and actions of Ireland's National Biodiversity Action Plan 2017 - 2021 which relate to the remit and functions of Meath County Council. <p>HER OBJ 31</p> <ul style="list-style-type: none"> To implement, in partnership with the Department of Culture, Heritage and the Gaeltacht, relevant stakeholders and the community, the objectives and actions of the County Meath Biodiversity Plan 2015-2020 and any revisions thereof. <p>HER OBJ 32</p> <ul style="list-style-type: none"> To actively support the implementation of the All Ireland Pollinator Plan 2021-2025 and any revisions thereof. <p>Policies and Objectives : Sites Designated for Nature Conservation</p>	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
	<p>HER POL 32</p> <ul style="list-style-type: none"> To permit development on or adjacent to designated Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas, Statutory Nature Reserves or those proposed to be designated over the period of the Plan, only where the development has been subject to the outcome of the Appropriate Assessment process and has been carried out to the satisfaction of the Planning Authority, in consultation with National Parks and Wildlife. <p>HER POL 33</p> <ul style="list-style-type: none"> To have regard to the views and guidance of the National Parks and Wildlife Service in respect of proposed development where there is a possibility that such development may have an impact on a designated European or National site or a site proposed for such designation. <p>HER POL 34</p> <ul style="list-style-type: none"> To undertake appropriate surveys and collect data to provide an evidence-base to assist the Council in meeting its obligations under Article 6 of the Habitats Directives (92/43/EEC) as transposed into Irish Law, subject to available resources. It is an objective of the Council: <p>HER OBJ 33</p> <ul style="list-style-type: none"> To ensure an Appropriate Assessment in accordance with Article 6(3) and Article 6(4) of the Habitats Directives (92/43/EEC) and in accordance with the Department of Environment, Heritage and Local Government Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities, 2009 and relevant EPA and European Commission guidance documents, is Meath County Development Plan 2021-2027 Chapter 8 carried out in respect of any plan or project not directly connected with or necessary for the management of the site but likely to have a significant effect on a Natura 2000 site(s), either individually or in combination with other plans or projects, in view of the site’s conservation objectives. <p>HER OBJ 34</p> <ul style="list-style-type: none"> To protect and conserve the conservation value of candidate Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas and proposed Natural Heritage Areas as identified by the Minister for the Department of Culture, Heritage and the Gaeltacht and any 	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
	<p>other sites that may be proposed for designation during the lifetime of this Plan in accordance with the provisions of the Habitats and Birds Directives and to permit development in or affecting same only in accordance with the provisions of those Directives as transposed into Irish Law.</p> <p>Policies and Objectives: Non-Designated Sites HER POL 35</p> <ul style="list-style-type: none"> To ensure, where appropriate, the protection and conservation of areas, sites, species and ecological/networks of biodiversity value outside designated sites and to require an appropriate level of ecological assessment by suitably qualified professional(s) to accompany development proposals likely to impact on such areas or species. <p>Policies and Objectives: Protected Species HER POL 36</p> <ul style="list-style-type: none"> To consult with the National Parks and Wildlife Service and take account of their views and any licensing requirements, when undertaking, approving or authorising development which is likely to affect plant, animal or bird species protected by law. <p>HER OBJ 35</p> <ul style="list-style-type: none"> 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. <p>Policies and Objectives: Peatlands HER POL 45</p> <ul style="list-style-type: none"> To ensure that peatland areas which are designated (or proposed for designation) as NHAs, SACs or SPAs are conserved for their ecological, climate regulation, archaeological, cultural and educational significance. <p>HER OBJ 39</p> <ul style="list-style-type: none"> To work in partnership with relevant stakeholders on a suitable peatland site(s) to demonstrate best practice in sustainable peatland conservation, management and restoration techniques and to promote their heritage and educational value subject to Ecological Impact 	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
	Assessment and Appropriate Assessment Screening, as appropriate, having regard to local and residential amenities.	
