7. BIODIVERSITY

This Chapter of the Environmental Impact Assessment Report (EIAR), prepared by the ecology team at TOBIN Consulting Engineers (TOBIN hereafter) on behalf of Bord na Móna Powergen Limited, presents the findings of an assessment of significant effects on biodiversity of the proposed Derryadd Wind Farm and associated supporting infrastructure, including all works required along the designated transportation route to be used for the delivery of wind turbine components to the wind farm.

7.1 INTRODUCTION

The proposed Derryadd Wind Farm is located at lands at the Derryaroge, Derryadd, and Lough Bannow bogs in County Longford. These bogs form part of the Mountdillon Bog Group. The lands at the bogs encompassing the proposed Derryadd Wind Farm and associated infrastructure are collectively referred to herein as the "proposed wind farm site". The layout and infrastructure at the proposed wind farm site is shown in Figure 7.1.

The proposed wind farm site will comprise 22 no. wind turbines with a top of foundation to blade tip height of 190 m. The proposed blade rotor diameter will be 165 m with a corresponding hub height of 107.5 m. All turbines and ancillary infrastructure will be located within the proposed wind farm site. The proposed wind farm site will include 27.5 km of access roads, a 110 kV substation, a 16 MW battery energy storage facility (BESS), two meteorological masts, four borrow pits, four temporary construction compounds, underground cabling, peat deposition areas, road modifications, 7.5 km of amenity tracks, and three amenity car parks. A 10-year planning permission is sought, with a 30-year operational lifespan. The full project description is detailed in Section 3.1. of Chapter 3 – Description of the Proposed Development.

The designated transportation route, including any lands required along the route for modifications/ upgrade are collectively referred to herein as the Turbine Delivery Route (TDR). The road network of the TDR extends from the N6 Junction 12 to the proposed wind farm site.

Turbine components for the wind farm development will be delivered to either Galway Port or Foynes Port, depending on logistical and scheduling considerations. Both ports are capable of accommodating the large vessels typically used for transporting wind turbine components and possess the necessary infrastructure to handle oversized and heavy cargo. From the selected port, components will be transported along a proposed transportation route to the wind farm site. While the initial sections of the TDRs differ depending on the port of origin, both routes ultimately follow a common section of the road network extending from the N6 Eastbound Slip Road at Athlone to the proposed wind farm site, along which upgrade or modification works are required at specific Points of Interest (POIs). The proposed POIs are shown in Figure 7.2. Five locations (POI1 to POI5) along this require temporary accommodation works in order to facilitate the delivery of turbine components to the proposed wind farm site. These POI are shown are as follows:

- POI 1: N6 Eastbound Slip Road;
- POI 2: N6/N61 Roundabout at Athlone;
- POI 3: N61/N63 Roundabout at Roscommon;

- POI 4: N63 Roscommon Arts Centre Roundabout; and,
- POI 5: N61/N63 Roundabout, Northeast of Roscommon

Proposed work at the POIs includes the removal of road signs, trees, lighting columns, and utility posts, and some vegetation clearance. Traffic splitter islands at POIs will be adapted with load-bearing surfaces, and the ground levels lowered. It should be noted that POI6 is at the main entrance to the proposed wind farm site and is located within the red line boundary of the development.

All works at the proposed wind farm site and at POIs are collectively referred to herein as the "proposed development".

Specifically, this Chapter provides an examination of effects and impacts of the proposed development on terrestrial and aquatic flora, habitats, and fauna, including both volant and non-volant mammals. Chapter 8 (Ornithology) of the EIAR presents the findings of an assessment of effects and impacts of the proposed development on avian receptors.

The application for the proposed development is also supported by an Appropriate Assessment Screening Report (AASR) and a Natura Impact Statement (NIS) that considers potential impacts of the proposed development on European sites including Special Areas of Conservation (SACs) designated under Habitat Directive, and Special Protection Areas (SPAs) designated under the Birds Directive.

Specifically, the purpose of this Chapter is to:

- describe the baseline biodiversity environment of the proposed wind farm site (i.e. lands encompassing the Derryadd Wind Farm and associated supporting infrastructure) and at POIs of the TDR through desktop data review, scoping and consultation, and a suite of directed ecological field survey.
- determine the ecological value and sensitivity of the identified ecological receptors at the proposed wind farm site and at POIs.
- evaluate the potential direct, indirect, and secondary effects on significant ecological receptors and assess the significance of these effects, which may arise from the proposed development during the construction, operation, and decommissioning phases of the proposed development.
- describe mitigation measures to avoid and/or reduce the identified effects and identify any residual effects after implementation of mitigation.
- evaluate residual effect remaining after implementation of mitigation measures.

The remainder of this Chapter is structured as follows:

- **Section 7.2 Statement of Authority** – provides an overview of the credentials, qualifications, and authority of the team responsible for preparing this Chapter. This statement also serves to confirm that the assessments and surveys have been conducted by competent professionals in compliance with relevant legal and regulatory standards.
- **Section 7.3 Assessment Methodology and Relevant Legislation** – provides an overview of the legislation, guidance and policy applicable. The section serves to highlight key elements that provide the framework for assessments undertaken in this Chapter,

ensuring adherence to current best practices for the assessment of impacts and effects on biodiversity.

- **Section 7.4 Activities Associated with the Proposed Development** –outlines the key activities and works involved in the construction, operation, and decommissioning phases of the proposed wind farm development, providing a comprehensive breakdown of each phase. The construction phase involves site preparation, infrastructure installation, turbine foundation construction, cabling, and setup of access tracks and construction compounds, and works at TDR POIs which comprise temporary modifications to road infrastructure and vegetation clearance. The operation phase focuses on wind farm performance monitoring, routine maintenance, and ongoing environmental management to ensure safe and efficient wind farm function. The decommissioning phase entails turbine removal, site restoration, and selective retention of key infrastructure like roads and substations for future use or grid integration.
- **Section 7.5 Methodology** – provides an overview of the desk study, scoping and consultations, and multidisciplinary walkover field surveys used to gather ecological information of the proposed wind farm site and at POIs to establish baseline ecological conditions.
- **Section 7.6 Methodology for Assessment of Impacts and Effects** – describes the methodology used to identify ecological important biodiversity receptors (termed Key Ecological Receptor [KERs]) of relevance to the proposed development and outlines the approach for assessing potential significant effects to these receptors.
- **Section 7.7 Methodology for Ecological Baseline -** The following sections outline the methodologies employed to gather information on the baseline ecological conditions.
- **Section 7.8 Existing Baseline – Proposed Wind Farm Site** – details the findings of the desk study and multidisciplinary walkover field surveys used to establish the ecological baseline against which the assessment of effects and impacts is conducted.
- **Section 7.9 Existing Baseline – Turbine Delivery Route Point of Interest** – similar to Section 7.8, this section details the desk study and multidisciplinary walkover field surveys performed to establish the ecological baseline for the POIs of the TDR. These findings are used to assess the potential effects and impacts on the environment along the delivery route.
- **Section 7.10 Key Ecological Receptors** – present a summary of the KERs identified that could potentially be affected by the proposed development.
- **Section 7.11 Ecological Impact Assessment** - presents an assessment of likely significant effects on KERs during the construction, operation and decommissioning phases of the proposed development.

  This section also presents an assessment of the projected environmental conditions if the proposed development was not carried out (i.e. the 'Do-Nothing' scenario). In this scenario the assessment considers the natural progression of environmental conditions at the proposed wind farm site in the absence of the proposed wind farm.
- **Section 7.12 Mitigation Measures** - outlines both general and specific mitigation measures aimed at reducing or, where possible, eliminating the risk of significant effects on ecological receptors.
- **Section 7.13 Residual Effects** – present an assessment of effects to biodiversity that persist after mitigation measures proposed have been implemented.

- **Section 7.11.5 Cumulative and In-combination Effects** - examines potential cumulative and in-combination effects, evaluating how the proposed development may interact with other ongoing or planned developments in the area, potentially amplifying or mitigating effects to biodiversity.
- **Section 7.14 Enhancement Measures** – details measures that will be undertaken as part of the proposed development to enhance biodiversity at the proposed wind farm site.
- **Section 7.15 Conclusion** – summarises the main findings of the assessment.

Table 7.1 below defines some terms commonly used in this Chapter.

Table 7.1: Terms and definitions

Term	Definition
Proposed Wind Farm Site	The lands at Derryaroge, Derryadd, and Lough Bannow bogs encompassing the wind farm and associated infrastructure.
Turbine Delivery Route (TDR)	The designated transportation route, including any lands required along the route for modification/ upgrade of the route.
Points of Interest (POIs)	Locations along the TDR where modification/ upgrade works are proposed.
Proposed Development	All works at the proposed wind farm site and at POIs.
Key Ecological Receptors (KERs)	Species or habitats of significant ecological importance that may be affected by likely significant effects from the proposed development are selected for detailed evaluation. Ecological importance is defined in accordance with the National Roads Authority (NRA) Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009a). These guidelines are referred to herein as the 'NRA EcIA Guidelines'.
Zone of Influence for KERs	Refers to the zone within which potential effects and impact to KERs (habitats and species) may occur. The Zone of Influence differ depending on the sensitivities of particular KER and were assigned in accordance with best available guidance and through adoption of a precautionary approach.

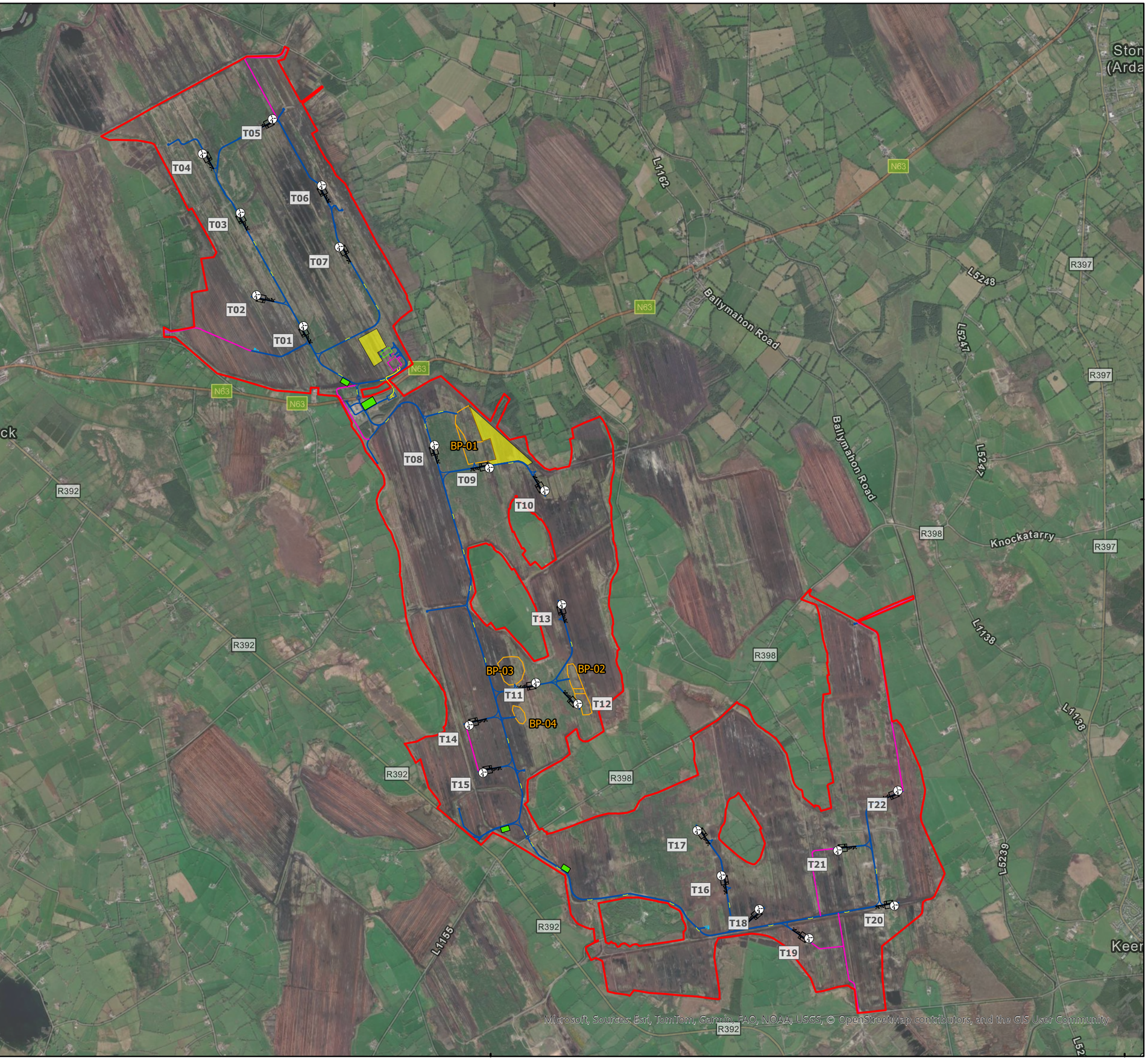
7°54'0"W

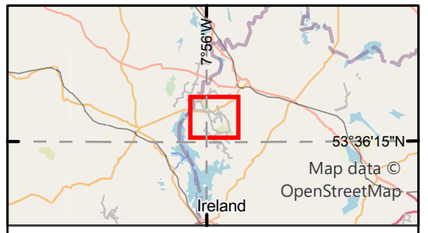
53°40'30"N

768000

606000

612000





Legend

- Proposed wind farm site
- Turbine Layout

Site Layout

- 110kV Grid Connection
- Battery Storage EBOP Compound
- Passing Bay
- Crane Harstanding
- Amenity Carpark
- Amenity Track
- Internal Access Road
- Substation Telecom Tower
- Borrow Pit
- Met Mast
- Deposition Area
- Temporary Construction Compounds

0 1 2
Kilometres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
A	09/04/2025	First issue	S.P	I.H

Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7-1 Proposed Wind Farm Site Layout

Scale @ A3:	1:35,000	
Prepared by:	Checked by:	Date:
S.Pezzetta	I.Heanue	April 2025

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Map Ref: 11399-123-LAY.INFR-P.APP.BO-TOB-A

Draft: A

8°12'0"W 8°0'0"W 7°48'0"W

53°37'0"N 53°30'0"N

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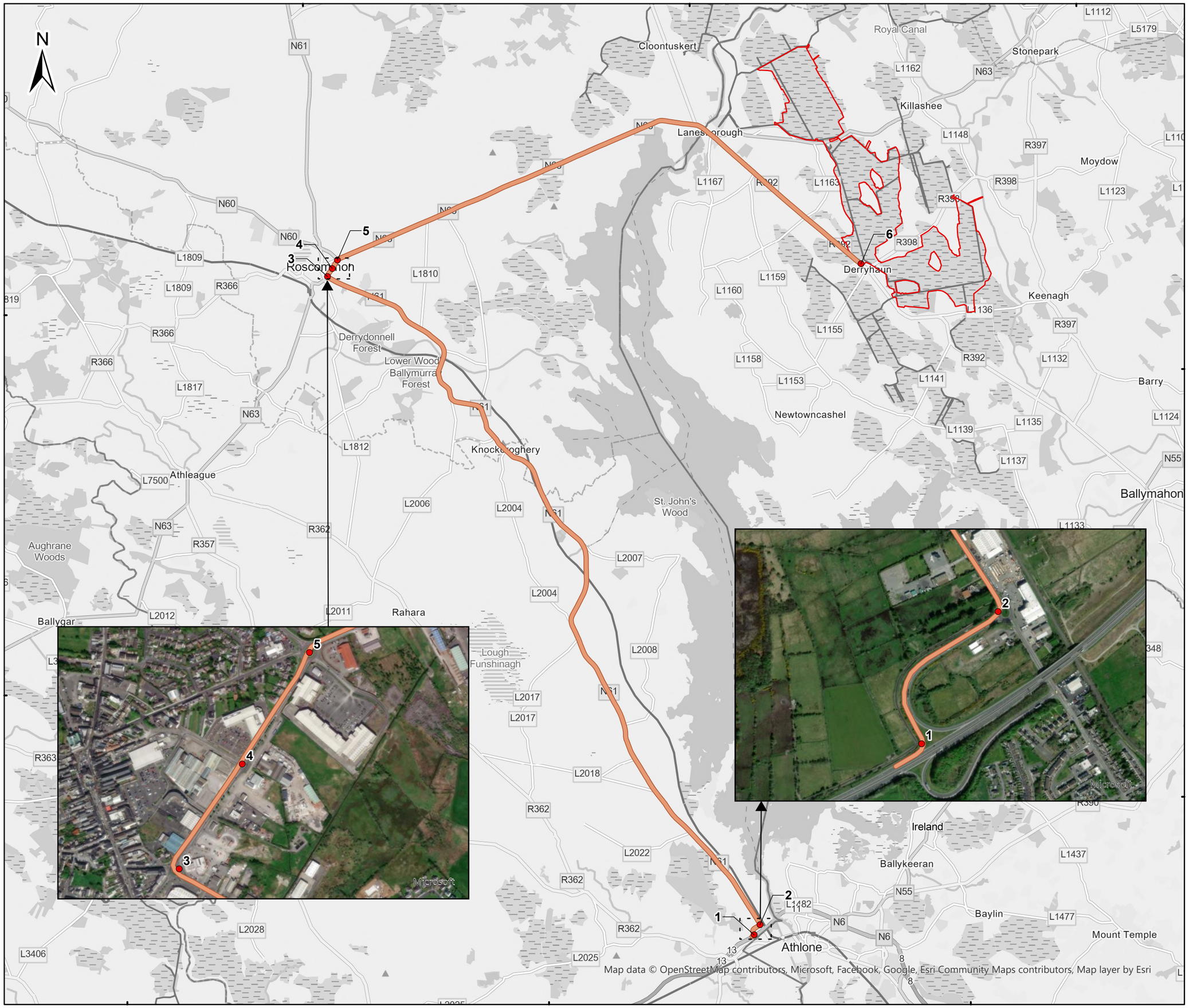
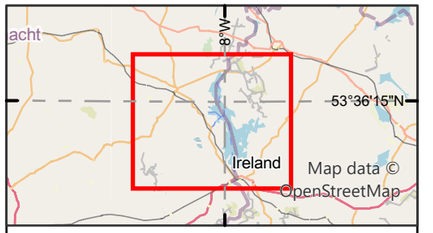
580800 595200 609600





Legend

- Proposed wind farm site
- Turbine Delivery Route POI
- Turbine Delivery Route

0 2.5 5
Kilometers

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
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4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

A	10/04/2025	First issue	S.P	I.H
Rev	Date	Description	By	Chkd

Client:

Bord na Móna

Project:

Derryadd Wind Farm

Title:

Figure 7.2:
POI's for the Proposed TDR

Scale @ A3:	1:120,000	
Prepared by:	Checked by:	Date:
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Map Ref: 11399-128-POIs-P.APP.BO-TOB-A

Draft: A

7.2 STATEMENT OF AUTHORITY

This Chapter was co-authored by Senior Ecologists Joao Martins (B.E. (Hons), M.Sc.) and Dr. James Forde (B.Sc. (Hons), M.Sc., Ph.D., MCIEEM), and senior reviewed by Áine Sands (B.Sc. (Hons), MCIEEM).

Joao is a Senior Ecologist in TOBIN's Environment and Planning (E&P) division and holds a B.E. (Hons) in Environmental and Natural Resources Engineering and an M.Sc. in Environmental Engineering (Freshwater ecology). Joao has over 14 years' experience in freshwater ecology, associated with monitoring for the EU Water Framework Directive (e.g. macroinvertebrates, habitat/hydromorphology) and projects of scientific nature, in Germany, Portugal and Ireland. He has worked for over 7 years in environmental consultancy, developing his expertise in Appropriate Assessment (AA), Ecological Impact Assessments (EcIA) and Environmental Impact Assessment Reports (EIAR). Joao has also conducted and coordinated bird surveys (e.g. I-WeBS, Vantage Point (VP), Countryside Bird Surveys (CBS) Woodcock (*Scolopax rusticola*) surveys etc.), botanical and habitat surveys, mammal surveys (bats and non-volant) and inland fisheries (electrofishing).

James is a Senior Ecologist and Technical Director of the TOBIN E&P division. James holds a B.Sc. (hons) and M.Sc. degrees in marine ecology, and a Ph.D. in ecology. James is also a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). James has almost 20 years' academic and environmental consultancy experience. He has an extensive understanding of ecology and appreciation of the objectives and mechanisms of national and international environmental legislation and policy. He has significant experience in preparing and reviewing ecological reports including Screenings for AA, Natura Impact Statement (NIS), EcIA reporting, and EIAR. James has provided strategic technical and environmental advice for developments across a wide range of sectors, including onshore and offshore renewables, telecommunications, flood relief schemes, port and harbour developments, energy generation and transmission.

Áine is Senior Ecologist in TOBIN's E&P division. She holds an Honours Degree in Applied Ecology and has over 10 years post-graduate experience in ecology and environmental consultancy and also holds a full CIEEM Membership. Áine has predominantly been involved in large public and private infrastructure projects which she has prepared numerous Screenings for AA, NIS and EcIA reports. Áine has a strong understanding of National and European legislation and is cognisant of relevant rulings by the Court of Justice of the European Union (CJEU) associated with biodiversity and AA. She also has experience in undertaking ecological surveys for protected habitats and species and is confidently able to analyse the data to inform ecological assessments.

TOBIN ecologists responsible for undertaking the surveys used to inform this Chapter were:

- Úna Butler (B.A. (Hons) MSc) - multidisciplinary walkover surveys
- Ria Aherne (BSc) - multidisciplinary walkover surveys
- Sinead O'Reilly (BSc MSc) - river habitat survey

Specialist survey and assessments were also provided by:

- Dr. Tina Aughney (B.Sc. (Hons) Ph.D.) (Bat Eco Services) - Bat surveys and assessment
- Adam Mantell (Arctia Ecology) - Whorl Snail survey

- Alexis FitzGerald (FitzGerald Ecology) - Habitat survey at the Derryaroge Bog
- John Browne (Stillwaters Consultancy) - Electrofishing and macroinvertebrate survey
- Nicholas O'Dwyer Ltd – Flood risk assessment

7.3 Assessment Methodology and Relevant Legislation

The assessment methodology in this Chapter follows the NRA 'Guidelines for Assessment of Ecological Impacts of National Road Schemes Rev 2' (NRA, 2009a) (referred to herein as the NRA EcIA Guidelines), with survey methodologies based on the NRA 'Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes' (NRA, 2009b) (referred to herein as the NRA Survey Guidelines). While these guidelines relate to road schemes, these standard guidelines are recognised methodologies that ensure good practice regardless of the development type.

Other guidance consulted in the preparation of this Chapter provided scope, structure and content of the assessment include CIEEM 'Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater and Coastal' (CIEEM, 2018, updated 2024) (herein referred to as the CIEEM EcIA Guidelines) and EPA 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (EIAR) (EPA, 2022) (herein referred to as the EPA EIA Guidelines).

Other guidance on survey techniques consulted included:

- Best Practice Guidance for Habitat Survey and Mapping. The Heritage Council (Smith *et al.*, 2011).
- A Guide to Habitats in Ireland. The Heritage Council (Fossitt, 2000).
- Birds of Conservation Concern in Ireland 2020-2026 (Gilbert *et al.,* 2021).
- Assessing Connectivity with Special Protection Areas (SPAs) Scottish Natural Heritage (SNH 2016).

In addition to the national and international legislation outlined in Chapter 1 (Introduction) of this EIAR, including the EIA Directive 2011/92/EU (as amended by 2014/52/EU) and the EU (Environmental Impact Assessment and Habitats) (No. 2) Regulations 2015 (S.I. No. 320 of 2015), this Chapter has been prepared in accordance with the following key pieces legislation applicable to habitats, fauna, and water quality in Ireland:

- European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011), as amended.
- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (commonly referred to as the Habitats Directive).
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (commonly referred to as the Birds Directive),
- The EU Water Framework Directive (2000/60/EC),
- The Wildlife Acts 1976 (as amended), herein referred to as the Wildlife Acts.
- The Flora (Protection) Order 2022 (S.I. No. 235/2022).
- Relevant fisheries legislation up to, and including the Inland Fisheries Acts 1959-2017, as amended.

