Planning and Environmental Consultants

Environmental Impact Assessment Report

Lemanaghan Wind Farm, Co. Offaly

Chapter 6 Biodiversity

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GLOSSARY OF TERMS

Terms	Definition
Qualifying Interests	The specific habitats or species for which Special Areas of Conservation are designated under the EU Habitats Directive
Special Conservation Interests	Specific species or habitats for which a site is designated as a Special Protection Area, primarily focusing on rare, vulnerable, or migratory birds, as well as wetlands
Special Areas of Conservation	Designated for habitats (e.g., active raised bogs, reefs) and non-bird species listed under the EU Habitats Directive 92/43/EEC.
Special Protection Areas	Designated specifically for the protection of wild birds and their habitats under the EU Birds Directive 2009/147/EC.

GLOSSARY OF ACRONYMS

Acronyms	Definition
AA	Appropriate Assessment
AASR	Appropriate Assessment Screening Reports
BCI	Bat Conservation Ireland
BMEP	Biodiversity Management and Enhancement Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
DAU	Development Applications Unit
EcIA	Ecological Impact Assessment
ECoW	Ecological Clerk of Works
EEC	European Economic Community
EnvCoW	Environmental Clerk of Works
ERICA	Engine for Relevés to Irish Communities Assignment
FPO	Flora Protection Order
HD	Habitats Directive

IAS	Invasive Alien Species
IFI	Inland Fisheries Ireland
ISMP	Invasive Species Management Plan
IVC	Irish Vegetation Classification
KER	Key Ecological Receptor
NBAP	National Biodiversity Action Plan
NBDC	National Biodiversity Data Centre
NHA	Natural Heritage Areas
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Service
pNHA	Proposed Natural Heritage Areas
PRF	Potential Roost Features
QI	Qualifying Interest
RPO	Regional Policy Objectives
S.I	Statutory Instrument
SAC	Special Area of Conservation
SCI	Special Conservation Interests
SNH	Scottish Natural Heritage
SPA	Special Protection Area
TDR	Turbine Delivery Route
TII	Trasport Infrastructure Ireland
WA	Wildlife Act
WFD	Water Framework Directive
ZOI	Zone of Influence

6. BIODIVERSITY

6.1 Introduction

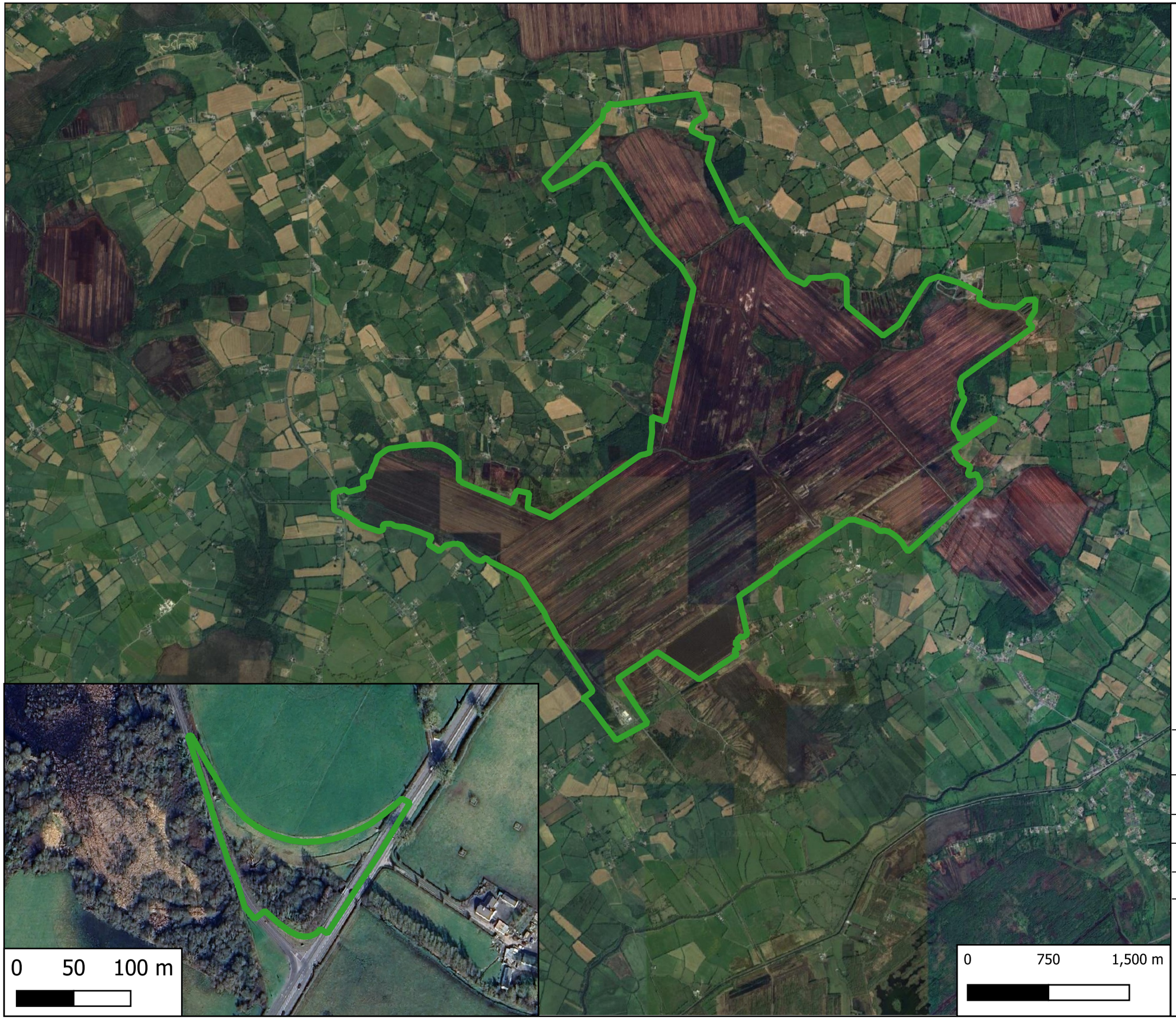
This chapter assesses the likely significant effects (both alone and cumulatively with other projects) that the Proposed Project may have on Biodiversity, Flora and Fauna (with the exception of avian receptors, which are specifically dealt with in Chapter 7 of this EIAR), and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified. The residual impacts on biodiversity are then assessed. Particular attention has been paid to species and habitats of ecological importance, as well as any role they may play in providing a supporting network for European Sites and their Qualifying Interests (QIs) and Special Conservation Interests (SCIs). These include species and habitats with national and international protection under the Wildlife Acts 1976 (as amended) and the EU Habitats Directive 92/43/EEC. The full description of the Proposed Project is provided in Chapter 4 of this EIAR.

The chapter is structured as follows:

- The Introduction provides a description of the legislation, guidance and policy context applicable to Biodiversity, Flora and Fauna.
- 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 and Receptor Evaluation is then provided.
- This is followed by an Assessment of Effects which are described with regard to each phase of the development: construction phase, operational phase and decommissioning phase. Potential Cumulative effects in combination with other projects are fully assessed.
- Proposed mitigation and best practice measures to avoid, reduce or offset the identified effects are described and discussed. This is followed by an assessment of residual effects taking into consideration the effect of the proposed mitigation and best practice measures.
- The conclusion provides a summary statement on the overall significance of predicted effects on Biodiversity, Flora and Fauna.

As detailed in Section 1.1.1 in Chapter 1 Introduction, for the purposes of this EIAR, the various project components are described and assessed using the following references: 'Proposed Project', 'Proposed Wind Farm' 'Proposed Grid Connection', 'Proposed Project site', and 'site'. The Proposed Project encompasses the Proposed Wind Farm and the Proposed Grid Connection. For this chapter:

- Where the 'Turbine Delivery Route accommodation area' is referred to, this relates to the area of the Proposed Project site at Kennedy's Cross where turbine delivery route works are proposed.
- "Key Ecological Receptor" (KER) is defined as a species or habitat occurring within the zone of influence of the Proposed Project upon which likely significant effects are anticipated.
- "Zones of Influence" (ZOI) for individual ecological receptors refers to the zone within which potential effects 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

EIAR Site Boundary

N

Drawing Title

Proposed Project Site

Project Title

Lemanaghan Wind Farm, Co Offaly

Drawn By	Checked By
SS	RW
Project No.	Drawing No.
200804	Figure 6-1
Scale	Date
1:47,600	2026-02-04

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6.1.1 Requirements for Ecological Impact Assessment

European Legislation

Habitats and species of European importance are provided legal protection under the EU Habitats Directive 92/43/EEC (the Habitats Directive) and the EU Birds Directive 2009/147/EC (the Birds Directive) this legislation forms the cornerstone of Europe's nature conservation within the EU. It is built around two pillars: the Natura 2000 network of protected sites (hereafter referred to as European sites[1]) and the strict system of species protection. Both the Habitats and Bird Directives have been transposed into Irish law by Part XAB of the Planning and Development Acts 2000 (as amended) (from a land use planning perspective) and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011) (as amended).

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

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

In summary, the species and habitats provided National and International protection under these legislative and policy documents have been considered in this Ecological Impact Assessment. A detailed assessment of the likelihood of the Proposed Project having either a significant effect or an adverse impact on any relevant European Sites (i.e., SACs, cSACs[2], SPAs or cSPAs) has been carried out in the Appropriate Assessment (AA) Stage 1 Screening Report and Natura Impact Statement (NIS). A separate assessment has not been carried out in this chapter, to avoid duplication of assessments. However, the relevant conclusions have been cross-referenced and incorporated.

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[1] The term Natura 2000 network was replaced by 'European site' under the EU (Environmental Impact Assessment and Habitats) Regulations 2011 S.I. No. 473 of 2011.

[2] Candidate SAC (cSAC) are afforded the same protection as SACs. The process of making cSAC into SACs by means of Statutory instrument has begun and while the process if ongoing the term SAC will be used to conform with nomenclature used in the National Parks and Wildlife Services (NPWS) databased. The name applies to candidate SPAs.

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

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

National Legislation

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

Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) are heritage sites that are designated for the protection of flora, fauna, habitats and geological sites. Only NHAs are designated under the Wildlife Act. NHAs are legally protected from damage from the date they are formally proposed for designation1. A list of pNHAs were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, these sites are considered to be of significance for wildlife and habitats as they may form statutory designated sites in the future.

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

National Policy

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

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

- **Objective 1: Adopt a Whole-of Government, Whole of-Society Approach to Biodiversity**. Proposed actions include capacity and resource reviews across Government; determining responsibilities for the expanding biodiversity agenda providing support for communities, citizen scientists and business; and mechanisms for the governance and review of this National Biodiversity Action Plan.
- **Objective 2: Meet Urgent Conservation and Restoration Needs.** Supporting actions will build on existing conservation measures. Efforts to tackle Invasive Alien Species will be elevated. The protected area network will be expanded to include the Marine

Protected Areas. The ambition of the EU Biodiversity Strategy will be considered as part of an evolving work programme across Government.

- **Objective 3: Secure Nature's Contribution to People**. Actions highlight the relationship between nature and people in Ireland. These include recognising the tangible and intangible values of biodiversity, promoting nature's importance to our culture and heritage and recognising how biodiversity supports our society and our economy.
- **Objective 4: Enhance the Evidence Base for Action on Biodiversity**. This objective focuses on biodiversity research needs, as well as the development and strengthening of long-term monitoring programmes that will underpin and strengthen future decision-making. Action will also focus on collaboration to advance ecosystem accounting that will contribute towards natural capital accounts.
- **Objective 5: Strengthen Ireland's Contribution to International Biodiversity Initiatives.** Collaboration with other countries and across the island of Ireland will play a key role in the realisation of this Objective. Ireland will strengthen its contribution to international biodiversity initiatives and international governance processes, such as the United Nations Convention on Biological Diversity.

In addition, the National Biodiversity Data Centre published guidance on pollinator-friendly management of wind farms[3]. This identifies an evidence-based action plan for wind farm operators that can help pollinators by employing changes to existing management strategies.

6.1.2 Review of Relevant Guidance and Information Sources

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, 2008). 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, 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, Coastal and Marine Version 1.3. Chartered Institute of Ecology and Environmental Management, Winchester. (CIEEM, 2018).

This assessment has been carried out in accordance with the Environmental Impact Assessment guidance as outlined in Section 1.2 of Chapter 1 of the EIAR. In line with the approach set out in Section 1.7.2 of Chapter 1 of the EIAR, this assessment has had regard to the EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

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. 272 of 2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009 and S.I. No. 722 of 2003 European Communities (Water

[3] https://pollinators.ie/wp-content/uploads/2022/12/Wind-Farm-Pollinator-Guidelines-2022-WEB.pdf *(accessed January 2024).*

Policy) Regulations 2003 which give further effect to EU Water Framework Directive (2000/60/EC).
- Planning and Development Acts 2000 (as amended).

This assessment has been prepared with respect to the various planning policies and strategy guidance documents listed below:

- Offaly County Development Plan 2021 – 2027.

6.1.3 Statement of Authority

This chapter has been prepared by Sorcha Shanley (B.A., M.Sc.) and has been reviewed by Rachel Walsh (B.Sc. Env., MCIEEM).

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

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

The baseline ecological surveys were undertaken by Patrick Ellison (B.Sc., M.Sc., ACIEEM), Rachel Walsh (B.Sc. Env. MCIEEM), Neansai O' Donovan (B.Sc.), Cuan Feely (B.Sc.), Adam Scott (B.Sc.), David Mesarcik (B.Sc.), Valerie Kendall (B.Sc., M.Env.Sc.), Kate Greaney (B.Sc., M.Sc.), Frederick Mosley (B.Sc.), David Culleton (B.Sc.), Nathan Finn (B.Sc.), Keith Costello (B.Sc.) and Cathal Bergin (B.Sc. Wildlife Biology) of MKO. Aquatic surveys were undertaken by Triturus Environmental Ltd (further details are included in Section 1.8.2.7 of Chapter 1.)

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

6.2 Methodology

The following sections describe the methodologies followed to establish the baseline ecological condition of the Proposed Project site and, where relevant, areas within the wider likely Zone of Influence. Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to and at the time of the project proceeding. Ecological Baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

6.2.1 Desk Study

The desk study undertaken for this assessment included a thorough review of available ecological data including the following:

- Review of existing information on the Proposed Project site provided by Bord na Móna (BnM) personnel, in particular ecological data including habitat data and bird survey data provided by the Ecology team.
- Review of Lemanaghan Bog Draft Cutaway Bog Decommissioning and Rehabilitation Plan
- Review of online web-mappers: National Parks and Wildlife Service (NPWS), EPA (Envision), Water Framework Directive (WFD) and Inland Fisheries Ireland (IFI).

- Data on potential occurrence of protected bryophytes – as per NPWS online map viewer; Flora (Protection) Order Map Viewer – Bryophytes[4].
- Available info from IPC licence P0500-01
- Review of the Bat Conservation Ireland (BCI) Private Database
- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper
- Inland Fisheries Ireland (IFI) Reports, where available.
- 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 Proposed Project is located.

6.2.2 Scoping and Consultation

MKO undertook a scoping exercise in 2021, 2024 and 2025 during preparation of this EIAR, as described in Chapter 2: Background to the Proposed Project, Section 2.8 of this EIAR.

Copies of all scoping responses are included in Appendix 2-1 of this EIAR. The recommendations of the consultees have informed the EIAR preparation process and the contents of this chapter. Table 2-4 in Chapter 2 of this EIAR describes where the comments raised in the scoping responses received have been addressed in this assessment. Table 6-1provides a list of the organisations consulted with regard to biodiversity during the scoping process, and notes where scoping responses were received.

Table 6-1 Scoping Responses

Consultee	Date of Response 2021	Date of Response 2024
An Taisce	No response received	No response received
Bat Conservation Ireland	No response received	No response received
BirdWatch Ireland	No response received	No response received
Butterfly Conservation Ireland	No response received	No response received
Department of Housing, Local Government and Heritage (includes National Parks & Wildlife Service)	No response received	Response received 24th October 2024 in relation to archaeological assessment only. Following the scoping response, a request for a meeting with DAU/NPWS was issued on the 9th of October 2025. A meeting with the DAU/NPWS was held on the 25th of November 2025 and is detailed in Section 6.2.2.1.1 below.
Inland Fisheries Ireland	Response received 16th June 2021	No response received
Irish Peatland Conservation Council	No response received	No response received
Irish Wildlife Trust	No response received	No response received
Offaly County Council	Response received 25th May 2021	Response received 22nd November 2024

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

6.2.2.1 Pre-Planning Meetings

6.2.2.1.1 *Development Applications Unit (DAU)/National Parks and Wildlife Service (NPWS)*

Members of the Proposed Project Team and Lemanaghan Wind Farm DAC (the Applicant) met with a representative from the NPWS to provide an overview of the Proposed Project and to discuss aspects relevant to biodiversity. The meeting was held via Microsoft (MS) Teams on the 25th of November 2025. Details are provided in Chapter 2 of the EIAR, with a summary relevant to biodiversity included here.

The Proposed Project team gave an overview of the Proposed Project in the form of a PowerPoint presentation which set out the following information:

- Overview of the Proposed Project site layout
- An overview of ecological surveys undertaken to date and the baseline data established for the Proposed Project site
- Identification of key ecological receptors and a summary of the potential impacts arising from the Proposed Project
- Proposed ecological enhancement and mitigation measures to be implemented as part of the design and operation of the Proposed Project.

Following this presentation, there was further discussion held between the Proposed Project team and the NPWS representative. Matters raised included:

- The need to ensure that potential groundwater and hydrological impacts on raised bog habitat are fully assessed;
- The requirement for a robust approach to collision risk assessment and the provision of appropriate mitigation, where necessary;
- The importance of giving detailed consideration to cumulative effects, particularly in relation to collision risk, when assessed alongside other permitted or proposed projects;
- The need for predator control or protection measures to be proposed for all enhancement and mitigation areas;
- A request that barn owl nest boxes be included as part of the Proposed Project.

The potential for groundwater and hydrological impacts on raised bog habitats are addressed in Section 6.4.2.1.2. Matters relating to ornithology are addressed in Section 7.2.2 of Chapter 7 Birds of this EIAR.

6.2.2.1.2 *An Coimisiún Pleanála*

Following the transposition of RED III into national law through the European Union (Planning and Development) (Renewable Energy) Regulations 2025 (S.I. No. 274 of 2025) in August 2025, a third pre-application meeting was held with ACP via Microsoft (MS) Teams on the 10th of December 2025.

The Proposed Project team gave a PowerPoint presentation which set out the following information:

- Overview of the Proposed Project site layout
- An overview of ecological surveys undertaken to date and the baseline data established for the Proposed Project site
- Identification of key ecological receptors and a summary of the potential impacts arising from the Proposed Project
- Proposed ecological enhancement and mitigation measures to be implemented as part of the design and operation of the Proposed Project.

Following this presentation, there was further discussion held between the project team and ACP representatives. Matters relevant to biodiversity that were raised included:

- The need for coordination and consistency between the EIAR and the NIS
- The interaction between the Proposed Project, the substitute consent application (PL. Ref SU19.323676) and the IPC licence (P0500-01), including confirmation that peatland rehabilitation works are subject to EPA oversight and will proceed independently of the Proposed Project
- The need to ensure that potential impacts on raised bog habitat are fully assessed
- Assessment of the effectiveness of mitigation measures and the potential for secondary effects on biodiversity
- The importance of assessment of cumulative effects, particularly in relation to other wind farm developments

The matters raised during the consultation have been considered and addressed, where relevant, within the EIAR and the accompanying NIS. The potential for impacts on raised bog habitats is addressed in Section 6.4.2.1.2. Mitigation measures are outlined and assessed where relevant in Section 6.4. The cumulative impact assessment is provided in Section 6.5.

6.2.3 Field Surveys

A comprehensive survey of the biodiversity of the Proposed Project site was undertaken on various dates between 2021 and 2025. Table 6-2 lists all surveys completed and the dates on which they were carried out. The following sections fully describe the ecological surveys that have been undertaken and provide details of the methodologies, dates of survey and guidance followed (bird survey details are provided in Chapter 7 of this EIAR).

Table 6-2 Summary of surveys undertaken to inform the Ecological Impact Assessment

Survey	Dates	Study Area	Guidance
Multidisciplinary Walkover Surveys	21st April 2021 30th July 2021 3rd August 2022 25th July 2023 10th August 2023 14th September 2023 29th July 2025	Proposed Project site	Smith *et al.* (2011); TII (2008); TII (2020)
Detailed Habitat and Vegetation Composition Surveys	29th June 2023 25th July 2023 17th July 2024 18th July 2024 19th August 2024 29th August 2024 10th September 2024 3rd October 2024 9th October 2024 29th July 2025	Proposed Wind Farm	Fossitt (2000); Smith & Crowley (2020); Cross & Lynn (2013); Fernandez et al. (2014); Foss & Crushell (2008); NPWS (2025); EC (2007); NBDC Irish Vegetation Classification (IVC) and ERICA: Engine for Relevés to Irish Communities Assignment.
Otter Surveys	17th August 2021 18th August 2021 18th August 2024 19th August 2024 10th September 2024	Suitable watercourses within 150m of the Proposed Project development footprint	TII (2006a); TII (2008); NPWS (2009)

Survey	Dates	Study Area	Guidance
Aquatic Surveys	17th August 2021 18th August 2021 18th August 2024 19th August 2024	Freshwater watercourses which could be affected directly or indirectly by the Proposed Project (outlined in Appendix 6-2)	CEN (2003) CFB (2008) EA (2003) Toner et al. (2005) TII (2008) Reynolds et al. (2010) Gammell et al. (2021) IFI (2010)
Marsh Fritillary Surveys	18th August 2021 14th September 2023 29th August 2024 10th September 2024	Proposed Project site	TII (2008)
Badger Surveys	30th July 2021 3rd August 2022 19th August 2024 10th September 2024	Proposed Project site	TII (2005a); TII (2008);
Bat Surveys	April, June, August 2021 April, May, July, August, October, November 2024	Proposed Project site	Collins (2023); NatureScot (2021); NIEA (2021, amended 2022)

6.2.3.1 Multidisciplinary Walkover Surveys

Multidisciplinary walkover surveys were undertaken on the 21st of April 2021, 30th of July 2021, 3rd of August 2022, 25th of July 2023, 10th of August 2023, 14th of September 2023 and 29th July 2025. The botanical surveys were carried out within the recognised optimum period for vegetation surveys/habitat mapping, i.e., April to September (Smith *et al.*, 2011). A comprehensive walkover of the entire Proposed Project site was completed.

The walkover surveys were also designed to detect the presence, or likely presence, of a range of protected species. The survey included a search for badger setts and areas of suitable habitat, potential features likely to be of significance to bats and additional habitat features for the full range of other protected species that are likely to occur in the vicinity of the Proposed Project, such as otter, other protected mammal species and marsh fritillary. In addition, an inventory of other species of local biodiversity interest was compiled, including records of invertebrate species encountered during the surveys.

The multidisciplinary walkover surveys comprehensively covered the entire Proposed Project site (EIAR site boundary as shown in Figure 6-1) and based on the survey findings, further detailed targeted surveys were 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, 2008).

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 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 development footprint, with relevés undertaken within representative habitats at each turbine base,

substation, borrow pits, peat and spoil management areas, temporary construction compounds and meteorological mast. Relevés were 4x4 metres for all habitats. The extent of each habitat on site was mapped using aerial photography, handheld GPS and Fieldmaps (ArcGIS). A representative photograph was also taken for each of the habitats recorded on site, including all relevés. These are included in the habitat descriptions in Section 6.3.2.1 and in Appendix 6-3.

All habitats recorded on site and described in this EIAR chapter have been classified in accordance Fossitt (2000). In addition, peatland and woodland habitats outside of the Proposed Project infrastructure but within the site are described in detail in this chapter. Full details of all the botanical surveys and results are provided in Appendix 6-3 and an assessment of the potential for the site to support Annex I habitats is also provided in this Appendix.

Botanical surveys were undertaken on the 29th of June 2023, 25th of July 2023, 17th of July 2024, 18th of July 2024, 19th of August 2024, 29th of August 2024, 10th of September 2024, 3rd of October 2024, 9th of October 2024 and 29th of July 2025. These surveys provided an understanding of the botanical baseline and informed further survey work following finalisation of the proposed infrastructure layout. The habitat assessment surveys described in this report have been undertaken with reference to the following guidelines and interpretation documents:

- Smith, G.F. & Crowley, W. (2020). *The habitats of cutover raised bog.* Irish Wildlife Manuals No. 128. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.
- Cross, J. & Lynn, D. (2013) *Results of a monitoring survey of bog woodland.* Irish Wildlife Manuals, No. 69. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- Fernandez, F., Connolly K., Crowley W., Denyer J., Duff K. & Smith G. (2014) *Raised Bog Monitoring and Assessment Survey 2013.* Irish Wildlife Manuals, No. 81. National Parks and Wildlife Service, Department of Arts, Heritage and Gaeltacht, Dublin, Ireland.
- Commission of the European Communities (2007) *Interpretation manual of European Union habitats.* Eur 27. European Commission DG Environment.
- Foss, P.J. & Crushell, P. 2008, *Guidelines for a National Fen Survey of Ireland, Survey Manual.* Report for the National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Ireland.
- NPWS (2025). *The Status of EU Protected Habitats and Species in Ireland.* Volume 2: Habitat Assessments. Unpublished NPWS report.

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

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

6.2.3.3 Terrestrial Fauna Surveys

The results of the desk study, scoping replies, incidental records of protected species during ecological survey work and multidisciplinary walkover surveys were used to inform the scope of targeted ecological surveys required. Dedicated surveys for bats, otter and badger were undertaken at the times set out below with the methodologies followed also provided below. Given the known occurrence of the marsh fritillary butterfly in the area, this species was also targeted during the site visits, with dedicated surveys undertaken to determine the occurrence, distribution and likely population size within the Proposed Project site.

6.2.3.3.1 Badger Surveys

Areas identified as providing potential habitat for badger were subject to specialist targeted surveys. Dedicated badger surveys were conducted on the 30th of July 2021, 3rd of August 2022, 19th of August 2024, and 10th of September 2024. The badger surveys covered all Proposed Project infrastructure and surrounding suitable habitats in the site. Targeted surveys were also undertaken in areas where incidental badger signs, setts or sightings were recorded during walkover bird surveys of the site. The badger surveys were not constrained by vegetation given the nature of the habitats within the site and the timing of the surveys (TII, 2005a).

The badger surveys were conducted in order to determine the presence or absence of badger signs within and outside (areas of identified suitable habitat) the Proposed Project site. This involved a search for all potential badger signs as per TII (2008) (latrines, badger paths and setts). If encountered, setts would be classified as per the convention set out in TII (2008) (i.e., main, annexe, subsidiary, outlier).

The badger survey was conducted adhering to best practice guidance (TII, 2008) and followed the *'Guidelines for the Treatment of Badger Prior to the Construction of National Roads Schemes'* (TII, 2005a) and CIEEM best practice competencies for species surveys (CIEEM, 2013[5]).

Camera traps

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

6.2.3.3.2 Otter Surveys

Following a review of the previously completed ecological surveys and the results of the multidisciplinary walkover survey; areas identified as providing potential habitat for otter were subject to specialist targeted survey. The otter survey of watercourses was conducted on the 19th of August 2024 and 10th of September 2024. Additional otter surveys of the watercourses both within and downstream of the Proposed Project site were undertaken by Triturus Ltd. on the 17th of August 2021, 18th of August 2021, 18th of August 2024, and 19th of August 2024. The drainage ditch at the Turbine Delivery Route accommodation area at Kennedy's Cross was not subject to targeted otter surveys given the small scale and nature of the works proposed at this location, which includes reinstatement of an existing grassed route.

The otter survey was conducted as per TII (2008) 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 150m upstream and downstream of the Proposed Project. 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 (2006a) *'Guidelines for the Treatment of Otters Prior to the Construction of National Roads Schemes'* and 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 Proposed Project site during habitat surveys as well as the results of the desk study, targeted surveys for the species were undertaken by MKO on the 18th of August 2021, 14th of September 2023, 29th of August 2024, and 10th of September 2024. The survey methodology followed that described in the TII (2008) best practice

[5] *CIEEM, 2013, Technical Guidance Series – Competencies for Species Survey, Online, Available at: https://cieem.net/resource/competencies-for-species-survey-css/*

guidance document and used and recording sheets designed by the NBDC[6]. This involved presence/absence surveys for marsh fritillary active larval webs within suitable areas of marsh fritillary habitat within the Proposed Project site. Devil's bit scabious plants *(Succisa pratensis*) were systematically searched for marsh fritillary larval webs throughout areas where the species occurs. The surveys were undertaken on dry, sunny days during the optimal survey period.