Westmeath County Development Plan 2014-2020	<p>Policies</p> <p>P-PTL1: To protect the county's designated peatland areas and landscapes, including any historical walkways through bogs and to conserve their ecological, archaeological, cultural, and educational heritage.</p> <p>P-PTL4: To plan and prepare for the future sustainable and environmentally sensitive use of large industrial bog sites when peat harvesting finishes and to encourage a balanced approach to the redevelopment of cutaway bogs, including habitat creation, in conjunction with adjacent Local Authorities. This plan will have regard to both National and Regional frameworks with regard to the future use of peatlands, including cutaway bogs.</p> <p>P-PTL5: To exercise control of peat extraction, both individually and cumulatively, which would have significant impacts on the environment.</p> <p>Objectives</p> <p>O-PTL3: To work with other bodies such as the NPWS and Coillte to support the conservation of peatlands.</p> <p>O-PTL5: To work in partnership with relevant stakeholders on suitable peatland site(s) to demonstrate best practice in sustainable peatland conservation, management and restoration techniques and to promote their heritage and educational value subject to Ecological Impact Assessment and Appropriate Assessment, as appropriate.</p> <p>O-PTL6: To support the preparation of a Sustainable Holistic Management Plan for the future use of the Industrial Peatlands in the county, which recognises the role of peatlands in carbon sequestration.</p>	
Westmeath County Development Plan 2008 - 2014	<p>Policies & Objectives</p> <p>Natural heritage</p> <p>O-EH2: To protect, manage and enhance the natural heritage, biodiversity, landscape and environment of County Westmeath in recognition of its importance as a non-renewable resource, unique identifier and character of the county and as a natural resource asset.</p>	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
	<p>O-EH3: It is a key objective to ensure as far as possible that development does not impact adversely on wildlife habitats and species. In the interests of sustainability, b</p> <p>P-EH19: It is the policy of Westmeath County Council to ensure the conservation of the county's peatlands in order to minimise the negative impact on natural diversity and the archaeological and cultural heritage of the county.</p> <p>O-EH14: To conserve peatlands and protect peatland landscapes within the county.</p> <p>O-EH15: To continue to identify and map peatland sites of high local ecological value and protect them for their biodiversity.</p> <p>O-EH16: To exercise control of peat extraction both individually and cumulatively which would have significant impacts on the environment as provided for under SI 364 of 2005.</p> <p>O-EH18: To seek hydrological reports for significant developments within and in close proximity to peatlands so as to assess impacts on integrity of peatland ecosystems.</p> <p>O-EH19: To plan and prepare for the future use of large industrial bog sites when peat harvesting finishes and to encourage a balanced approach to the redevelopment of cutaway bogs. There is potential for habitat creation such as woodlands, grasslands, and wetlands. There is also potential for amenity value with development of parklands and economic uses such as agricultural grasslands, forestry and wind energy.</p> <p>O-EH20 To work with other bodies such as NPWS and Coillte to support the conservation of Peatlands.</p> <p>Future of Cutaway Peatland</p> <p>P-EH32 Within the next 20–30 years large areas of peatland will be exhausted and provide tracts of land that have potential for agriculture, habitat and amenity. The Council, in consultation with relevant agencies, will explore future potential of cut away peatlands that may offer opportunities for habitat creation or amenity and recreation areas such as community woodlands or parklands.</p>	
Meath County Development 2013-2019	It was an objective of this Plan for Meath County Council to “ <i>investigate the potential of renewable energy identified in the initial assessment areas with a view to developing a renewable energy strategy for the County.</i> ”	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
Meath County Development 2007 - 2013	<p>Policies</p> <p>HER POL 18: To ensure that peatland areas which are designated (or proposed for designation) as NHAs or SACs are conserved and managed appropriately to conserve their ecological, archaeological, cultural and educational significance.</p>	
National Biodiversity Action Plan 2017-2021	<p>Target 6.2 - Sufficiency, coherence, connectivity and resilience of the protected areas network substantially enhanced by 2020.</p>	<p>The Plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity and Designated Sites.</p> <p>The peat extraction activities and all ancillary works 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.</p> <p>The ongoing operations since the peat extraction activities and all ancillary works during the Peat Extraction Phase, which were undertaken at different times and at different levels of intensity throughout the bog, 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.</p> <p>The implementation of the Cutaway Bog Decommissioning and Rehabilitation plan for the site will have a significant positive effect on biodiversity and is in compliance with the policies and objectives outlined within the plan.</p>