The following legislation applies with respect to non-native species:

- Regulation 49 and 50 of European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011).

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

- Relevant policies in Ireland's 4th National Biodiversity Action Plan 2023-2030 (NPWS, 2024).
- Objectives relevant to ecology and biodiversity in the Longford County Development Plan 2021-2027 (LCC, 2021).
- Objectives relevant to ecology and biodiversity in the Roscommon County Development Plan 2022-2028 (RCC, 2022).

7.4 Activities Associated with the Proposed Development

Detailed description of the activities associated with the proposed development are provided in Chapter 3 (Description of the Proposed Development) of this EIAR.

Key elements of the construction, operation, and decommissioning phases are listed in Section 7.4.1 through Section 7.4.3 below providing a comprehensive breakdown of the key activities and associated works for each phase of the proposed wind farm development. Table 7.2 below serves as a reference for understanding the key elements that will take place during the proposed development.

7.4.1 Construction Phase

- **Wind Turbines:** The construction of wind turbine foundations will involve excavation, soil replacement with granular fill, and pouring of concrete for pile/gravity/bored foundations as appropriate. Foundation types will be confirmed as part of the detailed design. Additionally, hardstands will be levelled, and compacted hardcore will be used.
- **Access Roads:** Internal site access roads will be constructed with excavation and granular fill, including drainage and geogrid/geotextile applications. Floating roads and amenity access tracks (3m wide, 7.5 km long) will be built for site access.
- **Borrow Pits:** Four borrow pits will be excavated, to extract usable stone material for construction purposes, with reprofiling and reseeding upon completion.
- **Peat Deposition Area**s: Two peat deposition areas (see Figure 3.1. in Chapter 3) are planned to manage surplus peat from wind farm construction. Where possible, peat will be reused for site restoration and ecological rehabilitation, supporting bog rewetting and habitat regeneration. Potential effects on biodiversity include habitat disturbance, altered hydrology, sediment runoff, and water pollution. To minimise these impacts, the deposition areas are designed with containment structures, drainage systems, and base reinforcement to ensure environmental stability and protection.
- **Battery Storage and Substation:** Battery storage areas will house 20 containers, each with a 2MW capacity. A substation will be constructed with soil stripping, excavation for foundations, and installation of infrastructure such as telecommunication masts and fencing.

- **Underground Cabling and Grid Connection:** Trenches for 28 km of underground cabling will be dug, and horizontal directional drilling will be used to connect the masts to the substation.
- **Construction Compound and Security Cabins:** Temporary compounds and security cabins will be set up, providing storage for construction material, welfare facilities, and hazardous materials.
- **Points of Interests:** Proposed works at POIs comprise removal of road signs, utility posts, bollards, and lighting columns, as well as tree and vegetation clearance at various locations. Where required load-bearing surfaces will be installed, including at splitter islands. In some areas, ground levels will be lowered, and tree canopies will be trimmed to facilitate the required infrastructure adjustments.

7.4.2 Operation Phase

- **Monitoring & Inspections:** Regular performance assessments, remote monitoring, and onsite inspections to ensure efficiency and safety.
- **Maintenance:** Component repairs and replacements (e.g. blades, gearboxes, or electrical components). During the operational phase, it may be necessary to transport components along the TDR. In such cases, all related activities including modifications required at POIs will follow the procedures and protocols established during the construction phase. Any potential ecological impacts arising from transport activities or POI modifications are thoroughly assessed herein to ensure compliance with relevant regulations and to minimise ecological disruption.
- **Environmental Management:** Implementing biodiversity protection measures, habitat monitoring, and compliance with environmental regulations.

7.4.3 Decommissioning Phase

- **Wind Turbines and Foundations:** Upon decommissioning, wind turbines will be disassembled, and the parts will be sent offsite. Foundations will be covered with earth and reseeded.
- **Other elements of the overall development at the wind farm site:** battery storage units and met masts, will be fully decommissioned and removed from the site at the end of their operational life. This process will be carried out in accordance with established decommissioning procedures, ensuring that all equipment is safely dismantled, transported off-site, and either recycled or disposed of in an environmentally responsible manner. Any ground disturbance resulting from these activities will be restored to its original condition, or as required by relevant environmental and regulatory guidelines.
- **Internal Cabling:** underground cables in-situ
- **Internal Site Roads and Amenity Tracks:** Access roads and amenity tracks will remain in place for future use
- **Substation:** substation and all the associated transmission infrastructure i.e. underground cables and overhead lines will be retained as a permanent structure managed by EirGrid/ESB.

Table 7.2: Summary of Relevant Activities Associated with the Proposed Development

Phase	Element	Area		Summary of Key Activities
Construction	Wind Turbines (Chapter 3 – Description of Proposed Development - Sections 3.3.1, 3.9.2, and 3.9.3)	• Foundations	531m^2 per turbine	Excavation (foundation and crane standing area)
				Replacement of access roads soil/peat by granular fill
				Pile/gravity/bored foundation (i.e. 15-18m deep)
				Reinforced steel placement
				Concrete pouring
		• Hardstands	2,660m^2 per turbine (plus 3m^2 working area per hardstand)	Levelling compacted hardcore
				Working area of 2-3 m to be excavated
				Excavated peat to be side cast, profiled and bermed
	Internal Site Access Roads, Including Site Entrance Works (Chapter 3 – Sections 3.3.2, 3.9.3, and 3.10.5.1)	~165,000m^2 (27,500m long x max. 6m wide)		Drain placement upslope
				Excavation (excavated peat to be stored or side-cast alongside excavation)
				Application of granular fill
				Geogrid/geotextile application
				Application of quarry dust (50 mm) at amenity track

Phase	Element	Area	Summary of Key Activities
	Amenity Access Tracks (Chapter 3 – Section 3.3.14.1	22,467m^2 (3m wide x approximately 7,500m long)	Amenity access tracks of 3 m wide and gravel/crushed stone finish surface (7.5 km in length)
	Borrow Pits (Chapter 3 – Section 3.3.3 and 3.9.4)	4 borrow pits: 223,149m^2 in total	Removal of topsoil (to be stored)
			Mechanical excavation (no blasting)
			Large material (e.g. boulders and cobbles) processing
			Stockpiling of processed material
			Material loading into lorries
			Extraction to take place above and below water table
			Drainage feature (interceptor)
			Upon completion of Construction Phase, reprofiling of the area
			Topsoil replacement and reseeding
			Removal of extraction plant and vehicles
			Total volume of material to be extracted estimated to be approximately 648,379m^3
	Peat Deposition Areas (Chapter 3, Section 3.2)	Permanent – Approximately 48,500m^2 Temporary- Approximately 93,800m^2	Prepare the sites by clearing any remaining vegetation and levelling the ground as necessary
			Construct the containment bunds, install geotextiles, and set up drainage systems.

Phase	Element	Area		Summary of Key Activities
				Transport the surplus peat from excavation areas to the designated deposition areas (both permanent and temporary)
	Battery Storage (Chapter 3 – Sections 3.3.6, and 3.9.5)	5,000m^2	Total of ~20,250m^2	20 standardised shipping containers (each with 2MW capacity)
				Will be crane lifted and placed into final position
				To be mounted on concrete foundations
	Electricity Substation (Chapter 3 – Sections 3.3.5, 3.3.7 and 3.9.5)	~15,250m^2		Stripping of soil and overburden (to be stored/sent to borrow pit)
				Excavation for foundations
				Laying of shuttered reinforced concrete
				Block laying scaffolding
				Telescopic load handler/mobile crane will position timber roof trusses
				Telecommunication mast (36m) to be installed
				Erection of perimeter fencing
				To include TSO building (450m^2) and IPP building (228m^2)
				It will include welfare facilities (wastewater to be tankered off-site)
	Underground cabling (Chapter 3 – Section 3.4.8)	28 km x 0.5 m wide = 14,000 m^2		Trenches of 1.2 m deep to be excavated

Phase	Element	Area		Summary of Key Activities
	Grid Connection (Chapter 3 – Section 3.3.9, 3.9.5 and 3.9.6)	460m		Horizontal Directional Drilling (at the crossing point with N63) at ca. 2 m depth
				Underground cabling (trenches of 0.6m wide and 1.2m deep to be excavated) to connect the masts to the substation
		Masts foundations	Total of 128m^2	Construction of 2 new Line Cable Interface Masts (LCIM) (approximately 16 m high)
				Excavation for legs foundation (excavated material to be stored nearby, to be later used on site roads)
				Foundation for each leg (3m deep)
				Concrete will be poured into each excavation
				Backfilling of foundations (300mm above ground) with stored excavation material)
		Hardstand for crane		Geogrid material to be laid on the ground surface
				Overlaying with aggregate
	Meteorological Masts (2 no.) (Chapter 3 – Section 3.3.11)	~1,400m^2		120 m height
				To be constructed on a hardstanding area
	Construction Compound (Chapter 3 - Section 3.3.12 and 3.9.1)	4 units: total of 21,750m^2		Four temporary compound areas
				Stripping of peat/topsoil
				Construction of hardstands (>0.5 m above existing ground level)

Phase	Element		Area	Summary of Key Activities
				Use of 22,400m^3 of borrow pit stone
				Office space
				Welfare facilities
				Storage of construction material
				Storage of hazardous material
	Security Cabins (Chapter 3 –Section 3.3.13)		4 units: total of 800m^2	Pre-fabricated structures
				Will be removed at the end of Construction Phase
	Car Parks (Chapter 3 –Section 3.3.14)		1,045m^2 (3 car parks)	Two are to be located within construction compounds, and will remain upon end of Construction Phase
				19 vehicle overall capacity per car park
	Existing 100m Meteorological Masts			Removal of instruments
				Remove mast supports
				Mast anchors and base excavation
				Mast dismantling
				Removal from the development site
	TDR POIs (overview of POI locations shown in Figure 7.2)	POI1 (see Figure 7.18)	~1,150m^2	Nine road signs to be removed
				One tree to be removed
				Provide over-run surfaces
			690m^2	Ten road signs to be removed

Phase	Element		Area	Summary of Key Activities
		POI2 (Figure 7.18)		Two lighting columns and two posts to be removed
				The splitter island to be provided with an oversail surface
				The splitter island to be provided with an overrunning surface
		POI3 (Figure 7.17)	~900m^2	One lighting column to be removed
				Four utility posts/bollard to be removed
				Five road signs to be removed
				Provision of a load bearing surfaces
				Removal of trees on the central island
		POI4 (Figure 7.17)	~130m^2	Five road signs to be removed
				Two trees to be removed
		POI5 (Figure 7.17)	~300m^2	Seven signs to be removed
				One tree to be removed
				Load bearing surface provided at the splitter island
				The ground level to be lowered
				Tree canopy to be trimmed
		POI6	~5,950m^2	Trees to be removed
				Vegetation to be cleared
				Utility posts to be removed

Phase	Element	Area	Summary of Key Activities
			Load bearing surface to be laid
Operation	Maintenance (as described in Chapter 3)	-	Traffic (four-wheel drive vehicles or vans);
			Visit checks
			Changing consumables (e.g. oil changes)
	Ancillary functions (see Chapter 3)	-	Routine maintenance programme involving a number of turbines checks and changing of consumables, including oil changes. The electricity substations components and site tracks will also require periodic maintenance in accordance with appropriate operation maintenance plans, procedures and health and safety plans.
Decommissioning	Wind Turbines (see Chapter 3)	-	Disassembling and parts sent offsite
	Turbine foundations (see Chapter 3)	-	Covered with earth/reseeded
	Internal site access roads and Amenity access tracks (see Chapter 3)	-	Leave in situ for further use
	Substation (see Chapter 3)	-	Retained as permanent structure (managed by EirGrid/ESB)

7.5 SCOPING AND CONSULTATION

TOBIN undertook a scoping and consultation exercise during preparation of this EIAR, as described in Chapter 1 (Introduction) of this EIAR, to identify key environmental issues, engage relevant stakeholders, and ensure full compliance with regulations. The biodiversity related scoping and consultation responses received are summarised in Table 7.3. The responses received helped identify sensitive receptors of note to be considered. The table also highlights how the responses have been taken into account in the design of the field surveys and the assessment of the potential impact of the proposed development. The full set of scoping and consultation responses is provided in Appendix 1.4 and Appendix 1-5 respectively.

Table 7.3: Summary of Biodiverity Relevant Scoping and Consultation Responses

Ref used in Chapter 1	Consultee	Response	Consideration of Stakeholder Responses in Survey Design and Impact Assessment
12	Development Applications Unit - Department of Housing, Local Government and Heritage	Field surveys should be designed so as to collect data that enable informed decision making regarding potential impacts, risks and pressures arising from the proposed development to European sites, biodiversity, the wider environment and other nature conservation interests	Field surveys for the proposed development were specifically designed to support informed decision-making regarding potential impacts on biodiversity, European sites, and the wider environment. The methodology was developed to capture relevant ecological data at both site and landscape scales, including assessments of habitat quality, species presence, and ecological connectivity. This approach ensures that risks and pressures on biodiversity and other nature conservation interests are comprehensively considered as part of the impact assessment.
36	Irish Wildlife Trust	The biodiversity impact should look at the connectivity of the lands to surrounding areas, in particular the River Shannon and Lough Ree SAC.	

7.6 METHODOLOGY FOR ASSESSMENT OF IMPACTS AND EFFECTS

This section provides an overview to the approach taken to establish the ecological baseline and assess the potential ecological impacts of the proposed development. It details the methodologies used to identify KERs, characterise potential effects, and determine their significance in line with best practice guidelines from CIEEM, EPA, and the NRA.

7.6.1 Establishing the Environmental Baseline

The ecological baseline at the proposed wind farm site and at POIs along the TDR where works are proposed, has been informed through a combination of:

- desk studies

- scoping and consultations
- field surveys

The desk study utilised existing data sources such as previous environmental assessments, habitat maps, and records of protected species to establish an understanding of the area. An overview to the methodology for the desk study undertaken to inform the environmental baseline is provided in Section 7.7.1

The desk study was complemented by scoping exercises and consultations with relevant stakeholders, including regulatory bodies and environmental groups (as described in Section 7.5) to gather additional insights and ensure a comprehensive understanding of the policy and environmental ecological context.

Based on the desk study and consultations a suite of directed ecological survey at the proposed wind farm site at the POIs were designed. An overview of scope of the survey is provided in Section 7.7.2.

7.6.2 Key Ecological Receptors (KERs)

KERs are those receptors of ecological importance that may be affected by likely significant effects. The KERs included habitats and species that are protected under the following legislation:

- Annexes of the EU Habitats Directive and EU Birds Directive including Qualifying Interests (QI) and Special Conservation Interests (SCIs) of Special Areas of Conservation (SAC) and) and Special Protected Area (SPAs) within the likely Zone of Influence.
- Species protected under the Wildlife Acts 1976-2023.
- Species protected under the Flora Protection Order 2022 (S.I. 235/2022).

The importance of the ecological receptors identified was assessed using geographic importance levels (e.g., International, National, County, and Local) following the NRA EcIA Guidelines (2009a). This ensured that only receptors of significant ecological importance were selected for detailed evaluation. The full set of KERs identified following the desktop and field survey are presented in Section 7.10, which serves as a quick reference checklist. This section identifies the KERs that could potentially be affected by the proposed development. It highlights the ecological features of the environment, including species, habitats, and ecosystems that are particularly sensitive to changes and disturbances caused by the development. Along with the identification of these receptors, the section outlines the **potential linkages, effects and impacts** of the proposed development on these ecological features.

The ecological impacts and effects were characterised according to the CIEEM EcIA Guidelines (2018), considering factors such as magnitude, duration, extent, reversibility, and whether the effects were positive or negative.

The assessments herein also adhered to the EPA EIA Guidelines (2022) ensuring all significant ecological effects, including cumulative and residual effects, were identified and addressed comprehensively.

By integrating the established methodologies described in the guidelines above, this Chapter provides a thorough evaluation of the likely ecological impacts and effects, both in isolation and cumulatively, ensuring alignment with best practice standards in EcIA and EIA.

7.6.3 Determining Importance of Ecological Receptors

The importance of the ecological features identified within the Proposed Development and surrounding areas followed the methodology set out in Chapter 3 of the NRA EcIA Guidelines (NRA, 2009a). These guidelines set out the context for the determination of value of receptors on a geographic basis with a hierarchy assigned in relation to the importance of the receptor. The NRA EcIA Guidelines outline criteria for assigning ecological features to the following geographic levels of importance:

- **International Importance** applies to sites designated under the Natura 2000 Network (SACs, SPAs) or other globally significant areas like Ramsar sites, which support critical habitats or species.
- **National Importance** includes sites protected under Irish law (e.g. Natural Heritage Areas (NHAs) or proposed NHAs, Flora Protection Order 2022) that are rare, biodiversity-rich, or vital for nationally significant species.
- County Importance covers ecological features valuable at a county or regional level, such as County Biodiversity Areas or habitats essential for regional ecological networks.
- **Local Importance (Higher Value)** refers to semi-natural habitats or species of local significance that support biodiversity and ecosystem services.
- **Local Importance (Lower Value)** includes common, widespread habitats and species with limited ecological significance beyond the immediate area.

The NRA Ecological Impact Assessment Guidelines emphasise the importance of selecting ecological receptors of a certain value for detailed assessment. The guidelines state

> "*In the context of national road projects, ecological resources of below 'Local Importance (higher value)' should not be selected as 'key ecological receptors' for which detailed assessment is required*" (NRA, 2009a).

Following this recommendation, any ecological receptors that are determined to be of International, or National or County or Local importance (Higher Value) are considered to be KERs for the purposes of ecological impact assessment if there is a pathway for effects to occur following the source-pathway-receptor model. Any receptors that are determined to be of Local Importance (Lower Value) are not considered to be KERs.

7.6.4 Characterisation of Effects and Impacts

In this Chapter the ecological effects of the proposed development are classified in line with the CIEEM EcIA Guidelines (2018).

This Chapter has also been prepared in accordance with the EPA EIA Guidelines (2022). The impacts are characterised using the headings outlined in the CIEEM EcIA Guidelines and applied as appropriate.

A summary the characteristics considered in assessments is provided below:

- Positive or Negative: Assessment of whether effect of a proposed development or project on the ecological receptor is beneficial or adverse.
- Extent: Description of the spatial area over which the effect occurs.

- Magnitude: Assessment of the size, amount, intensity, and volume of the impact quantified (if possible) in absolute or relative terms, such as the amount of habitat lost or the percentage change in a species population.
- Duration: Defining the time period over which the effect occurs, considering ecological characteristics and human timeframes.
- Frequency and Timing: Considering how often the impact occurs and its timing, noting that even small-scale impacts can be significant if repeated over time.
- Reversibility: Evaluating whether the effect can be undone within a reasonable timescale, which may vary between receptors.

7.6.5 Determining the Significance of Effects

The ecological significance of the proposed developments effects is determined using the precautionary principle, in line with the CIEEM EcIA Guidelines (2018). A 'significant effect' is one that meets or exceeds a threshold, either supporting or undermining biodiversity conservation objectives for the KERs or biodiversity overall. The objectives can be specific (e.g., for designated sites) or broad (e.g., national/local policies or biodiversity enhancement). Effects may be significant at scales ranging from international to local (CIEEM, 2018). Significance is assessed based on consideration of 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 EIA Guidelines (EPA, 2022) and the NRA EcIA Guidelines (NRA, 2009a) were also considered when determining significance and the assessment is in accordance with those guidelines, with the terminology used in this Chapter for the determination of significance following the suggested language set out in the EPA Guidelines as shown in Table 7.4.

Table 7.4: Criteria for determining significance of effect, based on EPA EIA Guidelines (2022)

Effect Magnitude	Definition
Imperceptible effect	An effect capable of measurement but without noticeable consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight effect	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate effect	An effect that alters the character of the environment that is consistent with existing and emerging trends.
Significant effect	An effect which, by its character, its magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity

Effect Magnitude	Definition
	significantly alters most of a sensitive aspect of the environment.
Profound effect	An effect which obliterates sensitive characteristics.

As per NRA EcIA Guidelines (2009a) and CIEEM EcIA Guidelines (2018) the following key elements should also be examined when determining the significance of effects:

- In the context of EcIA, **'integrity'** refers to the coherence of a site's ecological structure and function, enabling it to sustain its valued resources (NRA, 2009b). The likely effects on integrity should be used to determine whether an impact is significant. Adverse changes to habitat extent, structure, or function, as well as impacts on species population size and viability, can compromise integrity by shifting the ecosystem to an unfavourable condition. If an impact threatens long-term stability for example through habitat loss, degradation, fragmentation, or disruptions to population dynamics, it is considered significant. The assessment should evaluate whether proposed activities could undermine the site's viability, coherence, or conservation objectives.
- A '**significant effect**' is an effect that either supports or undermines biodiversity conservation objectives (CIEEM, 2018). Significant effects include impacts on the structure and function of designated sites, habitats, or ecosystems, as well as on the conservation status of habitats and species, encompassing changes in their extent, abundance, and distribution.

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 EcIA Guidelines (2018) the definition for conservation status in relation to habitats and species are as follows:

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

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

- Its natural range, and areas it covers within that range, are stable or increasing.
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future.
- The conservation status of its typical species is favourable.
- The conservation of a species is favourable when:
  - Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats.
  - The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future.
  - There is and will probably continue to be, a sufficiently large habitat to maintain its population on a long-term basis.

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

7.7 Methodology for Ecological Baseline

The following sections provide an overview of the methodologies employed to gather information on the baseline ecological conditions for the proposed wind farm site and the POIs along the TDR. Section 7.8 and Section 7.9 respectively provide detail of the desk studies and survey undertaken for the proposed wind farm site and the POIs.

7.7.1 Desk Study

The desk study for this assessment included a comprehensive review of available data on the proposed wind farm site, the TDR, and the surrounding areas. This review was essential in gathering relevant information on environmentally sensitive receptors (e.g. species, habitats, or ecological features of conservation significance or ecological sensitivity) developing a clear understanding of the site's ecological context, and identifying areas where targeted surveys were required, including at specific POIs along the TDR.

The desk study included a review of the following:

- Bord na Móna Cutaway Bog Decommissioning and Rehabilitation Plans (included in Appendix 7.1)
    - Derryaroge Bog – Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2025.
    - Derryadd Bog - Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2025
    - Lough Bannow Bog - Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2025.
- Review of historic 6 inch and 25 inch maps of the Application Site and surrounding area available through Ireland's National Geospatial Data Hub[1].
- Records from the National Parks and Wildlife Service (NPWS) web-mapper and review of records from the NPWS Rare and Protected Species Database[2] for the hectads in which the proposed wind farm site is located.
- Review of the publicly available National Biodiversity Data Centre (NBDC) web mapper and database[3].
- Review of online web-mappers: NPWS[4], EPA[5], Water Framework Directive[6] (WFD) and Inland Fisheries Ireland[7] (IFI).
- Review of NPWS Article 17 maps 2019, 2013 and 2007.

[1] Available at: https://www.geohive.ie/. Accessed January 2025.
[2] Available at https://www.npws.ie/protected-sites. Accessed in January 2025
[3] Available at https://maps.biodiversityireland.ie/. Accessed in January 2025
[4] Available at: https://www.npws.ie/maps-and-data. Accessed January 2025.
[5] Available at: https://gis.epa.ie/EPAMaps/. Accessed January 2025.
[6] Available at: https://www.catchments.ie/maps/. Accessed February 2025.
[7] Available at: https://www.fisheriesireland.ie/Research/interactive-mapping.html. Accessed July 2024.