6.2.3.3.4 *Bat Surveys*

A detailed description of bat survey methodologies undertaken at the Proposed Project site is provided in the Bat Report in Appendix 6-1 along with dates and details of all surveyors. Surveys carried out in 2024 were in accordance with NatureScot (2021) and form the core dataset for the assessment of effects on bats. The 2024 results are supplemented by data collected during surveys undertaken at the Proposed Project site in 2021 and 2022.

All surveys were undertaken in accordance with best practice guidance, including *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2023) and NatureScot (2021). Consideration was also given to the Northern Ireland Environment Agency (NIEA) Natural Environment Division (NED) Guidance, which was produced in August 2021 (amended May 2022).

The survey programme included bat habitat suitability walkover surveys to assess the suitability of habitats within the Proposed Project site to support roosting, foraging and commuting bats, as well as targeted roost surveys, manual activity surveys and ground-level static surveys, summarised as follows:

- **Bat Habitat Suitability Appraisal:** Bat walkover surveys were undertaken across the Proposed Project site to assess the suitability of habitats to support roosting, foraging and commuting bats. Habitat suitability was assessed in accordance with Collins (2023), with connectivity between habitats within the Proposed Project site considered.
- **Roost Surveys – Daytime Roost Inspections**: A search for roosts was undertaken within 200m plus the rotor radius (i.e. 75m) of the proposed turbine locations (NatureScot, 2021). The aim of these searches was to determine the presence of Potential Roost Features (PRFs) for bats. Three structures within the Proposed Project site were subject to detailed daytime internal and external inspections which included a search for evidence of bat use such as live and dead specimens, droppings, feeding remains, urine splashes and fur oil staining. Tree assessments were carried out from ground level to identify signs of rot holes, cracks, or other PRFs.
- **Manual Activity Surveys**: Walked and driven transect surveys were conducted across the Proposed Project site in Spring, Summer, and Autumn 2024, using full-spectrum bat detectors (Batlogger M). Dusk emergence surveys were also undertaken at the three identified structures. All bat activity was recorded for subsequent analysis to confirm species identifications
- **Ground-level Static Detector Surveys**: Full-spectrum static detectors (Song Meter SM4BAT) were deployed at 12 locations across a representative range of habitats during Spring, Summer, and Autumn 2024 (Figure 3-1 in Appendix 6-1). Where developments have more than 10 turbines, NatureScot (2021) requires one detector per turbine up to 10, plus one detector for every three additional turbines. Given that 15 turbines are proposed, 12 static bat detectors were deployed to ensure compliance with NatureScot guidance. Detectors were programmed to record from 30 minutes before sunset to 30 minutes after sunrise for at least 10 nights per season. Weather conditions were monitored throughout to ensure appropriate conditions were captured.

[6] https://biodiversityireland.ie/app/uploads/2021/11/Marsh-Fritillary-Larval-Survey-Form.pdf

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

6.2.3.4 Aquatic Surveys

Dedicated aquatic surveys of the watercourses draining the Proposed Project site were conducted by Triturus Environmental Ltd. on the 17th and 18th of August 2021 and the 18th and 19th of August 2024. The surveys assessed watercourses and ponds within and downstream of the Proposed Project site to evaluate fisheries potential, biological water quality, and the presence of aquatic species and habitats of conservation interest. A total of 13 riverine sites and three pond sites were surveyed. The survey site locations are shown in Figure 2-1 of the Aquatic Report in Appendix 6-2.

The surveys included electro-fishing, fisheries habitat appraisal, biological water quality (Q-sampling), macrophyte and aquatic bryophyte surveys, white-clawed crayfish surveys and otter surveys. In addition, environmental DNA (eDNA) sampling was undertaken at selected riverine and pond locations to assist in the detection of potential cryptically low populations of protected and rare aquatic species.

The surveys covered all watercourses draining the Proposed Project site and the survey effort was considered sufficient to provide comprehensive information on the nature of the watercourses within and draining the Proposed Project site. The drainage ditch at the Turbine Delivery Route accommodation area at Kennedys Cross was not subject to targeted aquatic surveys given the small scale and nature of the works proposed at this location, which includes reinstatement of an existing grassed route. A full description of the survey methodologies is provided in the Aquatic Report in Appendix 6-2.

6.2.3.5 Invasive Species Surveys

During the multidisciplinary walkover surveys and botanical surveys of the Proposed Project site, a search for non-native invasive species was 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).

6.2.3.6 Survey Limitations

Seasonal factors that affect distribution patterns and habits of species were taken into account when planning and conducting the surveys. The potential of the site to support certain populations (in particular those of conservation importance that may not have been recorded during the field surveys 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 site were readily identifiable, and comprehensive assessments were made during the field visits. No limitations in the scope, scale or context of the assessment have been identified.

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 a comprehensive desk study, initial site visits and stakeholder consultation; “target receptors” likely to occur in the ZOI of the Proposed Project

were identified. The target receptors included habitats and species that were protected under the following legislation:

- Annexes of the EU Habitats Directive.
- Qualifying Interests (QI) of Special Areas of Conservation (SAC) within the likely ZOI.
- Species protected under the Wildlife Acts 1976 (as amended).
- Species protected under the Flora (Protection) Order 2022.

6.2.4.2 Determining Importance of Ecological Receptors

The importance of the ecological features identified within the Proposed Project site 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) (hereafter referred to as TII (2009) Guidelines). The TII (2009) 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 TII (2009) Guidelines provide a basis for determination of whether any particular receptor is of importance on the following scales:

- International Importance
- National Importance
- County Importance
- Local Importance (Higher Value)
- Local Importance (Lower Value)

The TII (2009) 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 of any 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 TII (2009) Guidelines 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 following the criteria set out in TII (2009) Guidelines are considered to be Key Ecological Receptors (KERs) for the purposes of ecological impact assessment if there is a pathway for effects thereon.

6.2.4.3 Characterisation of Impacts and Effects

The Proposed Project will result in a number of potential impacts. The ecological effects of these impacts are characterised as per the CIEEM '*Guidelines for Ecological Impact Assessment in the UK and Ireland'* (2018) (hereafter referred to as the CIEEM 2018 Guidelines). The CIEEM 2018 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 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 the Proposed 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 Section 6.4 below.

6.2.4.4 Determining the Significance of Effects

The ecological significance of the effects of the Proposed Project is determined following the precautionary principle and in accordance with the methodology set out in Section 5 of the CIEEM 2018 Guidelines.

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 as per the CIEEM 2018 Guidelines.

When determining significance, consideration is given to whether:

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

The EPA Guidelines on information to be included in Environmental Impact Assessment Reports (EPA, 2022) and the TII (formerly NRA) (2009) Guidelines were also considered when determining significance and the assessment is in accordance with the above listed guidelines.

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 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 Guidelines the definitions 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 CIEEM 2018 methodology, if it is determined that the integrity and/or conservation status of an ecological feature will be impacted, 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 Mitigation

Section 6.4 of this EIAR assesses the potential effects of the Proposed Project to ensure that all effects on Key Ecological Receptors are adequately addressed. Where significant effects on sensitive ecological receptors are predicted, mitigation has been incorporated in the project design or layout to address such impacts. The implemented mitigation measures avoid or reduce or offset potential significant residual effects, post mitigation.

6.2.4.6 Limitations

The information provided in this assessment accurately and comprehensively describes the baseline ecological environment following surveys on numerous dates during all seasons and over four years; provides an accurate prediction of the likely ecological effects of the Proposed Project; prescribes best practice and mitigation as necessary; and describes the residual ecological impacts. The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines. The habitats and species on the site were readily identifiable and comprehensive assessments were made during the field visit. No significant limitations in the scope, scale or context of the assessment have been identified.

6.3 Establishing the Ecological Baseline

6.3.1 Desk Study

The following sections describe the results of a survey of published material that was consulted as part of the desk study for the purposes of the ecological assessment. It provides a baseline of the ecology known to occur in the existing environment. Material reviewed includes the NPWS Site Synopses for designated sites within the ZOI (as defined in Section 6.1), bird and plant distribution atlases and other research publications as outlined in Section 6.2.1.

6.3.1.1 Designated Sites

6.3.1.1.1 *Identification of the Designated Sites within the Likely Zone of Influence of the Proposed Project*

The potential for the Proposed Project to impact on Designated Sites for nature conservation was considered in this section.

Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are designated under the EU Habitats Directive and EU Birds Directive, respectively and are collectively known as 'European Sites'. The potential for significant effects and/or adverse impacts on the integrity of European Sites is fully assessed in the AA Screening Report and NIS that accompanies this application. As per the EPA guidance (EPA, 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 6.4.5 of this EIAR provides a summary of the key assessment findings with regard to Designated Sites.

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

Proposed Natural Heritage Areas (pNHAs) were designated on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, the potential for effects on these designated sites is fully considered in this assessment. NHAs and pNHAs are collectively known as 'Nationally Designated Sites'.

The following methodology was used to establish which Designated Sites for nature conservation have the potential to be impacted by the Proposed Project:

- 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) [7] and the EPA website (www.epa.ie). The datasets were utilised to identify Designated Sites which could feasibly be affected by the Proposed Project.
- All European and Nationally Designated Sites that could potentially be affected were identified using a source-pathway-receptor model and are shown on Figure 6-2 and Figure 6-3.
- Information on these sites with regard to the likely ZOI is provided in Table 6-3.
- 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.

[7] *The following SAC, SPA, NHA and pNHA GIS boundary datasets are the most recently available at the time of writing: SAC_ITM_2026_01, SPA_ITM_2026_01, NHA_ITM_2019_06, pNHA_ITM_2015_11.*

- All European Designated Sites and the QIs/SCIs for which they are designated are fully described and assessed in the Appropriate Assessment Stage 1 and NIS report submitted as part of the planning application.

Where potential pathways for significant effects are identified, the Designated Site is included within the Likely Zone of Influence and further assessment is required.

Table 6-3 Identification of European and Nationally Designated Sites within the Likely Zone of Influence

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
Special Area of Conservation		
Ferbane Bog SAC [000575]	1.2km from the Proposed Project site 1.2km from the Proposed Wind Farm 17.9km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >1km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this SAC via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Clara Bog SAC [000572]	3.1km from the Proposed Project site 3.1km from the Proposed Wind Farm 26.6km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >3km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this SAC via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Ridge Road, SW of Rapemills SAC [000919]	4km from the Proposed Project site 17.8km from the Proposed Wind Farm 4km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and 4km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. No connectivity or pathway for significant effects on the site was identified and the habitat for which the site is designated is terrestrial in nature. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
Moyclare Bog SAC [000581]	4.9km from the Proposed Project site 4.8km from the Proposed Wind Farm 15.9km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >4km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this SAC via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
All Saints Bog and Esker SAC [000566]	5.8km from the Proposed Project site 19km from the Proposed Wind Farm 5.8km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >5km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this SAC via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Lisduff Fen SAC [002147]	6.7km from the Proposed Project site 25.6km from the Proposed Wind Farm 6.7km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >6km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this SAC via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Ballyduff/Clonfinane Bog SAC [000641]	7.1km from the Proposed Project site 25.7km from the Proposed Wind Farm 7.1km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >7km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this SAC via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified.

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
		There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.
Island Fen SAC [002236]	7.5km from the Proposed Project site 24.3km from the Proposed Wind Farm 7.5km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >7km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this SAC via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Pilgrim's Road Esker SAC [001776]	7.7km from the Proposed Project site 7.7km from the Proposed Wind Farm 23.6km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >7km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. No connectivity or pathway for significant effects on the site was identified and the habitat for which the site is designated is terrestrial in nature. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Sharavogue Bog SAC [000585]	8km from the Proposed Project site 27.7km from the Proposed Wind Farm 8km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >8km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this SAC via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Mongan Bog SAC [000580]	8.4km from the Proposed Project site 8.3km from the Proposed Wind Farm	No pathway for direct effects was identified as this European Site lies entirely outside of and >8km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
	22.9km from the Turbine Delivery Route accommodation area	hydrological connection between the Proposed Project and this SAC via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
River Shannon Callows SAC [000216]	8.3km from the Proposed Project site 8.3km from the Proposed Wind Farm 9.5km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >8km from the Proposed Project site. There is hydrological connectivity between the Proposed Project site and this SAC (approximately 9.9km downstream) via drainage ditches and watercourses within the Proposed Project site which ultimately discharge to the Brosna River and the River Shannon, both of which are designated as part of the SAC. A potential pathway for indirect effects on the aquatic QIs of this SAC was identified. There 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 site. Therefore, a potential pathway for indirect effects on the aquatic QIs of the SAC where they occur downstream of the site was identified. A potential pathway for indirect effects on otter as a result of disturbance was also identified. While no evidence of otter was recorded during any surveys of the Proposed Project site, there is likely to be a regularly occurring population utilising the watercourses within and downstream of the Proposed Project site. Otters can utilise extensive territories, (approximately 7.5 ± 1.5km for females and 13.2 ± 5.3km for males (Ó'Neill, 2008)). On a precautionary basis, it is considered that otters potentially using watercourses within or downstream of the Proposed Project site may be associated with River Shannon Callows SAC. Therefore, a potential pathway for disturbance has been identified. **A complete source pathway receptor chain was identified and in the absence of mitigation, there is potential for significant effects on this European Site. Therefore, the European Site is located within the Likely Zone of Influence and is considered further in this assessment.**
Fin Lough (Offaly) SAC [000576]	8.4km from the Proposed Project site 8.4km from the Proposed Wind Farm 21.5km from the Turbine Delivery	No pathway for direct effects was identified as this European Site lies entirely outside of and >8km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this SAC via surface or groundwater. On this basis and

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
	Route accommodation area	given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Crosswood Bog SAC [002337]	9.6km from the Proposed Project site 9.6km from the Proposed Wind Farm 31.8km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >9km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this SAC via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Carn Park Bog SAC [002336]	9.8km from the Proposed Project site 9.8km from the Proposed Wind Farm 33.5km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >9km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this SAC via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Charleville Wood SAC [000571]	12.6km from the Proposed Project site 12.6km from the Proposed Wind Farm 26.9km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >12km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this SAC via surface or groundwater, and the SAC is located in a different surface water sub-catchment. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Lough Ree SAC [000440]	14.9km from the Proposed Project site 14.9km from the Proposed Wind Farm	No pathway for direct effects was identified as this European Site lies entirely outside of and >14km from the Proposed Project site.

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
	35km from the Turbine Delivery Route accommodation area	The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this SAC via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Lough Derg, North-east Shore SAC [002241]	17.9km from the Proposed Project site 33.6km from the Proposed Wind Farm 17.9km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >17km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is hydrological connectivity between the Proposed Project site and this SAC via watercourses within and adjacent to the Proposed Project site which discharge to the River Shannon which eventually discharges to Lough Derg. This European Site is located >17km from the Proposed Project site and a significant distance downstream of the Proposed Project (63.9km). Given the significant distance between the Proposed Project site and the SAC, and the attenuation properties of the intervening watercourses, no potential for significant indirect effects on the European Site was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Special Protection Areas (SPA)		
Dovegrove Callows SPA [004137]	2km from the Proposed Project site 20km from the Proposed Wind Farm 2km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >2km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connectivity between the Proposed Project site and this European Site. Therefore, no potential for indirect effect on supporting wetland habitat for SCI bird species due to deterioration in water quality exists. There were no observations of Greenland white-fronted geese within 500m of the Proposed Project site during ornithological surveys undertaken between October 2020 and March 2025. The Proposed Wind Farm lies outside the core foraging distance of the SCI species Greenland white-fronted goose (core range of 5-8km) as per Scottish Natural Heritage (SNH) Guidelines (SNH, 2016). This SPA lies within the core foraging distance of the Turbine Delivery Route accommodation area, however the works at this location are small in scale and the area does not provide suitable habitat to support Greenland white-fronted geese.

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
		Given this, and the distance between the Proposed Wind Farm and the SPA, no potential for significant indirect disturbance effects on Greenland white-fronted goose activities was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
River Little Brosna Callows SPA [004086]	5.4km from the Proposed Project site 20.6km from the Proposed Wind Farm 5.4km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >5.4km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connectivity between the Proposed Project site and this European Site. Therefore, no potential for indirect effect on supporting wetland habitat for SCI bird species due to deterioration in water quality exists. The potential for indirect disturbance effects on SCI bird species was also considered. The Proposed Wind Farm is located a considerable distance from the SPA, and no pathway for regular or functionally relevant connectivity between birds using the Proposed Project site and populations with potential to be associated with this SPA has been identified. While the SPA is located 5.4km from the Turbine Delivery Route accommodation area, the works at this location are small in scale and the area does not provide suitable supporting habitat for these SCI species. On this basis, no potential for significant indirect effects due to disturbance or ex situ habitat loss has been identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
All Saints Bog SPA [004103]	5.9km from the Proposed Project site 18.9km from the Proposed Wind Farm 5.9km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >5km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connectivity between the Proposed Project site and this European Site. Therefore, no potential for indirect effect on supporting wetland habitat for SCI bird species due to deterioration in water quality exists. There were no observations of Greenland white-fronted geese within 500m of the Proposed Project site during ornithological surveys undertaken between October 2020 and March 2025. The Proposed Project site lies outside the core foraging distance of the SCI species Greenland white-fronted goose (core range of 5-8km) as per Scottish Natural Heritage (SNH) Guidelines (SNH, 2016). Given the distance between the Proposed Project site and the SPA, no potential

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
		for significant indirect disturbance effects on Greenland white-fronted goose activities was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Middle Shannon Callows SPA [004096]	8.3km from the Proposed Project site 8.3km from the Proposed Wind Farm 9.5km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >8km from the Proposed Project site. There is hydrological connectivity (approximately 9.9km downstream) between the Proposed Project site and this SPA via watercourses within the Proposed Project site which discharge to the Brosna River and the River Shannon, both of which are designated as part of the SPA. A potential pathway for indirect effects on SCI bird species due to deterioration of water quality was identified. There 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 degradation of SCI supporting wetland habitat and negatively affect availability of food resources for SCI species. A potential pathway for indirect effects on SCI species as a result of disturbance, displacement and barrier effects, and collision risk was also identified. On a precautionary basis, it is considered that SCI species potentially using the Proposed Project site may be associated with Middle Shannon Callows SPA. A potential pathway for indirect effects on SCI species where they occur outside the SPA, as a result of loss of ex situ habitat, has also been identified. While much of the Proposed Project site comprises cutover bog and regenerating habitats of limited ecological value, SCI bird species with potential to be connected with SCI populations associated with the Middle Shannon Callows SPA have been recorded using areas within the site. The construction of the Proposed Project will result in a permanent loss of habitat within the footprint of turbines, tracks and associated infrastructure. Although the overall footprint is small relative to the extent of available habitat within the site and wider landscape, this has the potential to represent a direct loss of ex situ habitat for SCI species. On a precautionary basis, a potential pathway for effect due to habitat loss has therefore been identified. **A complete source pathway receptor chain was identified and in the absence of mitigation, there is potential for likely significant effects on this European Site. Therefore, the European Site is located within the Likely Zone of Influence and further assessment is required.**

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
Mongan Bog SPA [004017]	8.5km from the Proposed Project site 8.5km from the Proposed Wind Farm 22.9km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >8km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connectivity between the Proposed Project site and this European Site. Therefore, no potential for indirect effect on supporting wetland habitat for SCI bird species due to deterioration in water quality exists. There were no observations of Greenland white-fronted geese within 500m of the Proposed Project site during ornithological surveys undertaken between October 2020 and March 2025. The Proposed Project site lies outside the core foraging distance of the SCI species Greenland white-fronted goose (core range of 5-8km) as per Scottish Natural Heritage (SNH) Guidelines (SNH, 2016). Given the distance between the Proposed Project site and the SPA, no potential for significant indirect disturbance effects on Greenland white-fronted goose activities was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Lough Ree SPA [004064]	14.9km from the Proposed Project site 14.9km from the Proposed Wind Farm 34.9km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >14km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connectivity between the Proposed Project site and the SPA, which are located within separate hydrological catchments. Therefore, no potential for indirect effect on supporting wetland habitat for SCI bird species due to deterioration in water quality exists. During ornithological surveys undertaken between October 2020 and March 2025, the following SCI species were recorded within the Proposed Project site and/or within 500m of the Proposed Project site: little grebe, whooper swan, wigeon, mallard, golden plover and lapwing. The distance between the SPA and the Proposed Project site is greater than the core foraging range of little grebe, whooper swan (<5km), wigeon (2.5 - 2.8km) and mallard (0.5-1.3km) (SNH, 2016; Johnson *et al.,* 2014), and no regular or patterned flight activity of these species was recorded during surveys such as would suggest connectivity between the Proposed Project site and the SPA. Furthermore, in relation to whooper swan, regularly used closely located roost sites were identified within the Proposed Project site. Flock sizes recorded in the vicinity of the Proposed Project site were broadly in line with numbers observed at the roost sites, and therefore the birds recorded in the vicinity of the Proposed Project site are considered to be associated with these roost sites, and not the SPA.

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
		Therefore, based on published core foraging ranges and recorded flight activity, there is no evidence to suggest connectivity between the SPA and the Proposed Project site for whooper swan. There is no widely recognised foraging range for wintering golden plover or lapwing, and these species were recorded using the Proposed Project site. However, the site is not considered to represent an important foraging or roosting resource for the SCI populations of Lough Ree SPA, given its distance from the designated site (15.2 km). If any connectivity potentially exists between birds using the Proposed Project site and an SPA population, it is likely to be with the Middle Shannon Callows SPA, which lies closer to the site and supports significant populations of these species. Therefore, it is considered that there is no potential for significant indirect impacts due to ex situ habitat loss or disturbance effects on any SCI species as a result of the Proposed Project. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
River Suck Callows SPA [004097]	15.6km from the Proposed Project site 15.6km from the Proposed Wind Farm 20km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >15km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connectivity between the Proposed Project site and the SPA, which are in separate hydrological catchments. Therefore, no potential for indirect effect on supporting wetland habitat for SCI bird species due to deterioration in water quality exists. During ornithological surveys undertaken between October 2020 and March 2025, the following SCI species were recorded within the Proposed Project site and/or within 500m of the Proposed Project site: whooper swan, wigeon, golden plover and lapwing. The distance between the SPA and the Proposed Project site is greater than the core foraging range of whooper swan (<5km) and wigeon (2.5 - 2.8km) (SNH, 2016; Johnston *et al.*, 2013), and no regular or patterned flight activity of these species was recorded during surveys such as would suggest connectivity between the Proposed Project site and the SPA. Furthermore, in relation to whooper swan, regularly used closely located roost sites were identified within the Proposed Project site. Flock sizes recorded in the vicinity of the Proposed Project site were broadly in line with numbers observed at the roost sites, and therefore the birds recorded in the vicinity of the Proposed Project site are considered to be associated with these roost sites, and not the SPA. Therefore, based on published core foraging ranges and

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
		recorded flight activity, there is no evidence to suggest connectivity between the SPA and the Proposed Project site for whooper swan. There is no widely recognised foraging range for wintering golden plover or lapwing, and these species were recorded using the Proposed Project site. However, the site is not considered to represent an important foraging or roosting resource for the SCI populations of River Suck Callows SPA, given its distance from the designated site (15.7km). If any connectivity potentially exists between birds using the Proposed Project site and an SPA population, it is likely to be with the Middle Shannon Callows SPA, which lies closer to the site and supports significant populations of these species. Therefore, it is considered that there is no potential for significant indirect impacts due to ex situ habitat loss or disturbance effects on any SCI species as a result of the Proposed Project. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Lough Derg (Shannon) SPA [004058]	18.2km from the Proposed Project site 33.6km from the Proposed Wind Farm 18.2km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this European Site lies entirely outside of and >18km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is hydrological connectivity between the Proposed Project site and this SPA via watercourses within and adjacent to the Proposed Project site which discharge to the River Shannon which eventually discharges to Lough Derg. This European Site is located >18km from the Proposed Project site and a significant distance downstream of the Proposed Project (63.9km). Given the significant distance between the site and the SPA, and the attenuation properties of the intervening watercourses, no potential for significant indirect effects on the European Site was identified. The SCI species of this SPA were not recorded during ornithological surveys undertaken between October 2020 and March 2025. On this basis and given the considerable distance between the site and the SPA, and the lack of significant suitable habitat, there is no potential for significant indirect effects due to disturbance or ex situ habitat loss on any SCI species. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Natural Heritage Areas (NHA)		
Clonydonnin Bog NHA [000565]	2.5km from the Proposed Project site	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >2km from the Proposed Project site.

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
	2.5km from the Proposed Wind Farm 26.3km from the Turbine Delivery Route accommodation area	The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this NHA via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this NHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Killeen Bog NHA [000648]	5.3km from the Proposed Project area 24.3km from the Proposed Wind Farm 5.3km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >5km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this NHA via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this NHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
River Little Brosna Callows NHA [000564]	5.4km from the Proposed Project area 5.4km from the TDR 20.6km from the Proposed Wind Farm 5.4km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >5km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this NHA via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this NHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Ballynagrenia And Ballinderry Bog NHA [000674]	10.4km from the Proposed Project site 1.2km from the Proposed Wind Farm 17.9km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >10km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this NHA via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this NHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Carrickynaghtan Bog NHA [001623]	11.4km from the Proposed Project site	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >11km from the Proposed Project site.