6.7.2 Projects

As described in Chapter 2, Section 2.4 of the EIAR, the available planning history of the surrounding environs of the Application Site dates to 1985. The majority of planning applications granted permission by the Planning Authorities during the Peat Extraction Phase (July 1988 to June 2020) 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. Relevant projects granted during this period are listed in Appendix 2-2 of the EIAR.

With regard to planning applications lodged during the Current Phase (June 2020 to present day) (listed below), peat extraction 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.

- Meath Pl Ref. **96/418**: A two storey dwelling house, septic tank and percolation area (Final Grant – 12th November 1996)
- Westmeath Pl Ref. **98/250**: Erect dormer bungalow and septic tank (Final Grant – 23rd December 1998)
- Westmeath Pl Ref. **00/900**: Construction of house and septic tank (Final Grant – 14th December 2000)
- Westmeath Pl Ref. **01/792**: Dormer bungalow, septic tank and percolation areas [outline] (Final Grant – 19th July 2002)
- Westmeath Pl Ref. **04/2084**: New dwelling house, 'septech 2000' treatment system, percolation area and domestic garage (Final Grant – 15th September 2004)
- Westmeath Pl Ref. **04/2126**: Construct a bungalow with a proprietary wastewater treatment system (Final Grant – 15th October 2004)
- Westmeath Pl Ref. **06/2025**: Construct a new bungalow, domestic garage, septic tank and percolation area (Final Grant – 19th May 2006)
- Westmeath Pl Ref. **06/2236**: Erect a new dwelling house, septic tank, treatment system, percolation area and ancillary site works (Final Grant – 13th October 2006)
- Westmeath Pl Ref. **08/2101**: Demolish existing dwelling house and planning permission to erect a new replacement dwelling house, septic tank, treatment system and ancillary site works (Final Grant – 2nd February 2009)
- Westmeath Pl Ref. **15/6142**: Single storey dwelling, septic tank, sewage treatment system, percolation area, domestic garage, new entrance and all ancillary site works (Final Grant – 13th January 2016)
- Westmeath Pl Ref. **15/6135**: To erect a guyed wind monitoring mast, with instruments, up to 100m in height, at Lisclogher Bog, Lisclogher Great, Co Westmeath. The purpose of the proposed mast is to assess the suitability of the company's adjacent lands for wind farm development (Final Grant – 15th October 2015)
- Westmeath Pl Ref. **15/6143**: To Renovate and extend existing semi-detached dwelling. One and a half storey extension to the side & rear of existing dwelling, construction of a domestic garage/store, horse stable and tack room, relocate existing entrance & install proprietary waste water treatment system & percolation area (Final Grant - 15th October 2015)
- Meath Pl Ref. **TA150349**: development will consist of a storey and a half type dwelling, domestic garage, proprietary wastewater treatment system with associated polishing filter and open new entrance to site (Granted - July 2, 2015)
- Meath Pl Ref. **TA150738**: retention permission for essential structural repairs to date including roof & porch replacements and foundations to future extension, planning permission to complete general building upgrade with minor elevational changes and planning permission for a 2 storey extension to south west side, domestic waste treatment unit & new percolation area and removal of existing septic tank,

replacement road access vehicular gate and rebuild piers & flanking walls, replacement road access pedestrian gate, extended & repaired/rebuilt stepped road frontage walls, walls & hedges to new site's other boundaries and reusing existing sheds as domestic garage and storage facilities (Granted - October 7, 2015)