- Environmental Sensitivity Mapping[8].
- Geological Survey Ireland (GSI)[9].
- Botanical Society of Britain and Ireland (BSBI) database[10].
- Mammal Atlas[11].
- Regional Red Lists for the island of Ireland of Threatened Species[12]
- The Status of EU Protected Habitats and Species in Ireland (NPWS, 2019a, 2019b, 2019c.
- Irish Butterflies[13];
- Review of relevant of publicly available Plans, including the:
    - Ireland's 4th National Biodiversity Action Plan 2023-2030 [14].
    - Longford County Development Plan 2021–2027[15]
    - Roscommon County Development Plan 2022-2028[16]

The desk study has been informed by surveys and reports on the proposed wind farm site, as well as additional sources, including:

- The EIAR and NIS prepared for the Derryadd Wind Farm Planning Application in 2019 (Bord Pleanála Case reference: PA14.303592; TOBIN Consulting Engineers, 2019).
- Derryadd Wind Farm Flood Risk Assessment (Appendix 7.3).

The desk study has also been informed by a remedial Appropriate Assessment Screening Report (rAASR) and a remedial Natura Impact Statement (rNIS) (TOBIN, 2025) prepared to support an application for substitute consent (An Bord Pleanála Ref. 322204) by Bord na Móna Energy Ltd., a subsidiary of Bord na Móna plc for historic peat extraction and all ancillary works, at lands within the Derryaroge, Derryadd, and Lough Bannow bogs within the Mountdillon Bog Group. The rAASR and rNIS considered potential effects on European sites including SACs and SPAs.

7.7.2 Field Surveys

7.7.2.1 Overview

A suite of field surveys was defined for environmentally sensitive receptors identified in the desk study undertaken for the proposed wind farm site and the POIs. The scope of surveys was also informed by biodiversity related scoping and consultations undertaken for the proposed development (see Section 7.5 above).

[8] Available at https://airomaps.geohive.ie/ESM/. Accessed in January 2025
[9] Available at https://www.gsi.ie/. Accessed in January 2025
[10] Available at https://database.bsbi.org/maps/. Accessed in January 2025
[11] Collated by the National Biodiversity Data Centre from different sources, Atlas of Mammals in Ireland 2010-2015, National Biodiversity Data Centre, Ireland, accessed in January 2025, https://maps.biodiversityireland.ie/Dataset/252
[12] Available at https://www.npws.ie/publications/red-lists. Accessed in January 2025
[13] Available at https://www.irishbutterflies.com/general_information.html. Accessed in January 2025
[14] Available at: https://assets.gov.ie/233057/f1a92f68-e668-498d-a56c-df777a19b549.pdf. Accessed February 2025.
[15] Available at: https://www.longfordcoco.ie/services/planning/longford-county-development-plan-2021-2027/volume-1-compressed.pdf. Accessed February 2025.
[16] Available at: https://www.rosdevplan.ie/roscommon-county-development-plan-2022-2028/. Accessed February 2025.

In all cases the field surveys adhered to standardised survey methodologies. As described above the desk study, which examined existing ecological records, habitat classifications, and previous environmental assessments, provided insights relevant to the proposed development, helping to identify potential constraints and sensitivities ensuring that the surveys at the proposed wind farm site and at POIs were targeted and effective in capturing the ecological characteristics.

Additionally, the surveys at the proposed wind farm site and at the POIs offered an opportunity to identify any additional survey requirements that were not captured in the desk study that were be necessary to address ecological considerations.

Table 7.5 provides an overview of the different field surveys that were conducted for the proposed wind farm site and POIs. It provides details on the survey areas for various ecological surveys, including flora and habitats, aquatic ecology, Bats, and non-volant mammals, Whorl Snails, and Marsh Fritillary.

For each survey type, the table lists the relevant survey area and key guideline sources or references that were used to define these areas. The table demonstrates that all surveys were conducted within the appropriate geographic boundaries, as determined by guidelines and expert recommendations.

Table 7.5: Survey Areas

Survey	Survey Area	Guideline Source
Flora and Habitats	Proposed wind farm site: • Habitat Identification: Identify various habitats (e.g., grasslands, woodlands, wetlands) and assess their ecological value. • Flora Surveys: Conduct surveys to identify plant species, particularly rare or protected species. • Biodiversity Value: Evaluate the importance of habitats for conservation, focusing on endangered or protected species. • Potential Impacts: Assess direct and indirect impacts, such as habitat loss or disturbance during construction and operation. POIs: • Habitat and Flora at POIs: Assess habitats along the TDR, including grasslands and tree lines, which could be impacted by works like tree removal or ground disturbance. • Specific POI Considerations: Evaluate potential effects of tree or vegetation removal on sensitive plant species or habitats. • Buffer Zone: Assess a 150-meter buffer zone around each POI to understand indirect impacts (e.g., hydrology, noise).	NRA (2009b)
Aquatic Ecology	Proposed wind farm site: For the proposed wind farm site assessment of aquatic ecology focused on the wadable streams within and downstream of wind farm site. These streams are particularly important as they provide valuable habitats for a variety of aquatic species, including fish, invertebrates, and plant life. The assessment aims to evaluate the current condition of	IFI (2016) NRA (2009b)

Survey	Survey Area	Guideline Source
	these water bodies and predict the potential effects of the proposed development on their ecological integrity. POIs: All rivers water bodies in proximity of the POIs were culverted and located significant distance from the location of the proposed work precluding hydrological connectivity. Consequently, no aquatic surveys were required for these locations as likely significant effects are low and can be reasonably be excluded.	
Bats	Proposed wind farm site: In the context of the proposed wind farm and survey approach related to bats, the following was considered relevant: • Roost – 200 m from rotor radius: For bats, roost sites (such as trees or buildings used by bats for shelter or hibernation) located within a 200-meter radius of the turbine rotors need to be considered. This distance is particularly important to assess the potential risk to bats, which might be displaced or affected by the presence and operation of turbines near their roosting sites. • Activity – turbine locations: Bat activity will be monitored around the turbine locations to assess the potential risks of collision or disturbance. Bats tend to be more active at night, and their flight paths often pass near or through areas with wind turbines. Understanding bat activity around these turbine locations is crucial for evaluating any potential impacts, particularly in relation to bat species that are known to be vulnerable to turbine collisions. • Transects – Development footprint/route to roost: Transects will be conducted along the development footprint and the route leading to known bat roosts. These surveys will track bat movement patterns between roosts and foraging areas to understand how bats use the landscape and whether the turbine locations or associated infrastructure could obstruct these movements. The transects provide data on bat flight paths, roosting preferences, and activity levels in relation to the development. POIs: Tree removal and hedgerow trimming will be carried out at various POIs. Tree and hedgerows were inspected as part of multidisciplinary survey. It was deemed that detailed bat roost assessments were unnecessary, as surveys found no potential roost features due to the trees' isolated nature and management.	NatureScot (2021) Marnell *et al.,* (2022) Aughney *et al.,* (2018) Collins (2016)

Survey	Survey Area	Guideline Source
Non-volant mammals (	Proposed Wind Farm Site: Multidisciplinary walkover surveys at the proposed wind farm site considered mammal activity and paid particular attention to areas where proposed infrastructure will be located. POIs: The survey at the POI, where works are proposed included an assessment of the area within the proposed development footprint as well as a buffer zone extending 150 meters beyond the boundary of the works. This buffer zone ensures a comprehensive ecological assessment, allowing for the identification of any potential indirect or off-site impacts that may arise from the construction or operation of the proposed development. The survey focused on: • Direct Impact Area: The immediate area where works are planned, including the TDR route and infrastructure installations. • Buffer Zone: A 150-meter radius around the works area to account for potential ecological impacts on surrounding habitats, species, and ecological features, ensuring that the assessment covers possible indirect effects.	NRA (2009b) NRA (2009b)
Whorl Snail	Survey focused on habitat within the proposed wind farm site preferred by the species including dense, moisture-retaining vegetation like grasses and mosses.	Moorkens and Killeen (2011) Long and Brophy (2019)
Marsh Fritillary	Survey for Marsh Fritillary butterfly (*Euphydryas aurinia*) focused on wet grasslands, meadows, and peat bogs, particularly those with abundant host plants such as devil's-bit scabious (*Succisa pratensis*). These habitats are typically rich in biodiversity and require specific management to maintain the right conditions for the species.	Marsh Fritillary Monitoring Scheme[17]

7.7.2.2 Proposed Wind Farm Site

7.7.2.2.1 Multidisciplinary Walkover Survey

7.7.2.2.1.1 Habitat Survey

A multidisciplinary walkover survey was carried out at the proposed wind farm site in August 2022 by TOBIN ecologists. This survey was complemented by a second visit in July 2023, by the same ecologists. Representative habitats within the proposed wind farm site were surveyed and mapped, in good weather conditions and unconstrained, although particular focus was dedicated to the areas where the infrastructure associated with the proposed wind farm is to be located. Some marginal habitats were not surveyed, but were mapped based on historic survey effort (i.e. TOBIN Consulting Engineers, 2019).

[17] Available at https://biodiversityireland.ie/surveys/marsh-fritillary-monitoring-scheme/. Accessed in January 2025

Habitats surveyed within the survey area were classified upon the qualitative consideration of:

- plant species abundance
- diversity
- protection status
- vegetation structure
- topography
- drainage conditions
- evidence of disturbance and/or management

For specific habitat types, such as bog woodland or petrifying springs, specialised survey guidelines were followed, including Cross and Lynn (2013) and Denyer *et al.* (2023) respectively. Further information on these surveys is provide in Section 7.7.2.2.1. In all cases, the predominant plant species were identified and named according to Parnell and Curtis (2012) and Stace (2010) for higher plants; Atherton *et al.* (2010) for bryophytes; and Fitter and Fitter (1984) for grasses, sedges and rushes.

Habitats were classified according to the Fossitt (2000), while satellite imagery was used to inform habitat delineation and interpretation, following Smith *et al.* (2011). Surveys considered plant species protected under the Flora Protection Order (S.I. No. 235/2022), listed in Irish Red List Series (King *et al.* (2011); Lockhart *et al.* (2012); Wyse Jackson *et al.* (2016)) Attention was given to habitat/species that could qualify for designation under the Annex I of the Habitats Directive (Council Directive 92/43/EEC).

A search for Invasive Alien Species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011, as amended) was also conducted throughout the proposed wind farm site. Although this EIAR reports direct sightings of animals listed in Part 2 of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011, the proposed development is not considered to pose a risk of contributing to their spread, and likely significant effects from the proposed development were excluded. Particular attention was focused instead on Invasive Alien Plant Species (IAPS) listed in Part 1 S.I. 477/2011, which could spread as a result of activities associated with the proposed development.

While surveying the proposed wind farm site for habitats and flora, the multidisciplinary walkover survey also included the search for evidence for the presence of other protected species, to be described in Section 7.7.2.2.3.

7.7.2.2.1.2 Bog Woodland (WN7) Survey

As part of the broader habitat types surveyed, the multidisciplinary survey assessed five birch woodland and pioneering woodland locations classified a bog woodland (WN7) under Fossitt (2000). A Condition Assessment was undertaken to determine if the habitats at the locations corresponded to Habitats Directive Annex I habitat 91D0 Bog Woodland.

To evaluate their correspondence with Annex I habitat type, a Condition Assessment was conducted at each site using 2m x 2m relevés. Relevés were selected from the woodland interior, avoiding edges, and assessed against nine criteria (adapted from Cross and Lynn, 2013) (shown in Table 7.6). A minimum of seven criteria had to be met for a "pass." None of the

locations surveyed met the required threshold. The findings of the Condition Assessment are presented in Section 7.8.2.2.2.

Table 7.6: Condition Assessment Criteria for Annex I Habitat 91D0 Classification (adapted from Cross and Lynn, 2013)

Assessment Criterion	Habitat 91D0 Classification Target
Positive indicator species	*Betula pubescens* and *Sphagnum* sp. plus at least 5 other positive species
Negative species cover	≤ 10% cover of plot
Medium canopy height	≥ 4m
% total canopy cover	≥ 30% of plot
Portion of *Betula* in canopy	≥ 50% of canopy
% native dwarf shrub layer cover	< 50% of plot
% *Calluna* cover	< 40%
% *Sphagnum* cover	>25%
% total bryophyte cover	≥ 50%

7.7.2.2.1.3 Subsite (Derryaroge Mineral Island) Habitat Survey

During the multidisciplinary walkover survey, a subsite within the proposed wind farm site (i.e. within Derryaroge Bog, locally known as 'Derryaroge Mineral Island') was identified as holding potential to meet the designation criteria defined by the European Commission (2013) for habitats listed in the Annex I of the Habitats Directive (Council Directive 92/43/EEC). This mineral island, entirely surrounded by Bord na Móna lands, was identified as potentially sensitive during the multidisciplinary walkover survey. As a result, a more detailed survey was deemed necessary. In April 2023, FitzGerald Ecology conducted a comprehensive survey of this subsite, employing a methodology consistent with the habitat survey from the multidisciplinary walkover. This included habitat classification and species identification, The findings of the survey are presented in Section 7.8.2.2 below while the report is included here as Appendix 7.4.

7.7.2.2.2 Aquatic Surveys

In June and September 2022, a series of surveys were conducted at 12 river sampling sites within and downstream of the proposed wind farm site. River habitat surveys were carried out at the sampling sites by TOBIN while kick sampling and electrofishing survey were carried out by Still Waters Consultancy. The surveys were undertaken according to:

- River habitat survey (adapted from Environment Agency, 2003; and Toland and Murphy, 2013);
- Kick-sampling (adapted from Toner *et al.*, 2005); and
- Electrofishing (O'Grady, 2006; Matson *et al.*, 2018).

The 12 sampling sites were visited by TOBIN ecologists on June 29th and 30th 2022 (see Section 7.8.2.3 for details). Kick sampling and electrofishing survey were carried out at all sites on the

16th and 18th September 2022 by Still Water Consultancy. Figure 7.10 shows the 12 sampling sites while coordinates for the sampling sites are presented in Table 7.7.

Table 7.7: Sampling site coordinates

Sampling Site	Lat	Long
1	608409.2427	761107.0002
2	603150.4087	768199.4704
3	604468.9536	772044.9873
4	606700.9915	769474.9188
5	609977.4998	767720.929
6	605425.4677	764710.5047
7	603922.1066	766388.7646
8	604851.7526	768453.5924
9	602299.1077	771460.346
10	603836.2323	772475.8796
11	608524.2569	765827.2774
12	610069.9436	763194.8195

7.7.2.2.2.1 River Habitat Survey – June 2022

On June 29th and 30th, 2022, river habitat aquatic surveys were undertaken at the 12 sampling sites. The surveys were undertaken following Environment Agency (2003) and Toland and Murphy, 2013. At each site, the river habitat surveys covered a 50-meter reach of the river and were representative of the local habitat and hydromorphological conditions.

Relevant aquatic and riparian features were recorded, these included the characteristics of the riverbank, such as its height, width, and habitat classification based on Fossitt (2000). Riparian vegetation and land use were also documented. In addition, detailed information was collected on the aquatic habitat, including wetted width, depth, water level (qualitative), flow velocity (qualitative), flow typology, and substrate composition. Instream vegetation, including macrophytes and filamentous algae, was noted, along with any local pressures affecting the habitat.

The aquatic and riparian features were used to assess the physical suitability of each channel for supporting salmonids, lampreys and other fish species, and macroinvertebrate assemblage to inform the ecological evaluation at the survey sites. An overview of the surveys is provided in following sections, while surveys are described in detail in Section 7.7.2.2.2. The survey results and photos recorded at the sampling sites are included in Appendix 7.5a and Appendix 7.5b respectively.

7.7.2.2.2.2 Kick-Sampling and Water Quality Assessment – September 2022

In September 2022 the macroinvertebrate communities at the 12 sampling sites were surveyed with the use of a 'D' shaped net (250mm width; 500µm mesh size), which was submerged on the

riverbed with its opening facing upstream. The kick-sampling method involves disturbing the river substrate immediately upstream of the net for two minutes, to dislodge the invertebrates, which are then captured in the net. The survey started at riffle areas of the reach (if present), moving along other flow types and aquatic habitats (including vegetation sweeping), finalising with one minute of stone/cobble washing. This semi-quantitative sampling methodology ensures the final sample is representative of the macroinvertebrate assemblage of the reach, and suitable for a qualitative water quality classification (Letovsky *et al.*, 2012).

The water quality for each sampling site was assessed using the EPA scheme of Biotic Indices or Quality Value (Q Value) (Toner *et al.*, 2005), which uses benthic macroinvertebrates as indicators due to their well-documented responses to a wide range of water quality characteristics and pollutants (Feeley *et al.*, 2020). The Q Value system divides the benthic invertebrates into five 'Macroinvertebrate Faunal Groups' according to their tolerance to pollution (mostly related with deoxygenation and eutrophication), ranging from most sensitive species (Group A), to the most tolerant (Group E). Based on the relative taxa abundance within the sample, a Q Value is attributed, from Q1 to Q5, with intermediate values denoting transitional conditions (Toner *et al.*, 2005) (Table 7.8).

The findings of the surveys are presented in Section 7.8.2.3 while the survey results are included in Appendix 7.5c.

Table 7.8: Q Value Ranking and WFD Water Quality Status

Q Value	WFD Water Quality Status	EPA Quality Status
Q5	High	Unpolluted
Q4-5		
Q4	Good	
Q3-4	Moderate	Slightly Polluted
Q3	Poor	Moderately Polluted
Q2-3		
Q2	Bad	Seriously Polluted
Q1-2		
Q1		

7.7.2.2.2.3 Electrofishing Survey – September 2022

Electrofishing (following Bohlin *et al.*, 1989; CEN, 2003) was carried out on the 12 sampling sites under authorisation from the Department of Communication, Energy and Natural Resources, Section 14 of the Fisheries Act (1980) to determine freshwater fish species present, age class and hence provide an up-to-date baseline (September 2022) of fish present in receiving waters.

The qualitative timed (ten minute) electrofishing methodology (Matson *et al.*, 2018) was used, and fish were collected while wading each sampling site reach in a 'zigzag' manner, allowing the electrical field to cover the entire width of the river, as much as possible, in an upstream direction, carrying one portable Smith-Root® LR-24 electro-fisher backpack (40Hz, 250V, with 18% duty cycle). Captured fish were removed quickly using the anode net, or dip net (carried by an assistant operator), and placed into a container of water, located on the bank. After each

sampling site was surveyed, all captured fish were measured (fork length - for age group estimation), transferred to a container of river water (to recover), before being released alive, and spread evenly over the sampled reach. All fish recovered quickly, and no mortalities were observed. The findings of the surveys are discussed in Section 7.7.2.2.2 while the survey results are included in Appendix 7.5c.

7.7.2.2.2.4 Biosecurity

Strict biosecurity measures were carried out during the aquatic surveys. All equipment and used PPE were inspected and disinfected with 1% Virkon® solution prior to, and post-survey completion.

7.7.2.2.3 Protected Species Surveys

7.7.2.2.3.1 Bat Surveys

All Irish bat species are afforded protection under the Wildlife Acts (as amended).

Bats are also listed in Annex IV of the Habitats Directive (Council Directive 92/43/EEC), which aims to protect, amongst other species, bats and their habitats, and requiring appropriate monitoring of populations.

Several bat species are listed in Annex II of the Habitats Directive. In Ireland, SACs have been designated for one species of bat, the Lesser Horseshoe Bat (*Rhinolophus hipposideros*).

Bat Eco Services carried out a full suite of surveys at the proposed wind farm site between Autumn 2021 and Summer 2022 (see Appendix 7.6 for details), including:

- Bat roost searches (Buildings/Structures) - 9th August 2022;
- Bat Habitat and Commuting Routes (27th and 28th July; 9th August 2022);
- Night-time detection surveys:
  - Dusk Emergence Survey (27th and 28th July; 9th August 2022);
  - Walking Transects – 22nd August 2022;
  - Driving Transects – 22nd August 2022; and
  - Passive Static Detector Surveys (14 or 15 locations) – Autumn 2021, Spring and Summer 2022.

Survey methodologies employed followed Collins (2016), Marnell *et al.,* (2022), Aughney *et al.,* (2018), and NatureScot (2021) (see Appendix 7.6). The survey results were analysed using:

- EcoBat Tool[18]
- EUROBATS 200m Buffer Zone
- Habitat analysis and their suitability for bats

7.7.2.2.3.2 Whorl Snail Surveys

There are eight species of Whorl Snail (Vertigo sp.) in Ireland, with the species have varying IUCN and conservation status (Byrne *et al.*, 2009).

[18] Available at http://www.ecobat.org.uk/. Note basic principles of Ecobat tool used. Full tool has been inaccessible since November 2022

Whorl Snails are small terrestrial molluscs, with a life-cycle of up to 18 months, and are particularly sensitive to habitat and hydrological/hydrogeological disturbance (Moorkens and Killeen, 2011).

Of the eight species in Ireland, six are IUCN Red listed species. Red listed species classified as Vulnerable include Marsh, Geyer's, Lilljeborg's, and Narrow-mouthed Whorl Snail, while Red listed species classified as endangered are the Desmoulin's, and the Wall/Wry-necked Whorl Snail. The two Irish Whorl Snail species that are not listed on the IUCN Red list but are categorized as Near Threatened are the Striated, the Common Whorl Snail (Table 7.9).

Of the eight species in Ireland, three are listed in Annex II of the Habitats Directive: Geyer's, Desmoulin's and Narrow-mouthed Whorl Snail. As a result, SACs have been designated for the species in Ireland.

Table 7.9: Irish Whorl Snails, Red List Status and Habitats Directive Designation (Moorkens and Killeen, 2011)

Common Name	Scientific Name	Status	Habitats Directive
Marsh Whorl Snail	*Vertigo antivertigo*	Vulnerable	-
Geyer's Whorl Snail	*V. geyeri*	Vulnerable	Annex II
Lilljeborg's Whorl Snail	*V. lilljeborgi*	Vulnerable	-
Desmoulin's Whorl Snail	*V. moulinsiana*	Endangered	Annex II
Wall/Wry-necked Whorl Snail	*V. pusilla*	Endangered	-
Common Whorl Snail	*V. pygmaea*	Near Threatened	-
Striated Whorl Snail	*V. substriata*	Near Threatened	-
Narrow-mouthed Whorl Snail	*V. angustior*	Vulnerable	Annex II

A dedicated Whorl Snail Survey was carried out by Arctica Ecology at the proposed wind farm site on the 11th and 12th of November 2022. The survey was guided by the findings of the multidisciplinary walkover survey, directing efforts toward the most suitable habitats for Whorl Snails. This approach aimed to enhance the likelihood of recording their presence by focusing on reed beds, wet grasslands, sedges, and rushes.

The objective of the Whorl Snail survey was to establish the presence/absence, particularly of those species previously recorded in the area as part of the EIAR and NIS prepared for the Derryadd Wind Farm Planning Application in 2019 (TOBIN Consulting Engineers, 2019).

The November 2022 survey followed guidelines outlined in Moorkens and Killeen (2011), and Long and Brophy (2019). The guidelines stipulate the following optimal survey periods:

- Moorkens and Killeen (2011)
  - April and October - Narrow-mouthed Whorl Snail; and
  - September to November - Desmoulin's Whorl Snail.
- Long and Brophy (2019)
  - April and October - Narrow-mouthed Whorl Snail and Geyer's Whorl Snail; and
  - September to November - Desmoulin's Whorl Snail.

The Whorl Snail survey at the proposed wind farm site extended late into the Winter period (November) as it is not considered to affect Whorl Snails presence and/or detectability. The search methodology consisted of:

- beating tall vegetation, such as reeds, onto a white tray and inspecting the tray for snails (full height of the vegetation was sampled, although snails are more likely to be found higher in vegetation during Winter
- pulling out handfuls of grasses, sedges and herbs, and beating these onto a white tray to dislodge snails
- search on one wind-blown strand line flotsam for snails

Specimens were collected into a container and labelled with date, name of collector, grid reference and a description of the habitat type. Specimens were stored in a refrigerator until identification was completed in the laboratory.

Adam Mantell (Arctia Ecology) carried out the detailed survey, including sampling and analysis. Full description of methodology, results and analysis is included in Appendix 7.7. Survey results are discussed in Section 7.8.2.4.3 below.