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
	11.4km from the Proposed Wind Farm 28.3km from the Turbine Delivery Route	The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this NHA via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this NHA it is not located within the Likely Zone of Influence, and no further assessment is required.**
Screggan Bog NHA [000921]	12.6km from the Proposed Project site 12.6km from the Proposed Wind Farm 23.6km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >11km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connection between the Proposed Project and this NHA via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this NHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Proposed Natural Heritage Area (pNHA)		
Woodville Woods [000927]	14m from the Proposed Project site 18.9km from the Proposed Wind Farm 14m from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of the Proposed Project site. There will be no direct effects as the Proposed Project infrastructure footprint does not extend into the pNHA and no land take, vegetation clearance or works are proposed within the Designated Site. The potential for the Proposed Project to result in indirect effects on this Designated Site was considered. There is potential hydrological connectivity between the Proposed Project site and this pNHA via a drainage ditch at the Turbine Delivery Route accommodation area at Kennedy's Cross. This was assessed in Chapter 9 of this EIAR (Hydrology and Hydrogeology) and no significant impacts on surface or groundwater quality are anticipated as a result of these works in the absence of mitigation. On this basis, due to the limited nature and scale of the works at the Turbine Delivery Route accommodation area, and the significant distance and lack of pathway to the Proposed Wind Farm, no potential for significant indirect effects was identified. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Ferbane Bog [000575]	1.2km from the Proposed Project site 1.2km from the Proposed Wind Farm	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >1km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this Designated Site was considered. There is no hydrological connection between the Proposed Project and

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
	17.9km from the Turbine Delivery Route accommodation area	this pNHA via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Grand Canal [002104]	2.2km from the Proposed Project site 2.2km from the Proposed Wind Farm 11.9km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >2km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this Designated Site was considered. No connectivity or pathway for significant effects on the site was identified. There is no hydrological connectivity between the Proposed Project site and this pNHA via watercourses within the site boundary as the Brosna River acts as a hydraulic boundary between the Proposed Project site and the canal. On this basis, and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Dovegrove Callows [000010]	2.2km from the Proposed Project site 20.5km from the Proposed Wind Farm 2.2km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >2km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this Designated Site was considered. No connectivity or pathway for significant effects on the site was identified. There is no hydrological connection between the Proposed Project and this pNHA via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Ross And Glenns Eskers [000920]	2.4km from the Proposed Project site 19km from the Proposed Wind Farm 2.2km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >2km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this Designated Site was considered. No connectivity or pathway for significant effects on the site was identified. There is no hydrological connection between the Proposed Project and this pNHA via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
Birr (Domestic Dwelling No. 2, Occupied) [000568]	3km from the Proposed Project site 22.5km from the Proposed Wind Farm 3km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and 3km from the Proposed Project site. This pNHA is designated for the presence of a bat roost within an occupied domestic dwelling and no works are proposed that would result in habitat loss, disturbance or modification at the roost location. The potential for the Proposed Project to result in indirect effects was also considered. The roost is located 22.5km from the Proposed Wind Farm, and no loss or degradation of habitat within the vicinity of the roost is predicted. The Turbine Delivery Route accommodation area works are small in scale, temporary in nature, and will not result in the removal or modification of habitats that contribute to bat foraging or commuting. No lighting or other disturbance pathways relevant to bat roost function are proposed. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Clara Bog [000572]	3.1km from the Proposed Project site 3.1km from the Proposed Wind Farm 26.6km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >3km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this Designated Site was considered. No connectivity or pathway for significant effects on the site was identified. There is no hydrological connection between the Proposed Project and this pNHA via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Birr (Domestic Dwelling No.1, Occupied) [000569]	3.1km from the Proposed Project site 22.6km from the Proposed Wind Farm 3.1km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >3km from the Proposed Project site. This pNHA is designated for the presence of a bat roost within an occupied domestic dwelling and no works are proposed that would result in habitat loss, disturbance or modification at the roost location. The potential for the Proposed Project to result in indirect effects was also considered. The roost is located 22.6km from the Proposed Wind Farm, and no loss or degradation of habitat within the vicinity of the roost is predicted. The Turbine Delivery Route accommodation area works are small in scale, temporary in nature, and will not result in the removal or modification of habitats that contribute to bat foraging or commuting. No lighting or other disturbance pathways relevant to bat roost function are proposed. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
Clonlyon Glebe Bog [000893]	3.9km from the Proposed Project site 3.9km from the Proposed Wind Farm 19.4km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >3km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this Designated Site was considered. No connectivity or pathway for significant effects on the site was identified. There is no hydrological connection between the Proposed Project and this pNHA via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Doon Esker Wood [001830]	3.9km from the Proposed Project site 3.9km from the Proposed Wind Farm 23.9km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Sites lies entirely outside of and >3km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this Designated Sites was considered. No connectivity or pathway for significant effects on this site was identified. There is no connection between the Proposed Project site and this pNHA via surface water or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Bracken's Dwelling, Near Whiteford [002058]	4km from the Proposed Project site 23.2km from the Proposed Wind Farm 4km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and 4km from the Proposed Project site. This pNHA is designated for the presence of a bat roost within a dwelling and no works are proposed that would result in habitat loss, disturbance or modification at the roost location. The potential for the Proposed Project to result in indirect effects was also considered. The roost is located 23.2km from the Proposed Wind Farm, and no loss or degradation of habitat within the vicinity of the roost is predicted. The Turbine Delivery Route accommodation area works are small in scale, temporary in nature, and will not result in the removal or modification of habitats that contribute to bat foraging or commuting. No lighting or other disturbance pathways relevant to bat roost function are proposed. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Ridge Road, SW Of Rapemills [000919]	4km from the Proposed Project area 19.7km from the Proposed Wind Farm	No pathway for direct effects was identified as these Designated Sites lie entirely outside of and >4km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on these Designated Sites was considered. No

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
	4km from the Turbine Delivery Route accommodation area	connectivity or pathway for significant effects on these sites was identified. There is no connection between the Proposed Project site and these pNHAs via surface water or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on these pNHAs, they are not located within the Likely Zone of Influence, and no further assessment is required.**
Moyclare Bog [000581]	4.8km from the Proposed Project site 4.8km from the Proposed Wind Farm 15.9km from the Turbine Delivery Route accommodation area	
All Saints Bog And Esker [000566]	5.9km from the Proposed Project area 15.6km from the Proposed Wind Farm 5.9km from the Turbine Delivery Route accommodation area	
Lough Boora [001365]	6.9km from the Proposed Project site 6.9km from the Proposed Wind Farm 12.9km from the Turbine Delivery Route accommodation area	
Clonfinlough Esker [000892]	7.1km from the Proposed Project site 7.1km from the Proposed Wind Farm 22.3km from the Turbine Delivery Route accommodation area	
Ballyduff/Clonfinane Bog [000641]	7.1km from the Proposed Project area 25.7km from the Proposed Wind Farm	

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
	7.1km from the Turbine Delivery Route accommodation area	
Derrykeel Meadows [000897]	8.4km from the Proposed Project area 20.7km from the Proposed Wind Farm 8.4km from the Turbine Delivery Route accommodation area	
Ballyduff Esker [000885]	8.3km from the Proposed Project site 8.3km from the Proposed Wind Farm 27.8km from the Turbine Delivery Route accommodation area	
Mongan Bog [000580]	8.3km from the Proposed Project site 8.3km from the Proposed Wind Farm 22.9km from the Turbine Delivery Route accommodation area	
Pilgrim's Road Esker [001776]	8.3km from the Proposed Project site 8.3km from the Proposed Wind Farm 23.7km from the Turbine Delivery Route accommodation area	
Fin Lough (Offaly) [000576]	8.4km from the Proposed Project site 8.4km from the Proposed Wind Farm	

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
	21.5km from the Turbine Delivery Route accommodation area	
River Shannon Callows [000216]	8.5km from the Proposed Project site 8.5km from the Proposed Wind Farm 9.5km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >8km from the Proposed Project site. There is hydrological connectivity (approximately 9.9km downstream) between the Proposed Project site and this pNHA via drainage ditches and watercourses within the Proposed Project site which ultimately discharge to the Brosna River and the River Shannon, both of which are designated as part of the pNHA. There is potential for deterioration in surface and groundwater quality due to run off of pollutants, including silts and hydrocarbons, to watercourses within and downstream of the site. Therefore, a potential pathway for indirect effects on the aquatic habitats and species for which the pNHA is designated was identified. **A complete source pathway receptor chain was identified and in the absence of mitigation, there is potential for significant effects on this pNHA. Therefore, the pNHA is located within the Likely Zone of Influence and is considered further in this assessment.**
Ballynagarbry [001713]	8.7km from the Proposed Project site 8.7km from the Proposed Wind Farm 34km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >8km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this Designated Site was considered. No connectivity or pathway for significant effects on the site was identified. There is no hydrological connection between the Proposed Project site and this pNHA via surface water or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Woodfield Bog [000586]	9km from the Proposed Project site 9km from the Proposed Wind Farm 32.7km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >9km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this Designated Site was considered. No connectivity or pathway for significant effects on the site was identified. There is no hydrological connection between the Proposed Project site and this pNHA via surface water or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified.

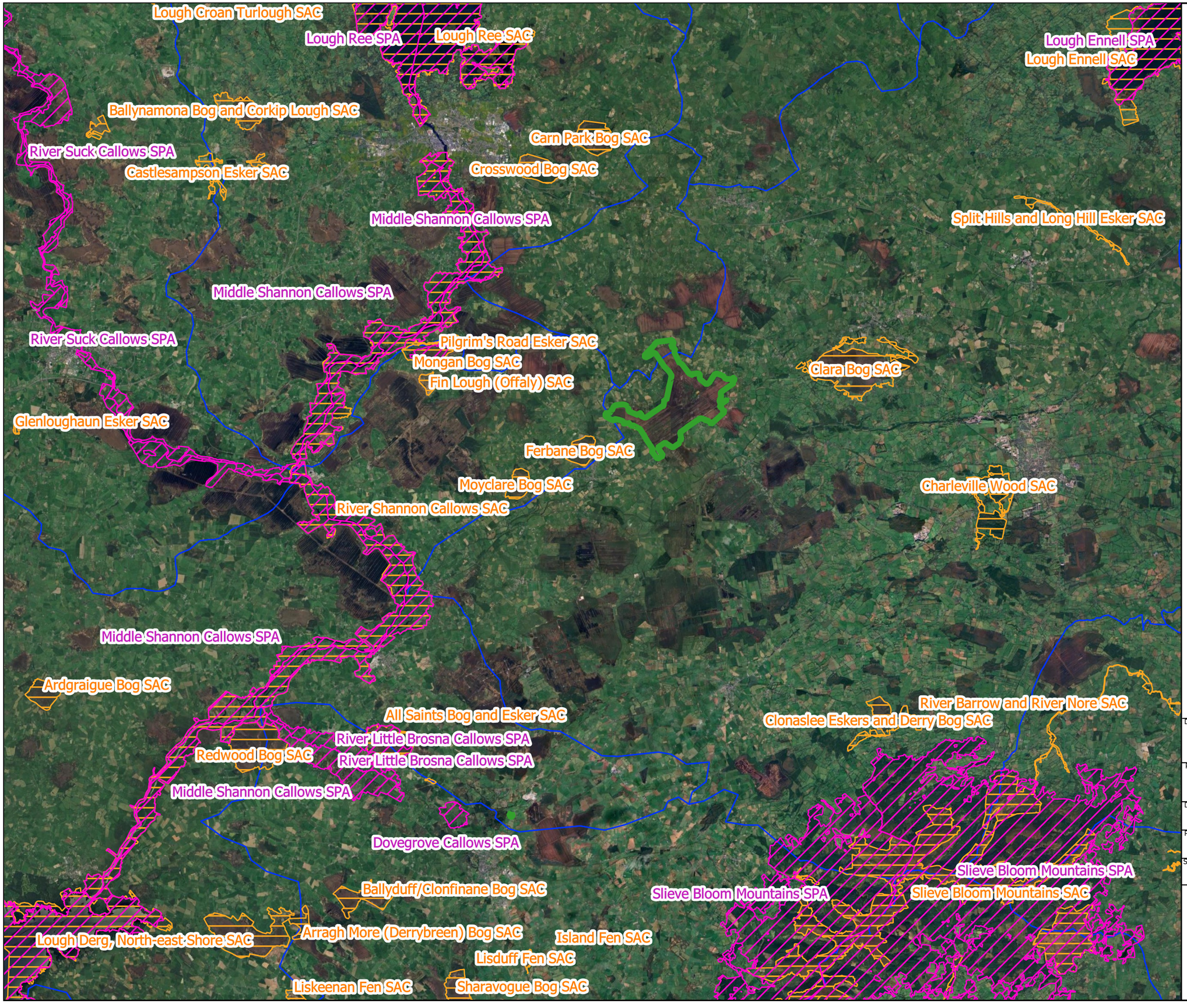
Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
		There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.
Crosswood Bog [000678]	9.6km from the Proposed Project site 9.6km from the Proposed Wind Farm 31.8km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as these Designated Sites lie entirely outside of and >9km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on these Designated Sites was considered. No connectivity or pathway for significant effects on these sites was identified. There is no connection between the Proposed Project site and these pNHAs via surface water or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on these pNHAs, they are not located within the Likely Zone of Influence, and no further assessment is required.**
Carn Park Bog [000676]	9.8km from the Proposed Project site 9.8km from the Proposed Wind Farm 33.5km from the Turbine Delivery Route accommodation area	
Pallas Lough [000916]	10.2km from the Proposed Project site 10.2km from the Proposed Wind Farm 22.1km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >10km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this Designated Site was considered. There is no hydrological connection between the Proposed Project and this pNHA via surface or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Kilcormac Esker [000906]	10.2km from the Proposed Project site 10.2km from the Proposed Wind Farm 19.9km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >10km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this Designated Site was considered. No connectivity or pathway for significant effects on the site was identified. There is no hydrological connection between the Proposed Project site and this pNHA via surface water or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
Lough Nanag Esker [000910]	11.7km from the Proposed Project site 11.7km from the Proposed Wind Farm 22km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >11km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this Designated Site was considered. There is no hydrological connection between the Proposed Project and this pNHA via surface or groundwater and the pNHA is located in a different surface water sub-catchment. On this basis, and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Lough Coura [000909]	12.3km from the Proposed Project site 12.3km from the Proposed Wind Farm 4.5km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >12km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this Designated Site was considered. No connectivity or pathway for significant effects on the site was identified. There is no hydrological connection between the Proposed Project site and this pNHA via surface water or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Clorhane Wood [000894	12.8km from the Proposed Project site 12.8km from the Proposed Wind Farm 21.6km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >12km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this Designated Site was considered. No connectivity or pathway for significant effects on the site was identified. There is no hydrological connection between the Proposed Project site and this pNHA via surface water or groundwater. On this basis and given the distance between the Proposed Project site and this site, no potential for indirect effects was identified. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Ballyduff Wood [001777]	13km from the Proposed Project site 13km from the Proposed Wind Farm 31.4km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as these Designated Site lie entirely outside of and >12km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on these Designated Sites was considered. There is no hydrological connection between the Proposed Project and these pNHAs via surface or groundwater and the pNHAs are located in a different surface water sub-catchment. On this basis and given the distance between

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
Charleville Wood [000571]	13.6km from the Proposed Project site 13.6km from the Proposed Wind Farm 27.5km from the Turbine Delivery Route accommodation area	the Proposed Project site and these sites, no potential for indirect effects was identified. **There is no potential for significant effect on these pNHAs, they are not located within the Likely Zone of Influence, and no further assessment is required.**
Banagher (Domestic Dwelling, Occupied) [000567]	9.2km from the Proposed Project site 13.1km from the Proposed Wind Farm 9.2km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >9km from the Proposed Project site. This pNHA is designated for the presence of a bat roost within an occupied domestic dwelling and no works are proposed that would result in habitat loss, disturbance or modification at the roost location. The potential for the Proposed Project to result in indirect effects was also considered. The roost is located 13.1km from the Proposed Wind Farm, and no loss or degradation of habitat within the vicinity of the roost is predicted. The Turbine Delivery Route accommodation area works are small in scale, temporary in nature, and will not result in the removal or modification of habitats that contribute to bat foraging or commuting. No lighting or other disturbance pathways relevant to bat roost function are proposed. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required. There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Waterstown Lake [001732]	14.6km from the Proposed Project site 37.7km from the Proposed Wind Farm 14.6km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >14km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on these Designated Sites was considered. There is no hydrological connection between the Proposed Project and these pNHAs via surface or groundwater and the pNHAs are located in a different surface water sub-catchment. On this basis and given the distance between the Proposed Project site and these sites, no potential for indirect effects was identified. **There is no potential for significant effect on these pNHAs, they are not located within the Likely Zone of Influence, and no further assessment is required.**
Lough Ree [000440]	14.9km from the Proposed Project site	

Designated Site	Distance from Proposed Project site boundary (km)	Likely Zone of Influence Determination
	14.9km from the Proposed Wind Farm 35km from the Turbine Delivery Route accommodation area	
Lough Derg [000011]	17.9km from the Proposed Project site 33.6km from the Proposed Wind Farm 17.9km from the Turbine Delivery Route accommodation area	No pathway for direct effects was identified as this Designated Site lies entirely outside of and >17km from the Proposed Project site. There is hydrological connectivity between the Proposed Project site and this pNHA via watercourses within and adjacent to the Proposed Project site which discharge to the River Shannon which eventually discharges to Lough Derg. This pNHA is located >17.9km from the Proposed Project site and a significant distance downstream of the Proposed Project (63.9km). Given the significant distance between the Proposed Project site and the pNHA, and the attenuation properties of the intervening watercourses, no potential for significant indirect effects on the European Site was identified. **There is no potential for significant effect on this pNHA, it is not located within the Likely Zone of Influence, and no further assessment is required.**

As outlined in the table above, surface water connectivity was identified between the Proposed Project and River Shannon Callows pNHA, which is located approximately 9.9km downstream of the Proposed Project site. The potential for impacts on this pNHA is fully assessed in Section 6.4.5 of this EIAR. The AA Screening that accompanies this application identifies the following European Sites as being within the Likely Zone of Influence and are fully assessed in the NIS which accompanies this application: River Shannon Callows SAC and Middle Shannon Callows SPA. The findings of the AASR and NIS are summarised in Section 6.4 5.



Map Legend

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

N

Drawing Title: European Sites

Project Title: Lemanaghan Wind Farm, Co Offaly

Drawn By	Checked By
SS	RW
Project No.	**Drawing No.**
200804	Figure 6-2
Scale	**Date**
1:255,000	2026-01-04

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Map Legend

- EIAR Site Boundary
- WFD Sub-catchments
- Natural Heritage Area (NHA)
- Proposed Nature Heritage Area (pNHA)

Drawing Title

Nationally Designated Sites

Project Title

Lemanaghan Wind Farm, Co Offaly

Drawn By	Checked By
SS	RW
Project No.	Drawing No.
200804	Figure 6-3
Scale	Date
1:243,000	2026-01-04

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6.3.1.2 NPWS Article 17 Reporting

The most recent NPWS data on the recorded distribution of EU Habitats Directive Annex I listed habitats was reviewed in relation to the Proposed Project site. This included the latest available NPWS Article 17 reporting (NPWS, 2025), as well as the most recent GIS data from the 2019 Article 17 dataset as part of '*The Status of EU Protected Habitats and Species in Ireland*' (NPWS, 2019)[8].

An area mapped as Annex I Orchid-rich calcareous grassland (6210) is present on the northern boundary of the Proposed Project site (Figure 6-4). The majority of the mapped area lies outside of Proposed Project boundary, with approximately 0.05ha of the eastern section of the habitat located within the Proposed Project boundary. This mapped area does not overlap with the footprint of the Proposed Project and is located within private lands at the north of the boundary, located approx. 700m away from any proposed new infrastructure. Given the separation distance, the absence of hydrological connectivity, and the fact that no works are proposed within or adjacent to this habitat, there is no pathway for direct or indirect effects on this Annex I habitat.

There are no other areas of mapped Annex I habitat within the Proposed Project site. Areas mapped as Active raised bog (7110) are present approximately 2km west, 3km north-west and 4.4km east of the Proposed Project site. An area mapped as Annex I Alkaline fen (7230) is present approximately 7.7km south-east of the Proposed Project site.

6.3.1.3 Vascular Plants

A search of the New Atlas of the British and Irish Flora (Preston *et al.*, 2002) was carried out to investigate whether any rare or unusual plant species listed under Annex I of the EU Habitats Directive, The Irish Red Data Book, 1, Vascular Plants (Curtis, 1988) or the Flora (Protection) Order (2022) had been recorded in the relevant 10km squares in which the Proposed Project site is situated (N12, N13 and N00). Each hectad contains 100 whole one-kilometre squares containing terrestrial habitats. Species of conservation concern are given in Table 6-4.

Table 6-4 Species listed designated under the Flora Protection Order or the Irish Red Data Book within Hectad N12 and N13

Common name	Scientific name	Designation	Date	Hectad
Upright brome	*Bromopsis erecta*	Near Threatened (NT)	Pre 1970	N12
Smooth brome	*Bromus racemosus*	Near Threatened (NT)	1987-1999	N13
Slender tufted-sedge	*Carex acuta*	Near Threatened (NT)	Pre-1970	N13
Spiked Sedge	*Carex spicata*	Near Threatened (NT)	1987-1999	N13
Greater knapweed	*Centaurea scabiosa*	Near Threatened (NT)	1987-1999, 1970-1986	N12, N13
Autumn gentian	*Gentianella amarella*	Near Threatened (NT)	Pre 1970	N13

[8] https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17

Field gentian	*Gentianella campestris*	Near Threatened (NT)	Pre-1970	N13
Frog orchid	*Coeloglossum viride*	Near Threatened (NT)	1970-1986	N13
Least bur-reed	*Sparganium natans*	Near Threatened (NT)	Pre 1970	N13
Green-winged orchid	*Orchis morio*	Vulnerable (VU)	Pre 1970	N12

Map Legend

- EIAR Site Boundary
- Orchid-rich Calcareous Grassland (6210)

N

Drawing Title

NPWS Article 17 Reporting Habitat

Project Title

Lemanaghan Wind Farm, Co Offaly

Drawn By	Checked By
SS	RW
Project No.	Drawing No.
200804	Figure 6-4
Scale	Date
1:13,400	2026-03-09

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6.3.1.4 Bryophytes

A search of the NPWS online data map for bryophytes was undertaken[9]. There were no records of protected bryophytes recorded within or adjacent to the Proposed Project site.

6.3.1.5 National Biodiversity Data Centre (NBDC) Records

A search of the National Biodiversity Data Centre (NBDC) website was conducted prior to the commencement of site surveys. This helped to inform survey effort and provide a baseline of likely species composition in the area. Updated searches was undertaken in April 2025 and in January 2026. Records of protected species recorded from hectads N12, N13 and N00 are provided in Table 6-5.

Table 6-5 NBDC records for species of conservation interest in hectads N12, N13 and N00.

Common name	Scientific name	Designation	Hectad
Large white-moss	*Leucobryum glaucum*	HD Annex IV	N13, N12
Marsh fritillary	*Euphydryas aurinia*	HD Annex II	N13, N12, N00
Freshwater white-clawed Crayfish	*Austropotamobius pallipes*	HD Annex II, V, WA	N12, N13, N00
Common frog	*Rana temporaria*	HD Annex V, WA	N13, N12, N00
Smooth newt	*Lissotriton vulgaris*	WA	N12, N00
Common lizard	*Zootoca vivipara*	WA	N00
European eel	*Anguilla anguilla*	IUCN Red-List	N12
Brown long-eared bat	*Plecotus auritus*	HD Annex IV, WA	N12, N00
Common pipistrelle	*Pipistrelle (Pipistrellus pipistrellus)*	HD Annex IV, WA	N13, N12, N00
Soprano Pipistrelle	*Pipistrellus pygmaeus*	HD Annex IV, WA	N13, N12, N00
Daubenton's bat	*Myotis daubentonii*	HD Annex IV, WA	N12, N00
Leisler's bat	*Nyctalus leisleri*	HD Annex IV, WA	N12, N13, N00
Nathusius' Pipistrelle	*Pipistrellus nathusii*	HD Annex IV, WA	N00
Natterer's Bat	*Myotis nattereri*	HD Annex IV, WA	N00
Whiskered Bat	*Myotis mystacinus*	HD Annex IV, WA	N00
Otter	*Lutra lutra*	HD Annex V, WA	N12, N13, N00
Pine marten	*Martes martes*	HD Annex II, V, WA	N13, N12, N00
Eurasian badger	*Meles meles*	WA	N12, N00

[9] *NPWS (2019) Online map for protected bryophytes,* http://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e

Eurasian pygmy shrew	*Sorex minutus*	WA	N13, N12, N00
Eurasian red squirrel	*Sciurus vulgaris*	WA	N12, N13, N00
Irish hare	*Lepus timidus subsp. hibernicus*	WA	N12, N13, N00
Irish stoat	*Mustela erminea subsp. hibernica*	WA	N12, N00
West European hedgehog	*Erinaceus europaeus*	WA	N12, N13, N00

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

6.3.1.6 Bat Records

The National Bat Database of Ireland was reviewed for records of bat activity and roosts within a 10km radius of the Proposed Wind Farm. Five of Ireland's nine resident bat species were recorded within 10 km of the site. The results of the database search are provided in Table 6-6 below.

Table 6-6 National Bat Database of Ireland records within 10km

Grid Square	Species	Designation	Dataset
N12, N13, N00	Soprano pipistrelle *(Pipistrellus pygmaeus)*	HD Annex IV, WA	National Bat Database of Ireland
N12, N00	Brown long-eared bat (*Plecotus auritus*)	HD Annex IV, WA	National Bat Database of Ireland
N12, N13, N00	Leisler's Bat (*Nyctalus leisleri)*	HD Annex IV, WA	National Bat Database of Ireland
N12, N00	Daubenton's Bat *(Myotis daubentonii)*	HD Annex IV, WA	National Bat Database of Ireland
N12, N13, N00	Common Pipistrelle (*Pipistrellus pipistrellus sensu stricto*)	HD Annex IV, WA	National Bat Database of Ireland
N00	Whiskered Bat (*Myotis mystacinus)*	HD Annex IV, WA	National Bat Database of Ireland
N00	Nathusius' Pipistrelle (*Pipistrellus nathusii)*	HD Annex IV, WA	National Bat Database of Ireland
N00	Natterer's Bat (*Myotis nattereri*)	HD Annex IV, WA	National Bat Database of Ireland

6.3.1.7 NPWS

NPWS online records were searched to see if any rare or protected species of flora or fauna have been recorded from hectads N12 and N13. An information request was also sent to the NPWS scientific data unit requesting records from the Rare and Protected Species Database on the 11th of October 2021. A response was received on the 14th of October 2021.

Table 6-7 lists rare and protected species records obtained from NPWS. A request for an updated data search was sent on the 15th of October 2024 with no response received to date.

Table 6-7 NPWS records for rare and protected species

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

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

6.3.1.8 Freshwater Pearl Mussel (*Margaritifera margaritifera*)

The NPWS *Margaritifera* Sensitive Area map (Version 10, 2020) was consulted during the desk study. There is no surface water connectivity between the Proposed Project site and any *Margaritifera* sensitive catchments shown on the *Margaritifera* Sensitive Area map. The nearest sensitive catchment to the Proposed Project is the Barrow *Margaritifera* Sensitive Area, located 20.4km southeast of the Proposed Project site, with no direct hydrological connection.

6.3.1.9 Marsh Fritillary (*Euphydryas aurinia*)

Records from the National Biodiversity Data Centre (NBDC) indicate that marsh fritillary (*Euphydryas aurinia*) has been recorded in hectads N12, N13 and N00, with the most recent records on the database dating from 2023. The BnM Biodiversity Action Plan 2016-2021 states that marsh fritillary, listed in Annex II of the EU Habitats Directive, are known to occur on '*marginal areas of regenerating cutaway*' of Clongawny bog, which is also part of the Boora Bog Group and located approximately 12km southwest of the Proposed Project site (Bord na Móna, 2016).

6.3.1.10 Inland Fisheries Ireland Data

The IFI online database was reviewed for fish species records within the catchments downstream of the Proposed Project site. The site drains into the River Brosna. It is located predominantly within the Brosna_SC_060 sub-catchment, with a small part of the easternmost section being located within the

Shannon[Lower]_SC_030 sub-catchment and a small part of the northernmost section located in the Shannon[Lower]_SC_010 sub-catchment.

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

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

European eel is classified as 'critically endangered' in '*Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish'* (King *et al.,* 2011). Lamprey (*Lampetra* spp.) are classified as 'near threatened' in '*Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish'* (King *et al.,* 2011). All three species of Irelands 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).

6.3.1.11 Invasive Species

The NBDC database also contains records of invasive species identified within the relevant hectads. Records of 'high impact' invasive species for hectads N12, N13 and N00 are provided in Table 6-8.

Table 6-8 NBDC records for invasive species (hectads N12 and N13)

Common Name	Scientific Name	Hectad
Canadian waterweed	*Elodea canadensis*	N12
Nuttall's waterweed	*Elodea nuttallii*	N12
Japanese knotweed	*Reynoutria japonica*	N13, N00
Rhododendron	*Rhododendron ponticum*	N13
Cherry laurel	*Prunus laurocerasus*	N13
Three-cornered Garlic	*Allium triquetrum*	N13, N00
Brown Rat	*Rattus norvegicus*	N12, N00
American Mink	*Mustela vison*	N13, N12
Grey Squirrel	*Sciurus carolinensis*	N13, N00
Fallow deer	*Dama dama*	N12, N00
Greylag Goose	*Anser anser*	N12, N00
Common Carp	*Cyprinus carpio*	N12
Roach	*Rutilus rutilus*	N12
Zebra Mussel	*Dreissena polymorpha*	N12

Giant knotweed	*Reynoutria sachalinensis*	N00
Giant-rhubarb	*Gunnera tinctoria*	N00
Giant hogweed	*Heracleum mantegazzianum*	N00
Spanish bluebell	*Hyacinthoides hispanica*	N00
Himalayan balsam	*Impatiens glandulifera*	N00
American skunk-cabbage	*Lysichiton americanus*	N00
Parrot's feather	*Myriophyllum aquaticum*	N00
Fringed water-lily	*Nymphoides peltata*	N00

6.3.1.12 Baseline Hydrology

A full hydrological assessment of the Proposed Project site was undertaken in Chapter 9: Water. Information from Chapter 9 of this EIAR was used to inform the assessment impacts on aquatic habitats and species presented in this chapter.

The Proposed Project site is located in a total of 3 no. surface water catchments. The vast majority of the Proposed Project site is located in the Lower Shannon surface water catchment within Hydrometric Area 25A of the Shannon Irish River Basin District (Shannon IRBD). A small area in the northwest of the Proposed Project site and the Turbine Route Delivery accommodation area are both located within the Lower Shannon surface water catchment within Hydrometric Area 25B of the Shannon IRBD. Another small section towards the north of the Proposed Project site is located in the Upper Shannon surface water catchment within Hydrometric Area 26G of the Shannon IRBD (www.epa.ie). Therefore, all surface waters draining the Proposed Project site will eventually discharge to the River Shannon. The River Shannon flows to the southwest approximately 10km northwest of the Proposed Project site before veering to the southeast at Shannonbridge, approximately 15km west of the Proposed Project site. The River Shannon then flows to the southwest, north of Banagher, approximately 17km southwest of the Proposed Project site before eventually discharging into Lough Derg.