- Meath PI Ref. **TA151297**: to retain existing dog kennels, enclosures & associated structures. The Rescue Centre contains (a) 4 no. timber kennels, (b) 2 no. concrete structure kennels, (c) 2 no. prefabricated structure incorporation office, store & grooming room. Significant further information/revised plans submitted on this application (Granted - March 8, 2017)
- Westmeath PI Ref. **17/6274**: Retention of existing dwelling house and ancillary site works (Final Grant – 10th July 2018)
- Meath PI Ref. **TA170047**: a single storey dwelling, a detached domestic garage, a proprietary domestic effluent treatment system, shared site entrance previously granted under Ref. TA/130317 and all associated site works. Significant further information/revised plans submitted on this application (Granted - September 1, 2017)
- Meath PI Ref. **TA180421**: a single storey dwelling, a detached domestic garage, wastewater disposal system, site entrance and all associated site works (Granted - August 9, 2018)
- Meath PI Ref. **TA180485**: extension of duration of planning permission ta130317 - single storey dwelling, detached domestic garage, proprietary domestic effluent treatment system, site entrance and all associated site works (Granted - July 5, 2018)
- Meath PI Ref. **TA201217**: change of house type from a single storey type dwelling to a storey and a half type dwelling and revisions to the site layout plan as previously granted under planning ref TA170047 and all associated site works (Granted - December 8, 2020)
- Westmeath PI Ref. **19/6104**: Construction of a new two storey type dwelling, domestic garage, installation of a new septic tank & percolation area, new vehicular entrance and all ancillary site services (Final Grant – 13th August 2019)
- Meath PI Ref. **21/1274**: The construction of 4 bay slatted shed for agricultural use and all associated site works (Final Grant – 7th October 2021);
- Westmeath PI Ref. **21/380**: Single storey dwelling & install a proprietary wastewater treatment system and all associated site development works (Notification of Grant - 29.10.2021);
- Westmeath PI Ref. **21/401**: Extension of Duration - Erection of a slatted shed, roofed dungstead, silage slab and ancillary site works (Final Grant – 3rd September 2021)
- Meath PI Ref. **21/1324**: An extension to the existing dwelling to include a part single storey / part dormer extension to rear, single storey extension to front / side, new front porch together with modifications to the existing elevations and internal plan layout (Notification of Grant – 18th October 2021)
- Westmeath PI Ref. **21/506**: Retain existing conservatory to south (Notification of Grant – 2nd November 2021)
- Westmeath PI Ref. **20/6054**: Construction of a 83.9m² extension to existing storey and a half type dwelling and all ancillary site services. (Final Grant - July 30, 2020)
- Meath PI Ref. **21/1324**: an extension to the existing dwelling to include a part single storey / part dormer extension to rear, single storey extension to front / side, new front porch together with modifications to the existing elevations and internal plan layout. The development also includes construction of detached domestic garage, decommissioning of the existing septic tank and percolation area, and installation of a new septic tank and percolation area, modifications and upgrade works to existing domestic entrance together with all associated site works (Granted - November 29, 2021)
- Westmeath PI Ref. **20/6221**: Retention permission and permission for development at this site as follows: (i) retention of existing 80 metre meteorological mast which was erected as exempted development in accordance with Class 20A, Schedule 2 of the planning and development regulations 2001 (as amended) and all ancillary infrastructure and associated site development and reinstatement works and (ii) the

increase in height of the existing meteorological mast from 80 metres to a maximum height of up to 100 metres. Existing access arrangements using agricultural access tracks, will remain unaltered. The operational lifetime of the proposed development will be up to five years (Retention)