7.7.2.2.3.3 Marsh Fritillary Surveys

Marsh Fritillary (*Euphydryas aurinia*) is a butterfly with a life-cycle of about one year, The species live in colonies that can transition geographically from year-to-year, occupying meadows and wetlands where there is abundant Devil's-bit Scabious (*Succisa pratensis*), which is the larval foodplant (Lavery, 1993). Marsh Fritillary abundance has declined sharply during the latter part of the 20th century, which resulted in its designation for protection under the Annex II of the Habitats Directive (Council Directive 92/43/EEC).

To study the presence of Marsh Fritillary at the proposed wind farm site, a Marsh Fritillary survey was carried out by TOBIN in November 2022. This survey was informed by the observations of habitats during the multidisciplinary walkover survey, in particular the occurrence of Devil's-bit Scabious stands, to direct searches for Marsh Fritillary larvae and webs to these locations. The survey methodology was adapted from the NBDC Marsh Fritillary Monitoring Scheme[19] to fit the survey's objectives, i.e. to confirm presence/absence of Marsh Fritillary within the proposed wind farm site. Locations with significantly large stands of Devil's-bit Scabious were mapped ahead of the survey and visited on the 1st of September 2022. The survey concentrated particularly on the areas with Devil's-bit Scabious at the Lough Bannow Bog as the stands were denser and more concentrated than the ones in the Derryaroge Bog, which were sparse and scattered. The survey consisted of:

- Identification of Devil's-bit Scabious stands
- Appraisal of habitat features (e.g. abundance of Devil's-bit Scabious, vegetation height, local pressures)
- Identification of the number of Marsh Fritillary webs
- Identification of the number of occupied webs

Survey results are discussed in Section 7.8.2.4.4 below.

[19] Available at https://biodiversityireland.ie/surveys/marsh-fritillary-monitoring-scheme/. Accessed in August 2022

7.7.2.2.3.4 Otter

During the August 2022 and July 2023 multidisciplinary walkover surveys and aquatic surveys searches for evidence of Otter (*Lutra lutra*) presence were carried out, following methodologies outlined by NRA (2009b). This included searches for Otter activity including holts (breeding and temporary), couches, slides, spraints, feeding remains and tracks. The surveys were undertaken along suitable habitats (i.e. streams, rivers and drainages ditches) within the proposed wind farm site (plus a 150m buffer to account for disturbance impacts), to determine the presence or absence of the species.

Survey results are discussed in Section 7.11.2.1.5.4.2 below

The aquatic surveys undertaken in June and September 2022 also provided an opportunity to assess suitability as Otter habitat and presence of the species.

7.7.2.2.3.5 Badger

During the multidisciplinary walkover surveys undertaken in August 2022 and July 2023 searches for Badger (*Meles meles*) activity were carried out following methodologies outlined by NRA (2009b). The searches were undertaken within the proposed wind farm site (plus a 150m buffer to account for disturbance impacts), and any evidence of badger activity (e.g. setts, trails, latrines and feeding signs) were recorded.

Survey results are discussed in Section 7.11.2.1.5.4.1below

7.7.2.3 Proposed Turbine Delivery Route

7.7.2.3.1 Multidisciplinary Walkover Survey

Similarly to the methodology employed for surveying the proposed wind farm site, a multidisciplinary walkover survey was conducted at the POI locations of the proposed TDR where works are proposed (see Figure 7.16 through Figure 7.18 in Section 7.9.2).

The habitats at these POIs were visited on the July 12th 2023 and were classified (according to Fossitt, 2000) based on the qualitative consideration of the plant species abundance, diversity, and protection status; vegetation structure; topography; drainage conditions; and evidence for disturbance and/or management.

Also, a search for IAPS listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011, as amended) was also conducted at the proposed wind farm site.

Survey results are presented in Section 7.7.2.4.1.

The multidisciplinary walkover surveys included searches for protected invertebrates, such as the Whorl Snail and Marsh Fritillary, and suitable habitats. However, no evidence of these species or suitable habitats were found.

7.7.2.3.2 Aquatic Surveys

All rivers and water bodies near the POIs are culverted and situated a considerable distance from the proposed POI work areas. It was deemed to be no hydrological pathway for impact, and no aquatic surveys were required.

7.7.2.3.3 Protected Species Surveys

7.7.2.3.3.1 Bats

At various POIs, tree removal and hedgerow trimming are required as part of the proposed works. Preliminary tree roost assessment for bats were conducted on the trees that were surveyed as part of the multidisciplinary survey. The survey indicated that the isolated nature and management of the trees and treeline to be removed, along with the absence of potential roost features, made a further roost assessment unnecessary.

However, if conditions change over time and the area of the POIs becomes suitable for roosting, a bat specialist will conduct further inspections before any works commence to manage risk of impacts on bats and ensure compliance with relevant conservation regulations.

7.7.2.3.3.2 Badger and Otter

Following NRA Guidelines (2009b), a multidisciplinary survey was conducted at the POIs to assess the presence of badgers and otters. The survey also considered a 150m buffer zone around the POIs to account for potential disturbance impacts.

7.7.2.4 Survey Limitations and Constraints

7.7.2.4.1 Multidisciplinary Walkover Survey

Access was granted to the whole the proposed wind farm site and POIs ahead of the multidisciplinary walkover survey. However, some areas at the proposed wind farm site could not be fully surveyed on foot due to dense vegetation or unsafe conditions (i.e. flooded areas; deep drainage ditches). In accordance with best practice guidelines (CIEEM, 2018), these areas were instead visually assessed from adjacent lands and/or from public roads using binoculars, where possible, and were supported by information obtained from a review of aerial photography and desktop study data (e.g. TOBIN Consulting Engineers, 2019). Despite this limitation, it is considered that robust surveys were undertaken to fully inform the assessment of potential impacts.

7.7.2.4.2 Aquatic Surveys

There are a number of limitations inherent to field-based surveying, in particular with regards to suitable weather/water flow conditions, which can restrict access to sampling sites, or integrate a bias in the field survey assessments.

Although careful consideration and planning was put in assuring optimal weather conditions during field surveys in September 2022, the sampling sites 1, 6, 7, 8, 9, 11 and 12 did not carry enough water to allow the use of the electrofishing. Nevertheless, every effort was made to carry out the surveys, including the adaptation of the methodologies to suit the observed conditions (i.e. using 'spot-electrofishing', which, instead of electrofishing a river reach, the survey technique is employed at discrete locations containing enough water depth). These adaptations are described on the description of the survey results Section 7.8.2.3 and Appendix 7.5c.

7.7.2.4.3 Bat Surveys

Appendix 7.6 includes a description of the bat survey constraints, outlining that

- "*there were limitations in relation to night-time work on Health & Safety grounds (i.e. safe traversing through the survey area during hours of darkness). This limited walking transects across open sections of bog within the survey area. Transects were limited to tracks and railway lines. However, static surveillance provided bat survey information for this area*".

Despite the limitation for the walking transects survey design, the comprehensive dataset collected from all the bat surveys conducted at the proposed wind farm site, and its immediate vicinity, provided a representative account of local bat activity and its relevant features.

7.7.2.4.4 Whorl Snail Survey

The Whorl Snail survey was constrained by the high-water levels, which resulted in access restrictions to some of the locations planned to be surveyed. Nevertheless, the locations that were surveyed are considered to be representative of the Whorl Snail favoured habitats within the proposed wind farm site and accurately represent the local presence of the species.

7.8 Environmental Baseline – Proposed Wind Farm Site

As outlined in Section 7.7 the existing ecological baseline at the proposed wind farm site has been informed through a combination of:

- desk studies
- scoping and consultations
- field surveys

Together, the desk study (see Section 7.8.1), scoping and consultations (see Section 7.5), and field surveys (see Section 7.8.2) provided essential background knowledge of terrestrial and aquatic ecology ensuring a robust description of the existing ecological baseline and forming the foundation for impact assessments.

7.8.1 Desk Study

7.8.1.1 Overview

The desk study utilised existing data sources such as previous environmental assessments, habitat maps, and records of protected species to establish a baseline understanding of the area. The desk study was complemented by scoping exercises and consultations with relevant stakeholders, including regulatory bodies and environmental groups (as described in Section 7.5) to gather additional insights and ensure a comprehensive understanding of the policy and environmental ecological context. The desk study and consultations informed the design of a suite of directed ecological survey at the proposed wind farm site. Together, the desk study, consultations, and field surveys provided essential background knowledge of terrestrial and aquatic ecological factors ensuring a robust description of the existing ecological baseline and forming the foundation for impact assessments.

A description of changing activity at the bogs is provided in Chapter 3 (Description of the Proposed Development). Chapter 3 describes that the main activity at the proposed wind farm site was industrial peat extraction which started in 1950's. The peat extraction activity occurred at varying levels of intensity across the proposed wind farm site before activity gradually declined to full cessation of all extraction activity in July 2019. The ecological transition from bare peat and cutover bog that would have previous dominated the landscape has been captured during the suite of surveys undertaken at the proposed wind farm site in 2022. These surveys are described in Section 7.7.2.2 below.

Section 7.8.1.2 provides an overview of the aquatic environment at the proposed wind farm site, including an assessment of the surface water catchments, river and lake water bodies, and groundwater bodies. It details the locations and characteristics of these water bodies, their WFD (Water Framework Directive) classifications, and their potential for receiving surface water runoff from the site. It also considers the impact of the proposed development on these aquatic environments, including water quality trends, hydromorphological conditions, and groundwater flow characteristics

Since 2000, the Mountdillon Bog Group, including the proposed wind farm site, has been licensed by the EPA under an Integrated Pollution Control (IPC) Licence, requiring Bord na Móna to implement an Environmental Management Programme focused on reducing emissions, waste, and protecting water systems. A description of the IPC Licence is provided in Section 7.8.1.4.

A review of the NPWS Protected Species Database and NBDC is provide in Section7.8.1.4 while a summary of European site and nationally important sites in the vicinity of the proposed wind farm site is provide in Section 7.8.1.4 and Section 7.8.1.6 respectively.

7.8.1.2 Aquatic Environment

7.8.1.2.1 Surface Water Catchments

The proposed wind farm site is located predominantly within the Upper Shannon Catchment (26C), with a small segment to the south located within the Upper Shannon Catchment (26E) and upstream of the Lough Ree Special Area of Conservation (SAC) (Site Code: 000440).

Three sub catchments are present at the proposed wind farm site, the majority of the proposed wind farm site is located within the Shannon [Upper] SC_080 Sub Catchment, with a small proportion of the proposed wind farm site located within the Bilberry _SC_010 Sub Catchment to the south and the Shannon [Upper]_SC_060 Sub Catchment to the southeast.

The naming of the streams varies between the historical maps, OSI maps and the EPA catchment maps.

7.8.1.2.2 River Water Bodies

The proposed wind farm site drains into four WFD river water bodies. Table 7.10 provides monitoring results for the river water bodies and indicates an apparent longitudinal WFD water quality status decreasing trend, from *Moderate*, for the river water bodies in the vicinity of the proposed wind farm, to *Poor* further downstream. There are no records of fisheries survey data available on any of these WFD river water bodies.

7.8.1.2.3 Lake Water Bodies

The river water bodies receiving surface water from the proposed wind farm site drain into the Ree WFD lake water body (LWB) (IE_SH_26_750a)) which, although classified with *Moderate* status for the *Hydromorphological Conditions* monitoring element, has been classified as *Good* WFD water quality status. Nevertheless, this lentic water body seems to display a similar rising trend for the nutrient concentrations to the WFD river water bodies, although the Chlorophyll concentrations have decreased over the same period.

The Ree WFD lake water body has been surveyed in 2013 as part of the WFD surveillance monitoring programme (Kelly *et al.*, 2014). A total of six fish species and one type of hybrid were recorded: Perch (*Perca fluviatilis*) was the most abundant fish species recorded, followed by Roach (*Rutilus rutilus*) and Roach x Bream hybrids (*Rutilus rutilus* × *Abramis brama*). Brown trout (*Salmo trutta*) and Eel (*Anguilla anguilla*) were also captured, along with small numbers of Pike (*Esox lucius*) and Stone Loach (*Barbatula barbatula*). Previously, in 2010 (IFI, 2010), beyond the species captured in 2013 (in similar abundances), Tench (*Tinca tinca*) was also included with occasional presence at the Ree WFD lake water body.

Surface water bodies located downstream of the Ree WFD lake water body are not considered for the assessment of significant effects from the proposed development. It is considered that the nature of the proposed wind farm and the lentic nature and size of this water body would preclude the significance of any potential effects further downstream.

7.8.1.2.4 Groundwater Bodies

The proposed wind farm site lies on three WFD groundwater bodies:

- Funshinagh (IE_SH_G_091)
- Inny (IE_SH_G_110)
- Longford Ballinalee (IE_SH_G_149)

These groundwater bodies have all been classified with *Good* WFD water quality status for the period 2016-2021 (see table below).

The part of the Inny WFD groundwater body intersected by the proposed wind farm site, and the Funshinagh WFD groundwater body are mostly formed by a karstic aquifer, where groundwater flows through conduits, mostly discharging to large springs or, in winter, to the abundant turloughs in the area, and/or streams and rivers crossing the respective groundwater body. Overall groundwater flow is towards Lough Ree, but the highly karstified nature of the bedrock means that locally groundwater flow directions can be highly variable, with path lengths reaching up to several kilometres[20, 21].

The eastern part of the proposed wind farm site also intersects the Longford Ballinalee WFD groundwater body (see Figure 7.3), an aquifer with a limited and relatively poorly connected network of fractures, fissures and joints, with permeability tending to decrease with depth (GSI, 2017). Thus, the groundwater paths are generally short, with groundwater discharging to small

[20] Available at https://gsi.geodata.gov.ie/downloads/Groundwater/Reports/GWB/InnyGWB.pdf. Accessed in February 2023.
[21] Available at https://gsi.geodata.gov.ie/downloads/Groundwater/Reports/GWB/FunshinaghGWB.pdf. Accessed in February 2023.

springs, or to the streams and rivers that traverse the aquifer. Water level data suggest that the water table is generally within 5m of the surface[22].

Table 7.10: WFD Water Quality Status (EPA, 2021) *of Water Bodies Draining the Proposed Wind Farm Site*

Unassigned Bad Poor Moderate Good High

WFD classification *	Water Body Name	WFD Reference	WFD Water Quality Status	Limiting Element
RWB	Ledwithstown_010	IE_SH_26L840850	Md**	-
	Lough Bannow Stream_010	IE_SH_26L120100	Md**	-
	Ballynakill_010	IE_SH_26B220790	Md**	-
	Shannon (Upper)_100	IE_SH_26S021600	M**	Invertebrate Status or Potential
LWB	Ree	IE_SH_26_750a	M**	Hydromorphological conditions
GWB	Funshinagh	IE_SH_G_091	-	-
	Inny	IE_SH_G_110	-	-
	Longford Ballinalee	IE_SH_G_149	-	-

* RWB – River Water Body; LWB – Lake Water Body – GWB – Groundwater Body
** M – Monitoring; Md – Modelling

7.8.1.3 Drainage Design

Nicholas O'Dwyer Ltd were appointed by Bord na Móna in February 2021 to carry out a drainage design, pumping station reviews and flood risk assessment for the proposed wind farm site (see Appendix 7.3). It included walkover surveys from January to March 2021, which verified the existence of a series of open field drains. An overview of the drainage design for Derryaroge, Derryadd, and Lough Bannow Bogs is presented in Table 7.11.

The surface of the cutover bog is drained by a network of parallel northwest-southeast generally orientated field drains that are typically spaced every 15 – 20 m. The field drains are approximately 0.5 - 1.5 m deep and in most areas, they intercept the mineral subsoil underlying the peat. These field drains mostly feed into larger surface water drains which drain the main catchments across the three bogs. The surface water drains are primarily in a northwest-southeast orientation but there are a number of shorter cross drains which intersect the small

[22] Available at https://gsi.geodata.gov.ie/downloads/Groundwater/Reports/GWB/LongfordGWB.pdf. Accessed in February 2023.

field drains. There are also a number of pump stations located at low points in the larger drains to direct the surface water to the outfall locations and boundary drains. There are various outfalls on the bog boundaries which comprise mainly pumped outfalls but also some areas of gravity drainage. Surface water draining/pumped from the site is routed via existing IPC settlement/slit ponds (in accordance with the IPC licence requirements) prior to discharge into off-site drainage channels, streams and rivers which ultimately flow into the River Shannon and Lough Ree.

Derryaroge Bog has several smaller field drains that conveys water to deep collector drains, connected through pipes at lower points. Water pumps are used to lift water from the central collector drains to peripheral collector drains (PO9 & PO9), and from the peripheral collector drains to the receiving surface water bodies (P05, P06 & P08) at unknown flow rates. Drainage at the Derryadd Bog has smaller field drains, which are connected by pipes, and discharge externally with the aid of 6 water pumps P10-P15 (although pump P13 is decommissioned, and discharge is via gravity outfall north of the pump station site) with unknown flow rates. The Lough Bannow Bog drainage is regulated by 3 water pumps, P16-P18, with unknown flow rates.

Table 7.11: Summary Description of Drainage Design at the Derryaroge, Derryadd and Lough Bannow Bogs

Bog	▪ Drains	Spacing between consecutive drains	Water Pumps
Derryaroge	▪ Deep collector drains	300m	9 water pumps (4 located outside the Proposed Wind Farm)
	▪ Smaller field drains	15m	
	▪ Central collector drains	-	
	▪ Peripheral collector drains	-	
Derryadd	▪ Small field drains (shorter than Derryaroge)	15m	6 water pumps (one pump is decommissioned)
Lough Bannow	▪ Small field drains (shorter than Derryaroge)	15m	3 water pumps

In terms of flood risk, it is reported that despite the proposed wind farm being located with areas classified at risk of fluvial/pluvial flooding, and refers the National Indicative Flood Mapping (NIFM) as indicating 2 areas with an Annual Exceedance Probability (AEP) of 0.1% (return period of 1000 years – low probability), and one area of 1% (return period of 100 years – medium probability), all within the proposed wind farm site, it concludes that the high vulnerability uses for the proposed wind farm (e.g. energy infrastructure – turbines, substation) are all located above the 1,000-year flood levels, while also considering the revegetation process taking place at the proposed wind farm site will "(…) *slow the runoff from the existing bog and will also increase evapotranspiration from the bog, further reducing the speed of runoff from the site*".

7.8.1.4 IPC P0504-01

Since 2000, the entirety of the Mountdillon Bog Group, a group of bogs under Bord na Móna management, which includes the proposed wind farm site, is licenced by the EPA under an Integrated Pollution Control (IPC) Licence regime (Reg. No. P0504-01) under Part IV of the EPA Act 1992.

The IPC Licence required the licensee (i.e. Bord na Móna Energy Limited) to establish and maintain an Environmental Management Programme (EMP), which would form part of the Annual Environmental Report[23] (AER) and includes the following objectives:

(i) *Reduction of fugitive dust emissions during loading and transfer operation on the bog and during unloading operations at the tippler and works yard areas.*

(ii) *Waste Reduction/Raw Material usage efficiency (i.e., continue to implement, and where possible, improve on waste streamlining and recycling).*

(iii) *Minimisation of suspended solids movement to surface water systems via peatland surface water drainage channels during development and operation of boglands.*

- *Effective spill/leak management of mobile fuelling units. Increased bund capacity will be provided where required. Bund integrity testing will be carried out where required.*
- *Collection, storage and reuse of polythyene covering.*

(iv) *Continue with implementation process of the Energy Standard 50001.*

- *Groundwater protection measure including upgrade to existing septic tank systems where required.*

It is relevant to note that, during the 12-year period of available monitoring data, there were no exceedances to the Suspended Solids (SS) Emission Limit Value (ELV) set for emissions to water –35mg/l – from the Derryaroge, Derryadd and Lough Bannow Bogs.

Although with a broader range than solely the aquatic environment, the Condition 10 of the IPC Licence P0504-01 requires Bord na Móna Energy Limited to prepare and implement, to the satisfaction of the EPA, a Cutaway Bog Decommissioning and Rehabilitation Plan.

The EPA set out these conditions in the Licence "*to make provision for the proper closure of the activity* [peat extraction] *ensuring protection of the environment*".

In 2025 Bord na Móna produced updated draft Cutaway Bog Decommissioning and Rehabilitation Plans for the Mountdillon Bog Group, including the three bogs within which the proposed wind farm site is located (i.e. Derryaroge Bog, Derryadd Bog, and Lough Bannow Bog).

[23] Available at https://leap.epa.ie/licence-profile/P0504/compliance. Accessed in November 2023

8°11'20"W
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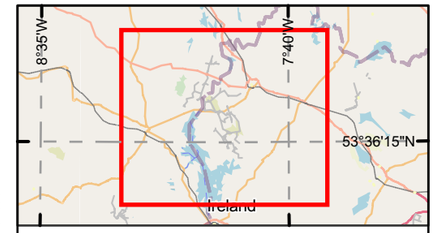

Legend

- Proposed wind farm site
- WFD - River Water bodies
- WFD - Lake Water bodies
- Zone of Influence
- WFD - Groundwater bodies

0 2.5 5
Kilometres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
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4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
A	09/04/2025	First issue	S.P	I.H

Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.3: Hydrological and Hydrogeological Pathways from the Proposed Wind Farm

Scale @ A3: 1:150,000

Prepared by:	Checked by:	Date:
S.Pezzetta	I.Heanue	April 2025

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Map Ref: 11399-030-WFD-P.APP.BO-TOB-A

Draft: A

7.8.1.5 Protected Species

7.8.1.5.1 Protected Species Database and NBDC website

A review of the NPWS Protected Species Database and the NBDC website for the N06, N07 and N16 10x10 km Irish Grid Squares, in which the proposed wind farm is located, revealed records of several protected species and/or IAPS (see Table 7.12). Records of bird species are not included in the table below but are included in Chapter 8 – Ornithology of this EIAR which presents the findings of an assessment of effects and impacts of the proposed development on avian receptors.