6.3.1.13 Existing Baseline Habitat Mapping

The habitats within the Lemanaghan Bog have been mapped in detail by the BnM Ecology team since 2011. This information has been reviewed as part of the baseline ecological data. Detailed GIS shapefiles of all habitat mapping prepared was received from BnM and ground-truthed by MKO when undertaking detailed habitat assessments and relevés of the proposed infrastructure footprint. In addition to detailed habitat mapping of Lemanaghan Bog by BnM, the following documents were also reviewed:

- BnM Biodiversity Action Plan 2010-2015 (BnM, 2010)
- BnM Biodiversity Action Plan 2016-2021(BnM, 2016)

6.3.1.14 Conclusions of the Desktop Study

The desktop study has provided information about the existing environment in hectads N12 and N13, within which the Proposed Project site is located. The Proposed Project site spans three surface water catchments within the Shannon River Basin District: the Lower Shannon (Hydrometric Areas 25A and 25B) and the Upper Shannon (Hydrometric Area 26G). On a more local scale, the majority of the site is located in the Brosna River sub-catchment (Brosna_SC_060). All surface waters from the site

ultimately discharge to the River Shannon, which flows southwest of the site before eventually reaching Lough Derg.

A number of watercourses that drain the Proposed Project site, lead to the following downstream EU Designated Sites, and are further considered in the Natura Impact Statement prepared for the Proposed Project:

- River Shannon Callows SAC
- Middle Shannon Callows SPA

The nationally designated site, River Shannon Callows pNHA, has also been identified as within the Likely Zone of Influence of the Proposed Project.

The desk study identified that a variety of protected faunal species are known to occur within the vicinity of the Proposed Project site, including bats, marsh fritillary, otter, white-clawed crayfish and badger. A review of bat roost records for the area did not identify any roosts within or immediately adjacent to the Proposed Project site. The mammal species recorded during the desk study informed the survey methodologies undertaken during the site visits.

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

6.3.2 Ecological Field Survey Results

6.3.2.1 Description of Habitats and Flora within the Proposed Project Site

Habitat information from previous surveys undertaken by BnM, including habitat mapping using the BnM habitat classification scheme and cross-referenced with Fossitt (2000), was reviewed as part of the desk study for the Proposed Project. The habitat mapping and descriptions presented in this section are informed by multidisciplinary and detailed vegetation surveys of the Proposed Project site undertaken by MKO in 2023, 2024 and 2025. Detailed botanical quadrat data is provided in Appendix 6-3 of this EIAR.

The Proposed Project site comprises primarily cutover raised bog. Peat production formally ceased at Lemanaghan Bog in 2020, although some areas have been out of commercial peat production for many years prior to this and thus vegetation, dominated primarily by birch scrub, common cottongrass and marsh arrowgrass, has regenerated over much of these areas. A habitat map is provided as Figure 6-5. A habitat map with the Proposed Project layout is provided as Figure 6-6. Small areas/remnants of uncut raised bog occur at various locations at the edges of the Proposed Project site with some small areas of active turbary present within the site.

The main habitat types on the site included bare peat communities, cutover bog habitats with a vegetative composition that is similar to degraded dry and wet heath type communities (dominated by Ling heather), woodlands and scrub (dominated by birch), poor fen and areas of grasslands occurring alongside railway tracks and in agricultural fields in the centre and north of the Proposed Project site. These habitats occur in intimate mosaics throughout the Proposed Project site as is shown in Figure 6-5. Areas of open water occur where peat extraction has ceased and the water levels in these areas are no longer managed through the onsite pumping and drainage infrastructure. The largest area of open water and reed swamp occurs within the southern central part of the site close to the existing pump stations, which is a linear standing water feature.

The habitats present across the Proposed Project site are described in the following subsections. Subsequent subsections provide additional location-specific detail for habitats occurring within the

Proposed Project development footprint, including the Proposed Grid Connection, amenity links and turbine delivery route and accommodation works.

6.3.2.1.1 Cutover Bog (PB4)

The vast majority of the Proposed Project site, with the exception of small remnant sections of raised bog around the peripheries, comprise of cutover or open cutaway peat. Large areas of the Proposed Project site have recently ceased to be in active production, with commercial peat extraction ending in 2020. These areas are dominated by bare peat with little growth of vegetation, see Plate 6-1. Where peat extraction has ceased for a number of years prior to 2020, these areas have begun to revegetate, predominantly by poor fen and birch dominated scrub/immature woodland. The following subsections provide a description of the secondary habitats that have begun to form on the cutover bog following cessation of milled peat extraction.

Most of the infrastructure proposed as part of the Proposed Project are sited within cutover bog habitat including turbines, access roads, meteorological mast, temporary construction compounds, borrow pits and peat and spoil management areas.

The majority of the infrastructure proposed as part of the Proposed Project are located within cutover bog habitat, including turbines, internal access roads, met mast, temporary construction compounds, borrow pits and peat deposition areas.

Plate 6-1 Open cutaway bog with sparse vegetation

Bog Woodland/Scrub (WN7/WS1)

The habitats within the Proposed Project site have developed as birch dominated scrub and woodland in the areas where the peat extraction has ceased for the longest periods, along unmaintained drainage channels and where the cutaway is relatively dry. A mosaic of these habitats dominates large sections of the western and central area of the site, and provide areas of separation, cover and shelter throughout

the site. In general, the woodlands and scrub are relatively recently colonised and have a poorly developed layer structure and ground flora. Typically, they are dominated by birch (*Betula pubescens*) with some willows (*Salix spp.*). Occasional Sitka spruce (*Picea sitchensis*) and Lodgepole pines (*Pinus contorta*) had started to establish as a result of natural seed dispersal. The ground flora is commonly dominated by brambles (*Rubus fruticosus agg.*). In more established areas, ivy (*Hedera hibernica*) dominate the understory with bracken (*Pteridium aquilinum*) and other fern species also a regular component of the ground flora. In some areas where the woodlands and scrub are colonizing the cutover bog, the ground flora is often dominated by ling (*Calluna vulgaris*) heather and in places purple moor grass (*Molinia caerulea*). Both birch scrub and birch dominated woodland occur throughout much of the site where peat extraction has ceased (all industrial peat extraction activity formally ceased in June 2020). Annex I habitat Bog Woodland (91DO) was not recorded within the site during the habitat surveys; the woodlands were predominantly very dry and none of the woodland areas had developed on *Sphagnum* rich substrates. Plate 6-2 shows a typical area of birch dominated bog woodland within the Proposed Project site with small trees and low structural diversity.

Plate 6-2 Typical Bog Woodland habitat found within the Proposed Project site.

Poor Fen (PF2)

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

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

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

Secondary heath habitats were dominated by tall ling heather (*Calluna vulgaris*), some cross-leaved heath (*Erica tetralix*), purple moor grass (*Molinia caerulea*) and common cottongrass (*Eriophorum angustifolium*) on dry peats with no Sphagnum present. It is likely that the dry heath areas would, if left undisturbed, colonise to form bog woodland (Dry Birch Woodland – Non-Annex I). The wetter heath communities supported higher abundance of purple moor grasses and common cottongrass. This habitat type covers a broad range of conditions from bare peat and dry but vegetated to much wetter areas that grade into poor fen. In more vegetated areas, dominated by cotton grasses, orchid species were present including; heath spotted orchid (*Dactylorhiza maculata*), twayblade (*Listera ovata*) and marsh helleborine (*Epipactis palustris*). This was mostly associated with areas of revegetated bare peat occurring within the western portion boundary of the Proposed Project site. The species composition, hydrological and geomorphological characteristics of the heath type habitat was assessed with reference to best practice guidance[2,10,11] and professional judgement, and was found not to conform to the EU Habitats Directive Annex I listed habitat European Dry Heaths [4030].

The cutover bog habitats on the site do not correspond to either Active Raised Bog (7110) or Degraded Raised Bog still capable of Natural Regeneration (7120). The NPWS Article 17 Reporting for 2019 states:

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

The 2025 Article 17 Report (NPWS 2025) recognises the publication of the classification and appraisal system for cutover raised bog habitats (Smith et al. 2020). Regarding this system it is stated,

This is the first time that ARB has been recognised as occurring on cutover in the Irish context. In general, however, regenerating ombrotrophic vegetation on cutover characterised by a high Sphagnum cover (i.e. greater than 40- 50% cover), lacks the diversity of Sphagnum species, microtopographical features and good quality indicators associated with ARB. These cutover areas have the capacity to develop into embryonic ARB but longer time periods (>30 years) are likely to be required for high quality ARB to develop.

With regard to the definition of Degraded Raised Bog (DRB), the 2025 Article 17 Report states,

Currently cutover areas are not considered to support DRB. However, the potential of cutovers to support peat-forming vegetation is recognised. Potential peat-forming habitat (PPFH) on cutover is defined using similar methods to that for DRB on the high bog. PPFH is not included under the definition of DRB as it is believed that these areas will require periods longer than 30 years to develop into ARB.

These Annex I habitats do not occur on the cutover habitats in the Proposed Project site. They do not conform to Annex I Heath habitat as defined by the Irish Wildlife Manual (Perrin *et.al.* 2014). As stated by Smith *et al.* (2020):

> *Cutover bog habitats should only rarely be considered examples of dry siliceous heath (HH1) or wet heath (HH3). These habitats are defined by peat depths of less than 0.5 m (Fossitt, 2000), which seldom occur on cutover bog. Only where a habitat is underlain by shallow peat*

[10] *Perrin, P.M., Barron, S.J., Roche, J.R. & O'Hanrahan, B. (2014). Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland. Version 2.0. Irish Wildlife Manuals, No. 79. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland*
[11] *Smith, G.F. & Crowley, W. (2020) The habitats of cutover raised bog. Irish Wildlife Manuals, No. 128. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.*

and good indicators of heath are present, such as Carex binervis, Galium saxatile and Juncus squarrosus, should heath habitats be considered for cutover bog.'

In light of the above, given the habitat history, peat depth in this area and the plant species present, the area does not correspond with Annex I habitat. Further details of the evaluation of the peatland habitats on the site are provided in Appendix 6-3.

Grasslands (GA1, GS2 and GS1)

Grasslands within the Proposed Project site primarily occur along old trackways and railway lines, and within agricultural fields in the centre and northern part of the Proposed Project site.. Many of the verge areas are classified as Dry Meadows and Grassy Verges with rank grasses including false oat grass (*Arrhenatherum elatius*), Yorkshire fog (*Holcus lanatus*), cocks foot (*Dactylis glomerata*) and encroaching scrub with nettle (*Urtica dioica*), bramble and rosebay (*Epilobium angustifolium*).

Other areas are less rank and support more calcareous grasslands with species such as knapweed (*Centaurea nigra*), sweet vernal grass (*Anthoxanthum odoratum*), lady's bedstraw (*Galium verum*), dandelion (*Taraxacum officinalis agg.*), common bird's foot trefoil (*Lotus corniculatus*), common centaury (*Centaurium erythraea*), occasional yellow rattle (*Rhinanthus minor*) and orchids such as common spotted orchid (*Dactylorhiza fuchsii subsp. fuchsia*).

Areas of improved species-poor pasture within the agricultural fields in the central and northern areas of the Proposed Project site were categorised as Improved agricultural grassland GA1). 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 or from the exposure of underlying calcareous subsoil due to the level of peat extraction had taken place.

Plate 6-3 Example of rank grassland habitat within of the Proposed Project site

Open Waterbodies

A number of standing water areas were present within the Proposed Project site. These were classified as Other artificial lakes and ponds (FL8) and are not permanent waterbodies (Plate 6-4).

Plate 6-4 Standing water on bare peat within the Proposed Project site

Drainage Channels (FW4)

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

6.3.2.1.2 *Lowland Depositing Streams (FW2)*

The site is drained by a number of watercourses that surround the Proposed Project site. As described in Chapter 9: Hydrology and Hydrogeology, the Proposed Project site spans three surface water catchments within the Shannon River Basin District: the Lower Shannon (Hydrometric Areas 25A and 25B) and the Upper Shannon (Hydrometric Area 26G). All surface waters from the site ultimately discharge to the River Shannon.

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

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

The Lemanaghan Stream has been highly modified where it runs through the Proposed Project site due to historical peat extraction activities. The current configuration of Lemanaghan Stream represents a peat drainage channel that had been heavily modified, i.e., extensively straightened and deepened historically during peat extraction activities. The channel has a deep U-shaped profile with 4m high banks. The flow profile was of very slow-moving deep glide and pool. The bed comprised of extensive soft peat. The channel supported no macrophytes given deep peat-stained water (Plate 6-5).

Plate 6-5 The Lemanaghan Stream within the site

6.3.2.1.3 Remnant Uncut Raised Bog (PB1)

There are some remnant uncut raised bog habitats at the Proposed Project site, see Figure 6-5. The areas of raised bog recorded within the site are typically small in area, have been historically drained, are relatively dry and in some areas extracted at the facebank. The vegetation comprises predominantly of tall ling heather with some purple moor grass and cottongrasses (Plate 6-6). Some wetter areas were also found to contain cross-leaved heath (*Erica tetralix*) and bog asphodel (*Narthecium ossifragum*). In general, the bog remnants did not contain significant areas of *Sphagnum* mosses. This is likely due to the historic draining of these small, fragmented remnant areas of raised bog during historical industrial peat extraction.

Plate 6-6 Example of remnant raised bog recorded within the Proposed Project site.

6.3.2.1.4 Buildings and Artificial Surfaces (BL3)

There are some areas of buildings and artificial surfaces (BL3) within the Proposed Project site. The majority of the artificial surfaces are associated with access roads, while works offices and storage buildings are also located within the south-western part of the site. Residential buildings are present along the L7001 road where it passes through the northern part of the Proposed Project site. Other small areas of hardcore occur within the Proposed Project site that are used for informal parking in close proximity to access roads.

6.3.2.1.5 Habitats within the Footprint of the Proposed Grid Connection

The Proposed Grid Connection infrastructure, encompassing 2 no. new pylons and the OHL connection to the existing Shannonbridge-Maynooth 220kV OHL, is located within agricultural grassland fields situated to the north of the site. These areas were classified as Improved Agricultural Grassland (GA1), based on species composition and land use.

The grassland is dominated by common agricultural grass species, including Yorkshire fog (*Holcus lanatus*), perennial ryegrass (*Lolium perenne*), and red fescue (*Festuca rubra*). Other grass species observed include creeping bent (*Agrostis stolonifera*), sweet vernal grass (*Anthoxanthum odoratum*), rough meadowgrass (*Poa trivialis*), and marsh foxtail (*Alopecurus geniculatus*). Forbs and ruderal species such as white clover (*Trifolium repens*), broadleaved dock (*Rumex obtusifolius*), and willowherb (*Epilobium* spp.) were also present.

Linear landscape features are present along field boundaries including sections of hedgerow and treeline. The hedgerows are dominated by hawthorn and bramble and managed in line with agricultural land use. Treelines occur in the north of the Proposed Project site along residential boundaries and provide localised linear habitat and connectivity within the wider agricultural landscape. No hedgerow or treeline removal is proposed as part of the Proposed Project.

The proposed onsite 220kV substation will be located on an area of cutover bog, classified as Bare Peat (PB4). The substrate at this location is dry and firm, with no remaining acrotelm and no *Sphagnum* cover recorded. Vegetation is sparse and indicative of early stage recolonisation following cessation of peat extraction.

Species recorded within this area include ling heather (*Calluna vulgaris*), cross-leaved heath (*Erica tetralix*), purple moor grass (*Molinia caerulea*), and occasional birch (*Betula pubescens*) saplings. Sheep's sorrel (*Rumex acetosella*) was also present. These species reflect the early development of dry heath or poor fen-type vegetation, although the area remains ecologically degraded and lacks the structure and function of active peatland habitat. The habitat within the proposed onsite 220kV substation footprint is therefore classified as bare, cutover bog in early natural recolonisation, with low ecological value in its current state.

6.3.2.1.6 Habitats within the Footprint of the Proposed Amenity Tracks

Proposed Wind Farm roads will predominantly be available for amenity use once the Wind Farm is operational. As part of the Proposed Wind Farm, 4km of additional dedicated amenity track are proposed to provide connectivity between the internal Wind Farm roads and local/regional roads around the site.

The eastern most proposed section of amenity track follows an existing track along a mixture of broadleaved woodland (WD2), immature woodland (WS2) and scrub (WS1). Species include downy birch (*Betula pubescens),* goat willow (*Salix caprea),* rowan (*Sorbus aucuparia),* ash (*Fraxinus excelsior)* and sycamore (*Acer pseudoplatanus).* The trail turns south-eastwards through bracken (*Pteridium aquilinum)* and scrub and then traverses the open cutover bog habitat (PB4) (Plate 6-7).

The section of proposed amenity track between proposed turbines T13 and T09, traverses across open cutover bog (PB4) habitat. It also crosses through dry meadows and grassy verges (GS2), scrub (WS1) and immature woodlands (WS2) (Plate 6-8). There will be some loss of woodland edge habitat within the east of the site to facilitate the amenity tracks, as well as dry meadows and grassy verge and scrub habitat in the middle of the site. However, the majority of the amenity track area is restricted to existing tracks and bare cutover peat.

Plate 6-7 Existing tracks in the vicinity of the proposed amenity track to the east of the site

Plate 6-8 Proposed amenity trail location through grassy meadow and along scrub habitats within a central area of the site

6.3.2.1.7 Habitats along the Proposed Turbine Delivery Route

For the purposes of this EIAR, it has been assumed that all turbine infrastructure will be imported to Galway Port. The proposed transport route for the Proposed Project has been the subject of a route assessment to determine if any works are required along its length. A temporary access road for the facilitation of abnormal load deliveries will be required at Kennedy's Cross, located in the townland of

Ballindown, Co. Offaly (junction of the N52 and N62 National Secondary Roads). These works will comprise the re-establishment of a temporary junction bypass road to facilitate the delivery of turbine components and other abnormal loads. The proposed temporary bypass will measure approximately 160 metres in length and have a 6-metre running width. Following the completion of the construction phase of the Proposed Project the gates will be removed, and boundary will be reinstated to its previous standard. The temporary turbine delivery access road will be closed, covered with a layer of topsoil and reseeded. It would only be used again in the event that an oversized delivery was required for wind turbine maintenance purposes.

The track to be used for re-establishment of the temporary junction bypass road comprises an existing grassed over track categorised as recolonising bare ground (ED3) transitioning to a grassland and is dominated by Yorkshire fog (*Holcus lanatus)* and dock (*Rumex spp.).*

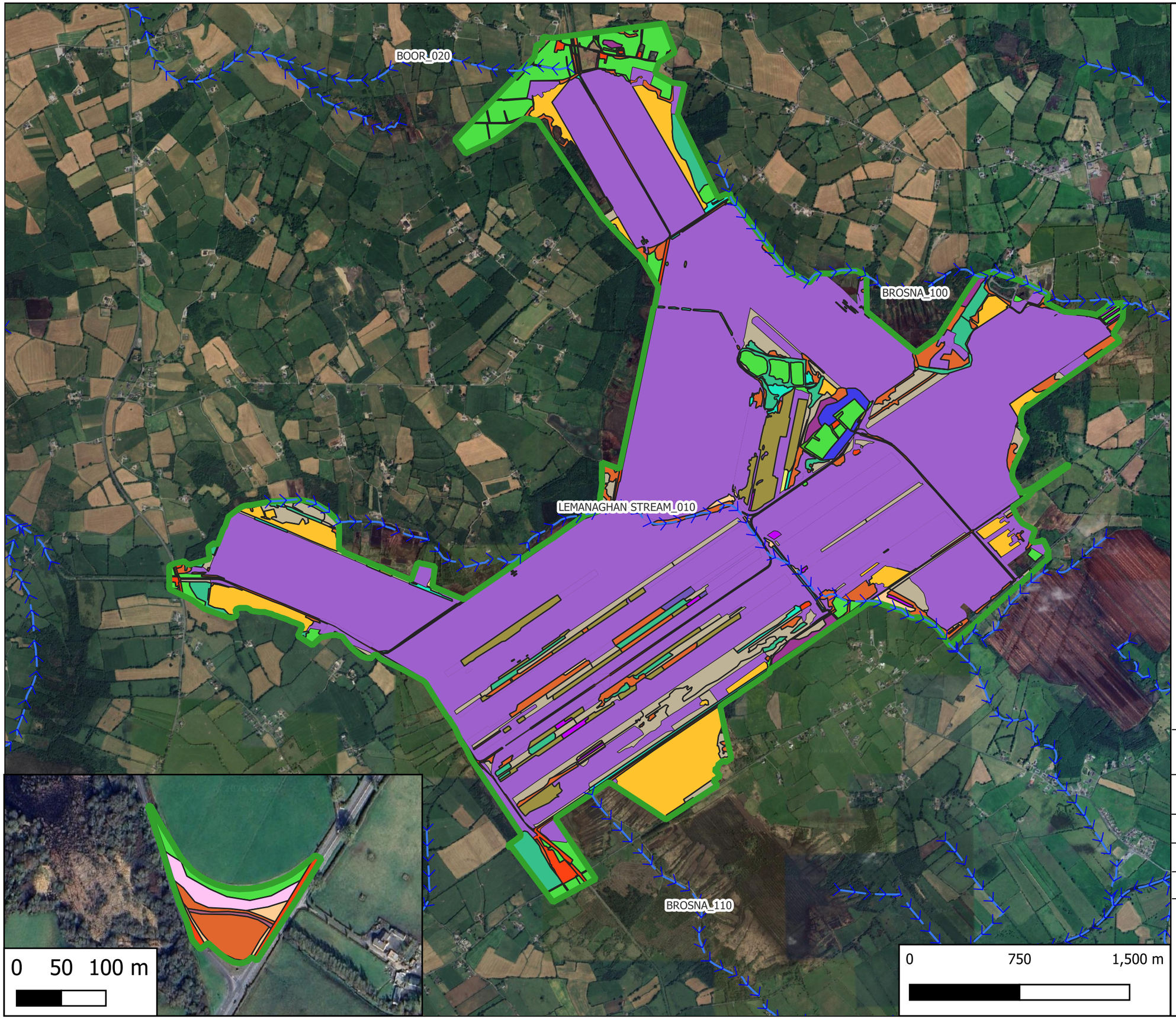
The habitat adjacent to the track comprises scrub (WS1) dominated by willows (*Salix* spp.*),* with some alder (*Alnus glutinosa),* hawthorn (*Crataegus monogyna),* bramble (*Rubus fruticosus agg.)* and birch (*Betula pubescens).* A drainage channel (FW4) is adjacent to the existing track and is culverted beneath the N62 and N52 national roads. This channel had a low flow and was densely overgrown. There will be no requirement for loss of trees to re-use the existing track to accommodate the turbine delivery.

Plate 6-9 Habitat in the footprint of accommodation works area at Kennedy's Cross, Birr

6.3.2.1.8 Invasive Species and Protected Flora Species

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

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



Map Legend

- EIAR Site Boundary
- WFD River Waterbodies
- Cutover Bog PB4
- Cutover bog - Secondary Heath Community
- Buildings and Artificial Surfaces BL3
- Recolonising Bare Ground ED3
- Other Artificial Lakes and Ponds FL8
- Other Artificial Lakes and Ponds FL8/ Scrub WS1
- Depositing/lowland Rivers FW2
- Drainage Ditches FW4
- Improved Agricultural Grassland GA1
- Dry Calcareous and Neutral Grassland GS1
- Dry Meadows and Grassy Verges GS2
- Dry Meadows and Grassy Verges GS2/ Scrub WS1
- Wet Grassland GS4
- Dense Bracken HD1
- Raised Bog PB1
- Cutover Bog PB4/Scrub WS1
- Conifer Plantation WD4
- Hedgerows WL1
- Treelines WL2
- Bog Woodland WN7
- Scrub WS1
- Immature Woodland WS2

N

Drawing Title

Habitat Map

Project Title

Lemanaghan Wind Farm, Co Offaly

Drawn By	Checked By
SS	RW
Project No.	Drawing No.
200804	Figure 6-5
Scale	Date
1:35,000	2026-02-04

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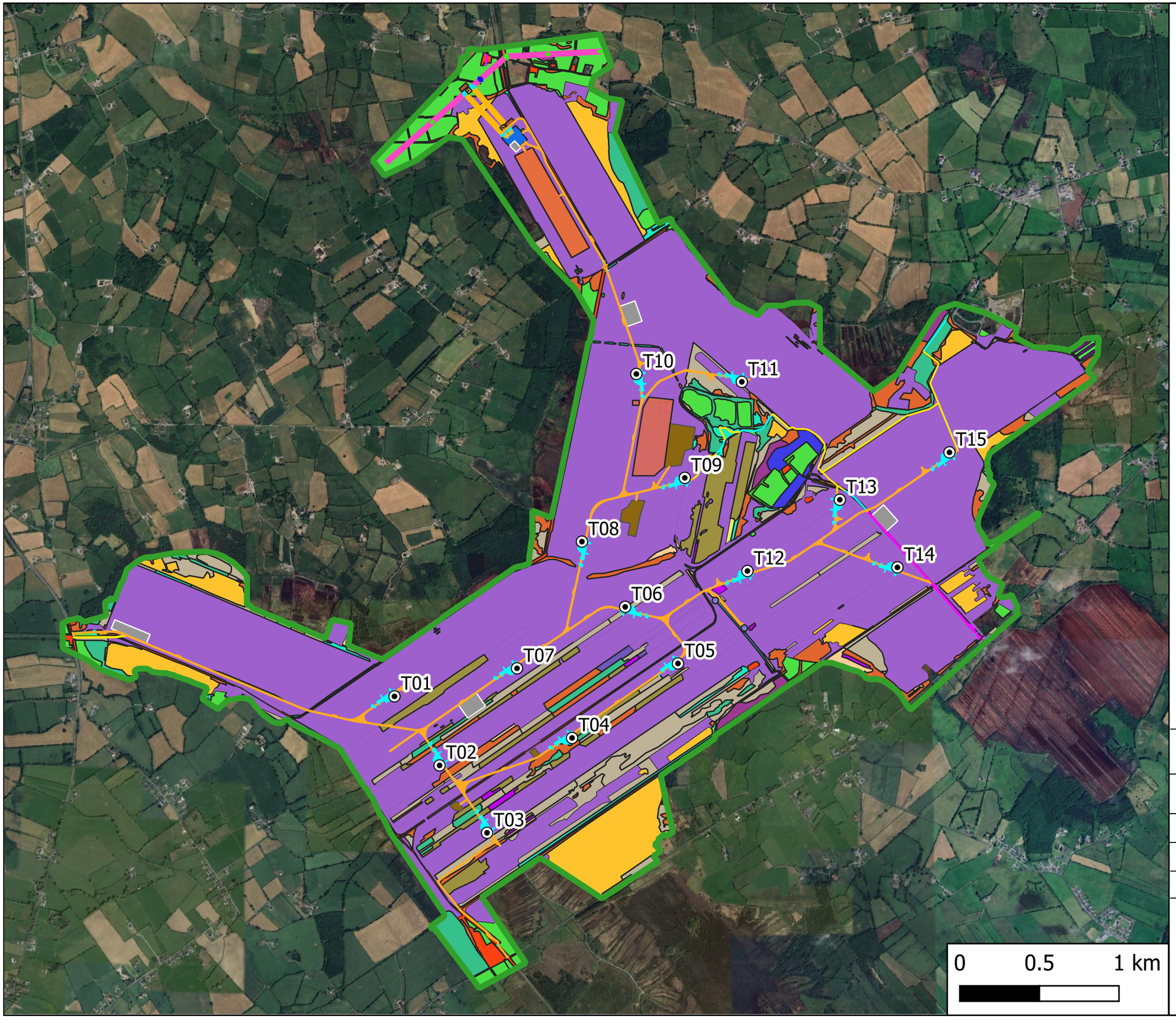

Map Legend

- EIAR Site Boundary
- Proposed Turbines
- Proposed Turbine Foundations
- Proposed Hardstand
- Proposed New Roads
- Proposed Temporary Access Track
- Proposed New Amenity Track
- Proposed Upgrades to Existing Roads
- Proposed Upgrades to Existing Roads for the Purposes of Amenity
- Proposed Lay By for Delivery Vehichles
- Proposed Gates
- Proposed Onsite 220 kV Substation
- Proposed Telecommunications Tower
- Proposed Met Mast
- Proposed Temporary Construction Compounds
- Proposed Amenity Carparks
- Proposed Borrow Pit
- Proposed Peat Deposition Areas
- Proposed Pump Station
- Proposed Pump Station Access Road
- Proposed New Pylon
- Existing Pylons
- Existing Pylon To Be Removed
- Proposed Crane Pads
- Proposed Tower Hardstand
- Proposed Gantry Structures
- Shannonbridge-Maynooth 220kV Overhead Line
- Proposed Grid Connection
- Cutover bog - secondary heath community
- BL3
- FL8
- FL8/WS1
- FW2
- GA1
- GS1
- GS2
- GS2/WS1
- GS4
- HD1
- PB1
- PB4
- PB4/WS1
- WD4
- WL1
- WL2
- WN7
- WS1
- WS2

N

Drawing Title

Habitat Map with Proposed Project Layout

Project Title

Lemanaghan Wind Farm, Co Offaly

Drawn By	Checked By
SS	RW
Project No.	Drawing No.
200804	Figure 6-6
Scale	Date
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6.3.2.2 Significance of Habitats

Ecological evaluation follows a methodology that is set out in Chapter 3 of the TII (2009) Guidelines. The habitats within the Proposed Project site were evaluated in accordance with the criteria developed by the TII (2009), 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 surveys that were undertaken from 2021-2025, it is concluded that the habitats of highest ecological significance within the Proposed Project site are those that are most closely associated with the remnant fragmented areas of raised bog habitat. The areas of marginal remnant raised bog habitat have been assigned County Importance as they contain the only remaining examples of Raised Bog habitat in the Proposed Project site and although predominantly degraded and dry, some areas of remnant raised bog have potential to correspond to the Annex I habitat '*Degraded raised bog still capable of natural regeneration*'. These areas are a small remnant of the entire area of raised bog that would have dominated the entire Proposed Project site prior to the commencement of the peat extraction. The vast majority of the areas of remnant bog within the Proposed Project site are small in size, degraded, largely dry underfoot and with little to no Sphagnum cover. They are avoided by the Proposed Project footprint and are highly degraded but are nonetheless of high ecological significance.