- Westmeath PI Ref. **20/6226**: Retention permission for external milk tank adjacent to existing milking parlour and all associated site works (Granted - November 24, 2020)
- Westmeath PI Ref. **20/6242**: One number residential dwelling consisting of two-part single, one-part two-storey house, associated garage/shed/workshop, approved wastewater treatment system and percolation area to EPA standard and new vehicular entrance (Granted - February 24, 2021)
- Meath PI Ref. **21/2428**: renovation of the existing dwelling and the construction of a new connecting two storey dwelling, upgrading of the existing entrance to facilitate entrance piers and gates, the installation of a packaged wastewater treatment system and polishing filter, and associated site works (Granted - April 7, 2022)
- Meath PI Ref. **21/281**: development consists of a Sheep Shed with Sheep Handling Yard, Meal Storage Bin, Concrete Apron, Farm Access Road, Agricultural Entrance and all site works (Granted - May 19, 2021)
- Westmeath PI Ref. **21/620**: Retention permission for continued use of an existing Guyed Wind Monitoring Mast with instruments, 100m in height on its lands at Lisclogher Bog, Lisclogher Great, Co. Westmeath for a further period of three years. The purpose of the mast is to assess the suitability of the company's adjacent lands for wind farm development. Previous planning application reference number 16/6259 refers. (Granted - February 23, 2022)
- Westmeath PI Ref. **21/659**: for a private dwelling house, proprietary effluent treatment system and percolation area, domestic garage, entrance onto public road and all ancillary site services (Granted - April 13, 2022)
- Meath PI Ref. **22/1656**: amendments to planning register no. 21/2428. The amendments include the increase in footprint and height of the new connecting dwelling (Granted - March 28, 2023)
- Westmeath PI Ref. **22/245**: construction of agricultural shed consisting of cubicles, feeding area and underground slatted slurry storage tanks and all associated site works (Granted - August 15, 2022)
- Westmeath PI Ref. **22/550**: to construct one number detached single storey dwelling, one number detached single storey garage, to create new entrance to public road, to connect to public watermain, to install a septic tank and percolation area and all associated site works (Granted - May 3, 2023)
- Meath PI Ref. **23/1042**: the construction of a two-storey style dwelling, detached domestic garage, a domestic wastewater disposal system, new site entrance and all associated site works (Granted - February 29, 2024)
- Meath PI Ref. **23/254**: detached domestic store shed/garage incorporating plant room area and home office with non-habitable loft storage space overhead. The development also includes p.v. solar panels on north east and south west elevations together with all associated site works (Granted - June 12, 2023)
- Meath PI Ref. **23/297**: the construction of a one and a half storey, 4-bedroom dwelling, a domestic garage, use existing site access, new percolation area and treatment system and all associated site works. Significant further information/revised plans submitted on this application (Granted - January 22, 2024)
- Meath PI Ref. **23/60242**: The development will consist of the renovation and extension to an existing detached bungalow and outbuildings, the installation of a wastewater treatment system and polishing filter, upgrading of existing entrance off the public road and all ancillary site works. (Granted - January 4, 2024)
- Meath PI Ref. **23/60401**: construction of a new bungalow type dwelling house, domestic garage, new vehicular entrance, septic tank and percolation area and all associated ancillary site works (Granted – not yet granted)

The proposed Ballivor Wind Farm planning application was lodged in 2023 to An Bord Pleanála (ABP Case No. 316212). The planning application for the proposed wind farm was accompanied by an EIAR and NIS, and contained mitigation measures to ensure that there will be no significant impacts on biodiversity, water quality or Designated Sites.

The consented Bracklyn Wind Farm (PL25M.311565), comprising 9 no. wind turbines with an overall tip height of 185m is located immediately south of Lisclogher West Bog and immediately north and west of Bracklin Bog. By virtue of its proximity to the Application Site, the Bracklyn Wind Farm has been considered within this cumulative impact assessment. Other infrastructural developments, including but not limited to the below, have been assessed on a pre-cautionary basis and considered, where deemed appropriate, within the supporting environmental cumulative assessments.

- N51 Higginstown to Earlsmeadow pavement works (5km from Application Site)
- N51 Dunmoe Phase 2 Realignment Scheme (c. 26 km from Application Site)

In the years since development commenced, small scale forestry in the form of conifer plantations as well as private turbary and agricultural development has been ongoing in the wider area.

6.7.3 Assessment of Cumulative Effects

Following the assessment provided in the preceding sections, other than for impacts on remnant raised bog in Lisclogher West during the Peat Extraction Phase, it is concluded that, the Project has not and will not result 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 EIAR and above, no potential for the development to contribute or have contributed to any likely significant negative cumulative effects on biodiversity was identified when considered in-combination with other plans and projects.

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.

The implementation of the Cutaway Bog Decommissioning and Rehabilitation plans and the ongoing Peatland Climate Action Scheme (PCAS), as detailed in Section 6.4.2.2, 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.

With regards to historical cumulative impacts, the original drainage and cutting of the acrotelm at Ballivor Bog Group from 1948 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 6.5. above in relation to raised bog habitat (and associated habitats and fauna) and potential impacts thereon due to peat extraction activities and all ancillary works 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 vast majority of the remaining uncut raised bog habitats at the Application Site, 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 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 activities and all ancillary works during the Peat Extraction Phase of the Project i.e. between July 1988 and June 2020, to have contributed to any likely significant negative cumulative effects on biodiversity.

6.8

Conclusion

By 1988, peat extraction activities and all ancillary works 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 the present day 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, which includes all operations from 2000 to the present day, has been licenced under IPC Licence (No. P0501) 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 Long-term Significant Positive Effect on the habitats and biodiversity within the Application Site, as well as on water quality (as per the conclusions of Chapter 8: Hydrology and Hydrogeology), within and downstream of the site.