Table 7.12: Biodiversity Records from Irish Grid Squares N06, N07 and N16

Grid Square	Common Name	Scientific Name	Last Record	Designation
Lichens				
N16	Cladonia	*Cladonia portentosa*	26/08/2016	EU Habitats Directive - Annex V
Clubmoss				
N06	Fir Clubmoss	*Huperzia selago*	18/03/2021	EU Habitats Directive - Annex V
Bryophytes				
N16	Large White-moss	*Leucobryum glaucum*	26/08/2016	EU Habitats Directive - Annex IV
N06	Clustered Earth-moss	*Ephemerum cohaerens*	04/09/2007	Flora Protection Order 2022 (S.I. 235/2022)
Insects				
N07, N16	Marsh Fritillary	*Euphydryas aurinia*	07/06/2020	EU Habitats Directive - Annex II
Crustaceans				
N07	Freshwater White-clawed Crayfish	*Austropotamobius pallipes*	15/06/2011	EU Habitats Directive - Annex II, Annex V; Wildlife Acts
Molluscs				
N07, N16	Desmoulin's Whorl Snail	*Vertigo moulinsiana*	22/09/2006	EU Habitats Directive - Annex II; Wildlife Acts
N07	Geyer's Whorl Snail	*Vertigo geyeri*	04/05/2006	EU Habitats Directive - Annex II; Wildlife Acts
Amphibians				
N06, N07, N16	Common Frog	*Rana temporaria*	23/02/2023	EU Habitats Directive - Annex V; Wildlife Acts

Grid Square	Common Name	Scientific Name	Last Record	Designation
N16	Smooth Newt	*Lissotriton vulgaris*	31/12/2012	Wildlife Acts
Reptiles				
N06, N16	Common Lizard	*Zootoca vivipara*	27/06/2019	Wildlife Acts
Volant Mammals				
N06, N07, N16	Brown Long-eared Bat	*Plecotus auritus*	02/08/2021	EU Habitats Directive - Annex IV; Wildlife Acts
N06, N07, N16	Daubenton's Bat	*Myotis daubentonii*	25/08/2021	EU Habitats Directive - Annex IV; Wildlife Acts
N06, N07, N16	Leisler's bat	*Nyctalus leisleri*	11/08/2021	EU Habitats Directive - Annex IV; Wildlife Acts
N06	Natterer's Bat	*Myotis nattereri*	06/09/2016	EU Habitats Directive - Annex IV; Wildlife Acts
N06, N07	Nathusius's Pipistrelle	*Pipistrellus nathusii*	03/08/2021	EU Habitats Directive - Annex IV; Wildlife Acts
N06, N07, N16	Common Pipistrelle	*Pipistrellus pipistrellus sensu lato*	17/06/2018	EU Habitats Directive - Annex IV; Wildlife Acts
N06, N07, N16	Soprano Pipistrelle	*Pipistrellus pygmaeus*	12/08/2021	EU Habitats Directive - Annex IV; Wildlife Acts
Non-Volant Mammals				
N06, N07, N16	Eurasian Badger	*Meles meles*	09/12/2018	Wildlife Acts
N07, N16	Eurasian Pygmy Shrew	*Sorex minutus*	09/07/2012	Wildlife Acts
N06, N07, N16	Eurasian Red Squirrel	*Sciurus vulgaris*	07/10/2016	Wildlife Acts
N06, N07, N16	European Otter	*Lutra lutra*	23/09/2014	EU Habitats Directive - Annex II, Annex IV; Wildlife Acts
N06, N07, N16	Irish Hare	*Lepus timidus* subsp. *hibernicus*	10/07/2023	Wildlife Acts
N06, N07	Irish Stoat	*Mustela erminea* subsp. *hibernica*	15/09/2022	Wildlife Acts
N06, N07, N16	Pine Marten	*Martes martes*	16/12/2022	EU Habitats Directive - Annex V; Wildlife Acts

Grid Square	Common Name	Scientific Name	Last Record	Designation
N06, N07, N16	West European Hedgehog	*Erinaceus europaeus*	16/08/2022	Wildlife Acts
Invasive Alien Species				
N06, N07	Canadian Waterweed	*Elodea canadensis*	17/07/2017	Regulation S.I. 477/2011
N06, N07	Japanese Knotweed	*Fallopia japonica*	03/11/2021	Regulation S.I. 477/2011
N06	Rhododendron	*Rhododendron ponticum*	14/03/2023	Regulation S.I. 477/2011
N06, N07	Zebra Mussel	*Dreissena polymorpha*	29/08/2023	Regulation S.I. 477/2011
N06, N07	Asian Clam	*Corbicula fluminea*	29/06/2022	Regulation S.I. 477/2011

7.8.1.5.2 Bats

A search on the Bat Conservation Ireland Database for bat records within 10 km of the proposed wind farm site confirmed the bat occurrences detailed in the Bat Survey report in Appendix 7.6. Records show occurrences of the following species: Soprano Pipistrelle (*Pipistrellus pygmaeus*), Common Pipistrelle (*Pipistrellus pipistrellus sensu lato*), Leisler's bat (*Nyctalus leisleri*), Brown Long-eared Bat (*Plecotus auritus*), Natterer's Bat (*Myotis nattereri*), Daubenton's Bat (*Myotis daubentonii*), *Pipistrelle* spp., and *Myotis* spp.) (see Appendix 7.6).

In terms of habitat and landscape bat favourability, overall, the proposed wind farm site is located within a low-medium landscape favourability for bat species (Figure 11b in Appendix 7.6), reflected by the reported low value of bog habitat for bats.

7.8.1.6 European Sites and Nationally Important Sites

In national legislation SACs and SPAs, designated under the EU Habitats Directive and EU Birds Directive respectively, are known as 'European sites'. To meet the provisions of Article 6(3) of the Habitats Directive the likely significant effects and/or adverse impacts of the proposed development on European sites are fully assessed, respectively, in the combined Stage 1 AASR and Stage 2 NIS report that accompany the application for the proposed development.

The EPA EIA Guidelines (2022) state:

- "*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*".

To comply with the above guidance, this Chapter summarises the key findings of the assessments of adverse impacts on European sites due to activities at the proposed wind farm site (see Section 7.8.1.6.1) and at the POIs (see Section 7.8.1.6.2).

In addition to European sites, this EIAR considers effects on sites of national importance for biodiversity and conservation which includes Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs).

7.8.1.6.1 Sites of International Importance

To identify all European sites that could potentially be affected by the proposed development, a source-pathway-receptor model was applied. This approach assessed the connectivity) hydrological, hydrogeological, ecological) between the proposed development site and European site. For context Figure 7.4 illustrates the European sites located in proximity to the proposed wind farm.

Based on identified source-pathway-receptor linkages, the Stage 1 Appropriate Assessment (AA) screening concluded that likely significant effects could not be ruled out for the following sites:

- Lough Ree SAC [Site code: 00440] (NPWS, 2016; 2019)
- Lough Ree SPA [Site code: 004064] (NPWS, 2015; 2022a)

Consequently, both sites were brought forward to Stage 2 of the AA process and subject to detailed assessment in the Natura Impact Statement (NIS). It should be noted that European sites located at greater distances from the proposed development were also examined to assess potential connectivity. However, for these more remote sites, no complete source-pathway-receptor chain was identified, and therefore, they were not considered further in the impact assessment.

Lough Ree SAC is designated under the EU Habitats Directive for a wide array of protected habitats and species, including priority and Annex I habitat types. These include aquatic habitats such as natural eutrophic lakes with floating and submerged vegetation, alkaline fens, and both active and degraded raised bogs. The SAC also encompasses terrestrial features like semi-natural dry grasslands rich in orchid species, limestone pavements, bog woodlands, and riparian alluvial forests. Furthermore, the site is of conservation importance for the Otter (*Lutra lutra*), a species listed under Annex II of the Directive.

Lough Ree SPA is designated for the protection of significant populations of wintering and wetland birds by conserving essential feeding, nesting, and roosting habitats. Bird species supported by the site include dabbling and diving ducks (e.g., Wigeon, Teal, Mallard, Shoveler, Tufted Duck, Common Scoter, Goldeneye), Whooper Swan, Little Grebe, and Coot. It also supports waders such as Golden Plover and Lapwing, as well as summer visitors like the Common Tern. The site is recognised under the Special Conservation Interest (SCI) category of "Wetlands and Waterbirds" for its critical role in supporting bird populations and wetland ecosystems.

The potential for adverse effects on the integrity of both Lough Ree SAC and Lough Ree SPA was comprehensively assessed in the NIS in accordance with Article 6(3) of the Habitats Directive (92/43/EEC). Based on the best available scientific knowledge, it was concluded that the proposed development, either alone or in combination with other plans or projects, will not adversely affect the integrity of any European site, provided that the identified mitigation measures are fully implemented and maintained.

Lough Ree SAC is identified as an Internationally Important KER in this Chapter (see Section 7.10.1.3) due to its designation for a range of sensitive Annex I habitats and Annex II species under the EU Habitats Directive. The site supports aquatic and semi-aquatic habitats, including natural eutrophic lakes, alkaline fens, and habitats important for the Otter (*Lutra lutra*). Potential effects of the construction phase on Lough Ree SAC are considered in Section 7.11.2.1.1 below, with particular focus on risks related to siltation, contamination of waters by toxic substances like hydrocarbons and construction-related particulates, including bentonite slurry and concrete washout that may lead to adverse ecological effects. This assessment informs the conclusions of the NIS, which finds that, subject to the implementation of mitigation measures, the proposed development will not result in adverse effects on the integrity of the SAC, either alone or in combination with other plans or projects.

Lough Ree SPA is identified as an Internationally Important Key Avian Receptor (KAR) in Chapter 8: Ornithology, which presents an assessment of the potential effects and impacts of the proposed development on avian receptors. Lough Ree SPA is identified as a Key Avian Receptor due to its international importance for a range of wintering and wetland bird species, many of which are sensitive to disturbance, habitat loss, and changes in hydrology. The ornithological assessment specifically evaluates potential collision risk, displacement, and disturbance effects associated with the construction and operation of the proposed development. This assessment informed the NIS and contributed to the conclusion that, with the implementation of appropriate mitigation measures, no adverse effects on the integrity of Lough Ree SPA are anticipated..

7.8.1.6.2 Sites of National Importance

Figure 7.5 show the National designated sites around the proposed wind farm.

Considering hydrological and hydrogeological flow associated with the proposed wind farm site, four Nationally important sites are considered as potentially connected with the proposed wind farm site:

- Lough Bawn pNHA [Site code: 001819] (NPWS, 2009a)
- Lough Bannow pNHA [Site code: 000449] (NPWS, 2009b)
- Lough Ree pNHA (see site synopsis for Lough Ree SAC [Site code: 00440] (NPWS, 2019)
- Derry Lough pNHA [Site code: 001444] (NPWS, 2009c)

Brief description of the pNHAs is provided in Table 7.13.

The sites are considered **Nationally Important** KERs.

Table 7.13: Hydrological and hydrogeological linked pNHAs

National site	Brief Description	Approximate Distance from Proposed Wind Farm
Lough Bawn pNHA [001819]	Lough Bawn is a relatively small site composed of raised bog, fen, wet and dry woodland and freshwater marsh habitats. It is the area of fen however that gives this site its primary scientific interest. Any further drainage and/or peat extraction should be discouraged if the	0.0 km

National site	Brief Description	Approximate Distance from Proposed Wind Farm
	wetland habitat is to be maintained at Lough Bawn (NPWS, 2009a).	
Lough Bannow pNHA [000449]	Lough Bannow was mapped as a drying out lake and/or infilling with vegetation, as surveyed in 1907. The site is traversed by deep drains, which, adding to the local nutrient enrichment/eutrophication and land reclamation, can potentially threat the ecological value of this site (NPWS, 2009b).	0.1 km
Lough Ree pNHA [000440]	Same description as Lough Ree SAC – Lough Ree is the third largest lake in Ireland, beyond the lake itself (an example of a mesotrophic to moderate-eutrophic system), interesting shoreline, terrestrial and semi-aquatic habitats also occur, supporting a rare fish assemblage and a good diversity of breeding and wintering birds. Some of the woodlands around the lake are particularly important, as examples of very few remaining ancient woodlands in Ireland (NPWS, 2019).	2.4 km
Derry Lough pNHA [001444]	Derry Lough is a relatively small area of wet grassland, fen, fen woodland and open water. It is bounded on the east by sloping farmland and on the west by a Bord na Móna bog. The water table is kept high by the Lough Ree levels. Although the transition from lake to woodland, which has been occurring for very many years, has been accelerated by a certain amount of drainage, Derry Lough still has many interesting features, which are a valuable complement to habitats on the shores of Lough Ree (NPWS, 2009c).	2.6 km

National sites located further away were also considered, but no potential source-pathway-receptor link was found that would affect any of the sites beyond those listed above.

It should be noted that although Forthill Bog NHA [001448], Fortwilliam Turlough pNHA [000448], Lough Slawn pNHA [001443], and Cordara Turlough pNHA [001821] are located within the same WFD groundwater body as the proposed wind farm site (i.e. Funshinagh WFD Groundwater body), the groundwater levels at the proposed wind farm site are below the water levels at these Nationally Important sites, which would drive the groundwater flow towards the proposed wind farm site.

8°11'20"W
7°55'40"W
7°40'0"W
53°47'5"N
53°38'40"N
53°30'15"N
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592000
608000
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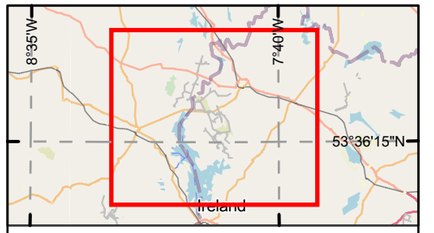
Elphin
Grange Lough
Lough Gowna
Strokestown
Newtown Forbes
Longford
County Roscommon
Doughill Forest
County Longford
Edgeworthstown
Royal Canal
Roscommon
Ballymahon
Lough Ree

Clooneen Bog SAC
Lough Forbes Complex SAC
Ballykenny-Fisherstown Bog SPA
Brown Bog SAC
Mount Jessop Bog SAC
Corbo Bog SAC
Fortwilliam Turlough SAC
Lough Ree SAC
Lough Ree SPA

N4
N5
N55
N61
N63
N60

OpenStreetMap: Map data © OpenStreetMap contributors, Microsoft, Facebook, Google, Esri Community Maps contributors, Map layer by Esri



Legend

- Proposed wind farm site
- Special Areas of Conservation (SACs)
- Special Protection Areas (SPAs)
- WFD - River Water bodies
- WFD - Lake Water bodies

0 2.5 5
Kilometres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
A	06/05/2025	First issue	S.P	I.H

Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.4: EU Designated Sites Surrounding the Proposed Wind Farm Site

Scale @ A3: 1:150,000

Prepared by:	Checked by:	Date:
S.Pezzetta	I.Heanue	May 2025

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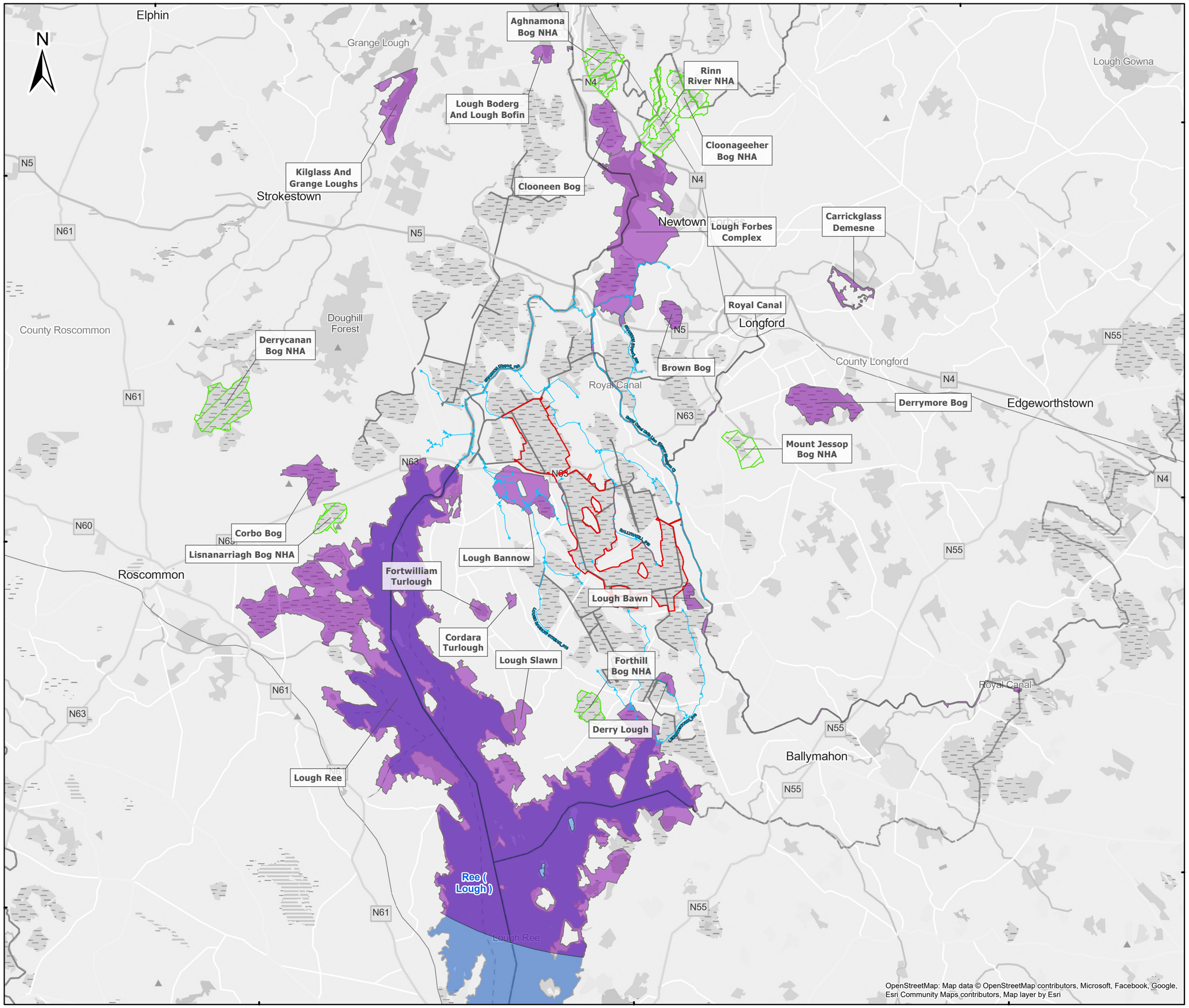
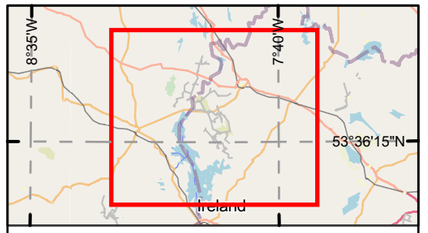
Map Ref: 11399-028-EU.S-WFD-TOB-A

Draft: A





Legend

- Proposed wind farm site
- National Heritage Areas (NHA)
- proposed National Heritage Areas (pNHA)
- WFD - River Water bodies
- WFD - Lake Water bodies

0 2.5 5
Kilometres

NOTES

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Rev	Date	Description	By	Chkd.
A	06/05/2025	First issue	S.P	I.H

Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.5: Nationally Important Sites Surrounding the Proposed Wind Farm Site

Scale @ A3: 1:150,000

Prepared by:	Checked by:	Date:
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Map Ref: 11399-029-N.S-WFD-TOB-A

Draft: A

Field Studies

7.8.2.1 Overview

The ecological transition of the proposed wind farm site from cutover bog and bare peatlands and the emerging transition habitats have been in-part captured by the suite of habitat surveys undertaken at the proposed wind farm site in 2022 (see Section 7.8.2.2).

Section 7.8.2.3 through Section 7.8.2.5 described the findings of ecological surveys conducted at the proposed wind farm in 2022. These include aquatic and water quality assessments. The sections also highlight the finding of survey undertaken for protected species such as bats, non-volant mammals, the Whorl Snail, and the Marsh Fritillary butterfly. The section concludes by addressing invasive alien species, both plant and animal.

7.8.2.2 Habitats

7.8.2.2.1 Multidisciplinary Walkover Surveys

The habitats found in the 2022 survey reflect the historic use of the site for peat extraction, as well as the first signs of habitat transition. Overall, the area surveyed occupies a total extent of approximately 1,900ha, encompassing a total of 29 Fossitt (2000) habitat types (excluding the Derryaroge Mineral Island described below).

The habitats identified during the multidisciplinary walkover surveys are shown in Figure 7.6. through Figure 7.8. Species lists for the habitats are provided in Appendix 7.9a. Each habitat has been assessed based on its classification, extent, and ecological significance. The survey recorded the habitat type and its spatial coverage, measured either in hectares or meters, to understand its distribution within the site. The percentage of the total site occupied by each habitat was calculated to provide a clearer picture of its relative dominance. An ecological valuation was assigned to each habitat, reflecting its conservation importance and contribution to biodiversity. This valuation was supported by a rationale, which considered habitat quality, ecological function, and potential sensitivity to change.

Over 90% of the surveyed area (approximately 1,700ha) is occupied by five habitat types (Table 7.14) namely:

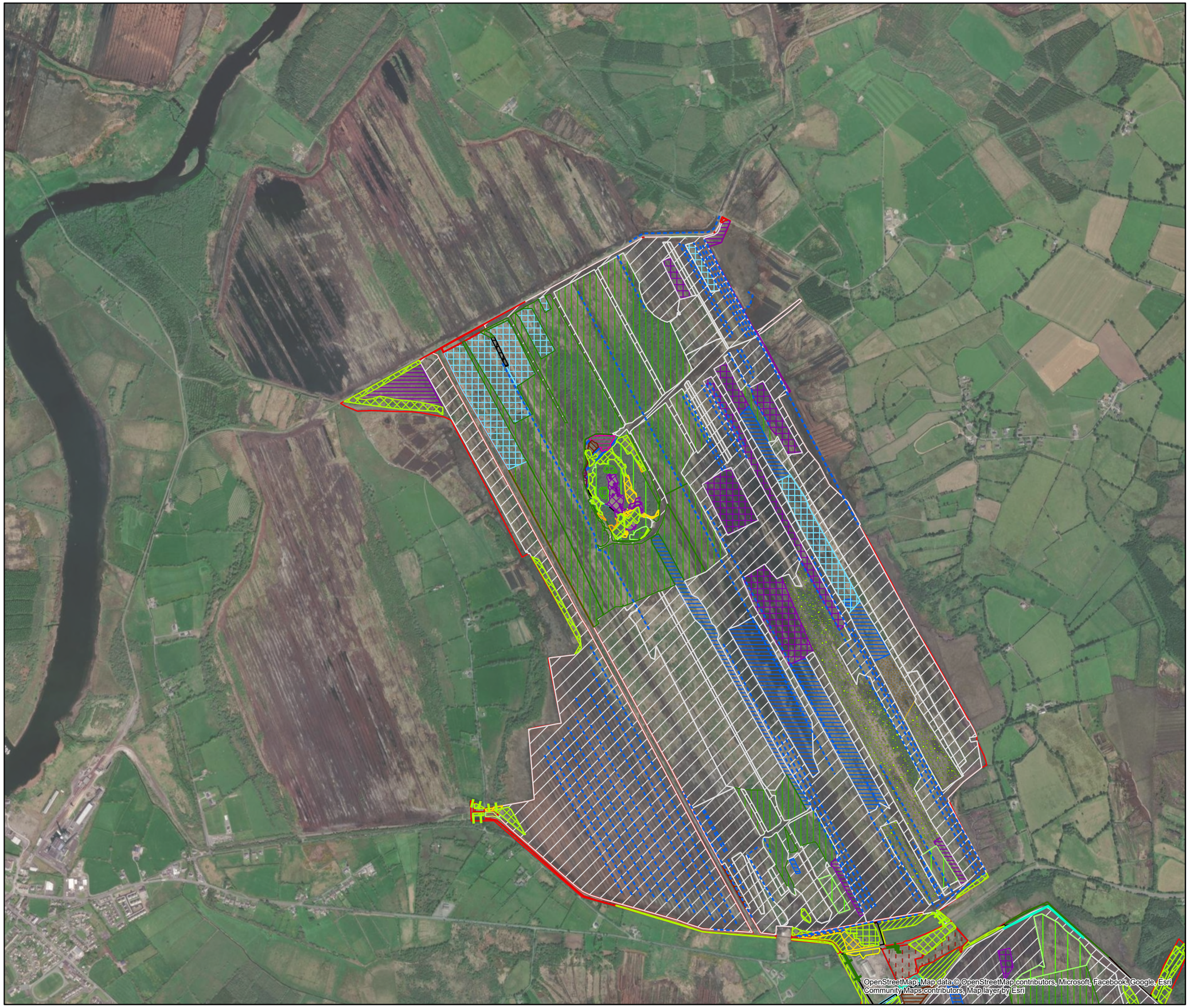
- Cutover bog (PB4)
- Bog woodland (WN7)
- Other artificial lakes and ponds (FL8)
- Raised bog (PB1)
- Conifer plantation (WD4)

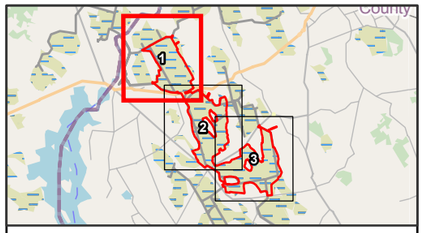
Beyond this habitat homogeneity, habitats at the proposed wind farm site do not seem to show great intrinsic diversity, being occupied by a large quantity of graminoids, with limited ecological value, perhaps reflecting the longevity and intensity of the historical industrial activity operating at the proposed wind farm site. Nevertheless, the occurrence of some characteristic species of peatland habitats (e.g. Round-leaved Sundew, *Drosera rotundifolia*; Common Cottongrass, *Eriophorum angustifolium*) confer some degree of rehabilitation potential to this large peatland area.