The secondary habitats recorded on the cutaway sections of the Proposed Project 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 (see Appendix 6-3). The bog woodland within the Proposed Project 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 Proposed Project 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 Proposed Project site are of low ecological significance in their current state and have been assigned Local Importance (Lower Value). However, the bare peat habitats will eventually revegetate in a similar manner to the recolonising habitats in other areas of the Proposed Project site, transitioning into heath communities, scrub or bog woodland over time, depending on local hydrological conditions. Small natural watercourses, including streams and rivers draining the Proposed Project site have been assigned Local Importance (Higher Value) in line with the Aquatic Survey report (Appendix 6-2).

Following the detailed studies undertaken and provided in Appendix 6-3, it is concluded that there are no Annex I habitats listed under the EU Habitats Directive present within the Proposed Project footprint.

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

6.3.2.3 Fauna

Dedicated faunal walkover surveys were undertaken at the Proposed Project site on the dates listed in Table 6-2. In addition to the targeted surveys, additional faunal signs/sightings were also recorded during other surveys including habitat assessments, bat surveys and bird surveys.

6.3.2.3.1 *Badger*

Dedicated surveys for this species were undertaken on the above dates between 2021 and 2024, in addition to incidental records recorded during other species-specific surveys. One sett was recorded within the Proposed Project site, over 370m south of the footprint of the Proposed Project. The location is shown within Confidential Appendix 6.5[12] of this EIAR. The entrances associated with this sett did not display spoil heaps, fresh digging, bedding material, or other indicators of active or regular use as defined in TII (2005a). Camera-trap monitoring confirmed that badgers were present in this area. During dedicated badger surveys, signs of badger, i.e., badger foraging signs, latrines etc. were predominantly restricted to the margins of the Proposed Project site. Due to the nature of the cutover peatland habitats recorded within the Proposed Project site, these habitats do not provide optimal foraging habitat or badger. The sett was recorded on the periphery of the Proposed Project site and showed signs of commuting trails to the agricultural grasslands south of the site. Such habitat provides suitable foraging habitat for the species surrounding the site.

6.3.2.3.2 *Otter*

No otter resting or breeding sites were recorded within the Proposed Project 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 Proposed Project site undertaken by Triturus Environmental Ltd.

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

6.3.2.3.3 *Bats*

The results of the dedicated bat surveys undertaken in 2024 are outlined in full in the bat survey report in Appendix 6-1 and summarised below.

Bat Habitat Appraisal

Proposed Wind Farm

With regard to foraging and commuting bats, areas of cutover bog, poor fen, and grassland habitats were considered *Low* suitability for foraging/commuting, i.e., *Habitat that could be used by small numbers of bats as flightpaths such as a gappy hedgerow or unvegetated stream, but isolated* (Collins, 2023). Bog woodland, scrub, artificial lakes and ponds, drainage channels and lowland depositing stream habitats may provide greater foraging and commuting opportunities. These habitats within the Proposed Wind Farm occur where peat production has ceased. As such, these habitats were classified as *Moderate* to *High* suitability.

[12] *Following standard best practice, the location of breeding or resting places of protected species should be provided as a confidential appendix for review by the competent authority and not made available to the public in order to avoid potential for persecution.*

With regard to roosting bats, an assessment of the various woodland and forestry habitats was undertaken. Trees present within the Proposed Wind Farm comprised immature bog woodland. In general, the woodlands and scrub are relatively recently colonised and have a poorly developed layer structure and ground flora. Typically, they are dominated by birch with some willows. Occasional Sitka spruce and Lodgepole pines were present. These were assessed as having no potential *(None)* to *Negligible* roosting potential. Three structures were identified within the site and are discussed further below. All other habitats present were assigned a *Negligible* value.

Proposed Grid Connection

The Proposed Grid Connection will consist of approximately 0.8km of overhead line (comprising 0.4km of OHL of double loop-in/loop-out from the proposed onsite 220kV substation to the existing OHL), 4 no. new steel masts, 2 no. new gantry structures, and the removal of 1 no. existing steel mast. The proposed 2 no. new pylons and the OHL connection to the existing Shannonbridge-Maynooth 220kV OHL is located within t agricultural grassland fields located in the north of the site. The proposed onsite 220kV substation and temporary construction compound will be located on bare cutover bog (PB4) habitat. Agricultural grassland was assigned *Low* potential for foraging and commuting bats). Bare cutover bog also has relatively low suitable potential for commuting and foraging bats. Thus, they were assigned *Low* potential. The habitats along the Proposed Grid Connection do not provide significant suitable roosting opportunities for bats and were thus assigned no roosting potential (*None*).

Turbine Delivery Route

As described in Chapter 4 of this EIAR, the Turbine Delivery Route accommodation area required to facilitate the delivery of components to the Proposed Wind Farm is located at Kennedys Cross. These works will comprise the re-establishment of a temporary junction bypass road to facilitate the delivery of turbine components and other abnormal loads. The proposed temporary road will measure approximately 160 metres in length and have a 6-metre running width.

The existing track to be reinstated for the delivery of turbine components was assessed and provides Negligible to Low suitability for commuting and foraging bats and has Negligible roosting potential.The scrub habitat adjacent to the area for proposed accommodation works provide Low to Moderate suitability for commuting and foraging bats and Negligible roosting potential due to the lack of suitable potential roosting features. **Amenity Tracks**

With regard to commuting and foraging bats, areas of broadleaved woodland, immature woodland, existing tracks and scrub provide *Moderate* to *High* suitability. Areas of open cutover bog and grassland habitats were classified as *Low* potential.

Habitats along the proposed amenity tracks were assessed as having *Negligible* roosting potential due to the lack of suitable potential roost features.

Roost surveys - Daytime Roost Inspections

Three structures were identified adjacent to the Proposed Wind Farm. Roost inspections were carried out to assess the structures for PRFs and evidence of bat use. The following are the results of the daytime roost inspections:

- Structure 1 (stone house) – no evidence of roosting bats was found and the structure was assigned Moderate potential for roosting bats.
- Structure 2 (stone shed) – no evidence of roosting bats was found in this structure and it was assigned Low roost potential.
- Structure 3 (steel and concrete block shed) – no evidence of roosting bats was found within this structure and it was assigned Negligible suitability.

The nighttime emergence survey results are detailed in the following section. The Proposed Wind Farm was also checked for potential tree roosts but no trees with significant roosting features were identified. Trees may have increased or decreased probability of hosting roosting bats in certain circumstances, i.e., having large broadleaf trees with cavities or other damage such as rot or loose bark increased probability whereas, conifer plantations and young trees with little to no damage will have a decreased probability of hosting bats. Trees within the Proposed Wind Farm lacked the features and size to host roosting bats. No potential tree roosts were identified within the Proposed Project site.

Manual Activity Surveys

Presence/Absence

Following the initial daytime roost suitability assessments, dusk emergence (presence/absence) surveys were carried out on the structures in April and August 2021 and 2024. No bats were recorded emerging from any of the structures in 2021. Five bats were observed emerging from the stone house in April 2024. These were 4 no. soprano pipistrelle and 1 no. suspected brown long-eared bat. This structure is located >340m northwest of proposed turbine T13 within the mineral island in the centre of the Proposed Project site. This structure will be retained, and no infrastructure is proposed within 340m of the roost.

Transects

Manual bat activity surveys took place at dusk in the spring, summer, and autumn of 2024. Bat activity was recorded on all surveys, with a total of 213 bat passes. Common pipistrelle (n=156) was the species recorded most frequently, followed by soprano pipistrelle (n=44), Leisler's bat (n=9), and Brown long-eared bat (n=3) and *Myotis* spp. (n=1). Bat activity was concentrated along scrub and linear (road/track) habitats.

Ground-level Static Surveys 2024

In total, 67,296 bat passes were recorded throughout spring, summer and autumn deployments in 2024. In general, common pipistrelle (n=44,344) was recorded much more frequently than all other species. The second and third most frequently recorded species were soprano pipistrelle (n=12,647) and Leisler's bat (n=8,829), respectively. *Myotis* spp. (n=826) and brown long-eared bat (n=579) were recorded significantly less frequently on site. Nathusius' pipistrelle (n=71) was rarely recorded during static detector deployments in 2024.

Bat activity was calculated as total bat passes per hour (bpph) per season to account for any bias in survey effort, resulting from varying night lengths between seasons. Overall, bat activity was highest in summer. Slightly lower levels of bat activity were recorded in spring. Significantly lower overall bat activity was recorded in the autumn survey period.

Bat activity was dominated by common pipistrelle in all seasons. The least abundant species was Nathusius' pipistrelle. The activity composition for each of the other species, although similar across seasons, varied slightly. Leisler's bat was the second most active bat at the Proposed Wind Farm in Spring (22.9% of bat passes), with activity decreasing significantly as the year passed (10.1% of all bat passes in Summer and 4.1% in Autumn). Soprano pipistrelle, although somewhat active in Spring (13.6% of all bat passes in spring), was most active in Autumn (21.4%) - recording similar relative activity levels in Summer (20.7%). Brown long-eared bat was recorded very infrequently in spring and summer (<1%) but represented a significant percentage of bat passes in autumn (4.1%). *Myotis* species abundance increased as the year progressed (spring = 0.7%; summer = 1.2%; autumn = 3.1%). Nathusius' pipistrelle represented <1% of all bat passes in all seasons.

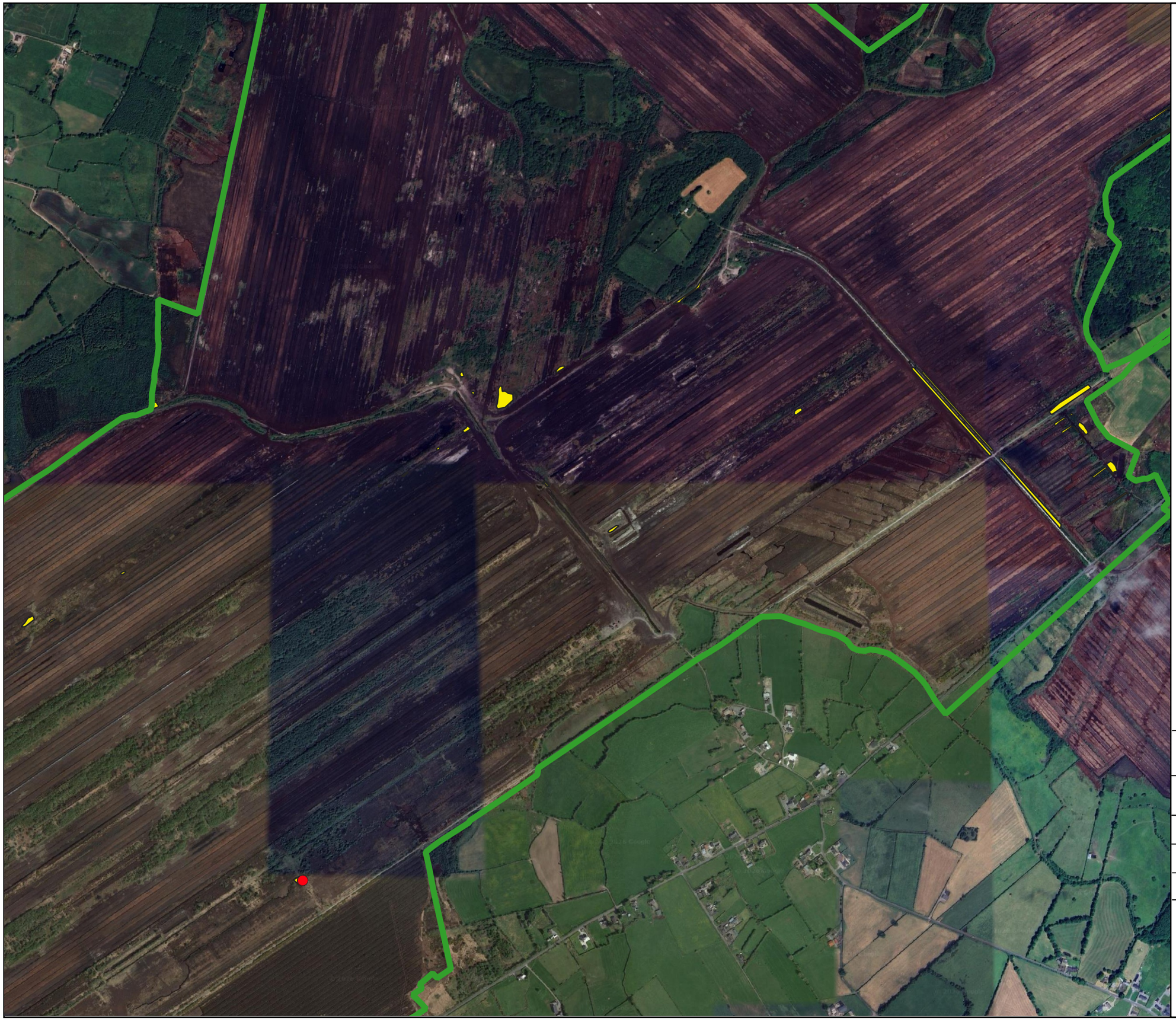
6.3.2.3.4 Marsh Fritillary

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

During habitat walkover surveys of the Proposed Project site, small areas of suitable marsh fritillary habitat were identified, as shown in Figure 6-7.Suitable habitat was recorded in small scattered areas throughout the Proposed Project site and was mainly associated with areas where stone material has been brought into the site for the construction of railway tracks and access roads, with the greatest densities recorded along access road verges.

Targeted marsh fritillary larval web surveys did not record any active larval webs within the Proposed Project site. Inactive larval webs were recorded in one patch of habitat on surveys undertaken in 2023. The location of these records is shown in Figure 6-7.

Plate 6-10 Area of abundant devil's bit scabious within the Proposed Project site suitable marsh fritillary habitat.



Map Legend

- EIAR Site Boundary
- Marsh Fritillary Inactive Larval Webs
- Marsh Fritillary Habitat

N

Drawing Title

Marsh Fritillary Habitat and Webs

Project Title

Lemanaghan Wind Farm, Co Offaly

Drawn By	Checked By
SS	RW
Project No.	Drawing No.
200804	Figure 6-7
Scale	Date
1:15,500	2026-03-09

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6.3.2.3.5 Fisheries and Aquatic Fauna

The results of aquatic surveys undertaken by Triturus Environmental Ltd. are described in full in the aquatic reports included in Appendix 6-2. These surveys, completed in August 2021 and repeated in August 2024, assessed watercourses and ponds within and downstream of the Proposed Project site to evaluate fisheries potential, biological water quality, and the presence of aquatic species and habitats of conservation interest.

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

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

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

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

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

6.3.2.3.6 Other Fauna

During the walkover survey, signs of the following mammal species were recorded:

- Fox (*Vulpes vulpes*) scat was recorded at various locations throughout the Proposed Project site.
- Hare (*Lepus timidus hibernicus*) was occasionally recorded throughout the Proposed Project site. The species is widespread throughout the habitats present and no dedicated survey for the species was required.
- Irish Stoat (*Mustela erminea hibernica)* was recorded on camera trap footage within the south of the site. However, no dens were recorded within the Proposed Project site.
- Common frog (*Rana temporaria)* was recorded in areas with wetter habitat within the site on several occasions. Suitable breeding habitat for the species is present to the southeast of the site, outside of the Proposed Project development footprint.

In general, given the highly modified and bare nature of the exposed peat, limited suitable habitat occurs on site for protected faunal species. No signs of any additional protected fauna were recorded within the Proposed Project site during the field survey.

The Proposed Project site provides habitat for a range of other faunal species as described in the preceding sections. No evidence of populations of species such as common frog, Irish hare, pine marten being significant at more than a local level was recorded. These species have been assessed as of local importance (higher value). However, due to the small footprint of the Proposed Project infrastructure relative to the abundance of the habitat within the site, they are unlikely to be significantly affected by the Proposed Project. For this reason, these species are not considered further in this EIAR.

Incidental records of invertebrates were recorded during the walkover surveys of the 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 Proposed Project site:

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

6.3.2.4 Significance of Fauna

6.3.2.4.1 Badger

Badger has been assigned Local Importance (Higher Value) on the basis that the habitats within and adjacent to the Proposed Project site are likely to be utilised by a locally occurring badger population of Local Importance. As a potential outlier sett has been identified within the Proposed Project site, further assessment of impact is required.

6.3.2.4.2 Otter

There is likely to be a regularly occurring population utilising the watercourses within and downstream of the Proposed Project site. While no evidence of otter was recorded during any surveys of the Proposed Project site, otters can utilise extensive territories, (approximately 7.5 ± 1.5km for females and 13.2 ± 5.3km for males (Ó'Neill, 2008)). On a precautionary basis, it is considered that otters potentially using watercourses within or downstream of the Proposed Project site may be associated with River Shannon Callows SAC. They are therefore assessed as being of International Importance.

6.3.2.4.3 Bats

All bat species in Ireland are protected under the Bonn Convention (1992), Bern Convention (1982) and the EU Habitats Directive (92/43/EEC). Additionally, in Ireland bat species are afforded further

protection under the Birds and Natural Habitats Regulations (2011) and the Wildlife Acts 1976, as amended. No bat roosts were identified within the footprint of the Proposed Wind Farm, Proposed Grid Connection or Turbine Delivery Route accommodation area. Bats as an Ecological Receptor have been assigned Local Importance (Higher value) on the basis that the Proposed Wind Farm habitats are utilised by a regularly occurring bat population of Local Importance.

During the 2024 surveys, one small roost containing soprano pipistrelle and potentially brown long-eared bat, was identified outside the Proposed Wind Farm. However, this roost was characterised by limited emergences, with only single-digit counts observed. No roosting site of National Importance (i.e. site greater than 100 individuals) was recorded within the Proposed Project site during the 2024 surveys.

6.3.2.4.4 Marsh Fritillary

The Proposed Project site contains small, scattered areas of suitable marsh fritillary habitat, particularly within grassy verges running parallel to access tracks where devil's-bit scabious is present (Figure 6-7). During targeted marsh fritillary surveys undertaken in 2021, 2023 and 2024, no active larval webs were recorded within the Proposed Project site. However, inactive larval webs were recorded in one patch of suitable habitat approximately 360m southeast of proposed turbine T04 during surveys undertaken in 2023, indicating previous use of the site by the species. Marsh fritillary is known to occur within the wider landscape, including within other sites in the Boora Bog Group, and the species typically occurs as a metapopulation with local presence fluctuating over time depending on habitat availability and condition.

On this basis, marsh fritillary is considered to be of Local Importance (Higher Value) on a precautionary basis and further assessment of potential impacts is required.

6.3.2.4.5 Fisheries and Aquatic Fauna

The aquatic species that are associated with the rivers and streams located within and surrounding the Proposed Project 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 (*Austropotamobius pallipes*), European eel (*Anguila anguila*), aquatic invertebrates and other aquatic species.

6.3.2.4.6 Reptiles and Amphibians

Common frog was recorded within wetter habitats in the Proposed Project site, with suitable breeding habitat located outside Proposed Project infrastructure. Smooth newt eDNA was recorded at low concentration in one pond (P3) in the east of the Proposed Project site. Amphibians are assessed as being of Local Importance (Lower Value).

6.3.3 Identification of Key Ecological Receptors

Table 6-9 lists all identified receptors and assigns them an ecological importance in accordance with TII (2009) Guidelines. This table also provides the rationale for this determination and identifies the habitats that are Key Ecological Receptors. These ecological receptors are considered in Section 6.4 of this report, and mitigation measures will be incorporated into the Proposed Project where required, to avoid potential significant impacts on the features.

Table 6-9 Key Ecological Receptors identified during the assessment

Ecological feature or species	Reason for inclusion as a KER	KER
Designated Sites	**Nationally Designated Sites** The following pNHA is located downstream of the Proposed Project site via watercourses draining the Proposed Project site that ultimately discharge to the River Shannon. This site has been assessed as of **National Importance** in line with TII (2009) Guidelines as it is proposed as Natural Heritage Area (NHA). › River Shannon Callows pNHA Taking a precautionary approach, the above listed downstream pNHA was identified in Table 6-3 above as occurring within the Zone of Influence and is included as a KER.	Yes
	European Sites The following European sites are identified as being within the Likely Zone of Influencet and are assessed fully in the Natura Impact Statement (NIS) that accompanies this application: › River Shannon Callows SAC › Middle Shannon Callows SPA These sites are assigned **International Importance** and included as a KER. **Note: SPAs within the Likely Zone of Influence are considered in Chapter 7, Birds and in the NIS.**	Yes
Aquatic Habitats and Related Species	**Drainage Ditches** The Proposed Project site is drained by numerous drainage ditches. These are small man-made channels that are often devoid of vegetation and regularly maintained or choked with vegetation and are slow flowing. These drains are assigned **Local Importance (Lower Value)**.	No
	Rivers and Streams The River Brosna is located adjacent to the Proposed Project site and flows downstream into the River Shannon. The Lemanaghan Stream is located within the Proposed Project site and feeds into the River Brosna. The River Brosna is of **International Importance** as it forms part of the River Shannon Callows SAC and Middle Shannon Callows SPA. A number of natural or slightly modified watercourses are located either within or at the perimeter of the Proposed Project site. These watercourses include: › Lemanaghan Stream (25L04), Ballynahown River (26B17), Fortified House Castlearmstrong Stream (25F69), Derrynagun Stream (25D94), Kilcolgan Beg Stream (25Q21) and Ferbane Stream (25F31). These smaller rivers and streams have been assigned **Local Importance (Higher Value)** in that whilst many are highly modified where they adjoin the	Yes

Ecological feature or species	Reason for inclusion as a KER	KER
	Proposed Project site, they are conduits to waterbodies with a high biodiversity value in the local area. They also provide a conduit to downstream European Sites of international importance.	
	Open Water No large oligotrophic lakes were recorded within the site. Whilst wetter areas of the Proposed Project 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
	Aquatic and Fisheries Species The aquatic species that are associated with the rivers, streams and wetlands that are located within and surrounding the site assigned **Local Importance (Higher Value)** in that they have a high biodiversity value in the local context. There is potential for indirect effects on these features. These species include salmonid and coarse fish, lamprey species, white clawed crayfish (*Austropotamobius pallipes*), European eel (*Anguila anguila*), aquatic invertebrates and other aquatic species.	Yes
Uncut Raised Bog	The areas of uncut raised bog located in fragmented patches at the edges of the site are assigned **County Importance** on a precautionary basis, as they may potentially contain highly degraded and non-viable examples of the Annex I habitat 'Degraded Raised Bog Still Capable of Natural Regeneration (7120)'. These areas have been avoided in the design of the Proposed Project and do not overlap with any proposed wind farm infrastructure. A small area of degraded uncut non-Annex I raised bog (approximately 0.017 ha) will be intersected by proposed upgrades to an existing amenity pathway. This area is heavily drained, extremely dry, supports little to no Sphagnum cover and has been assigned Local Importance (Higher Value). Given the sensitivity of raised bog habitats and the small area of habitat loss associated with the Proposed Project, uncut raised bog is identified as a KER.	Yes
Cutover Bog and Associated Secondary Habitats	**Bare peat habitats** The cutover bog and bare peat habitats are of low ecological importance in their current state and have been assigned **Local Importance (Lower Value).**	No
	Immature Bog Woodland and Pioneering Scrub The habitats listed above are assigned **Local Importance (Higher Value)**. This is on the basis that they consist of semi-natural (although they have arisen due to past human activities and drainage of the bog) habitats with a high biodiversity value in the local area but do not correspond to habitats that are listed on Annex I of the EU Habitats Directive. **Note: The bog woodland does not correspond to the Annex I Habitat Bog Woodland 91D0.**	Yes

Ecological feature or species	Reason for inclusion as a KER	KER
	Poor fen This habitat is assigned **Local Importance (Higher Value)**. This is on the basis that it consists of semi-natural (although they have arisen due to past human activities and drainage of the bog) 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 they have arisen due to past human activities and drainage of the bog) 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
Grassland Habitats	**Dry Meadows and Grassy Verges (GS2) and Dry Calcareous and Neutral Grassland (GS1)** These habitats have been assessed as of **Local Importance (Higher Value)** due to their role in supporting local biodiversity and contributing to habitat diversity within the site. These habitats are largely associated with artificial site access tracks, are common and widespread in the wider area and are unlikely to be significantly impacted. The loss of a revegetating track in the footprint of the existing junction by-pass track to be used as part of the accommodation for the turbine delivery is not considered significant, this habitat is of **Local Importance (Lower Value)** and the temporary loss of same is not considered significant. These habitats have not been identified for further assessment and are not a KER.	No
Otter	There is likely to be a regularly occurring population utilising the watercourses within and downstream of the Proposed Project site. While no evidence of otter was recorded during any surveys of Proposed Project site, otters can utilise extensive territories, (approximately 7.5 ± 1.5km for females and 13.2 ± 5.3km for males (Ó'Neill, 2008)). On a precautionary basis, it is considered that otters potentially using watercourses within or downstream of the Proposed Project site may be associated with River Shannon Callows SAC. They are therefore assessed as being of **International Importance.**	Yes
Marsh Fritillary	Marsh fritillary is listed on Annex II of the EU Habitats Directive. Small areas of suitable habitat for the species occur within the Proposed Project site, particularly within grassy verges associated with existing access tracks where devil's-bit scabious is present. Targeted marsh fritillary surveys undertaken in 2021, 2023 and 2024 recorded inactive larval webs within one patch of suitable habitat approximately 360m southeast of proposed turbine T04 during the 2023 surveys, indicating previous use of the site by the species. Marsh fritillary is known to occur within the wider landscape, including within other sites in the Boora Bog Group, and the species typically occurs as a metapopulation with local presence fluctuating over time depending on habitat availability and condition. As sections of suitable habitat occur adjacent to existing access roads where upgrade works are proposed, there is potential for loss or disturbance of suitable habitat associated with the Proposed Project.	No

Ecological feature or species	Reason for inclusion as a KER	KER
	On a precautionary basis, marsh fritillary is considered to be of Local Importance (Higher Value) and is therefore included as a KER for further assessment.	
Bats	Bat species has 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, are listed in Annex IV of the EU Habitats Directive and they are included as a KER as the potential for habitat loss, disturbance and collision risk requires assessment	Yes
Badger	Due to the presence of a badger sett within the Proposed Project site, the species has been assessed as of **Local Importance (Higher Value)** as there is likely to be a regularly occurring population assessed to be important at the local level.	Yes
Reptiles and Amphibians	Amphibian species recorded within the Proposed Project site include common frog and smooth newt. Records indicate that amphibians occur at low levels within the site and that the Proposed Project site does not support populations of more than local importance and significant impacts are not anticipated. Amphibians and reptiles are therefore assessed as being of Local Importance (Lower Value) and are not considered to be a KER.	No
Additional Protected Fauna	The site surveys did not identify any other protected faunal species with the potential to be significantly affected by the Proposed Project at the population level.	No

6.4 Ecological Impact Assessment

6.4.1 Do-Nothing Scenario

If the Proposed Project were not to proceed, the site would continue to be managed under the requirements of the IPC licence (P0500-01) and therefore the ongoing decommissioning activities, site management and environmental monitoring would continue.

In the absence of the Proposed Project, natural revegetation processes would continue across the site. Areas of bare peat would progressively revegetate and transition through successional stages, potentially developing into heath communities, scrub or bog woodland over time, depending on local hydrological conditions. Therefore the existing baseline of the landscape will transition from a predominantly industrial cutover peatland landscape, with open exposed peat surfaces and drainage features, to a more natural mosaic landscape of cutaway peatland, wetland and regenerating bog habitats.