It is also evident that the majority of the remaining area surveyed—comprising approximately 157 hectares (8% of the total area)—is made up of a combination of semi-natural habitats and habitats with relevant vegetation cover. Within this, around 44.4 hectares (2.43%) consist of managed habitats of limited ecological value, such as conifer plantations (classified as WD4). The rest, approximately 112 hectares (6%), includes several ecologically valuable habitats. These are notable for their species diversity and their potential to support the expansion and colonisation of adjacent lower-quality habitats. These higher-value habitats are dispersed throughout the surveyed area in relatively limited patches.

With respect to linear habitats, four distinct types frequently intersect the habitat areas described above: Depositing/lowland rivers (FW2), Drainage ditches (FW4), Hedgerows (WL1), and Treelines (WL2). Due to their widespread presence, these linear features occur in a regular pattern, often aligned in rows along drainage ditches which are spaced approximately 5 to 10 meters apart. This habitat connects hydrologically the area surveyed with neighbouring surface water bodies, also establishing important ecological corridors that, although holding water seemingly of poor quality, present the highest plant species diversity within the whole area surveyed.

Hedgerows (WL1) and Treelines (WL2) habitats occurred sparsely in the area surveyed, with the few examples displaying a good structure, but limited diversity. One hedgerow included an IAPS but, otherwise, these habitats are important features in the current landscape.





Legend

- Proposed wind farm site

Habitats

- FW4 - Drainage ditches
- WL1 - Hedgerows
- WL2 - Treelines
- WS1 - Scrub
- BC1 - Arable crops
- BL2/FS1
- BL2/WS1
- BL3 - Buildings and artifical surfaces
- ED1 - Exposed sand, gravel or till
- ED2 - Spoil and bare ground
- ED3 - Recolonising bare ground
- FL8 - Other artificial lakes and ponds
- FL8/PF2
- FP1 - Calcareous springs
- FS1 - Reed and large sedge swamps
- FW4 - Drainage ditches
- GA2/GS2
- GS1 - Dry calcareous
- GS4 - Wet grassland
- GS4/WS1
- GS4/WS1
- HD1 - Dense bracken
- HH1 - Dry siliceous heath
- HH1/WS1
- PB1 - Raised bog
- PB4 - Cutover bog
- PB4/WS1
- PF1 - Rich fen and flush
- PF2 - Poor fen and flush
- WD2 - Mixed broadleaved/ conifer woodland
- WD3 - (Mixed) conifer woodland
- WD4 - Conifer plantation
- WN2 - Oak-ash-hazel woodland
- WN7 - Bog woodland
- WN7/PB4
- WS1 - Scrub
- WS1/GS4
- WS1/WS2
- WS2 - Immature Woodland

0 500 1,000
Meters

NOTES

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Rev	Date	Description	By	Chkd.

Client:

Bord na Móna

Project:

Derryadd Wind Farm

Title:

Figure 7.6:
Proposed Wind farm Site Habitat map
- Page 1 of 3 -

Scale @ A3: 1:16,000

Prepared by:	Checked by:	Date:
S.Pezzetta	I.Heanue	April 2025

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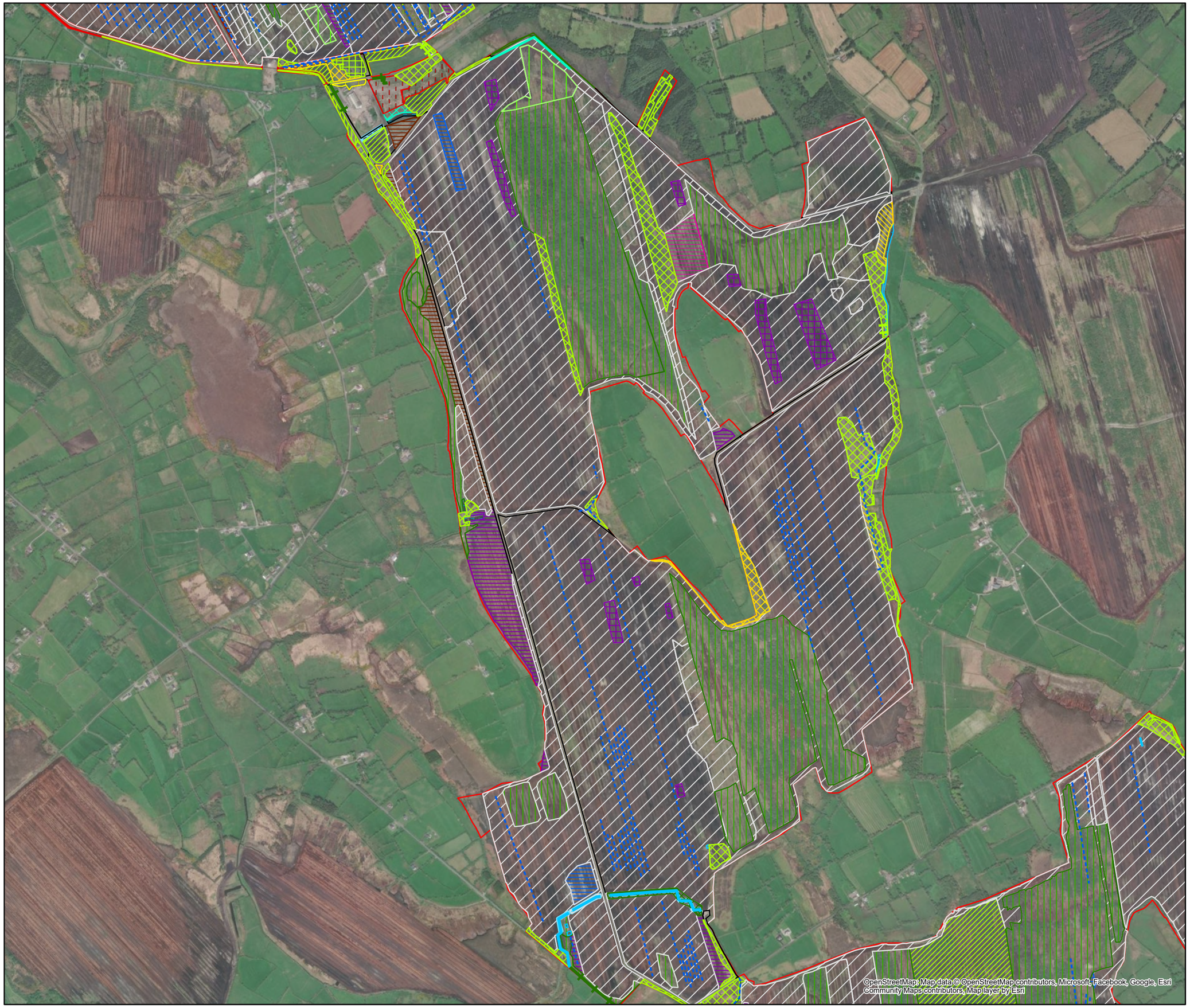
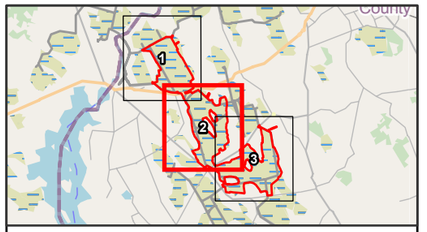
Map Ref: 11399-033-HAB-P.APP.BO-TOB-A

Draft: A





Legend

- Proposed wind farm site

Habitats

- FW2 - Depositing/ lowaland rivers
- FW4 - Drainage ditches
- WL1 - Hedgerows
- WL2 - Treelines
- WS1 - Scrub
- BL2 - Earth banks
- BL2/WS1
- BL3 - Buildings and artifical surfaces
- ED2 - Spoil and bare ground
- ED3 - Recolonising bare ground
- FL8 - Other artificial lakes and ponds
- FS1 - Reed and large sedge swamps
- FW4 - Drainage ditches
- GA2/GS2
- GS3 - Dry-humid acid grassland
- GS4 - Wet grassland
- GS4/WN7
- HH1 - Dry siliceous heath
- PB1 - Raised bog
- PB4 - Cutover bog
- PB4/GS4
- PF2 - Poor fen and flush
- WD1 - (Mixed) broadleaved woodland
- WD2 - Mixed broadleaved/ conifer woodland
- WD3 - (Mixed) conifer woodland
- WD4 - Conifer plantation
- WN5 - Riparian woodland
- WN6 - Wet willow-alder-ash woodland
- WN7 - Bog woodland
- WN7/PB4
- WS1 - Scrub
- WS2 - Immature Woodland

0 500 1,000
Meters

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
A	22/04/2025	First issue	S.P	I.H

Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.7: Proposed Wind farm Site Habitat map - Page 2 of 3 -

Scale @ A3: 1:16,000

Prepared by:	Checked by:	Date:
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Map Ref: 11399-033-HAB-P.APP.BO-TOB-A

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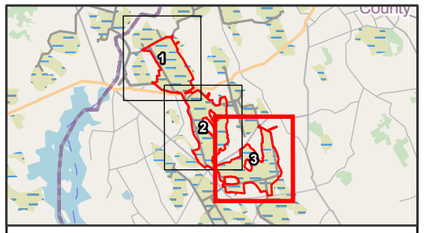

Legend

- Proposed wind farm site

Habitats

- FW2 - Depositing/ lowaland rivers
- FW4 - Drainage ditches
- WL2 - Treelines
- BL2 - Earth banks
- BL3 - Buildings and artifical surfaces
- FL8 - Other artificial lakes and ponds
- FL8/PF2
- FS1 - Reed and large sedge swamps
- FW4 - Drainage ditches
- GS2 - Dry meadows and grassy verges
- GS3 - Dry-humid acid grassland
- GS4 - Wet grassland
- PB1 - Raised bog
- PB4 - Cutover bog
- PB4/GS4
- PB4/WS1
- PF2 - Poor fen and flush
- WD1 - (Mixed) broadleaved woodland
- WD4 - Conifer plantation
- WD4/WN7
- WN5 - Riparian woodland
- WN6 - Wet willow-alder-ash woodland
- WN7 - Bog woodland
- WS1 - Scrub

0 500 1,000
Meters

NOTES

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A	22/04/2025	First issue	S.P	I.H
Rev	Date	Description	By	Chkd

Client:

Bord na Móna

Project:

Derryadd Wind Farm

Title:

Figure 7.8:
Proposed Wind farm Site Habitat map
- Page 3 of 3 -

Scale @ A3:	1:16,000	
Prepared by:	Checked by:	Date:
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Map Ref:

11399-033-HAB-P.APP.BO-TOB-A

Draft:

A

*Table 7.14: Summary of Habitats (Fossitt, 2000) within the Proposed Wind Farm Site/Area surveyed and Their Ecological Valuation[24]. KERs highlighted in **bold**.*

Code	Habitat Name	Area (ha)/ Length (m)	% of Proposed Wind Farm Site Surveyed[25]	Ecological Valuation	KER	Rationale
Polygon Habitats						
PB4	Cutover bog	1,120.8ha	59.67%	Local Importance (Lower Value)	No	Cutover bogs formed from areas where peat extraction has occurred are degraded ecosystems. Despite their historical ecological importance, the habitat here is severely impacted by extraction activities, leading to soil compaction and the loss of natural hydrological processes. While they may still host a variety of wetland species, these bogs lack the complexity and functionality of a healthy, natural peatland ecosystem. Furthermore, cutover bogs are particularly sensitive to disturbance and require careful management to address ecological integrity. Given the degradation and limited biodiversity present, cutover bogs are not considered a KER, as they do not play a crucial role in supporting the key protected species or maintaining significant ecological functions in their current condition.
WN7	**Bog woodland**	**413.5ha**	**22.37%**	**Local Importance (Higher Value)**	**Yes**	**Although not qualifying for National or International Importance the habitat displays high species diversity, and occupies a significant extent of the area surveyed, offering both unique**

[24] Table 7.14 does not include the habitats within the Derryaroge Mineral Island.

[25] A total of 1822.9ha of the habitat was successfully surveyed within the redline boundary area which measures approximately 1,900ha, representing approximately 98% coverage, with only minor marginal sections not surveyed due to access limitations, some of which included watercourses or peripheral features. This high level of coverage provides a robust baseline for assessing potential effects.

Code	Habitat Name	Area (ha)/ Length (m)	% of Proposed Wind Farm Site Surveyed[25]	Ecological Valuation	KER	Rationale
						vegetation and habitat for species adapted to wetland conditions. These woodlands are characterised by a mix of wetland-adapted trees, shrubs, and mosses, forming diverse and complex habitats that support a range of species. The species richness and structural complexity of bog woodlands make them highly valuable for biodiversity, including for protected species. Additionally, they play vital roles in carbon sequestration, water filtration, and maintaining hydrological cycles. Given their significant ecological value, including their contribution to local biodiversity and their role as a resource for protected species, WN7 Bog Woodland is classified as a KER.
FL8	Other artificial lakes and ponds	76.5ha	4.14%	Local Importance (Higher Value)	Yes	While artificial, these lakes and ponds showed evidence of poor water quality they serve as critical habitats for a variety of aquatic and wetland species, especially waterfowl. These habitats may be seasonally flooded and are capable of supporting wetland plants and invertebrates, which in turn provide food sources for birds and other fauna. Despite the challenges posed by poor water quality, these habitats are still ecologically important, as they can support biodiversity in areas where natural water bodies are lacking or scarce. The periodic flooding of these artificial lakes increases their value as a foraging resource for

Code	Habitat Name	Area (ha)/ Length (m)	% of Proposed Wind Farm Site Surveyed[25]	Ecological Valuation	KER	Rationale
						birds. Their ability to support a variety of species, particularly protected avian species, justifies their classification as a KER. Importance of this habitat to bird species is assessed in Chapter 8 - Ornithology.
WD4	Conifer plantation	44.3ha	2.40%	Local Importance (Lower Value)	No	Conifer plantations, typically dominated by non-native tree species such as pine, spruce, or fir, offer limited ecological diversity. The habitats are monocultures, which do not support a wide range of native species. While the edges of these plantations may provide some habitat for birds or small mammals, the overall habitat quality is low due to the absence of structural diversity and limited availability of food and shelter for native species. Therefore, the ecological function of conifer plantations is minimal, making them unsuitable for designation as a KER.
FS1	**Reed and large sedge swamps**	**33.7ha**	**1.83%**	**Local Importance (Higher Value)**	**Yes**	**Reed and sedge swamps are important wetland habitats that support numerous species of waterfowl, invertebrates, and other wetland-adapted flora and fauna. These habitats are particularly valuable because they provide breeding grounds, shelter, and foraging resources for a variety of protected species. The dense vegetation structure of reedbeds and sedge swamps offers a safe haven for birds and other wildlife, while the wetlands play a role in nutrient cycling and water filtration. Given their high**

Code	Habitat Name	Area (ha)/ Length (m)	% of Proposed Wind Farm Site Surveyed[25]	Ecological Valuation	KER	Rationale
						ecological value and role in supporting both local and migratory species, reed and sedge swamps are classified as KERs. Importance of this habitat to bird species is assessed in Chapter 8 - Ornithology.
WS1	Scrub	30.6ha	1.65%	Local Importance (Higher Value)	Yes	Scrub habitats, which consist of dense, shrubby vegetation, are critical for maintaining ecological continuity and providing shelter, food, and breeding grounds for a wide range of species, particularly birds and small mammals. Scrub habitats also serve as transitional zones between more mature ecosystems such grasslands, allowing for species movement across fragmented landscapes. Furthermore, scrub areas are often ecologically rich and diverse, supporting a variety of invertebrates and plants. Due to their importance in biodiversity conservation and their role in ecological corridors, scrub habitats are designated as KERs.
PB1	Raised bog	30.5ha	1.65%	Local Importance (Higher Value)	Yes	Despite its poor condition, the raised bog habitat at the proposed wind farm site displays high plant diversity (see Plant Species List in Appendix 7.9) and natural character, offering significant ecological value in the local context. Raised bogs are important wetland habitats, providing critical ecosystem services such as carbon storage and water regulation, the current condition and limited extent to be lost during the Construction Phase is a

Code	Habitat Name	Area (ha)/ Length (m)	% of Proposed Wind Farm Site Surveyed[25]	Ecological Valuation	KER	Rationale
						slight ecological impact relative to its potential value. The habitats support specialised plant species, such as Sphagnum mosses, and rare invertebrates and other wetland-adapted species. The ecological value of raised bogs is high, particularly due to their rarity and the biodiversity they support, particularly within areas of historic cutaway bog, as the proposed wind farm site. In addition to supporting wildlife. The naturalness and plant diversity present in these areas of PB1 Raised Bog make it a highly valuable ecological asset, justifying its classification as a KER.
BL3	Buildings and artificial surfaces	17.9ha	0.97%	Local Importance (Lower Value)	No	Buildings and artificial surfaces, such as roads and parking lots, are human-made environments that offer little in terms of habitat value for wildlife. Consequently, Buildings and Artificial Surfaces are not classified as a KER.
WS2	**Immature woodland**	**15.7ha**	**0.85%**	**Local Importance (Higher Value)**	**Yes**	**Although currently of limited diversity (see Plant Species List in Appendix 7.9), the habitat provides valuable shelter and connectivity for wildlife, especially as an ecological corridor. Immature woodlands, though in the early stages of development, still provide important ecological functions. These habitats offer shelter, foraging resources, and migration corridors for birds, mammals, and invertebrates. Their role in supporting wildlife, along with their potential to**

Code	Habitat Name	Area (ha)/ Length (m)	% of Proposed Wind Farm Site Surveyed[25]	Ecological Valuation	KER	Rationale
						develop into richer ecosystems, justifies their classification as a KER.
ED2	Spoil and bare ground	12.2ha	0.66%	Local Importance (Lower Value)	No	Sparse vegetation and limited structural diversity reduce its ecological function and value. Spoil heaps and bare ground areas as the result of disturbance are devoid of significant vegetation and have limited ecological value due to the lack of structural complexity and biodiversity. Though they may eventually undergo natural or assisted ecological succession, their current value in supporting protected species is low. These habitats do not provide significant resources for wildlife, particularly species that require more stable and diverse environments. As a result, they are not considered a KER.
GS4	**Wet grassland**	**6.7ha**	**0.36%**	**Local Importance (Higher Value)**	**Yes**	**Relatively diverse habitat, which, beyond Wet grasslands are typically rich in plant and invertebrate diversity and are essential habitats for waterfowl and other bird species, particularly during migration periods. These habitats also support a wide range of other wildlife, including amphibians and small mammals. Wet grasslands provide important feeding, breeding, and shelter opportunities for a variety of species, making them a vital component of the ecosystem. Given their biodiversity value and their potential role in supporting protected bird species, wet grasslands**

Code	Habitat Name	Area (ha)/ Length (m)	% of Proposed Wind Farm Site Surveyed[25]	Ecological Valuation	KER	Rationale
						is classified as a KER. Importance of this habitat to bird species is assessed in Chapter 8 - Ornithology.
PF2	**Poor fen and flush**	**4.90ha**	**0.27%**	**Local Importance (Higher Value)**	**Yes**	**Habitat comprising diverse species (see Plant Species List in Appendix 7.9) and considered of special importance, making it a valuable habitat despite its limited extent. Poor fen and flush habitats are waterlogged areas with low nutrient availability, supporting specialised plant species such as mosses, sedges, and grasses. The habitats are of high ecological importance due to their support for rare plant communities and their role in maintaining wetland biodiversity. Poor fen and flush areas also contribute to the local hydrological cycle and can serve as valuable resources for bird species and invertebrates. The diversity of species and the role of these habitats in supporting rare and specialised flora make it an important KER.**
HD1	Dense bracken	3.4ha	0.18%	Local Importance (Lower Value)	No	This habitat is dominated by bracken (Pteridium aquilinum), which tends to suppress species diversity due to its aggressive growth habit. Although it may provide cover for some terrestrial animals, it generally lacks the floristic diversity and structural variety required to support a broad range of species. It also provides limited ecosystem services in the context of the site. Due to these limitations, HD1 is not considered ecologically significant enough to qualify as a KER.

Code	Habitat Name	Area (ha)/ Length (m)	% of Proposed Wind Farm Site Surveyed[25]	Ecological Valuation	KER	Rationale
GS3	**Dry humid acid grassland**	**3.1ha**	**0.17%**	**Local Importance (Higher Value)**	**Yes**	**Although it accounts for a small proportion of the site, GS3 is classified as a habitat of Local Importance (Higher Value) due to its role as a transitional habitat between different vegetation types. It supports a relatively high diversity of plant species, as outlined in the Plant Species List (Appendix 7.9), and may serve as important foraging grounds for protected species, particularly the Marsh Fritillary butterfly (Euphydryas aurinia), a species of conservation concern. Additionally, this grassland type can serve as a stepping-stone habitat, facilitating ecological connectivity across fragmented landscapes. These features justify its inclusion as a KER in the context of the proposed development.**
ED3	Recolonising bare ground	2.00ha	0.11%	Local Importance (Lower Value)	No	While representing an early successional habitat type, ED3 is characterised by sparse vegetation cover and minimal faunal use. These sites typically offer limited shelter, nesting, or foraging opportunities for protected species. Although such areas may gradually regenerate into more valuable habitats, their current condition and ecological function do not meet the threshold for designation as a KER.
WD1	**(Mixed) broadleaved woodland**	**1.6ha**	**0.09%**	**Local Importance (Higher Value)**	**Yes**	**This woodland type is present in four discrete patches totalling 1.6 ha (0.09%) and is primarily located adjacent to Lough Bannow Bog, an area of ecological significance. Although the species**

Code	Habitat Name	Area (ha)/ Length (m)	% of Proposed Wind Farm Site Surveyed[25]	Ecological Valuation	KER	Rationale
						diversity within these patches is modest, the woodland supports native broadleaved species such as Hawthorn (*Crataegus monogyna),* which are beneficial for insect pollinators, birds, and small mammals. The habitat contributes to local biodiversity, especially at the edge of sensitive wetland environments, and offers potential for natural succession and ecological enhancement. Due to its location, habitat function, and contribution to biodiversity, it is designated as a KER.
HH1	Dry siliceous heath	1.2	0.06%	Local Importance (Lower Value)	No	Although heathland can be of high ecological value, the specific area recorded as HH1 within the wind farm site is limited in extent and is characterised by low structural and species diversity (refer to Plant Species List, Appendix 7.9). This particular heath does not support any known populations of protected flora or fauna, nor does it function as a key ecological corridor or refuge. Its fragmented and isolated nature limits its ecological contribution, and as such, it is not considered a KER.
WN6	**Wet willow-alder-ash woodland**	**1.2ha**	**0.06%**	**Local Importance (Higher Value)**	**Yes**	**Covering 1.2 ha (0.06%), this habitat is considered of Local Importance (Higher Value). It occupies part of the floodplain of the Lough Bannow stream_010, which is part of a WFD river water body. Wet woodlands like this are valuable for their role in water retention, filtration, and habitat continuity in**

Code	Habitat Name	Area (ha)/ Length (m)	% of Proposed Wind Farm Site Surveyed[25]	Ecological Valuation	KER	Rationale
						riparian zones. This habitat functions as an ecological corridor, allowing the movement of species along watercourses and contributing to landscape-level biodiversity. Its position within a functionally connected habitat network increases its importance beyond its size, warranting its designation as a KER.
WD3	(Mixed) conifer woodland	1.0ha	0.05%	Local Importance (Lower Value)	No	This habitat (1.0 ha / 0.05%) originated as a Lodgepole Pine (*Pinus contorta*) plantation, and has since been naturally encroached by native species such as Downy Birch, Common Alder, and Willow spp. While this suggests some ecological succession, the habitat remains limited in area and is of low ecological complexity. The lack of structural diversity and its origin as a monocultural plantation reduce its value, and it is therefore not considered a KER.
GS2	**Dry meadows and grassy verges**	**0.6ha**	**0.03%**	**Local Importance (Higher Value**	**Yes**	**This habitat occupies only 0.6 ha (0.03%) and is limited in spatial extent, primarily located along the western margin of Lough Bannow Bog. However, it supports a range of herbaceous flowering plants that provide nectar and larval food sources for important invertebrates, including pollinators and the Marsh Fritillary. Despite its small area, its ecological function is significant in the local context, offering seasonal foraging resources and contributing to habitat heterogeneity. Therefore, it meets the criteria to be included as a KER.**

Code	Habitat Name	Area (ha)/ Length (m)	% of Proposed Wind Farm Site Surveyed[25]	Ecological Valuation	KER	Rationale
BL2	Earth banks	0.6ha	0.03%	Local Importance (Lower Value)	No	While earth banks may offer microhabitats in some contexts, the recorded areas (0.6 ha / 0.03%) show minimal vegetation cover and do not support significant ecological functions such as species refuges, corridors, or nesting grounds. These features provide negligible value in the broader ecological network and are not considered a KER.
WD2	Mixed broadleaved/conifer woodland	0.5ha	0.03%	Local Importance (Lower Value)	No	Covering only 0.5 ha (0.03%), this habitat is small and scattered, with limited ecological diversity. Its small scale within the overall surveyed area means it has a minimal contribution to ecological connectivity or habitat provision. Due to its restricted extent and lack of species or habitat features of note, it is not designated as a KER.
GA2	Amenity grassland (improved)	0.3ha	0.02%	Local Importance (Lower Value)	No	Occupying 0.3 ha (0.02%), this habitat consists of improved, species-poor grassland typically associated with agricultural or landscaped areas. It has low plant diversity and provides minimal habitat value for protected species. Its structure and species composition do not support significant biodiversity, and therefore, it is not identified as a KER.
ED1	Exposed sand, gravel or till	0.1ha	0.01%	Local Importance (Lower Value)	No	This habitat covers only 0.1 ha (0.01%) and is composed of largely unvegetated substrate with minimal capacity to support plant or animal life. The lack of cover, food sources, and nesting

Code	Habitat Name	Area (ha)/ Length (m)	% of Proposed Wind Farm Site Surveyed[25]	Ecological Valuation	KER	Rationale
						opportunities renders it of limited ecological value, and it is not considered a KER.
Linear Habitats						
FW2	**Depositing/ lowland rivers**	**931m**	**-**	**County Importance**	**Yes**	**Important ecological habitat, establishing hydrological connectivity with Internationally important sites. Lowland rivers provide vital hydrological and ecological functions, connecting terrestrial and aquatic ecosystems. These watercourses support aquatic species and provide critical ecosystem services such as water purification, sediment control, and nutrient cycling. The rivers also act as corridors for species movement, facilitating gene flow between populations. The connectivity these rivers establish with larger conservation areas further emphasizes their importance. Due to their significance in maintaining hydrological balance and supporting biodiversity, lowland rivers is classified as a KER.**
FW4	**Drainage ditches**	**~1,230,000**	**-**	**Local Importance (Higher Value)**	**Yes**	**Drainage ditches, though artificial, can provide important ecological functions, particularly in agricultural landscapes. These ditches may support a wide range of plant species (see Plant Species List in Appendix 7.9), some of which are uncommon in surrounding habitats. They also serve as important ecological corridors, facilitating species movement and providing resources such as water, food, and shelter. Despite their artificial nature, the high**

Code	Habitat Name	Area (ha)/ Length (m)	% of Proposed Wind Farm Site Surveyed[25]	Ecological Valuation	KER	Rationale
						plant diversity observed in these ditches and their role in linking habitats make Drainage Ditches a valuable KER.
WL1	Hedgerows	521m	-	Local Importance (Higher Value)	Yes	Although showing evidence of active management (localised), this habitat was of general good condition, establishing important ecological corridors for protected species (e.g. bats). It is important to note that this habitat holds an IAPS (Appendix 7.9). Hedgerows are a critical element of the landscape, providing habitat connectivity, shelter, and resources for a wide range of species. They support birds, mammals, insects, and other fauna, and they play an important role in linking fragmented habitats. Hedgerows can also act as windbreaks and provide important ecological corridors for species moving across the landscape. Due to their role in supporting biodiversity and their importance as habitat links, hedgerows are classified as KERs. It is important to note that this habitat holds an IAPS, Rhododendron (*Rhododendron ponticum*), (Appendix 7.9).
WL2	Treelines	1,596m	-	Local Importance (Higher Value)	Yes	Treelines, like hedgerows, are linear habitats that provide crucial ecological functions, such as habitat connectivity and resources for wildlife. These habitats support a variety of species, particularly birds, bats, and insects, and serve as ecological corridors that link other habitats. Treelines can also

Code	Habitat Name	Area (ha)/ Length (m)	% of Proposed Wind Farm Site Surveyed[25]	Ecological Valuation	KER	Rationale
						offer shelter and foraging resources for mammals and other fauna. Their structural complexity and importance in maintaining ecological continuity make them a key KER.

7.8.2.2.2 Bog Woodland (WN7

As part of the broader habitat types surveyed in the multidisciplinary survey Bog woodland (WN7) was recorded with birch woodland and pioneering woodland in large patches in the area surveyed (see Section 7.7.2.2.1 above), particularly along the margins of the Cutover Bog habitat (PB4). The habitat was identified as holding potential high ecological value in the local context. There was evidence of water level fluctuation throughout the woodland habitat, with some areas being permanently waterlogged, while the majority of the habitat was recorded as being very dry underfoot.

A Condition Assessment was conducted at five locations (relevés) shown in Figure 7.9 to determine whether the habitat corresponded with the protected Annex I habitat type 91D0 Bog Woodland which listed as priority habitat in the Habitats Directive (Council Directive 92/43/EEC). None of the five locations surveyed were shown to correspond to 91D0 Bog Woodland. Table 7.15 presents the Condition Assessment results at the five surveyed locations, with each plot evaluated against key ecological indicators to determine overall habitat condition. Based on the Condition Assessment the following conclusions on the habitat classification were drawn:

- At all five locations survey, none of the five positive indicator species were noted. In all plots, Birch (*Betula pubescens*) was dominant with Purple Moor-Grass (*Molinia caerulea*), and Soft Rush (*Juncus effusus*) also present. None of the areas of bog woodland met the pass target for positive indicator species.
- Four out of the five plots (relevé plots B to E) were found to have negative species, such as Bramble (*Rubus fruticosus*) and Bracken (*Pteridium aquilinum*), with a coverage greater than 10%. The presence of Bramble and Bracken are indicative of dry conditions within the woodland which, in turn, is likely to be a consequence from the historical turf cutting and associated drainage (Cross and Lynn, 2013). Only relevé (A) had a negative species *coverage* lower than 10%.
- Medium canopy height of most of bog woodland ranged between 4-8m in height (with the exception of plot A) and, therefore, met the pass target for medium canopy height. At relevé plot A, the *median* canopy height was lower than 4m, thus resulting in a fail.
- In relation to total canopy cover, relevé plots B, C and E displayed a total canopy cover greater than 30% and therefore passed this *condition* criterion. Relevé plots A and D had less than 30% of total canopy cover.
- In relation to *Betula* cover, in relevé plots A to C, *Betula* cover accounted for more than 50%. Plots D and E displayed a *Betula* cover lower than 50%, failing to pass this target criterion.
- The percentage of native dwarf shrub layer, in all relevé plots, was less than 50%, which granted a pass for all plots.
- All relevé plots displayed a percentage of *Calluna* cover ranging between 10% to 20%, thus failing to meet the target for *Calluna* cover.
- The percentage of *Sphagnum* cover at bog woodlands was very low, ranging between 10% to 20%. Thus, none of the relevé plots met the pass target for *Sphagnum* cover; and
- Similarly, the percentage of bryophyte cover at the five representative relevé plots of bog woodland ranged between 5% and 20%, failing to achieve a pass for this Condition Assessment criterion.

As none of the relevé plots passed a minimum of seven criteria, all five plots failed the Condition Assessment (Cross and Lynn, 2013). Therefore, it is concluded that the Bog Woodland (WN7) at the proposed wind farm site does not correspond to the Annex I habitat 91D0.

The condition of the Bog Woodland habitat (WN7) within the proposed wind farm site is poor and degraded, likely due to the historical peat drainage and extraction, and consequent drying out process that occurred since then. Bog Woodland (WN7) is then evaluated as being of **Local Importance (Higher Value)**, as this is a natural habitat with high biodiversity in the local context.

Table 7.15: Condition Assessment of Bog Woodland (WN7) Plots. ITM coordinates in parenthesis.

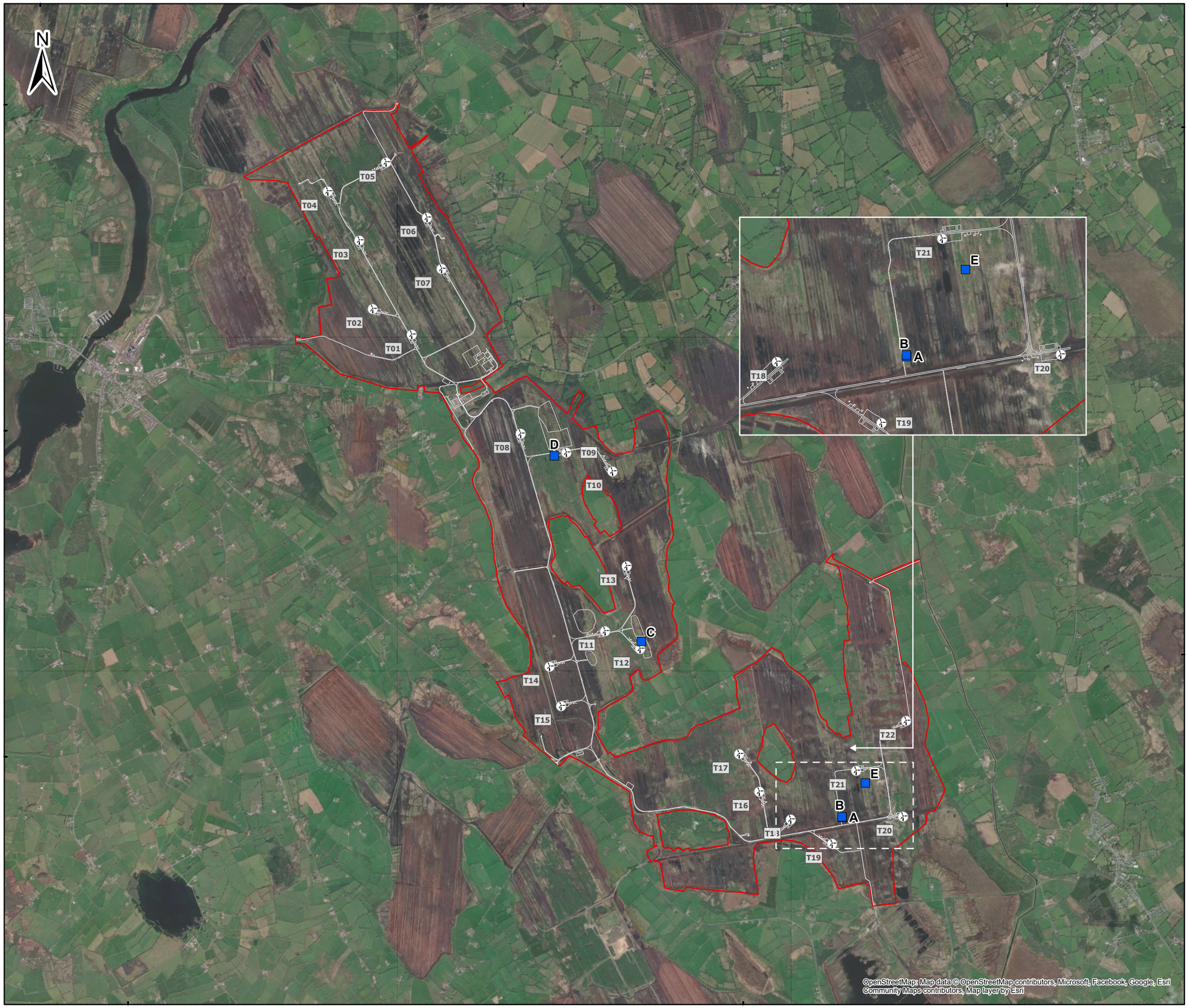
Relevé Plot	A (609126.8, 764145.7)	B (609124.4, 764153.0)	C (606841, 766147)	D (605851, 768260)	E (605342.2, 76911.0)
Positive indicator species	Fail	Fail	Fail	Fail	Fail
Negative species cover	Pass	Fail	Fail	Fail	Fail
Medium canopy height	Fail	Pass	Pass	Pass	Pass
% total canopy cover	Fail	Pass	Pass	Fail	Pass
Portion of *Betula* in canopy	Pass	Pass	Pass	Fail	Fail
% native dwarf shrub layer cover	Pass	Pass	Pass	Pass	Pass
% *Calluna* cover	Fail	Fail	Fail	Fail	Fail
% *Sphagnum* cover	Fail	Fail	Fail	Fail	Fail
% total bryophyte cover	Fail	Fail	Fail	Fail	Fail
Overall Result	**Fail**	**Fail**	**Fail**	**Fail**	**Fail**

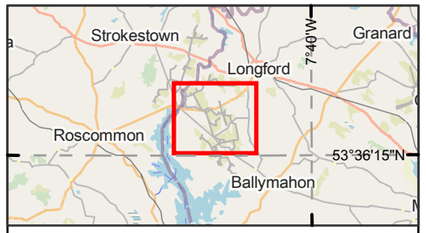
8°0'0"W 7°55'0"W 7°50'0"W

53°42'0"N 53°40'0"N 53°38'0"N

772000 766000

601000 608000





Legend

- Proposed wind farm site boundary
- Turbine Layout
- Site Layout
- Bog Woodland Assessment locations

0 1 2
Kilometers

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
A	09/04/2025	First issue	S.P	I.H

Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.9: Locations Where Bog Woodland Condition Assessment Was Undertaken

Scale @ A3: 1:40,000

Prepared by:	Checked by:	Date:
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Map Ref: 11399-026-Bog.W-P.APP.BO-TOB-A

Draft: A

7.8.2.2.3 Subsite (Derryaroge Mineral Island) Habitat Survey

The subsite in Derryaroge Bog, was subject to a detailed survey (see Derryaroge Mineral Island Habitat Survey in Appendix 7.4). The subsite displayed 12 habitat types (Fossitt, 2000), and/or their mosaics. Moreover, the detailed analysis of the species composition and habitat features allowed the identification of two habitats listed in the Annex I of the Habitats Directive, one designated as priority habitat – see table below.

*Table 7.16: Classification of Habitats within the Derryaroge Subsite. KERs highlighted in **bold**.*

Habitat	Code (Fossitt, 2000)	Area (ha)	Annex I Habitat [Habitat code]	Valuation	KER
Other artificial lakes and ponds	**FL8**	**0.02**	**-**	**Local importance (Higher value)**	**Yes**
Dry calcareous and neutral grassland	**GS1**	**0.13**	**-**	**Local importance (Higher value)**	**Yes**
Scrub	**WS1**	**3.20**	**-**	**Local importance (Higher value)**	**Yes**
Wet grassland	**GS4**	**1.51**	**-**	**Local importance (Higher value)**	**Yes**
Dense bracken	HD1	0.17	-	Local importance (Lower value)	
Oak-ash-hazel woodland	**WN2**	**0.58**	**-**	**County importance**	**Yes**
Cutover Bog	**PB4**	**0.13**	**-**	**County importance**	**Yes**
Immature woodland	**WS2**	**0.01**	**-**	**Local importance (Higher value)**	**Yes**
Buildings and artificial surfaces	BL3	4.48	-	Negligible importance	No
Rich fen and flush	**PF1**	**1.07**	**Alkaline fens [7230]**	**National importance**	**Yes**
Calcareous springs	**FP1**	**0.16**	**Petrifying springs with tufa formation (*Cratoneurion*)* [7220]**	**International importance**	**Yes**
Total		**11.46**	-	-	No
* priority habitat under the Habitats Directive					

7.8.2.3 Aquatic Ecology

The baseline aquatic environment was appraised with results of the surveys described in Section 7.7.2.2.2, carried out on 12 sampling sites in eight EPA streams, part of 5 WFD river water bodies.

Table 7.17: Survey Design and Corresponding EPA Streams and WFD River Water Bodies

Unassigned Bad Poor Moderate Good High

Sampling Site	EPA Name	EPA Code	WFD Name	WFD Code	WFD Water Quality Status
3	Ballynakill_26	26B22	Ballynakill_010	IE_SH_26B22 0790	
4					
10					
11					
2	Lough Bannow Stream	26L12	Lough Bannow Stream_010	IE_SH_26L12 0100	
7					
6	Derrygeel	26D77			
8	Rappareehill	26R40			
1	Bilberry	26B03	Ledwithstown_010	IE_SH_26L84 0850	
12	Ledwithstown_26	26L84			
5	Trib Fallan West	26F52	Fallan_020	IE_SH_26F01 0200	
9	Kilnacarrow	26K64	Shannon (Upper)_100	IE_SH_26S02 1600	

7.8.2.3.1 River Habitat Survey – June 2022

The analysis of the full dataset of the results of the River Habitat Survey carried out in June 2022 reflect the local historical land-use, where peat extraction activities were carried out for decades. Thus, the majority of these watercourses show signs of having been regulated (i.e. the river channel shows signs of being man-made, or having been straightened/excavated in the past), noticeable by the presence of high banks (an average bank height across all the sampling sites of almost 3m), and a limited extent between the water edge and respective bank, reflective of the existing limited riparian gallery lateral extent (average of 1m as the difference between the average bank width and average wetted width, across all sampling sites – i.e. 0.5m on each margin).

Moreover, the riparian vegetation on each sampling site, beyond limited in its lateral extent, also reflects the local land use pressures on the wider landscape (e.g. pasture, peat extraction), where ruderal species occupy most of the lower vegetation *stratum* at the sampling sites (e.g. Bramble, Nettle, *Urtica dioica*), while more than half of those sampled reaches had little to no canopy cover (i.e. % of shading).

Table 7.18: Summary of Hydro morphology Features Surveyed in 2022

EPA Name	Sampling Site	Average Bank Height (m)	Average Bank Width (m)	Average Wet Width (m)
Ballynakill_26	**3**	2.50	6.00	5.00
	4	3.50	7.00	5.50
	10	1.50	6.00	5.00
	11	8.00	6.00	5.00
Lough Bannow Stream	**2**	1.50	7.00	6.00
	7	0.75	7.00	5.00
Derrygeel	**6**	2.50	4.00	3.50
Rappareehill	**8**	2.50	7.00	5.00
Bilberry	**1**	4.00	2.50	2.00
Ledwithstown_26	**12**	4.00	3.50	1.50
Trib Fallan West	**5**	1.00	5.00	5.00
Kilnacarrow	**9**	3.00	6.00	5.50
Average		**2.9**	**5.58**	**4.50**

7.8.2.3.2 Kick-Sampling and Water Quality Assessment – September 2022

Kick-sampling results carried out at the sampling sites in September 2022 (see Appendix 7.5c and Figure 7.10) generally confirmed the local pressures to the aquatic environment, as well as the failure of the majority of the WFD river water bodies in the vicinity of the proposed wind farm site to achieve the WFD objectives (Table 7.10). The Q-Value of the sampling sites was typically Q3, while none of the 12 sites met the WFD and Surface Water Regulations (S.I. No. 77/2019) (as amended) objectives (i.e. ≥Q4; EQR good ≥0.75). The macroinvertebrate assemblages were dominated by Group C taxa, whereas only two sampling sites had Group A individuals in their samples (Sampling Site 2 and 3; see Table 7.19). The aquatic habitats at the sampling sites were generally unsuitable for supporting the White-clawed Crayfish, with the exception of Sampling Site 4, White-clawed Crayfish require moderate to good water quality, similar to that needed by brown trout, with conditions such as oxygen saturation above 50% and BOD below 3ppm (Reynolds, 1998; Demers *et al.*, 2003). This protected species also needs relatively hard water, with a pH of 7 or above, and calcium concentrations of at least 5mg/l, as sufficient calcium is necessary to harden their exoskeletons after moulting (Gallagher *et al.*, 2006). Additionally, firm substrates and moderate productivity levels are important for crayfish habitats (Reynolds, 1998). The watercourses on the wind farm site were deemed unsuitable to sustainable populations of White-clawed Crayfish due to inappropriate geology, low channel energy, and lack of suitable habitat, particularly the absence of gravels required for crayfish hatchlings (Reynolds, 1998; Reynolds *et al.*, 2010). Larger crayfish need stones to hide under or earthen banks for burrowing (Demers *et al.*, 2003), while hatchlings typically shelter in vegetation, gravel, and fine tree roots, and smaller crayfish are often found among weeds and debris in shallow water. Larger juveniles are more commonly found among cobbles and detritus, such as leaf litter (Reynolds and O'Keeffe, 2005).

There was also a lack of suitable burrowing habitat required for White-clawed Crayfish. As such there is no clear availability of suitable refuges for this species.

7.8.2.3.3 Electrofishing Survey – September 2022

More than half of the sampling sites (i.e. 55%) retrieved null results for the electrofishing survey. The remainder of the sampling sites displayed limited diversity, with Brown Trout accounting for 90% of all the sampled fish. Furthermore, overall, these sites had limited value as salmonid habitat due to the absence of enough holding pools, oxygenated riffle habitat, slow to moderate flow, boulders, spawning gravels, combined with the presence of heavy siltation and low energy nature of the watercourses.

Salmonid populations across Ireland have been negatively impacted by various land management practices, particularly affecting the survival of juvenile fish. While many rivers still provide suitable spawning habitats capable of producing large numbers of fry, the quality of nursery habitats is often inadequate. These nursery areas, essential for the growth and development of juvenile salmonids, often lack necessary structural features such as pools and riffles. As a result, the survival of salmonids, including brown trout and Atlantic salmon, through to the smolt stage is limited. The impact of land management practices on river health further exacerbates these challenges. Farming runoff, including fertilisers and soil, enters rivers, causing nutrient pollution that smothers vital habitats. Forestry activities such as tree felling and drainage disrupt the natural landscape, leading to increased sedimentation and the loss of important habitats. River drainage practices, such as straightening or deepening river channels, reduce habitat diversity, making these areas less suitable for fish. Similarly, livestock access to watercourses causes erosion of riverbanks and the introduction of pollutants, further degrading water quality. In many Irish rivers, particularly those in drained catchments with a channel gradient of less than 1%, insufficient water energy prevents the natural movement of bed materials, hindering the formation of key in-stream features like riffles and pools. This limits the availability of mobile gravels and cobbles needed for healthy, functional habitats. Urban development, with its roads and buildings, increases surface runoff and obstructs the natural movement of fish, while peat extraction alters water flow, raises acidity levels, and contributes to sediment build-up. Finally, the spread of invasive plant species weakens riverbanks, reducing essential shading and cover for aquatic life. Together, these land practices negatively affect water quality and habitat availability for salmonids in many of Ireland's rivers.

Access for salmonids from downstream rivers into the proposed wind farm site would be challenging due to the modified nature of the watercourses within the area. The presence of dense, encroaching in-stream vegetation, coupled with culverts, low gradients, and heavy siltation, further complicates their movement. These factors limit the availability of suitable habitats and impede the natural flow dynamics that salmonids rely on for migration and survival.

Peat based catchments, such as the one in which the proposed wind farm site is located, are commonly less productive than those flowing over other geologies (O'Grady, 2006), with reduced primary productivity, macroinvertebrate diversity and lower fish biomass (Richardson, 1993). In addition, the low local gradient might contribute to the lower fish abundance and diversity in the sampled reaches as it is one of the principal determinants of juvenile salmonid production, with medium gradients being the most optimal in terms of successful recruitment and population persistence (Amiro, 1993; Kennedy and Strange, 2006; O'Grady, 2006; Wood

and Budy, 2009). Due to the historic modification of these watercourses, channel gradient is very low and not optimal for salmonids.

Overall, the survey sites were not considered suitable for lamprey species, despite the occasional occurrence of small areas of suitable habitat. Suitable spawning habitat consist of finer, unbedded gravels that was absent from all sampling sites, with the exception of sampling site 5. Electrofishing at sampling site 5 contained one ammocete, while there was light to moderate siltation present at the culvert on this section of river providing good localised ammocoete habitat (burial areas in silt and nearby fine gravels for spawning) and creating overall moderate habitat for lampreys.