The Proposed Project site is located on lands that are subject to ongoing and future peatland rehabilitation and decommissioning works required under the existing IPC Licence. Therefore, under a 'Do-Nothing' scenario, the implementation of the Draft Rehabilitation Plans as required under IPC License would continue. These rehabilitation works are mandatory and will proceed irrespective of whether the Proposed Project is permitted, in order to ensure compliance with the IPC Licence. However, biodiversity enhancement measures proposed as part of the Proposed Project (please see Appendix 6-5 for more detail), including native woodland planting, marsh fritillary habitat enhancement and native hedgerow planting would not be implemented under the do-nothing scenario

The opportunity to capture part of Offaly's valuable renewable energy resource would be lost, as would the opportunity to contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions. The opportunity to generate local employment and investment and to diversify the local economy would also be lost.

6.4.2 Likely Significant Effects During Construction Phase

6.4.2.1 Effects on Habitats During Construction

Potential impacts on habitats include direct loss of habitat within the Proposed Project footprint and indirect deterioration of aquatic habitats due to deterioration of water quality.

The Proposed Project will result predominantly in the loss of areas of habitat that are of Local Importance (Lower Value) and are not identified as KERs (e.g., Cutover Bog (PB4)). The primary habitat that will be lost consists of bare peat that was in active production until 2020 and is of low ecological value. Any direct or indirect impacts on these habitats are not significant.

The Proposed Project will also result in the loss of small areas of a number of habitats of Local Importance (Higher Value) which were identified as KERs in Table 6-9 above. This includes bog woodland and pioneering scrub, poor fen and secondary heath type communities.

There is also potential for deterioration of stream and river habitats as a result of the Proposed Project due to run-off of pollutants during the construction and operational phases of the Proposed Project.

Construction of the Proposed Project will take place within the context of ongoing peatland rehabilitation works required under the IPC Licence (P0500-01). These works are expected to result in changes to hydrology, vegetation structure and habitat condition over time. The assessment of construction phase effects on habitats has had regard to these site conditions and the potential for interaction between construction activities and rehabilitation measures is assessed in Section 6.5.3.

The potential impacts on habitats as a result of the Proposed Project are discussed in detail in the sections below.

Table 6-10 below provides details of the extent of the habitat that will be lost to facilitate the Proposed Project. Overall, a total of 60.8ha of habitat will be lost due to the Proposed Project, 50.66 ha of which is bare cutover bog. An additional 18.52 ha of habitat will be temporarily impacted by the peat deposition areas, all of which is bare cutover peat of low ecological value and will be used for the temporary storage of excavated peat during construction

Table 6-10 Extent of habitat lost to the Proposed Project

Habitat	Area to be lost (ha)	KER
Cutover bog (PB4)	50.6	No
Cutover bog supporting secondary heath community	**3.27**	**Yes**
Buildings and artificial surfaces (BL3)	2.45	No
Improved agricultural grassland (GA1)	1.05	No
Immature woodland (WS2)	**1.02**	**Yes**
Scrub (WS1)	**0.64**	**Yes**

Cutover bog/scrub mosaic (PB4/WS1)	**0.98**	**Yes**
Dry meadows and grassy verges/scrub mosaic (GS2/WS1)	0.46	No
Dry meadows and grassy verges (GS2)	0.29	No
Raised bog (PB1)	**0.017**	**Yes**
Total Habitat Loss	**60.8**	-
Total KER Habitat Loss	**5.9 ha**	-

6.4.2.1.1 Assessment of Potential Effects on Aquatic Habitats and Related Species

Table 6-11 Assessment of potential for impact on Aquatic Habitats and Related Species

Description of Effect	The Proposed Project site is drained by a network of drains and watercourses, all of which ultimately discharge to the River Shannon. The potential effects on water quality are fully described in Chapter 9 Water of this EIAR and are described here specifically in relation to ecological receptors. The layout of the Proposed Project has been designed to avoid watercourses wherever possible, including a minimum 50m buffer between the main wind farm infrastructure and any natural watercourses, with the exception of two required crossings of Lemanaghan Stream. There will also be a requirement for the proposed turbine access roads to cross artificial drains throughout the Proposed Project site, necessitating the installation of culverts. While these artificial drainage ditches, are not themselves ecologically sensitive and provide poor fisheries and aquatic faunal habitat, they do provide connectivity to the larger watercourses that surround the site. Both natural watercourse crossings will comprise clear-span watercourse crossings or bottomless box culverts designed to OPW and IFI standards. One is a new crossing, while the second will replace an existing substandard crossing. In both cases, the design eliminates the requirement for instream works, the stream bed and banks will remain undisturbed, and hydrological and ecological continuity will be fully maintained. Therefore, there will be no direct loss of potential fisheries habitat at either crossing location. Culverts will be installed at a number of artificial field drains within the Proposed Project site. These drains are highly modified, subject to heavy siltation, and support poor-quality aquatic habitat. All new culverts at drain crossings will be appropriately sized for peak flows and oversized to maintain mammal passage. Culverts will be regularly inspected to ensure they are free of debris and maintain conveyance capacity. Given the modified nature of these drains and the design of the culverts, no significant direct effects on aquatic habitats or aquatic fauna are anticipated. There is potential for construction activities associated with the Proposed Project, including the construction of turbine foundations and hardstands, Grid Connection works, excavation of peat and subsoil, and the construction or upgrading of internal roads, to result in the runoff or infiltration of pollutants, including silt, peat sediment, nutrients, hydrocarbons and cementitious materials, to drains and watercourses within the Proposed Project site. Similar risks may arise from vegetation removal or large-scale movement of peat. These represent potential indirect effects on aquatic habitats and sensitive aquatic species in the form of water quality deterioration and subsequent habitat degradation. There is no potential for significant direct effects on fisheries or aquatic fauna arising from direct habitat loss, as:

	› The only natural watercourse crossings will use clear span/bottomless designs, › No instream works are required in natural watercourses, and › Artificial drains to be crossed provide low-quality aquatic habitat that is not important for sensitive aquatic species. Accordingly, any potential effects on aquatic habitats and sensitive aquatic species arise solely from indirect impacts associated with potential deterioration in water quality. **Note: Whilst this impact assessment is in the habitats section, it also assesses the impact on the Proposed Project on aquatic species including salmonids, lamprey, coarse fish, white-clawed crayfish, European eel, aquatic invertebrates and other aquatic species.**
Assessment of Significance prior to mitigation	In the absence of mitigation, and following the precautionary principle, there is potential for the Proposed Project to result in short-term, negative, indirect, likely significant effect on aquatic habitats and sensitive aquatic species at a local geographic scale, arising from habitat degradation caused by deterioration in water quality during the construction phase. No significant effects due to direct habitat loss are anticipated, as no instream works will occur in any natural watercourse and the crossings of artificial drains relate to waterbodies that provide poor-quality habitat for fisheries and aquatic fauna.
Mitigation	The pathways that would allow potential impacts to occur due to deterioration of water quality were considered in the design of the Proposed Project. The environmental management framework to be adhered to during the construction phase of the Proposed Project includes comprehensive detail regarding site set up, pollution prevention and hydrocarbon management and incorporates mitigating measures as detailed in Chapter 9 Water of the EIAR and in the CEMP in Appendix 4-4 of the EIAR to ensure that there are is no significant effect on water quality or aquatic receptors within or downstream of the Proposed Project. The measures include the use of interceptor drains and collector drains to collect and intercept run-off from construction areas, temporary settlement ponds to attenuate and treat run-off, the use of silt fences between works and watercourses and dewatering silt bags to remove silts from pumped waters. The existing drainage system at the proposed site, which is operating in accordance with IPC licence requirements, with environmental monitoring and silt control measures being implemented, will be maintained and expanded locally as required for use within the Proposed Project drainage system. The measures are outlined in full in Chapter 9. While there will be no requirement for instream works (with the exception of artificial drains), all works adjacent to watercourses, will adhere to Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016).
Residual Effect following Mitigation	Following the implementation of mitigation measures, there will be no significant residual effect on aquatic habitats or species as a result of the Proposed Project. The design of the Proposed Project and combined with the best-practice water quality protection measures set out in Chapter 9 and the CEMP, will ensure that no significant residual effects occur on watercourses or on sensitive aquatic fauna downstream of the Proposed Project site.

6.4.2.1.2 *Assessment of Potential Effects on Uncut Raised Bog*

Table 6-12 Assessment for potential effects on Uncut Raised Bog

Description of Effect	The Proposed Project has been specifically designed to avoid areas of remnant uncut raised bog where possible and avoids the largest, undrained areas of remnant raised bog within the Proposed Project site, however a section of proposed upgrades to existing roads for amenity pathways passes through an area of approximately 0.017 ha of drained but uncut non- Annex I raised bog. In addition to the direct habitat loss, there is potential for indirect effects on adjacent uncut non-Annex I raised bog habitat during construction due to hydrological impacts.
Assessment of Significance prior to mitigation	The uncut raised bog to be lost as a result of the Proposed Project is extremely limited in extent and represents a very small proportion of the raised bog habitat within the Proposed Project site and in the wider landscape. This area of raised bog habitat is highly degraded, supports little to no Sphagnum cover and has been subject to extensive drainage. It is fragmented and isolated within the wider cutover bog landscape. The loss of approximately 0.017 ha of uncut raised bog habitat is therefore a permanent negative, likely, direct impact that is not considered significant at any geographic scale. The Proposed Project will not introduce any new drainage infrastructure in proximity to raised bog habitat, nor will it alter existing drainage regimes affecting the raised bog. The hydrological assessment (Chapter 9) concludes that the Proposed Project will not result in changes to groundwater levels, surface water flows or hydrological regimes that could affect uncut raised bog habitat either within or adjacent to the Proposed Project site. The effect on uncut raised bog prior to mitigation is not considered significant at any geographic scale.
Mitigation	While the Proposed Project has been deliberately designed to minimise the loss of uncut raised bog within the site, there will be some loss of small areas of highly degraded remnants of this habitat. Construction works associated with the amenity track upgrade will be confined to the defined works footprint, with appropriate controls in place to prevent encroachment into adjoining habitats. Prior to construction activities within or adjacent to this habitat, the works area will be demarcated and fenced off. No drainage works will be undertaken in proximity to raised bog habitat, and construction activities will be implemented in accordance with standard best-practice measures to prevent accidental disturbance or indirect impacts.
Residual Effect following Mitigation	No significant residual effects on uncut raised bog habitat, including through hydrological pathways, are predicted.

6.4.2.1.3 *Assessment of Potential Effects on Cutover Bog Associated Secondary Habitats*

Table 6- 13 Assessment of Potential Effects on Cutover Bog Associated Secondary Habitats

Description of Effect	The construction of the Proposed Project will result in the direct loss of approximately 3.27ha of cutover bog habitat which is developing as a mosaic of pioneer dry heath type vegetation and poor fen communities and scrub. It will also result in the loss of approximately 1.02ha of immature woodland. The loss of these habitats will occur as a result of the construction of turbine hardstands, internal roads, roads and other associated infrastructure. In addition to the infrastructure footprint, in accordance with NatureScot Guidance, a minimum 50m buffer to all habitat features used by bats is applied to the siting of all wind turbines, within which scrub and trees will be removed. There is also the potential for the Proposed Project to result in indirect effects on cutover bog habitats immediately adjoining the footprint through drainage impacts.

Assessment of Significance prior to mitigation	The revegetated cutover bog habitats are highly modified from their original state, i.e., uncut raised bog, and have come about through natural recolonisation of cutaway bog. The Proposed Project only affects a very small percentage of the cutover peatland habitat, which makes up the vast majority of the land area within the Proposed Project site, and the impact is therefore not considered significant at any geographic scale. The areas of immature woodland to be lost to facilitate the Proposed Project are small, approximately 1.02ha, representing a very small percentage of this habitat within the Proposed Project site and throughout Lemanaghan Bog. While this will result in a permanent, negative, likely direct effect on this habitat, it is not considered significant at any geographic scale.
Mitigation	While no significant effects are anticipated as a result of the loss of the cutover bog and woodland habitats, a Biodiversity Management and Enhancement Plan (BMEP) (Appendix 6-5) has been prepared for the Proposed Project which has been developed to offset the loss of habitats within the Proposed Project site and further enhance the biodiversity of the site and surrounding environment. The plan provides for the setting aside of an area approximately 7.8ha for native woodland replanting to ensure that there will be no net loss of woodland/scrub and that there will be a net gain in this habitat within the site.
Residual Effect following Mitigation	There will be no significant negative residual effect on these cutover bog and woodland habitats. There may be a short-term negative effect in the early stages of implementation of the BMEP in the form of habitat loss where scrub encroachment is managed but as new habitats develop as a result of the proposed enhancement measures, there is potential for the Proposed Project to result in an overall long-term positive effect on habitats at a local scale.

6.4.2.2 Effects on Protected Fauna During Construction

The Proposed Project has the potential to result in habitat loss and disturbance impacts on faunal species that were recorded on the site but were not included as KERs. Given the extensive area of cutover habitats that will remain undisturbed throughout the site and the avoidance in so much as possible of the most significant areas of faunal habitat, no significant effects on non-KER faunal biodiversity are anticipated as a result of the Proposed Project. Therefore, these species were excluded from further assessment.

It should be noted that no significant habitat for salmonids, lamprey, coarse fish, white-clawed crayfish, European eel, aquatic invertebrates or other aquatic species was recorded within the footprint of the Proposed Project. There will be two crossings of the Lemanaghan Stream, comprising a clear-span watercourse crossing with construction methodology designed to eliminate the requirement for in-stream works (see Section 4.11.1.5 of Chapter 4). The potential for significant effects on aquatic species is predominantly restricted to indirect effects on their habitat resulting from water pollution in addition to the potential for direct loss of small areas of supporting habitat as a result of water crossings at Lemanaghan Stream. This has been assessed in Section 6.4.2.1.1 above and is not repeated below.

Construction of the Proposed Project will take place within the context of ongoing peatland rehabilitation works required under IPC Licence (P0500-01). The assessment of construction phase effects on faunal receptors has had regard to these site conditions and the potential for interaction between construction activities and rehabilitation measures is assessed in Section 6.5.3.

6.4.2.2.1 Assessment of Potential Effects on Otter

Table 6-14 Assessment of Potential Impacts on Otter

Description of Effect	**Habitat Loss/Degradation** As described above in Section 6.4.2.1.1 in relation to aquatic habitats and species, the Proposed Project has been deliberately designed such that all major infrastructure avoids the main watercourses within the site. No otter resting or breeding sites (including holts and couches) were recorded within the Proposed Project site during dedicated otter surveys, and the streams and drains within the site do not provide optimal fisheries habitat. There is no potential for direct effects on otter resting or breeding sites.
	Disturbance While no otter holts were recorded, taking a precautionary approach, there is potential for disturbance of otter as a result of minor infrastructure including access roads which are located in close proximity to some of the watercourses on the Proposed Project site. Works at the Turbine Delivery Route accommodation area will involve the re-establishment of a temporary access road along a previously used and re-seeded route. The Proposed Project does not introduce new permanent road infrastructure at this location and will not result in a material change to baseline traffic patterns on the public road network. Use of the temporary access will be intermittent and tightly regulated, occurring only during abnormal load deliveries with Garda escort, and the access will remain closed and secured between deliveries. The area is already subject to regular disturbance associated with traffic on the N52 and N62. Therefore, the works will not give rise to sustained disturbance, permanent lighting, or continuous human or vehicle presence, and no pathway for project-related disturbance effects on otter is identified at this location.
Assessment of Significance prior to mitigation	**Habitat loss/degradation** There is no potential for the construction phase of the Proposed Project to result in significant habitat loss or fragmentation for otter. In the absence of mitigation and following the precautionary principle, there is potential for the Proposed Project to result in short-term, negative, indirect, likely effects at the local scale on otter in the form of habitat deterioration resulting from water pollution.
	Disturbance There is no potential for the construction phase of the Proposed Project to result in significant disturbance of otter. No evidence of otter holts was found during dedicated baseline surveys. Otter are predominantly crepuscular in nature (prefer dim light and tend to be active during dawn/dusk) and are unlikely to be adversely impacted by the proposed works. Construction activity will be confined to daytime hours, thus minimizing potential disturbance related impacts to the species. The NPWS Threat Response Plan for Otter acknowledges that "*Little evidence has come to light in recent studies to suggest that disturbance by recreation is a significant pressure.*" It also identifies that otter are known to travel significant distances from streams and lakes in search of new territory and feeding areas. Chanin 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). The report also describes

	successful breeding in towns, under ferry terminals and under the jetties of one of Europe's largest oil and gas terminals at Sullom Voe in North Scotland. Irish Wildlife Manual No 23 (National Otter Survey of Ireland 2004/2005) found no significant relationship between disturbance and otter occurrence. In addition, no significant difference in otter presence was found between sites with and without recreational activity. It also states, "*the lowest percentage occurrence was found at the sites with the lowest recorded disturbance*." 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). The effect of disturbance is considered to be temporary, negative, unlikely, direct and not significant at any geographic scale. Based on the above review of scientific literature, and the absence of significant suitable habitat for otter within the Proposed Project site, there is no potential for significant effects on otter as a result of disturbance during construction activities.
Mitigation	The pathways that would allow potential impacts to occur due to deterioration of water quality were considered in the design of the Proposed Project. A detailed drainage maintenance plan for the Proposed Project is provided in Section 4.8 of this EIAR. This plan provides details of how water quality will be protected during the construction of the Proposed Project. In addition to this, specific mitigation is provided in relation to water quality in Chapter 9: Hydrology and Hydrogeology of this EIAR. The Construction Environmental Management Plan (CEMP) that is provided in Appendix 4.5 provides the details of how the measures will be implemented during construction. No otter holts were recorded within 150m of any Proposed Project infrastructure within the Proposed Project site. However, it is noted that this is a mobile species and could potentially migrate within the site. As such, prior to the commencement of construction works associated with the installation of watercourse crossings, a pre-commencement otter survey will be undertaken to ensure that no otter holts/breeding sites have been established since the original surveys undertaken (TII, 2008). This will be undertaken by a suitably qualified ecologist in accordance with standard best practice guidance.
Residual Effect following Mitigation	Following the implementation of mitigation, there will be no significant residual effect on otter as a result of the Proposed Project, at any geographic scale.

6.4.2.2.2 *Assessment of Potential Effects on Badger*

Table 6-15 Assessment of Potential Impacts on Badger

Description of Effect	**Habitat Loss/Fragmentation** One badger sett and evidence of foraging activity was recorded within the Proposed Project site, however the Proposed Project has been designed to avoid the identified sett. There is some potential for small scale loss of foraging habitat to facilitate the construction footprint.

	Disturbance/Direct Mortality While there was only one subsidiary badger sett identified near the southern boundary of the Proposed Project site, and it is located over 300m from any proposed infrastructure, badgers may potentially use the wider site for foraging or commuting. In the absence of mitigation/best practice, there is potential for disturbance or displacement, and potentially mortality, of badger during the construction phase of the Proposed Project, given that new setts could be constructed in infrastructure areas in the interim between planning consent and construction commencement. Works at the Turbine Delivery Route accommodation area will involve the re-establishment of a temporary access road along a previously used and re-seeded route. The Proposed Project does not introduce new permanent road infrastructure at this location and will not result in a material change to baseline traffic patterns on the public road network. Use of the temporary access will be intermittent and tightly regulated, occurring only during abnormal load deliveries with Garda escort, and the access will remain closed and secured between deliveries. The area is already subject to regular disturbance associated with traffic on the N52 and N62. Therefore, the works will not give rise to sustained disturbance, permanent lighting, or continuous human or vehicle presence, and no pathway for project-related disturbance or direct mortality effects on badger is identified at this location.
Assessment of Significance prior to mitigation	**Habitat Loss/Fragmentation** In the absence of mitigation, no significant loss or fragmentation of badger habitat is anticipated at any geographic scale.
	Disturbance/Direct Mortality Increased human presence and noise or vibration during construction has the potential to displace badgers from foraging and commuting habitat. However, given the availability of suitable habitat in the surrounding area, and the fact that most disturbance will occur during daylight hours when badgers are typically inactive, significant displacement from foraging areas is unlikely to impact the local badger population. These effects are considered to be temporary, negative, unlikely, direct and not significant at any geographic scale. In the absence of mitigation, there is potential for injury or mortality of individual badgers within the Proposed Project. While there are no significant impacts expected on the local badger population as a result of this, mitigation measures are included on a precautionary basis.
Mitigation	**Habitat Loss/Fragmentation** The loss of habitat will be small scale in nature and suitable habitat is abundant in the wider landscape. As such no specific mitigation is required for the avoidance of habitat loss.
	Disturbance/Displacement The following measures for the avoidance of disturbance/displacement and direct mortality will be implemented during the construction phase of the Proposed Project: › As the usage of the site by badgers can change over time, a pre-construction badger survey of the Proposed Project footprint and adjacent areas will be undertaken and will include the location of the identified sett. This will be undertaken by a qualified ecologist prior to the commencement of any works to determine if the sett is in use and to identify any additional setts or sett entrances that may have been excavated in

	the intervening period. Any new badger setts will be afforded protection in line with the requirements set out in the TII (2005a) guidance document. An exclusion zone around the identified sett will be maintained for the duration of the construction works. No works will be undertaken within 30m of the sett. › During the breeding season (December to June inclusive) no works will be undertaken within 50m of active setts or pile driving within 150m of active setts. If such works are required, exclusion measures will be put in place (as outlined above) prior to construction in line with TII Guidelines to ensure that the sett is evacuated. › To protect individual badgers during the construction phase of the Proposed Project, all open excavations on site will be covered when not in use and backfilled as soon as possible. Excavations will also be covered at night and any deep excavations left open will have appropriate egress ramps in place to allow mammals to safely exit excavations should they fall in. All of the above works will be undertaken or supervised by an appropriately qualified ecologist.
Residual Effect following Mitigation	**Habitat Loss/Fragmentation** No significant fragmentation or loss of badger habitat is anticipated at any geographic scale.
	Disturbance Following the incorporation of the mitigation measures described above, no significant negative impacts on badger are anticipated at any geographic scale.

6.4.2.2.3 Assessment of Potential Effects on Bats

Table 6-16 Assessment of Potential Impacts on Bats

Description of Effect	**Loss or damage to Commuting and Foraging Habitat** In absence of appropriate design, the loss or degradation of commuting/foraging habitat has potential to reduce feeding opportunities and/or displace bat populations. Bog woodland, scrub, artificial lakes and ponds, drainage channels and lowland depositing stream habitats were assessed as having *Moderate* to *High* potential for commuting or foraging bats. However, the infrastructure is primarily located in areas of cutover bog, poor fen, and grassland habitats, which were considered to have *Low* suitability with regard to foraging and commuting bats. The Proposed Project has been deliberately designed to avoid loss of uncut raised bog and natural woodlands. The proposed amenity tracks will predominantly use the new internal site roads. Additional links are proposed to provide connectivity between the internal roads and local/regional roads around the site. Sections of the amenity track traverse areas of immature woodland and scrub which provide *Moderate* to *High* suitability for commuting and foraging bats. Other sections traverse areas of open cutover bog and grassland habitats which provide *Low* suitability for commuting and foraging bats. There will be some loss of woodland edge habitat within the east of the site to facilitate the amenity tracks, as well as dry meadows and grassy verge and scrub habitat in the middle of the site. However, the majority of the amenity track area is restricted to existing tracks and bare cutover peat. The car parks cover areas of open cutover bog and buildings and artificial surfaces, which provide *Low* suitability for commuting and foraging bats. The Proposed Grid Connection infrastructure is located within agricultural grassland, and the proposed substation infrastructure will be located on bare peat. These habitats have relatively low suitable potential for commuting and foraging bats. As a result, there will be no loss of linear landscape connectivity associated with these works. The proposed turbine delivery route and its associated required accommodation works at Kennedy's cross has adjacent habitat comprised of scrub. The scrub habitat adjacent to the

	area for proposed accommodation works provide *Low* to *Moderate* suitability for commuting and foraging bats. There will be no requirement for loss of trees to accommodate the turbine delivery route. It is noted also that the Proposed Project will only involve the loss of a negligible percentage of the available habitat within the site and vegetative connectivity will be largely retained. **Loss of, or Damage to Roosts** No bat roosts or suitable roosting habitat was identified within the Proposed Project development footprint. The trees present within the Proposed Project site consist primarily of scrub and immature bog woodland and as such do not provide significant potential roosting habitat for bats. A small bat roost was identified in a structure located >340m northwest of proposed turbine T13 within the mineral island in the centre of the Proposed Project site. However, this structure will be retained and avoided as part of the Proposed Project and no infrastructure is proposed within 340m of the roost. The Proposed Grid Connection is confined to areas of cutover bog and wet agricultural grassland and as a result there will be no loss of potential tree roosting habitat or linear landscape connectivity associated with these works. The proposed accommodation works for the turbine delivery route will not require the loss of any suitable roosting habitat. The proposed amenity track will be largely confined to existing tracks and trails. The nature and scale of the works associated with the amenity pathways are such that there is no potential for significant effect with regard to loss of potential roosting habitat. Consequently, there is no potential for significant effect with regard to the loss or disturbance of roosting habitat associated with the Proposed Project. **Displacement of Individuals or Populations** The Proposed Project is predominantly located in cutover bog with areas of bog woodland and scrub. There will be no net loss of linear landscape features for commuting and foraging bats and there will be no loss of any roosting site of ecological significance. The habitats on the site will remain suitable for bats and no significant displacement of individuals or populations is anticipated.
Assessment of Significance prior to mitigation	No significant effects with regard to loss of commuting and foraging habitat are anticipated. No significant effects with regard to loss of, or damage to roosts are anticipated. No significant effects with regard to displacement of individuals or populations are anticipated. However, mitigation is prescribed below on a precautionary basis.
Mitigation	**Habitat Creation** The limited removal of small areas of woodland and scrub will be offset through habitat enhancement measures. While some localised woodland edge will be altered, connectivity for commuting and foraging bats will be retained across the site. The BMEP provides for the planting of 7.8 ha of native woodland and 6.5km of native hedgerow within the Proposed Project site which will ensure no net loss of bat commuting and foraging habitat and provide additional habitat over time. **Disturbance Limitation Measures** The Applicant commits to the use of lighting during construction (such that they are necessary) having consideration of the following guidance that is provided in the Dark Sky Ireland Lighting Principles:

	› All lighting will be justified and used only when required. › Warm colour temperatures will be used to minimise impacts on wildlife and the night sky. › Glare and brightness will be minimised to protect visual comfort. › Luminaires will be angled downward with appropriate beam control to avoid over-lighting. › Lower mounting heights will be used where possible to better contain light. › Lighting will incorporate timers, dimmers, or PIR sensors to reduce energy use and emissions. › Natural areas such as trees, waterbodies, and nesting habitats will not be illuminated. These measures will be implemented through the Construction Environmental Management Plan (CEMP) and will be overseen by the Environmental Clerk of Works (EcOW) during the construction phase.
Residual Effect following Mitigation	There is no potential for the construction of the Proposed Project to result in Significant effects on the local bat population at any geographic scale. There is potential for a long-term localised positive effect on bats due to the creation of additional linear native hedgerow habitat and native woodland habitat.

6.4.2.2.4 Assessment of Potential Effects on Marsh Fritillary

Table 6-17 Assessment of Potential Impacts on Marsh Fritillary

Description of Effect	Small areas of suitable marsh fritillary habitat occur within the Proposed Project site, primarily within grassy verges associated with existing access tracks where the larval foodplant devil's-bit scabious is present. Targeted marsh fritillary surveys undertaken in 2021, 2023 and 2024 recorded three inactive larval webs within one patch of suitable habitat during the 2023 surveys, indicating previous use of the site by the species. These records are located approximately 360m southeast of proposed turbine T04. No active larval webs were recorded during the survey period. Sections of suitable marsh fritillary habitat occur adjacent to existing access roads where upgrade works are proposed as part of the Proposed Project. In the absence of mitigation, potential effects could occur through: › Direct loss of small areas of suitable habitat, › Direct effects on marsh fritillary larvae should active larval webs be present at the time of construction
Assessment of Significance prior to mitigation	**Loss of Suitable Habitat** The Proposed Project has been designed to avoid areas of suitable marsh fritillary habitat where possible. However, there is potential for small areas of suitable habitat to be lost as part of access road upgrade works. Given the limited extent and fragmented nature of the suitable habitat within the Proposed Project site, and the absence of a confirmed breeding population within the site, the loss of this small area of suitable marsh fritillary habitat is not considered likely to result in a significant effect at any geographic scale prior to mitigation. **Direct Effects/Mortality** No active marsh fritillary larval webs were recorded during surveys undertaken in 2021, 2023 and 2024, and the inactive larval webs recorded in 2023 are located approximately 350m from any proposed infrastructure. Therefore, no direct effects on marsh fritillary are anticipated. However, small areas of suitable marsh fritillary habitat occur adjacent to and existing access road where upgrade works are proposed. While it is possible that marsh

	fritillary larvae could occur within this habitat at the time of construction, the likelihood of such effects occurring is considered low. Therefore, any potential effect is not considered significant at any geographic scale. However, a pre-construction marsh fritillary survey will be undertaken on a precautionary basis in areas of suitable habitat adjacent to the proposed access road upgrade works.
Mitigation	The Proposed Project has been designed to minimise impacts on areas of suitable marsh fritillary habitat where possible. The following mitigation measures will be implemented: › A pre-construction marsh fritillary survey will be undertaken by a suitably qualified ecologist at the appropriate time of year in areas of suitable habitat within or adjacent to access road upgrade works. If active marsh fritillary larval webs are recorded within the construction footprint, these webs will be translocated by a suitably qualified ecologist to suitable habitat outside of the construction footprint. This will be achieved by translocating a sod of earth with entire, intact devil's-bit scabious plants upon which the larvae are feeding. › The construction footprint will be clearly demarcated prior to the commencement of works. Suitable marsh fritillary habitat adjacent to the works will be retained and the extent of habitat affected will be kept to the minimum necessary for construction. › No storage of materials, side-casting, or tracking of machinery will be permitted within suitable marsh fritillary habitat outside the demarcated construction works footprint. In addition, the BMEP (Appendix 6-5) provides for the enhancement of approximately 6.7 ha of suitable marsh fritillary habitat and monitoring of marsh fritillary presence in this habitat. This will result in a net gain in availability of suitable habitat for the species within the site as a result of the Proposed Project.
Residual Effect following Mitigation	Following the incorporation of the mitigation measures, there is no potential for residual significant effect on marsh fritillary. With the proposed BMEP in place, there will be a net gain in suitable marsh fritillary breeding and foraging habitat within the Proposed Project site.

6.4.2.3 Introduction and Spread of Invasive Species

No invasive species (listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) were recorded within or adjacent to the Proposed Project footprint during the ecology surveys undertaken. Therefore, there is limited potential for spread of invasive species due to disturbance during the construction of the Proposed Project. Nonetheless the following best practice biosecurity measures will be in place during construction of the Proposed Project to avoid the introduction of invasive species to the site:

- Good construction site hygiene will be employed to prevent introduction of problematic invasive alien plant species (e.g., Japanese knotweed, Rhododendron, Giant Rhubarb, etc.) to the site by thoroughly washing vehicles at designated off-site wheel-wash facilities prior to entering the site;
- Any soil and topsoil required on the site will be sourced from a stock that has been screened for the presence of any invasive species and where it is confirmed that none are present;
- A pre-commencement invasive species survey of the construction footprint will be undertaken by a qualified ecologist to determine if any invasive species have established on the site since the undertaking of the previous surveys. The treatment and control of invasive alien species if recorded will follow guidelines issued by the National Roads Authority – The Management of The Management of Invasive Alien Plant Species on National Roads – Technical Guidance (TII, 2020).

6.4.3 Likely Significant Effects During Operational Phase

6.4.3.1 Effects on Habitats during Operation

The operation of the Proposed Project will not result in any additional land take or loss of revegetated peatland habitats and as such there is no potential for any significant effects in this regard. These habitats are not considered to be a KER in the context of the operation of the Proposed Project. However, the Proposed Project has the potential to result in enhancement of the surrounding areas through habitat enhancement that will be undertaken throughout the operational phase of the Proposed Project. Details of the management that will be undertaken are provided in the BMEP in Appendix 6-5. Measures included within the BMEP are linked specifically to the Proposed Project and are additional to those that are included within the draft Rehabilitation Plan that will be implemented as part of Condition 10 of the IPC Licence requirements for Lemanaghan Bog, within which the majority of the Proposed Project site is located. The Draft Rehabilitation Plans for Lemanaghan Bog is provided in Appendix 2-4 of this EIAR. During the operational phase, the Proposed Project will occur alongside continued implementation of the Draft Rehabilitation Plan. The assessment of operational phase effects on habitats has had regard to the rehabilitation plans and cumulative assessment is included in Section 6.5.3.

Potential for effects on rivers, streams, open waterbodies and sensitive aquatic species remains during operation and is assessed in detail in the following subsections.

6.4.3.1.1 *Effects on Aquatic Habitats and Related Species*

Table 6-18 Assessment of Potential Impacts on Rivers, Streams, Open Waterbodies and Sensitive Aquatic Faunal Species

Description of Effect	The potential impacts on water quality during the operational phase of the Proposed Project are fully described in Chapter 9: Water of this EIAR and are described here specifically in relation to ecological receptors. There will be no instream activity during the operational phase of the Proposed Project and therefore no potential for loss of aquatic habitat or disturbance of aquatic species. Operation of the Proposed Project will result in an overall increase in impermeable hard surfaces (e.g. turbine foundations, internal roads, hardstands), which has the potential to increase surface water runoff from the Proposed Project Site. This has potential to cause erosion of watercourses and impact on water quality. There is also potential for run-off of pollutants due to accidental spillage or release of hydrocarbons from site vehicles during any routine maintenance works during the operational phase of the Proposed Project. However, it is not envisaged that any significant refuelling works will be undertaken on site during the operational phase. **Note: Whilst this impact assessment is in the habitats section, it also assesses the impact on the Proposed Project on aquatic species including salmonids, lamprey, coarse fish, white-clawed crayfish, European eel, aquatic invertebrates and other aquatic species. The operation of the Proposed Project will have no direct impact on the aquatic habitat of these species and there is no potential for disturbance. The only pathway for effect to occur during the operational phase of the development is as a result of water pollution and this is discussed in this section in relation to habitats and species.**
Assessment of Significance prior to mitigation	In the absence of mitigation, and taking a precautionary approach, construction of hard surfaces and operation-phase activities associated with the Proposed Project could result in deterioration of water quality within drains, small streams and the Lemanaghan Stream on the Proposed Project site, and in downstream receiving waters. This could arise from increased surface runoff from new impermeable surfaces and accidental release of hydrocarbons during routine maintenance activities. Such deterioration in water quality could indirectly affect aquatic habitats and sensitive aquatic faunal species by degrading water quality and altering habitat conditions. No

	instream works will occur during the operational phase, and there is no pathway for direct habitat loss or direct disturbance of aquatic species. The magnitude of any such unmitigated impact is considered slight. This is because all major infrastructure is located more than 50m from any natural watercourse, no instream works will occur during the operational phase, the extent of new hardstanding is small relative to the overall size of the Proposed Project site, and Chapter 9 concludes that the increase in runoff rates associated with the Proposed Project will be negligible. Significant effects on water quality are not anticipated at any geographic scale during the operation of the Proposed Project.
Mitigation	Whilst no significant effects on water quality are anticipated, potential for effects on water quality associated with the operational phase drainage of the site has been fully mitigated through appropriate drainage design and mitigation as fully described in Chapter 9 of the EIAR.
Residual Effect following Mitigation	The drainage design and detailed mitigation measures outlined in Chapter 9 of this EIAR ensure that there is no potential for significant negative effects on water quality during the operational phase of the Proposed Project. There will be no instream activities during the operational phase. All major infrastructure will be located greater than 50m from any watercourse and the drainage design will ensure that there is no potential for significant negative impacts on watercourses during the operational phase of the Proposed Project.

6.4.3.2 Effects on Fauna during Operation

The operation of the Proposed Project will not result in any additional habitat loss or deterioration. While the site may experience some recreational use associated with amenity access, the operational phase of the Proposed Project will not involve the intensive industrial activity historically associated with peat extraction at the site. Mammal species such as badger and otter are considered tolerant of low levels of human activity and are likely to continue to utilise the wider site during operation. No evidence of badger setts or otter resting sites was recorded in proximity to the proposed amenity tracks within the Proposed Project site. Consequently, the magnitude of disturbance to terrestrial fauna during operation is expected to be low.

The assessment of operational phase effects on fauna has been undertaken with consideration of the ongoing peatland rehabilitation of Lemanaghan Bog, within which the majority of the Proposed Project site is located, as required as part of the IPC License (P0500-01). Potential interactions between the operational Proposed Project and rehabilitation-driven changes in the Proposed Project site have been considered and cumulative assessment is included in Section 6.5.3.

The implementation of the BMEP will ensure that any woodland and scrub that is lost to facilitate the proposed infrastructure will be replaced within the Proposed Project site. As such the operation of the Proposed Project has the potential to result in positive effects on the non-volant terrestrial fauna at the site of the Proposed Project. There is no potential for significant negative effects on non-volant terrestrial fauna including badger and otter that were identified as KERs during the construction phase of the development.

It should be noted that no significant habitat for salmonids, lamprey, coarse fish, white-clawed crayfish, European eel, aquatic invertebrates or other aquatic species was recorded within the footprint of the Proposed Project and all major infrastructure such as turbine bases are located over 50m from the watercourses within the site. The potential for significant effects on the above aquatic species is restricted to indirect effects on their habitat resulting from water pollution. This has been assessed in Section 6.4.3.1.1 and is not repeated below.

Potential for significant effects on bat species resulting from the operation of the Proposed Project were identified and are assessed in detail in the following subsections.

6.4.3.2.1 Assessment of Potential Effects on Bats during operation

Table 6- 19 Assessment of Potential Impacts on Bats during Operation

Description of Effect	**Collision Risk and Barotrauma** The potential for collision risk for high collision risk bat species during the operational phase of the Proposed Project is assessed in the bat survey report in Appendix 6-1. Death may occur through collision with turbine blades or as a result of barotrauma. Fatalities may negatively affect local bat populations. The following high-risk species were recorded during the dedicated surveys: › Leisler's bat › Common pipistrelle › Soprano pipistrelle › Nathusius' pipistrelle The Overall Risk Assessment for high collision risk species was determined, in accordance with Table 3b of NatureScot guidance a cross-tablature of the site risk level (i.e., Medium). The assessment was carried out for both median and maximum Ecobat (mammal.org.uk) activity categories in order to provide insight into typical bat activity (median values) and activity peaks (maximum values). As per NatureScot guidance there is no requirement to complete an Overall Risk Assessment for low-risk species. During the extensive suite of surveys undertaken that following low risk species were recorded: › Myotis sp., › Brown long-eared bat. Overall activity levels for Myotis sp. and brown long-eared bat were low and therefore no significant collision related effects are anticipated.
Assessment of Significance prior to mitigation	Following the precautionary principle, there is potential for the operation of the Proposed Project to result in long-term significant effects on the local bat population.
Mitigation	**Lighting** The proposed lighting around the Proposed Project shall be designed with consideration of the Institute of Lighting Professionals Guidance Note 08/23 Bats and Artificial Lighting at Night (ILP, 2023). In addition, the applicant commits to the use of lights during construction, operation and decommissioning (such that they are necessary) having consideration of the following guidance that is provided in the Dark Sky Ireland Lighting Principles: › All lighting will be justified and used only when required. › Warm colour temperatures will be used to minimise impacts on wildlife and the night sky. › Glare and brightness will be minimised to protect visual comfort. › Luminaires will be angled downward with appropriate beam control to avoid over-lighting. › Lower mounting heights will be used where possible to better contain light. › Lighting will incorporate timers, dimmers, or PIR sensors to reduce energy use and emissions. › Natural areas such as trees, waterbodies, and nesting habitats will not be illuminated.

With regard to the potential for lighting to increase collision risk, it is noted that there will be limited illumination of the turbines in the form of aviation lighting. Post construction monitoring will be carried out (as outlined below) to assess any potential changes in bat activity patterns and collision risk. Significant effects as a result of lighting are not anticipated; however, if in the course of this monitoring, any potential for significant effects on bats is identified, the site-specific mitigation measures will be reviewed and any changes necessary will be implemented to avoid any such impacts.

Bat Buffers

In order to reduce the value of the habitat for bat species in the areas surrounding the turbines, a buffer of at least 50m between the tip of the blade and any trees or other tall vegetation that could provide high quality foraging habitat for bat species will be implemented. Details of this mitigation and how it is calculated is provided in Appendix 6.2. Given the proposed turbine dimensions (145m hub height) the clearance distance between the tip of the turbine blade and the nearest habitat feature is sufficient without implementing vegetation removal. However, on a precautionary basis, a 50m vegetation free buffer area will be applied and maintained.

Blade Feathering

NIEA Guidelines also recommend that, in addition to buffers applied to habitat features, all wind turbines are subject to 'feathering' of turbine blades when wind speeds are below the cut-in speed of the proposed turbine. This means that the turbine blades are pitched either perpendicular (at 90 degrees) or parallel (at 0 degrees) to the wind to reduce their rotation speed to below two revolutions per minute while idling. This measure has been shown to significantly reduce bat fatalities (by up to 50%) in some studies (NIEA, 2021).

Blade feathering below the turbine cut-in speed is expected to be implemented automatically through the turbine control system. Feathering will be limited to periods and locations as follows:

- Seasonal Application:

Feathering will be applied during the main bat activity season (typically April–October) when bats are active and at potential increased risk of collision. Blade feathering will not be applied during winter months (November - March) when bats are largely inactive.

- Spatial Targeting:

Feathering will be implemented only at turbines located in areas of high bat activity, as identified through baseline surveys. Turbines positioned in habitats unsuitable for bats (e.g., extensive bare peat, exposed upland areas with no foraging or commuting value) will not require feathering at low wind speeds.

Should any variations in activity or risk levels be identified during post-construction monitoring, this will be adjusted accordingly as part of the mitigation and monitoring strategy

In the event that blade feathering is not available for the selected turbine model, an equivalent operational measure will be implemented to ensure that turbines do not rotate at low wind speeds when electricity generation is not occurring. This may include operational controls such as manual stop or stop-on-demand procedures during periods when turbines would otherwise idle below cut-in speed.

Operational Monitoring

In addition to this, ongoing monitoring of bat activity will be undertaken for at least three years' post construction of the Proposed Wind Farm. This will provide data and information on the actual recorded impact of the wind turbines on the local bat

	populations. Full details of the proposed monitoring programme are provided in Appendix 6.2 and include measurement of bat activity, weather conditions and any correlation between the two. The monitoring will also include corpse searching in the areas surrounding the turbines to gather data on any actual collisions. At the end of each year, the efficacy of the mitigation and monitoring plan will be reviewed, and any identified efficiencies incorporated into the programme. This approach allows for an evidence-based review of the potential for bat fatalities at the Proposed Project, post construction, to ensure that the necessary measures, based on a new baseline post-construction, are implemented for the protection of bat species locally. The effectiveness of any mitigation/curtailment needs to be monitored in order to determine (a) whether it is working effectively (i.e., the level of bat mortality is incidental), and (b) whether the curtailment regime can be refined such that turbine down-time can be minimised whilst ensuring that it remains effective at preventing casualties.
Residual Effect following Mitigation	There is no potential for the operation of the Proposed Project to result in significant residual effects on the local bat population at any geographic scale.

6.4.4 Likely Significant Effects During Decommissioning phase

Decommissioning is fully described in Chapter 4 of the EIAR. The wind turbines proposed as part of the Proposed Project are expected to have a lifespan of approximately 35 years. Following the end of their service life, the wind turbines may be replaced with a new set of turbines or components, subject to planning permission being obtained, or the Proposed Project may be decommissioned fully. The onsite substation will remain in place as it will be under the ownership of the ESB/EirGrid.

During decommissioning of the Proposed Project, the wind turbines and meteorological masts would be disassembled. All above ground turbine and mast components would be separated and removed off-site for recycling. Turbine and mast foundations would remain underground and would be covered with earth and allowed to revegetate. Site roadways will be in use as amenity and recreational pathways, and therefore will not be removed during decommissioning. If it were to be confirmed that the roads were not required in the future for any other useful purpose, they could be removed where required. Underground cables, including grid connection, will be removed and the ducting left in place.

It is anticipated that there will be no additional habitat loss associated with the decommissioning of the Proposed Project and therefore there will be no significant effects in this regard. In addition, the removal of the infrastructure will involve similar operations to those involved in construction but without the large-scale earth moving or excavations as the turbine bases and roads etc. will be left in place. These works would therefore be of a smaller scale but would have similar impacts on ecology to those experienced during construction. There would be no additional or ancillary impacts associated with the decommissioning phase.

The same mitigation to prevent significant impacts on water quality and associated aquatic fauna and other terrestrial fauna during construction will be applicable to the decommissioning phase.

6.4.5 Effects on Designated Sites

None of the elements of the Proposed Project are located within the boundaries of any Nationally or European designated sites important for nature conservation (Figure 6-2 and Figure 6-3). There will be no direct effects on any designated site as a result of the construction, operation and decommissioning of the Proposed Wind Farm or the Proposed Grid Connection.

6.4.5.1 European Designated Sites

In relation to European sites, an Appropriate Assessment Screening Report and Natura Impact Statement (NIS) have been prepared to provide the competent authorities with the information necessary to complete an Appropriate Assessment for the Proposed Project 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 concluded 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 Proposed Project, individually or in combination with other plans and projects, would not be likely to have a significant effect on the following sites:*
>
> - River Shannon Callows SAC
> - Middle Shannon Callows SPA

As a result, an Appropriate Assessment is required, and a Natura Impact Statement shall be prepared in respect of the Proposed Project'.

The findings presented in the NIS are that *it can be objectively concluded that the Proposed Project, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site.*

6.4.5.2 Nationally Designated Sites

The River Shannon Callows pNHA was identified as being within the Likely Zone of Influence of the Proposed Project due to hydrological connectivity. A potential pathway for indirect effects on this pNHA as a result of deterioration of water quality arising from run-off of pollutants during construction, operation and decommissioning of the Proposed Project was identified. Section 6.4.2.1.1, Section 6.4.3.1.1 and Section 6.4.4 above provide an assessment of the potential for impacts on water quality during construction, operation and decommissioning of the Proposed Project. A range of best practice pollution prevention measures are in place and described above and in Chapter 9 Hydrology and Hydrogeology of this EIAR and in the CEMP included as Appendix 4-4 to this EIAR to ensure that there is no potential for impacts on water quality within and downstream of the Proposed Project site. Therefore, there is no potential for indirect effects on River Shannon Callows pNHA due to deterioration of water quality.

6.5 Cumulative Impact Assessment

The Proposed Project was considered in combination with other plans and projects in the area that could result in cumulative impacts on biodiversity. 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 methodology for cumulative assessment and the projects considered are detailed and listed in Section 2.10 of Chapter 2. The full list of projects has been considered and relevant projects from the list are discussed in this section.

As part of the IPC licence rehabilitation requirements, BnM is required to produce cutaway bog decommissioning and rehabilitation plans, please see Appendix 2-4 to view the draft Cutaway Bog

Decommissioning and Rehabilitation Plan for of Lemanaghan Bog, within which the majority of the Proposed Project site is located. These plans have considered the Proposed Project footprint and demonstrate that both peatland rehabilitation and renewable energy can coexist harmoniously onsite. Irrespective of any further development on of Lemanaghan Bog, BnM's statutory duties to discharge the conditions of its IPC Licence will remain ongoing.

The Peatland Climate Action Scheme (PCAS) comprises enhanced peatland rehabilitation (above and beyond IPC licence requirements). As identified in Section 2.10.2.4 of Chapter 2, PCAS is proposed in bogs in the vicinity and adjacent to the Proposed Project site; PCAS will not occur within the site and does not form part of the Proposed Project application. Please note, PCAS activities in the vicinity and adjacent to the Proposed Project site have been cumulatively assessed.

6.5.1 Assessment of Plans

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

- Offaly County Development Plan 2021-2027
- 4th National Biodiversity Action Plan 2023-2030

The review focused on policies and objectives that relate to designated sites for nature conservation, biodiversity and protected species. Policies and objectives relating to the conservation of peatlands and sustainable land use were also reviewed, particularly where the policies relate to the preservation of surface water quality. An overview of the search results with regard to plans is provided in Table 6.19.

Table 6-20 Assessment of Plans

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Compliance with Policy
Offaly County Development Plan 2021-2027	**Biodiversity and Landscape Policies** Designated and Non-Designated Sites **BLP-01** It is Council policy to protect, conserve, and seek to enhance the county's biodiversity and ecological connectivity. **BLP-02** It is Council policy to conserve and protect habitats and species listed in the Annexes of the EU Habitats Directive (92/43/EEC) (as amended) and the Birds Directive (2009/147/EC), the Wildlife Acts 1976 (as amended) and the Flora Protection Orders. **BLP-03** It is Council policy to support and co-operate with statutory authorities and others in support of measures taken to manage proposed or designated sites in order to achieve their conservation objectives. **BLP-04** It is Council policy to protect and maintain the conservation value of all existing and future Natural Heritage Areas, proposed Natural Heritage Areas, Nature Reserves, Ramsar Sites, Wildfowl Sanctuaries and Biogenetic Reserves in the county. **BLP-05** It is Council policy to ensure that development does not have a significant adverse impact, incapable of satisfactory avoidance or mitigation, on plant, animal or bird species protected by law. **BLP-06** It is Council policy to consult with the National Parks and Wildlife Service, and take account of any licensing requirements, when undertaking, approving or authorising development which is likely to affect plant, animal or bird species protected by law. **BLP-07** It is Council policy to support the implementation of the National Biodiversity Action Plan 2017- 2021 and the Offaly Heritage Plan Key Actions 2017-2021 and future editions in partnership with relevant stakeholders subject to available resources. **BLP-08** It is Council policy to work with all state agencies to promote the development of all aspects of park management in the Slieve Bloom Mountains.	The Development Plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the biodiversity, protected species and designated sites. There will be no significant negative effects on biodiversity as a result of the Proposed Project. The Proposed Project has been designed to avoid, in so far as possible, the most sensitive habitats within the site. A range of mitigation measures are in place to ensure that there will be no significant negative effects on any habitats, species, protected sites or water quality and a BMEP has been prepared, providing for the enhancement of peatland and woodland habitat within the Proposed Project site. The Proposed Project is not considered to be in contravention of the policies and objectives within the development plan. No potential for negative cumulative impacts were identified.

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Compliance with Policy
	Peatlands **BLP-14** It is Council policy to protect the county's designated peatland areas and landscapes, including any historical walkways through bogs and to conserve their ecological, archaeological and cultural heritage and to develop educational heritage. **BLP-15** It is Council policy to work with adjacent local authorities and relevant stakeholders in promoting a National Park designation for the peatlands in the midlands and a 'Regional Peatway' connecting natural and cultural attractions. **BLP-16** It is Council policy to support the provision of outdoor pursuits, walking and cycling routes through the county's peatlands and network of industrial railways linking the River Shannon Blueway, Royal Canal, Grand Canal and Barrow Blueway across the midlands as outlined in the 'Major Cycling Destination in the Midlands of Ireland –Feasibility Study 2016', which is a priority of the 'Outdoor Recreation Plan State Lands and Waters' (2017). **BLP-17** It is Council policy to support the National Parks and Wildlife Service in carrying out an EU LIFE fund supported raised bog restoration project in restoring the following Special Areas of Conservation sites in the county to favourable conservation status: › Clara Bog; › Ferbane Bog; › Mongan Bog; › Moyclare Bog; › Raheenmore Bog; and › Sharavogue Bog. **BLP-18** It is Council policy to support collaboration between Offaly County Council, Regional Transition Team and relevant stakeholders of a partnership approach to integrated peatland management for a just transition that incorporates the management, rehabilitation and restoration / re-wetting of significant tracts of peatlands in conjunction with appropriate developed after uses. Waterways, Lakes and Wetland Landscapes	

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Compliance with Policy
	BLP-19 It is Council policy to protect the landscape associated with the River Shannon, including the Callows and views of special interest, and also to encourage the development of Shannonbridge, Banagher and Shannon Harbour as focal points. It will also be Council policy to investigate the possibility of providing a Linear Park based on the River Shannon from Banagher to Meelick, which takes account of the sensitive ecological nature of the Callows area. **BLP-20** It is Council policy to preserve riparian buffer strips free from development by reserving a minimum of 10 metres either side of all watercourses (measured from top of bank) with the full extent of the protection determined on a case by case basis by the Council, based on site specific characteristics and sensitivities. **BLP-21** It is Council policy to promote clear span bridging structures as the preferred option for culverts Any development proposal requiring culverting should also document stream habitat lost and provide compensatory habitat where possible. Realignment of water courses should incorporate stream enhancement measures, as outlined in Office of Public Works Environmental Guidance. The Council will consult with Inland Fisheries Ireland in relation to riparian and instream works as appropriate. **BLP-22** It is Council policy to promote the removal of historic culverts and infilling of watercourses. **BLP-23** It is Council policy to consider the Waterways Corridor Study 2002 and protect the recreational, educational and amenity potential of navigational and non-navigational waterways within the county, such as the Grand Canal Corridor, towpaths and adjacent wetland landscapes, taking into account more recent heritage and environmental legislation (including the SEA Directive) and environmental policy commitments. <u>Trees, Forestry and Hedgerows</u> **BLP-24** It is Council policy to support the protection and management of existing networks of woodlands, trees and hedgerows which are of amenity or biodiversity value and/or contribute to landscape character, and to strengthen local networks. **BLP-25** It is Council policy to encourage the planting of native species in all new residential developments (individual and multiple units) and as part of landscaping for commercial and industrial developments.	

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Compliance with Policy
	BLP-26 It is Council policy to require, where practical, the management of mature trees, such as tree surgery instead of felling particularly where the trees contribute to amenity. All Ireland Pollinator Plan **BLP-32** It is Council policy to support the aims and objectives of the All Ireland Pollinator Plan 2021- 2025 and any subsequent editions by delivering appropriate management actions as set out in their guidance documents. **BLP-33** It is Council policy to support alternative landscape maintenance regimes which promote and work towards the reduction and ultimate elimination of use of herbicides in Parks and public land, while supporting the National Bee Pollinator Plan in promoting bee friendly habitats. Invasive Species **BLP-34** It is Council policy to continue to deliver and support measures for the prevention, control and/or eradication of invasive species within the county, and to seek details of how these species will be managed and controlled where their presence is identified. **Biodiversity and Landscape Objectives** Designated and Non-Designated Sites **BLO-02** It is an objective of the Council that no plans, programmes 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). **BLO-03** It is an objective of the Council that all projects and plans arising from this Plan will be screened for the need to undertake Appropriate Assessment under Article 6 of the Habitats Directive. A plan or project will only be authorised after the competent authority has ascertained, based on scientific evidence, Screening for Appropriate Assessment, and subsequent Appropriate Assessment where necessary, that:	

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Compliance with Policy
	1. The plan or project will not give rise to significant adverse direct, indirect or secondary effects on the integrity of any European site (either individually or in combination with other plans or projects); or 2. The plan or project will have significant adverse effects on the integrity of any European site (that does not host a priority natural habitat type/and or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000; or 3. The plan or project will have a significant adverse effect on the integrity of any European site (that hosts a natural habitat type and/or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons for overriding public interest, restricted to reasons of human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000. **BLO-04** It is an objective of the Council to ensure that the impact of development within or adjacent to national designated sites, Natural Heritage Areas, proposed Natural Heritage Areas, Ramsar Sites and Nature Reserves likely to result in significant adverse effects on the designated site is assessed by requiring the submission of an Ecological Impact Assessment prepared by a suitably qualified professional, which should accompany planning applications. **BLO-05** It is an objective of the Council in accordance with Article 4(4) of the Birds Directive and Regulation 27(4) of the European Communities (Birds and Habitats) Regulations 2011-2015 to strive to avoid pollution or deterioration of bird habitats outside Special Protection Areas. **BLO-06** It is an objective of the Council to take account of the objective and management practices proposed in any management or related plans for European Sites (SACs and SPAs) in and adjacent to the county published by the Department including the National Raised Bog Special Areas of Conservation (SACs) Management Plan 2017-2022 and any subsequent editions.	

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Compliance with Policy
	Peatlands **BLO-10** It is an objective of the Council to require the preparation and submission of a Hydrological Report/Assessment for significant developments within and in close proximity to protected raised bogs and to take account of same in the assessment of impacts on the integrity of peatland ecosystems. **BLO-11** It is an objective of the Council to work with relevant stakeholders on suitable peatland sites in order to demonstrate best practice in sustainable peatland conservation, management and restoration techniques to promote their heritage and educational value subject to ecological impact assessment and appropriate assessment screening. Waterways, Lakes and Wetland Landscapes **BLO-12** It is an objective of the Council to maintain a riparian zone for larger and smaller river channels based on the Inland Fisheries Ireland updated guideline document, 'Planning for Watercourses in the Urban Environment, a Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning'. **BLO-13** It is an objective of the Council to (a) investigate the feasibility of and cooperate with relevant agencies in providing a Linear Park based on the River Shannon from Banagher to Meelick, which takes account of the sensitive ecological nature of the Callows area and (b) to support the development of an overall vision/strategy for the Shannon Callows in co-operation with all stakeholders to ensure that the area is appropriately managed at a landscape scale. Trees, Forestry and Hedgerows **BLO-14** It is an objective of the Council to preserve individual trees and groups of trees that are included in Table 4.13 and 4.14. **BLO-15** It is an objective of the Council to consider the making of Tree Preservation Orders to protect trees and woodlands of high value.	

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Compliance with Policy
	BLO-16 It is an objective of the Council to encourage the preservation and enhancement of native and semi-natural woodlands, groups of trees and individual trees, not listed in Table 4.13 and 4.14; (a) in particular, on the grounds of Country Houses, Gardens and Demesnes and on approaches to settlements in the county; and (b) as part of the development management process, require the planting of native, deciduous, pollinator friendly trees in all new developments where possible. **BLO-17** It is an objective of the Council to encourage pursuant to Article 10 of the Habitats Directive, the management of features of the landscape, such as traditional field boundaries, important for the ecological coherence of the Natura 2000 network and essential for the migration, dispersal and genetic exchange of wild species. **BLO-18** It is an objective of the Council to encourage the retention, wherever possible, of hedgerows and other distinctive boundary treatment in the county. Where removal of a hedgerow, stone wall or other distinctive boundary treatment is unavoidable, provision of the same type of boundary will be required of similar length and set back within the site in advance of the commencement of construction works on the site (unless otherwise agreed by the Planning Authority). Invasive Species **BLO-20** It is an objective of the Council to require, as part of the planning application process, the appropriate eradication/control of invasive species when identified on site or in the vicinity of a site, in accordance with Regulation 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 to 2015. **BLO-21** It is an objective of the Council to continue to maintain mapping identifying the location of invasive species in the county in conjunction with the National Biodiversity Data Centre. Wilderness Corridors **BLO-28** It is an objective of the Council to work with stakeholders such as Bord Na Móna, Coillte, National Parks and Wildlife Service, Waterways Ireland and Just Transition related groups to examine the feasibility of developing a Wilderness Corridor on rehabilitated peatlands linked to routes identified in Figure 6.13 'Midlands Cycling Destination, Offaly Network Map at; (i) Cavemount, Esker, Ballycon, Derrycricket, Clonsast North,	

Plans	Key Policies and Objectives directly related to Biodiversity in the Zone of Influence	Assessment of Compliance with Policy
	Clonsast and Derryounce Bogs in East Offaly; and (ii) Blackwater, Ballaghurt and Belmont Bogs in West Offaly, from Clonmacnoise in the direction of Belmont village in West Offaly	
4th National Biodiversity Action Plan 2023-2030	The purpose of the 4th National Biodiversity Action Plan is to set out the approach to governance and conservation of biodiversity through a series of targeted actions within the Plan. This is underpinned by five strategic objectives aimed at ensuring that Ireland's biodiversity and ecosystems are conserved and restored, delivering benefits essential for all sectors of society and that Ireland contributes to efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally. The strategic objectives are: › Objective 1: Adopt a Whole-of Government, Whole of-Society Approach to Biodiversity › Objective 2: Meet Urgent Conservation and Restoration Needs › Objective 3: Secure Nature's Contribution to People › Objective 4: Enhance the Evidence Base for Action on Biodiversity › Objective 5: Strengthen Ireland's Contribution to International Biodiversity Initiatives	The Plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity and Designated Sites. There will be no significant negative effects on biodiversity as a result of the Proposed Project. The Proposed Project has been designed to avoid, in so far as possible, the most sensitive habitats within the site. A range of mitigation measures are in place to ensure that there will be no significant negative effects on any habitats, species, protected sites or water quality and a BMEP has been prepared, providing for the enhancement of peatland and woodland habitat within the Proposed Project site. The Proposed Project is not considered to be in contravention of the policies and objectives within the development plan. No potential for negative cumulative impacts were identified.

6.5.2 Assessment of Projects

As described in Section 2.10 of the EIAR, relevant projects have been assessed in combination with the Proposed Project and include planning applications in the vicinity of the site and other wind energy applications within the wider area. These have not been repeated here to reduce the duplication of information within this EIAR. However, they have been fully considered in this assessment in terms of their potential for impact on biodiversity.

Table 6-20 below provides the cumulative study areas for individual EIAR topics that are relevant in relation to ecological receptors i.e., hydrological connectivity is important for assessing potential for effects on designated sites.

Potential for cumulative effects in relation to birds is assessed separately within Chapter 7 of this EIAR.

Table 6-21 Cumulative Study Areas in relation to ecological receptors

Individual Topic	Maximum Extent	Justification
Biodiversity (excluding birds)	**Proposed Wind Farm** 10km from the Proposed Wind Farm Wind farm developments within 25km of the Proposed Wind Farm turbines	A 10km study area from the Proposed Project site has been applied for the cumulative assessment of terrestrial ecological receptors. This extent aligns with NatureScot (2021) guidance in relation to bats, as they are a mobile species which can cover large distances for foraging and roosting over a range of varied habitats. This extent is considered appropriate to assess potential for cumulative effects on other terrestrial ecological receptors. On a precautionary basis, existing, permitted and proposed wind farm developments within a 25km radius of the Proposed Wind Farm have also been considered. This extended search area reflects the potential for cumulative effects associated with multiple wind energy developments across the wider landscape. In addition, in relation to aquatic habitats and species, the cumulative assessment boundary for hydrological impacts has also been considered, based on Water Framework Directive (WFD) sub-catchments as detailed below under 'Water', and identified downstream connectivity.
Water	**Proposed Wind Farm** WFD Catchment for large infrastructural developments such as wind farms, energy and public transport developments. River Sub Basins for all smaller proposed, permitted or existing plans or projects (i.e. private and commercial type developments).	The Proposed Project site is located in 3 no. WFD river sub-catchments and the cumulative hydrological study area has been delineated as follows: › The majority of the Proposed Project site drains to the Brosna River within the Brosna_SC_110 sub-catchment and there are several outfalls from the bog including SW22, SW22A, SW22B, SW22C, SW19, SW19A and SW19B. A quantitative analysis using flow volumes derived from the EPA Hydrotool database shows that there is no potential for effects associated with the Proposed Project downstream of EPA Hydrotool Node: 25_611 on the Brosna River. This Node marks the downstream extent of the cumulative study area within this sub-catchment. This section of the cumulative study area includes several WFD river sub-basins (Brosna_100, Brosna_110, Lemanaghan Stream_010, Derrycooly

		Stream_010, Pollagh Stream_010, Boora_010 and Boora_020 WFD river sub-basins). Any development upstream of these sub-basins will have no potential to result in cumulative effects with the Proposed Project due to the large flow volumes in the Brosna River. › A small area in the northwest of the Proposed Project site is located in the Shannon[Lower]_ SC_030 sub-catchment and the Blackwater (Shannonbridge)_010 WFD river sub-basin. Whilst there is no outfall from the bog with this WFD river sub-basin, it has been included in the cumulative study area for the purposes of a conservative assessment. › A small area in the north of the Proposed Project site is located in the Shannon[Lower]_SC_010 sub-catchment and the Boor_020 WFD river sub-basin. There is 1 no. surface water discharge point (SW22D) from the bog within this river sub-basin. This river sub-basin has also been included in the cumulative study area.

6.5.2.1 Other Wind Farm Projects

For the purposes of this cumulative assessment, existing, permitted and proposed wind farms within a 25-kilometre radius of the Proposed Project area are listed below in Table 6-21. In total, 9 no. applications relating to wind energy were identified within 25km of the Proposed Wind Farm. Each project is considered in further detail in the sections below.

Table 6-22 Wind farm projects within 25km of the Proposed Project

Wind Farm	Planning Ref.	Planning Status	No. of Turbines	Distance (turbine to turbine)	County
Bellair Wind Farm	N/A	Proposed	N/A	2.73km*	Offaly
Leabeg Wind Farm	10130	Existing	2	6.25km	Offaly
Lea Mor Single Turbine	OCC24/60326; ACP 321244	Permitted	1	6.75km	Offaly
Derrinlough Wind Farm	19.306706	Existing	21	10.68km	Offaly
Cloghan Wind Farm	14188, 19404	Existing	9	10.79km	Offaly
Umma More Wind Farm	25M.321595	Proposed	9	16.28km	Westmeath
Kilbeggan Turbine	22537	Permitted	1	17.08km	Westmeath
Cush Wind Farm	19.318816	Permitted	8	17.43km	Offaly
James Nally Single Turbine	114099	Existing	1	18.84km	Westmeath

**Only indicative location of site boundary available in the public domain*

6.5.2.1.1 *Leabeg Wind Farm (Existing)*

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the existing Leabeg Wind Farm was considered. The planning file was reviewed on the Offaly County

Council planning register, and the associated Environmental Impact Report was consulted. The existing Leabeg Wind Farm comprises two turbines located within improved agricultural grassland, with adjacent commercial forestry and cutover bog habitats, situated more than 6 km south of the Proposed Project. While it lies within the same hydrological sub-catchment, it is a small-scale operational development.

The ecological assessments did not identify significant residual effects as a result of the existing Leabeg Wind Farm, and appropriate mitigation measures were included to address any potential operational and decommissioning impacts. There are no significant residual effects predicted as a result of the Proposed Project. Given the distance between the projects, the small scale of the existing Leabeg Wind Farm, the lack of identified operational impacts, and the absence of significant residual effects associated with the Proposed Project, there is no potential for significant cumulative effects.

6.5.2.1.2 *Derrinlough Wind Farm (Existing)*

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the existing Derrinlough Wind Farm was considered. The planning file was reviewed on the An Coimisiún Pleanála planning register, and the associated EIAR and NIS were consulted. The existing Derrinlough Wind Farm comprises 21 turbines located within cutover bog over 10km southwest of the Proposed Project and lies partially within the same hydrological sub-catchment.

The ecological assessments did not identify significant residual effects, and appropriate mitigation measures were incorporated to address any potential operational and decommissioning impacts. No significant residual effects are predicted as a result of the Proposed Project. Given the separation distance between the two projects, the absence of identified operational impacts for the existing Derrinlough Wind Farm, and the lack of significant residual effects associated with the Proposed Project, there is no potential for significant cumulative effects.

6.5.2.1.3 *Cloghan Wind Farm (Existing)*

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the existing Cloghan Wind Farm was considered. The planning files for the original planning application and amendment application to alterations to turbine siting and dimensions were reviewed on the Offaly County Council planning register. The original EIS (and appended Ecological Impact Assessment Report) and the updated Ecological Impact Assessment Report were consulted. The existing Cloghan Wind Farm comprises nine turbines located within cutover bog habitat over 10 km southwest of the Proposed Project and lies within the same hydrological sub-catchment.

The ecological assessments did not identify significant residual effects, and appropriate mitigation measures were incorporated to address any potential operational and decommissioning impacts. Given the separation distance between the two projects, the absence of identified operational impacts for the existing Cloghan Wind Farm, and the lack of significant residual effects associated with the Proposed Project, there is no potential for significant cumulative effects

6.5.2.1.4 *Cush Wind Farm (Permitted)*

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the permitted Cush Wind Farm was considered. The planning file was reviewed on the An Coimisiún Pleanála planning register, and the associated EIAR and NIS were consulted. The permitted Cush Wind Farm comprises eight turbines located in cutover bog and woodland habitat over 17 km southwest of the Proposed Project within a separate hydrological sub-catchment.

The EIAR did not identify significant residual effects as a result of the permitted Cush Wind Farm, and appropriate mitigation measures were incorporated to address any potential impacts. No significant residual effects are predicted for the Proposed Project. Given the substantial distance between both

sites, the separate hydrological catchment, and the absence of predicted significant effects for either development, there is no potential for significant cumulative effects.

6.5.2.1.5 Bellair Wind Farm (Proposed)

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the proposed Bellair Wind Farm was considered. While the project has not yet been submitted for planning, available mapping and aerial imagery were consulted. The proposed Bellair Wind Farm is located in cutover bog over 2.5km north of the Proposed Project. It lies within the same hydrological sub-catchment and discharges to the River Shannon upstream of the Proposed Project.

As no EIAR or NIS is yet available, detailed potential impacts cannot be characterised; however, any future proposal would be subject to its own environmental assessment and mitigation requirements. Based on aerial imagery of the site, the proposed Bellair Wind Farm is located within bare cutover bog with limited ecological value. Given the early stage of the proposed Bellair Wind Farm project, the absence of design detail, the lack of significant residual effects predicted for the Proposed Project, there is no potential for significant cumulative effects at this time.

6.5.2.1.6 Umma More Wind Farm (Proposed)

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the proposed Umma More Wind Farm was considered. The planning file was reviewed on the An Coimisiún Pleanála planning register, and the associated EIAR and NIS were consulted. The proposed development comprises nine turbines located in agricultural land and commercial forestry over 16 km north of the Proposed Project within a separate hydrological sub-catchment.

The ecological assessments did not identify significant residual effects as a result of the proposed Umma More Wind Farm, and appropriate mitigation measures were incorporated to address any potential impacts. No significant residual effects are predicted as a result of the Proposed Project. Given the substantial distance between the projects, their location in separate catchments, and the absence of identified residual impacts, there is no potential for significant cumulative effects.

6.5.2.1.7 Single Turbines

Lea More Turbine (Permitted)

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the permitted Lea Mor single turbine was considered. The planning file was reviewed on the Offaly County Council and An Coimisiún Pleanála planning registers, and the associated Ecological Impact Assessment Report and AASR were consulted. The permitted Lea Mor single turbine is located within arable land over 6.5 km south of the Proposed Project and lies within the same hydrological sub-catchment.

The Ecological Impact Assessment did not identify significant residual effects as a result of Lea More Turbine and appropriate mitigation measures were incorporated to address any potential operational and decommissioning impacts incorporated. No significant residual effects are predicted as a result of the Proposed Project. Given the separation distance, the very small scale of the permitted Lea Mor single turbine, and the absence of identified significant impacts, there is no potential for significant cumulative effects.

Kilbeggan Turbine (Permitted)

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the permitted Kilbeggan single turbine was considered. The planning file was reviewed on the Westmeath County Council planning register, and the associated Ecological Impact Assessment Report

and AASR were consulted. The permitted Kilbeggan single turbine is located within agricultural land over 17 km east of the Proposed Project and lies in the same hydrological sub-catchment.

The ecological assessments did not identify significant residual effects as a result of the permitted Kilbeggan single turbine, and appropriate mitigation measures were incorporated to address any potential impacts. No significant residual effects are predicted for the Proposed Project. Given the large separation distance, the very small scale of the single turbine, and the absence of identified impacts, there is no potential for significant cumulative effects.

James Nally Turbine (Existing)

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the existing James Nally single turbine was considered. The planning file was reviewed on the Westmeath County Council planning register, and no ecological information was available. The existing James Nally single turbine is located within agricultural land over 18 km north of the Proposed Project and within a separate hydrological catchment.

Given the very small scale of the development that is currently in operation, the considerable distance from the Proposed Project, and the absence of significant residual effects associated with the Proposed Project, there is no potential for significant cumulative effects.

6.5.2.2 Other EIA or Large-scale Projects

A number of other large-scale projects (excluding wind farms) were identified within 10 km of the Proposed Project. These include the following:

- ACP Ref. 304056 - 38 kV underground electricity connection from the permitted Cloghan Wind Farm to Derrycarney substation (Galetech Energy Developments Cloghan Ltd; PL2/19/555).
- ACP Ref. 304951 - Extraction at Clonfinlough Quarry (Dermot Nally Stone Ltd; ABP-304951-19).
- ACP Ref. 323676 – Substitute Consent under the provisions of Section 177E of the Planning and Development Act 2000 (as amended) for peat extraction and ancillary works (Lemanaghan Bog, Co. Offaly).
- ACP Ref. 306246 – Application for leave to apply for substitute consent under section 177C of the Planning and Development Act 2000 (as amended) to regularise the planning status of Bord na Móna's historic peat extraction (and ancillary works) on the milled peat production bogs (Boora Bog Group, Co. Offaly).
- ACP Ref. 306490 – Application for leave to apply for substitute consent under section 177C of the Planning and Development Act 2000 (as amended) to regularise the planning status of Bord na Móna's historic peat extraction (and ancillary works) on the milled peat production bogs (Blackwater Bog Group, Co. Offaly).
- ACP Ref. 316303 – Development of a Solar Photovoltaic (PV) Energy Development (Lumcloon and surrounding townlands, Co. Offaly).
- ACP Ref. 300919 – The extraction of material over an area of 0.95 hectares and planning permission for the restoration to agricultural use of the same area (Clonaderg, Ballinahown, Co. Offaly).
- ACP Ref. 321244 – Construction of wind energy converter on a tower and all associated development works (Rin, Ferbane, Co. Offaly).
- ACP Ref. 322004 – Construction of two independent power provider (IPP) buildings, associated infrastructure and all associated works (Lumcloon, Cloghan, Co. Offaly).
- ACP Ref. 247027 – Upgrade Birr Water Supply Scheme comprising refurbishment of 2-storey masonry WTP building, demolition of open sludge lagoon, construction of new WTP process building and new tank structures (Seefin, Birr, Co. Offaly).
- (PL Ref: 25/60014) Midlands Trail Network (MTN)

A full list of projects is included in Appendix 2-3. Industrial peat extraction activities associated with Lemanaghan Bog ceased in June 2020, therefore there is no potential for ongoing or future cumulative effects arising from those projects. Given the lack of significant residual effects predicted as a result of the Proposed Project, and considering the nature, scale and locations of the above projects relative to the Proposed Project, no potential for significant cumulative effects in combination with these projects is predicted.

6.5.2.3 Existing Habitats and Land Uses

The potential for the Proposed Project to result in a cumulative loss or deterioration of habitats, or impact on the KER species identified, was considered in relation to the existing land uses in the area. Land use in the wider area is dominated by agricultural pasture, as well as commercial forestry, turbary activity and uncut raised bog habitats.

The Proposed Project is located primarily on degraded cutover peatland (PB4). There are no Annex I peatlands, heath or grasslands within the Proposed Project site. While a very small proportion of revegetated cutover bog habitat will be lost due to proposed wind farm infrastructure, the extent of loss is limited relative to the size of the Proposed Project site and the similar habitat in the surrounding landscape. Any habitat loss will be offset through the measures set out in the BMEP (Appendix 6-5), which provides for targeted biodiversity enhancement within the Proposed Project Site, including measures to increase high value habitat areas and support key faunal species.

The existing land uses identified above do not interact with the Proposed Project in a manner that would increase the magnitude or extent of predicted effects on habitats or species. Given the nature of the receiving environment, the limited extent of habitat loss, and the enhancement measures committed to under the BMEP, the Proposed Project will not contribute to any significant cumulative deterioration of habitats at a local or wider landscape scale. Accordingly, no significant cumulative effects with existing land uses are predicted.

6.5.3 Decommissioning and Rehabilitation Plan

Lemanaghan Bog is subject to a Draft Cutaway Decommissioning and Rehabilitation Plan (Draft Rehabilitation Plan) prepared by Bord na Móna in accordance with the requirements of the EPA Integrated Pollution Control (IPC) Licence (P0500-01) (Section 2.10.2.3 of Chapter 2 and included in Appendix 2-4). The Draft Rehabilitation Plan will be implemented independently of the Proposed Project, irrespective of whether the Proposed Project proceeds.

The objectives of the Draft Rehabilitation Plan are to achieve environmental stabilisation of cutaway peatlands, including the management of drainage, reduction of suspended solids and protection of receiving water quality. While the rehabilitation measures are not specifically designed as biodiversity enhancement, their implementation is expected to result in gradual changes in ecological conditions over time through rewetting and natural revegetation.

The potential for cumulative effects between the Proposed Project and the implementation of the Draft Rehabilitation Plan has been assessed for all relevant KERs identified in this chapter. Potential interaction pathways considered include habitat condition and availability, hydrology and surface water quality, and indirect effects on downstream ecological receptors.

The Proposed Project has been designed to be compatible with the planned rehabilitation of Lemanaghan Bog. There is no overlap in activities or impact pathways that would give rise to significant cumulative effects on terrestrial habitats or fauna.

In relation to aquatic habitats and species, both the Proposed Project and the Draft Rehabilitation Plan include measures to protect surface water quality. These measures are complementary and are not

predicted to interact in a manner that would result in adverse cumulative effects on receiving watercourses or downstream designated sites.

Overall, when assessed in combination, the Proposed Project and the Draft Rehabilitation Plan are not predicted to give rise to significant cumulative effects on biodiversity at any geographic scale. The rehabilitation of cutaway peatlands is expected to contribute positively to the wider ecological context over the longer term, independent of the Proposed Project.

Irrespective of any further development on Lemanaghan Bog, within which the majority of the Proposed Project site is located, the measures outlined in the Draft Rehabilitation Plan (Appendix 2-4) will be implemented by BnM in agreement with the EPA, per BnM's IPC Licence Obligations. The measures outlined in the Draft Rehabilitation Plan will also be implemented should the Proposed Project be developed.

6.5.4 Peatland Climate Action Scheme

In 2023 the Peatland Climate Action Scheme (PCAS) selected Ballaghurt and Glebe Bogs located approximately 4.4km west of the Proposed Wind Farm at its closest point (i.e., T01). In 2024, PCAS has selected Curraghalassa Bog and Derrynagun bog which are adjacent to the Proposed Project site. These two areas are on the southern side of the R436 road which connects Ferbane, Co. Offaly to Ballycumber, Co. Offaly. The two sections include an area of drained high bog, Curraghalassa Bog, located 65m south of the site and a larger section of cutaway bog, Derrynagun Bog, located 105m south of the site.

This form of enhanced peatland rehabilitation, which is above and beyond what is required under IPC license, has also been successfully implemented at the recently constructed Cloncreen Wind Farm. To date, approximately 20,955ha of peatland has been rehabilitated under the PCAS[13]. PCAS is supported by Government through the Climate Action Fund and Ireland's National Recovery and Resilience Plan administered by the Department of Environment, Climate and Communications (DECC). Please see https://www.bnmpcas.ie/ for details. The NPWS acts as the Scheme regulator and there is ongoing engagement with the EPA. This scheme is separate to the IPC licence requirements and does not form part of the Proposed Project application.

PCAS involves peatland rehabilitation measures including rewetting and revegetation which are intended to restore ecological function to degraded peatlands. These activities do not introduce hydrological, disturbance or habitat loss pathways that would interact with the Proposed Project in a manner that could result in significant negative cumulative effects on habitats or fauna.

6.5.5 Conclusion of Assessment of Cumulative Effects

The residual construction, operational and decommissioning impacts of the Proposed Project are considered cumulatively with other plans and projects as described above. Particular focus has been placed on those plans and projects that are in closest proximity to the Proposed Project and those that could be potentially affected via downstream surface water.

Following the detailed surveys undertaken and impact assessment provided in Section 6.4, it is concluded that there will be no significant residual effects on biodiversity. The other permitted, proposed, and/or existing wind farms in the area were considered cumulatively and the Proposed Project has been deliberately designed to minimise the effects on biodiversity. The Proposed Project will result in a loss of approximately 60.8 ha of habitats. The majority of this loss (approximately 50.6 ha) comprises bare cutover bog (which is heavily degraded through extensive drainage and former peat extraction activities), which is of low ecological value. The remainder of the habitat loss includes

[13] https://www.bnmpcas.ie/news-and-updates/

approximately 3.27 ha of revegetating bog and 1.02 ha of immature woodland. This is a very small proportion of the overall quantum of habitats within the site of the Proposed Project and does not represent a significant loss of peatland or woodland habitats. In addition, the Proposed Project includes enhancement in the form of habitat management and rehabilitation that will protect and enhance a far greater area that that which will be lost. This is fully described in Appended 6-6. As such, there is no potential for the Proposed Project to contribute to any significant cumulative habitat loss when considered in combination with any other plans and projects.

The potential for the Proposed Project to contribute to a cumulative effect on water quality in the Shannon catchment was considered in this chapter and also in Chapter 9 of this EIAR. Following detailed surveys, the watercourses on the site were assessed to be of low ecological significance, with the watercourses becoming increasingly more ecologically sensitive further downstream. The Proposed Project includes a range of measures that are in place to prevent any water pollution or hydrological effects outside the Proposed Project development footprint. The implementation of these measures ensures that there is no potential for significant cumulative effects on any downstream receptors, whether the Proposed Project is considered on its own or in combination with other plans or projects.

No significant effects as a result of the Proposed Project in relation to disturbance, displacement or mortality of faunal species has been identified. Furthermore, there is no identifiable pathway through which the Proposed Project could interact with other plans or projects to give rise to cumulative effects on faunal species. Therefore, there is no potential for the Proposed Project to contribute to any cumulative effect in this regard.

The Proposed Project will not result in any significant residual effects on biodiversity and will not contribute to any cumulative effect 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 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 Proposed Project.

6.6 Conclusion

Following consideration of the residual effects (post mitigation) it is concluded that the Proposed Project will not result in any significant effects on any of the identified KERs. No significant effects on receptors of International, National, County or Local Importance were identified.

The potential for effects on the European Designated Sites is fully described in the Appropriate Assessment Screening report and Natura Impact Statement that accompanies this application. The NIS concludes that in view of best scientific knowledge and on the basis of objective information, the Proposed Project either individually or in combination with other plans or projects, is not likely to have significant effects on the European Sites that were assessed as part Appropriate Assessment process. Following the implementation of mitigation, no potential for significant effects on Nationally designated sites downstream, of the site were identified.

Provided that the Proposed Project is constructed and operated in accordance with the design, best practice and mitigation measures that are described within this application, significant individual or cumulative effects on ecology are not anticipated at the international, national, county or local scales or on any of the identified KERs.

6.7 EIA Classification Summary

Please see the below table for a summary of all identified impacts for the Proposed Project relating to biodiversity.

Table 6-23 Impact Assessment Classification Summary

Topic	Pre-Mitigation Effect	Mitigation Section Reference	Residual Effect	Significance
Construction Phase				
European Sites	Effects on European Sites are addressed in the NIS. The NIS finds that it can be objectively concluded that the Proposed Project, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site.			
Nationally Designated Sites	Short-term, Negative, Not Significant any geographic scale	Section 6.4.5 Section 6.4.2.1.1	No significant residual effect at any geographic scale	Not Significant
Aquatic Habitats and Related Species	Short-term, Negative, Significant at the local scale	Section 6.4.2.1.1	No significant residual effect at any geographic scale	Not Significant
Uncut Raised Bog	Permanent, Negative, Not significant at any geographic scale	Section 6.4.2.1.2	Permanent, Long-term, Not Significant at any geographic scale	Not Significant
Cutover Bog Associated Secondary Habitats	Permanent, Negative, Not Significant at any geographic scale	Section 6.4.2.1.3	Long-term, Positive at the local scale	Not Significant
Otter	**Habitat Degradation** Short-term, Negative, Significant at the local scale **Disturbance** Temporary, Negative, Not Significant at any geographic scale	Section 6.4.2.2.1	No significant residual effect at any geographic scale	Not Significant
Badger	Temporary, Negative, Not Significant at any geographic scale	Section 6.4.2.2.2	No significant residual effect at any geographic scale	Not Significant
Bats	Short-term, Negative, Not Significant at any geographic scale	Section 6.4.2.2.3	No significant residual effect at any geographic scale	Not Significant

Marsh Fritillary	**Habitat Loss** Permanent, Negative, Not Significant at any geographic scale **Direct Effects** Permanent, Negative, Not Significant at any geographic scale	Section 6.4.2.2.4	No significant residual effect at any geographic scale	Not Significant
Operational Phase				
European Sites	Effects on European Sites are addressed in the NIS. The NIS finds that it can be objectively concluded that the Proposed Project, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site.			
Nationally Designated Sites	Short-term, Negative, Not Significant at any geographic scale	Section 6.4.5 Section 6.4.3.1.1	No significant residual effect at any geographic scale	Not Significant
Aquatic Habitats and Related Species	Short-term, Negative, Not Significant at any geographic scale	6.4.3.1.1	No significant residual effect at any geographic scale	Not Significant
Bats	Long-term, Negative, Significant at the local scale	6.4.3.2.1	No significant residual effect at any geographic scale	Not Significant
Decommissioning Phase				
Biodiversity	The potential impacts associated with decommissioning of the Proposed Project will be similar to those associated with construction but of a reduced magnitude, due to the reduced scale of the proposed decommissioning works in comparison to construction phase works.	Section 6.4.2	No significant residual effect at any geographic scale	Not Significant