Three of the sites surveyed contained high levels of mud and wooden debris, mud, and lacked the deposition of fine, organic rich sediment, which are favoured by larval lamprey (Goodwin *et al.*, 2009; Aronsuu and Virkkala, 2014).

Table 7.19: Summary of Aquatic Survey Findings in September 2022 (Appendix 7.5c)

Sampling Site	Summary of Findings (see Appendix 7.5c)	Q-Value
3	• Dominated by glide habitat with very localised riffle upstream of a culvert; ▪ Riparian vegetation comprised of Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Grey Willow (*Salix cinerea*), Bramble (*Rubus fruticosus* agg.), Bracken (*Pteridium aquilinum*), Field Bindweed (*Convolvulus arvensis*), Bittersweet (*Solanum dulcamara*) and Reed Sweet-grass (*Glyceria maxima*); ▪ Instream vegetation included Branched Bur-reed (*Sparganium erectum*), Yellow Water Lily (*Nuphar lutea*) and Common Duckweed (*Lemna minor*); ▪ Stagnant flow downstream of the culvert crossing, containing dark coloured, peat-stained, water; • Spawning and nursery value is low given the low percentage of riffle zones and heavy siltation; • No fish were recorded during electrofishing; • The channel was not considered of value to Crayfish given the observed heavy siltation; • Macroinvertebrate sample dominated by Group C, but also containing Group A, B and D taxa. • No sign of Otters was recorded at the sampling site.	Q3-4
4	• Substrate containing gravels, but with heavy silt content; ▪ The riparian vegetation included comprised of Grey Willow, Blackthorn, Field Bindweed, Great Willowherb (*Epilobium hirsutum*), and Bramble; ▪ Instream vegetation included Branched Bur-reed, Common Water-starwort (*Callitriche stagnalis*) and patches of Small Pondweed (*Potamogeton berchtoldii*); • Electrofishing retrieved 15 individuals of two fish species: Three-spined Stickleback (*Gasterosteus aculeatus*) (n=2); and Brown Trout (*Salmo trutta*) (n=13); • The sample did not include any Lamprey species, despite the presence of some soft sediment; • The electrofishing sample also included one White-clawed Crayfish (*Austropotamobius pallipes*) (n=1), while several individuals were incidentally observed in the water; • Remains of Crayfish were evident in regular Otter spraints in the culvert. Here both Otter latrine sites in mud and spraint sites on concrete ledges were observed.; • Macroinvertebrate sample was dominated by Group C, while also containing Group A, B and D taxa.	Q3

Sampling Site	Summary of Findings (see Appendix 7.5c)	Q-Value
10	• Instream vegetation contained dense growths of Common Reed (*Phragmites australis*); • The riparian vegetation included dense Bramble, Bracken, Nettle (*Urtica dioica*), and Grey Willow scrub; ▪ The reach was unsuitable for electrofishing as it comprised a series of small pools with minimum flow through the dense reed growth. • There was no suitable spawning or nursery habitat present for salmonids. The reach would not support Lamprey habitat; • Invertebrate sample was dominated by Group C and D species; • There was good foraging value for Otter, but no evidence of the species was recorded.	Q3
11	• Substrate comprised of coarse gravel and fibrous peat material. It also included boulder, cobble and gravel, bedded with heavy siltation; ▪ Instream vegetation contained Fool's-water-cress (*Apium nodiflorum*); • The riparian vegetation included dense Bramble and Willow scrub. • Fished sample included 3 fish species, in a total of 14 individuals: Brown Trout (n=11); Gudgeon (*Gobio gobio*) (n=2); and Roach (*Rutilus rutilus*) (n=1); • There was limited, or no salmonid value given the depth, peat-substrate and the lack of flow but the site may have some holding value for coarse fish at times. It was not suitable for Crayfish or Lamprey; • The channel had moderately suitable for Crayfish, but none were observed; • There were some small pockets of gravel and silt suitable for Lamprey, but no individuals were recorded; • It was deemed that the sampling site may have some value as a foraging and commuting habitat for Otter albeit no signs were recorded; • Macroinvertebrate sample was dominated by Group C species.	Q3

Sampling Site	Summary of Findings (see Appendix 7.5c)	Q-Value
2	• Substrate was gravel and soft silt; ▪ Instream vegetation included a dense cover of Fool's-water-cress (*Apium nodiflorum*), Shining pondweed (*Potamogeton lucens*) and Common Water-starwort. Ivy-leaved Duckweed (*Lemna trisulca*) and Common Duckweed were also present; • The riparian vegetation steep banks included Bramble, Great Willowherb, Wild Angelica (*Angelica sylvestris*), rank grasses and Willow (*Salix* spp.); • A single Pike (*Esox lucius*) (29.5cm in length) was recorded during the electrofishing survey. This stretch of river did not hold fisheries value for salmonids, but was considered of value for coarse fish due to its deep channel and slow gradient; • Poor bank and river quality for Otter and no visible signs found; • Invertebrate sample was dominated by Group C and D taxa.	**Q3-4***
7	• Substrate consisted of soft peat with gravels, at places; ▪ Instream vegetation included Water Mint, Fool's-water-cress and Water-cress (*Nasturtium officinale*); ▪ Riparian vegetation included dense Bramble, Bracken and Grey Willow scrub; ▪ The electrofishing sample contained one specimen - a Tench (*Tinca tinca*); ▪ The reach contained holding area value for coarse fish; • The samples did not include any Crayfish; • The channel had some foraging value and as a commuting route for Oter albeit no signs were recorded. • The invertebrate sample was dominated by Group C species, but also included Group B and D taxa.	**Q2-3***
6	• The stream substrate had a gravel and peat base; ▪ The riparian vegetation contained Bramble, Bracken, Field Bindweed and Willow scrub; ▪ Instream vegetation included Branched Bur-reed, Common Water-starwort, Water-plantain (*Alisma plantago-aquatica*) and Small Pondweed;	**Upstream:** **Q2-3**

Sampling Site	Summary of Findings (see Appendix 7.5c)	Q-Value
	• No fish were sampled during the electrofishing. However, two Three-spined Stickleback (*Gasterosteus aculeatus*) were caught within the kick sample for macroinvertebrates; • The reach did not contain suitable spawning or nursery habitat for salmonids; • The channel has some foraging value for Otter as a single spraint was observed at the downstream area of the site; • Invertebrate sample was dominated by Group C, but also included significant abundance of Group D taxa.	**Downstream:** **Q3**
8	• Substrate composed of mixed gravels and soft silt; ▪ The riparian vegetation included Bramble, Gorse (*Ulex europaeus*), Nettle, Hedge Bindweed (*Calystegia sepium*), Grey Willow, Osier (*Salix viminalis*) and Ash (*Fraxinus excelsior*); • Instream vegetation was abundant and included Water Horsetail (*Equisetum fluviatilis*), Yellow Water Lily, Water Mint and Common Reed; • The channel was not of value to salmonid species, considering the slow flows, extensive instream vegetation and heavy siltation; • Heavy siltation reduced the potential for salmonid spawning or nursery habitat to be present; ▪ No fish were recorded during the electrofishing survey. One Stone Loach (*Barbatula barbatula*), measuring 4cm, was recorded in the macroinvertebrate sample; • The channel had some foraging value and as a commuting route for Otter albeit no signs were recorded; • Invertebrate sample dominated by Groups C and D.	**Q2-3***
1	• The substrate comprised of gravels with heavy peat sedimentation; • The channel was heavily overgrown with instream macrophytes, including Branched Bur-reed, Bulrush, and Water Mint. ▪ The riparian vegetation comprised of dense Gorse, Field Bindweed, Great Willowherb and Grey Willow, bordering cutover lowland blanket bog; • No fish were recorded during the electrofishing survey; ▪ The channel had limited value to fish or Crayfish due to heavy sedimentation, limited flows and dense vegetation growth. • No evidence of Otter was recorded; • The macroinvertebrate sample was dominated by Group C and D indicators.	**Q3**

Sampling Site	Summary of Findings (see Appendix 7.5c)	Q-Value
12	• Instream vegetation contained Spiked Watermilfoil (*Myriophyllum spicatum*), Floating Sweet-grass (*Glyceria fluitans*) and Water-plantain (*Alisma plantago-aquatica*); • Riparian vegetation contained Grey Willow, Downy Birch (*Betula pubescens*), Ash, Bramble, Hogweed (*Heracleum sphondylium*) and Great Willowherb. • This sampling site was not electrofished (Appendix 7.5c); • There was limited, or no salmonid holding value, due to the reach's depth, peat-substrate and absence of flow. It does not have any spawning or nursery value for salmonids; • The reach did not hold potential (or suitability) for Crayfish or Lamprey species; • Invertebrate sample was dominated by Group C, and occasional Group D species. • No evidence of otters but activity unlikely due to lack of prey.	Q3
5	• The substrate included a mix of coarse gravels, with silt accumulations in the margins; ▪ The riparian vegetation comprised of Great Willowherb, Bramble, Wild Angelica, along with rank grasses; ▪ Instream vegetation included Fool's-water-cress, Branched Bur-reed, and frequent Common Duckweed; • Electrofishing sample retrieved 66 individuals of two species: Brown Trout (n=65) and Lamprey (n=1); • The sampling site presented light to moderate siltation, with most silt accumulations occurring the box culvert, providing moderate lamprey habitat (burial areas in silt and nearby fine gravels for spawning); • Channel was deemed suitable for Crayfish albeit none were recorded; • The channel offered good foraging value for otter given the river was a good salmonid nursery, but no Otter signs were recorded. • Invertebrate sample was dominated by Group C. However, the presence of Group B species and absence of Group A, were contributing factors for the Q-Value valuation.	Q3

Sampling Site	Summary of Findings (see Appendix 7.5c)	Q-Value
9	• The substrate was mostly compacted peat; ▪ Instream vegetation included Broad-Leaved Pondweed (*Potamogeton natans*), Fool's-water-cress and occasional Water Mint; ▪ The riparian vegetation included Grey Willow, Alder, Ash and Bramble; • No fish were recorded in electrofishing sample; • Due to the limited flow of water, this sampling site did not hold fisheries value. Also, beyond not supporting suitable salmonid spawning or nursery habitat, the sampling site did not present suitable lamprey habitat; • Considering the water flow conditions, the sampling site was not suitable for Crayfish, nor any were captured in the electrofishing sample; • There was low foraging value for Otter and no signs were recorded during the survey; • No invertebrate sample was collected at this sampling site.	-

* Adjusted Q-Value from the classification attributed in Appendix 7.5c

8°2'0"W 7°55'35"W 7°49'10"W

53°42'40"N 53°40'15"N 53°37'50"N

773500 768000 762500

600000 606000 612000

Legend

- Proposed wind farm site
- Aquatic Sampling Sites
- EPA - Streams hydrological pathway
- EPA - Lakes

0 1 2
Kilometres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd
A	09/04/2025	First issue	S.P	I.H

Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.10: Aquatic Survey Locations

Scale @ A3: 1:50,000

Prepared by:	Checked by:	Date:
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Map Ref: 11399-027-Aq.S-EPA-TOB-A

Draft: A

7.8.2.4 Protected Species

7.8.2.4.1 Bats

Although no bat roosts were recorded onsite, nine bat species were recorded during the suite of bat surveys carried out at the proposed wind farm site between Autumn 2021 and Summer 2022, with Common Pipistrelle (*Pipistrellus pipistrellus*) and Soprano Pipistrelle (*Pipistrellus pygmaeus*) being the most recorded species (Table 8a - Appendix 7.6) Overall, the proposed wind farm site is used as foraging habitat, as observed in Spring and Summer 2022, the periods with the highest bat activity of the survey period, indicative of the higher abundance of insects during periods of higher air temperatures, and the good foraging habitat quality the proposed wind farm (Appendix 7.6).

In terms of spatial distribution, the Derryadd bog seems to attract higher bat activity than the Derryaroge and Lough Bannow bogs. In fact, the highest average of bat passes during Spring 2022 was recorded within the Derryadd bog (average of 137.55 bat passes per night – Figures 6a, and 6b in Appendix 7.6).

Overall, the beyond the mentioned Common Pipistrelle and Soprano Pipistrelle, other species recorded during the survey period included Leisler's Bat (*Nyctalus leisleri*), Natterer's Bat (*Myotis nattereri*), Daubenton's Bat (*Myotis daubentoniid*), Brown Long-eared Bat (*Plecotus auritus*), Whiskered Bat (*Myotis mystacinus*), *Myotis* species and Nathusius' Pipistrelle (*Pipistrellus nathusii*). Of these species, Leisler's Bat, Common Pipistrelle and Soprano Pipistrelle are classified as locally common (Roche *et al.*, 2014), and with High Risk (NatureScot, 2021) in relation to wind turbines (Table 7.20). The Bat Assessment Report (2023) presented in Appendix 7.6 includes a detailed description of all the surveys' results, as well as Sections dedicated to each bat species recorded at the proposed wind farm site.

It should be noted that while only six of the eight species recorded at the proposed wind farm were deemed KERs of relevance to the proposed development and therefore required impact assessments following NRA Guidance (2009a), a precautionary approach was taken and impact assessments were undertaken for all eight species (see Section 7.11.3.2.1below).

*Table 7.20: Bats' Ecological Valuation (Table 12 - Appendix 7.6). Key Ecological Receptors highlighted in **bold**.*

Bat Species	Key Ecological Receptors (NRA 2009b)	Ecological Value/ Potential Vulnerability (Wray *et al.*, 2010)	Irish Status (Marnell *et al.*, 2019)	Bat Risk (NatureScot, 2021)	Population Numbers/Core Area (Roche *et al.*, 2014)
Leisler's bat	**International Importance**	**International**	Least Concern	High	Common
Natterer's bat	**County Importance**	**County**	Least Concern	Low	Widespread
Whiskered bat	**County Importance**	**Regional**	Least Concern	Low	Rare

Bat Species	Key Ecological Receptors (NRA 2009b)	Ecological Value/ Potential Vulnerability (Wray *et al.*, 2010)	Irish Status (Marnell *et al.*, 2019)	Bat Risk (NatureScot, 2021)	Population Numbers/Core Area (Roche *et al.*, 2014)
Nathusius' Pipistrelle	**County Importance**	**Regional**	Least Concern	High	Rare
Daubenton's bat	**County Importance**	**County**	Least Concern	Low	Common
Brown Long-eared bat	**County Importance**	**County**	Least Concern	Low	Widespread
Common Pipistrelle	Local (Lower Value)	Local	Least Concern	High	Common
Soprano Pipistrelle	Local (Lower Value)	Local	Least Concern	High	Common

7.8.2.4.1.1 Building and Structure Inspection

Three groups of buildings belonging to Bord na Móna were inspected on the 9th of August 2022 (at daytime and at dusk) in search of bat roosts and/or activity (secondary evidence). These buildings, beyond being appraised as having negligible to low bat roost suitability, did not hold evidence of bat activity (Appendix 7.6).

7.8.2.4.1.2 Static Surveillance (Autumn 2021 to Summer 2022)

During the static surveillance survey at the proposed wind farm site, from the Autumn 2021 to the Summer 2022, eight bat species were recorded (Appendix 7.6).

The survey findings indicate that the proposed wind farm site is, overall, a foraging habitat for bats during the periods of higher temperatures (Summer and Spring periods), demonstrated by Common Pipistrelle and Soprano Pipistrelle number of passes during these periods, likely indicating good quality foraging habitats within the proposed wind farm site. From the static surveillance survey detailed in Appendix 7.6, the Derryadd Bog seemed to hold higher bat activity than the Derryaroge and Lough Bannow Bogs (Figure 6b of Appendix 7.6).

Table 7.21: Average Number of Bat Passes Per Surveillance Period for Each Bat Species (adapted from Appendix 7.6)

Soprano Pipistrelle	Common Pipistrelle	Nathusius' Pipistrelle	Leisler's Bat	Brown Long-eared Bat	Daubenton's Bat	Natterer's Bat	Whiskered Bat
Autumn 2021							
10.1	14.1	0.1	3.4	2.4	4.2	6.5	0.9
Spring 2022							
63.1	430.0	1.6	48.4	1.7	4.2	1.6	1.1

Summer 2022							
75.2	142.0	0.2	19.5	4.8	9.5	11.2	1.2

Based on previous analysis of similar wind fam development projects using the EcoBat Tool, a 'Bat Activity Category' was assigned for turbine locations reflecting the recorded bat activity during each season (Autumn of 2021, Spring of 2022 and Summer of 2022) for High Risk bat species, i.e. Leisler's Bat, Common Pipistrelle, Soprano Pipistrelle, and Nathusius' Pipistrelle. It assigned a High 'Bat Activity Category' for:

- Zero turbines/static surveillance locations in the Autumn of 2021;
- Seven turbine/static surveillance locations in Spring 2022; and
- Two turbine/static surveillance locations in Summer 2022.

Appendix 7.6 includes a more detailed description, including locations for static surveillance classified as *Moderate to High* 'Bat Activity Category.

7.8.2.4.1.3 Transects Survey

The transect surveys (walking and driving) concentrated on accessible areas (illustrated in Figure 7a of Appendix 7.6). It is possible to distinguish three zones of higher concentrations of bat encounters: 1) on the southern part of Derryaroge Bog; 2) in the centre of the Derryadd Bog; and 3) on the southern part of Lough Bannow Bog The concentration of bat encounters in 1) and 2) appears to be related with the occurrence of linear habitat features, the concentration of encounters in 3) might be associated with the presence of aquatic habitats (e.g. FL8 - Other artificial lakes and ponds) and the consequent higher abundance of insects.

7.8.2.4.2 Non-Volant Mammals

7.8.2.4.2.1 Badger (Meles meles)

Badger (*Meles meles*) and its breeding/resting sites (setts) are legally protected under the Wildlife Act 1976 (as amended). The desk study revealed records for this species presence which were confirmed during the multidisciplinary walkover survey by the identification of secondary evidence. No Badger individuals were observed, but used tracks, latrines and snuffle holes were observed throughout the proposed wind farm site.

Two potential Badger setts (i.e. 'D'-shaped burrows) were identified at the southern boundary of the Derryadd Bog. However, the presence of leaf litter and spider webs at their entrances is indicative that these structures may have been abandoned and are unoccupied.

Given the protection afforded by the Wildlife Act 1976 (as amended), Badger is considered a KER of **Local Importance (Higher Value)**.

7.8.2.4.2.2 Otter (Lutra lutra)

Otter (*Lutra lutra*) and its breeding/resting sites (holts, couches) are protected under the Wildlife Act 1976 (as amended), and listed on the Annex II and Annex IV of the Habitats Directive (Council Directive 92/43/EEC). As with Badger, the desk study indicated the local presence of Otter, and it was also confirmed during the multidisciplinary walkover survey, where several Otter tracks were identified across the area surveyed . Although no Otter holts

or couches have been recorded, Otter tracks were observed near the northern boundary of Lough Bannow Bog.

Considering its international designation, and the presence of a SAC designated for Otter (i.e. Lough Ree SAC) in relative proximity of the proposed wind farm site, Otter is considered to be a KER of **International Importance**.

7.8.2.4.2.3 Irish Hare (Lepus timidus hibernicus)

Irish Hare (*Lepus timidus hibernicus*) and its breeding/resting sites (setts) are legally protected under the Wildlife Act 1976 (as amended). During the multidisciplinary walkover survey, frequent sightings of Irish Hare, as well as evidence of their presence (tracks and scat) were recorded throughout the proposed wind farm site, confirming the desk study records.

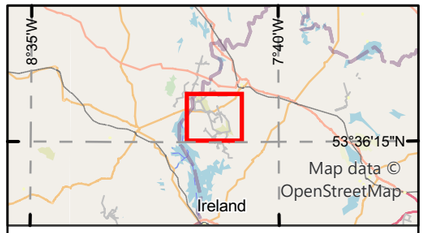
Considering protection under the Wildlife Act 1976 (as amended) to the Irish Hare, it is considered a KER of Local Importance (Lower Value).

7.8.2.4.2.4 Other Mammals

No evidence for other protected mammal species was found during the multidisciplinary walkover survey. However, given the presence of favoured habitat, some other protected species may occur within the proposed wind farm site. Species protected under the Wildlife Act 1976 (as amended), such as Hedgehog (*Erinaceus europaeus*), Pygmy Shrew (*Sorex minutus*), Irish Stoat (*Mustela erminea hibernica*) and Pine Marten (*Martes martes*), which could occur around woodlands and their fringing habitats at the proposed wind farm site.

The potential likely occurrence of other protected mammal species within the proposed wind farm site is valued as of Local Importance (Lower Value).

Although not a protected species, secondary evidence of Fox (*Vulpes vulpes*) was also regularly observed throughout the proposed wind farm site (e.g. scat, tracks and dens).



Legend

- Proposed wind farm site
- Turbine Layout

Relevant findings

- Rhododendron
- Badger Activity
- American Mink
- Common Blue
- Common Frog
- Deer
- Eurasian Badger
- Irish Hare
- Large White
- Meadow Brown
- Pine Marten
- Raft Spider
- Red Fox
- Small Tortoiseshell

0 1 2
Kilometres

NOTES

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A	09/04/2025	First issue	S.P	I.H

Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.11: Relevant Observations Within the Study Area During the Multidisciplinary Walkover Survey

Scale @ A3: 1:40,000

Prepared by:	Checked by:	Date:
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Map Ref: 11399-034-SPE-P.APP.BO-TOB-A

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7.8.2.4.3 Whorl Snail (Vertigo sp.)

The detailed Whorl Snail Survey (Appendix 7.7) revealed the presence of three species in the proposed wind farm site: Common Whorl Snail, Striated Whorl Snail and Marsh Whorl Snail. None of these species is listed in Annex II of the Habitats Directive (Council Directive 92/43/EEC), while only Marsh Whorl Snail is listed in Irish Red List (Byrne *et al.*, 2009).

Despite Appendix 7.7 describing the available habitat as favourable for the occurrence of the Annex II species of the Habitats Directive Desmoulin's Whorl Snail, it is considered unsuitable due to variation in water levels, while Desmoulin's Whorl Snail typically requires habitats with more stable and limited flooding conditions, and the hydrological regime observed at this location is likely to hinder its potential occurrence that the regular flooding of the site would hinder the potential for its occurrence (Desmoulin's Whorl-snail requires limited flooding habitat conditions). A similar conclusion was made from the results of the dedicated survey carried out in 2018 at the proposed wind farm site, which reports that Desmoulin's Whorl Snail was not present, nor there was favoured habitat for its presence (TOBIN Consulting Engineers, 2019).

Therefore, considering its Red List classification, and the activities proposed at the wind farm site, Marsh Whorl Snail is considered to be a KER of **County Importance**, while Common Whorl Snail, and Striated Whorl Snail are valued as a KER of **Local Importance (Higher Value)**.

7.8.2.4.4 Marsh Fritillary

The locations of Marsh Fritillary survey within the proposed wind farm site is shown in Figure 7.12. Three locations within the proposed wind farm site have been identified holding Marsh Fritillary larval webs, although only two of those locations had webs occupied by larvae (see Figure 7.13).

Despite the relative abundance of Devil's-bit Scabious (*Succisa pratensis*), the primary larval food plant of the Marsh Fritillary, within the proposed wind farm site, the absence of recorded individuals during the most recent surveys may reflect a local decline or absence of the species. This could be influenced by historic habitat modification associated with extensive peat extraction activities across the site, which began in the 1950s (Bord na Móna, unpublished data). Peatland drainage and intensive land use changes have long been recognised as significant pressures on wet grassland species, with wetland drainage specifically identified as a major threat to the Marsh Fritillary (Lavery, 1993).

However, it is also important to acknowledge that Marsh Fritillary populations are known to exhibit natural fluctuations at local scales, often influenced by a range of ecological factors including weather conditions, food plant quality and availability, parasitism, and interannual variability in habitat structure. These fluctuations can result in very low population densities or even local extinctions, followed by natural recolonisation if suitable habitat is maintained. As such, the current absence of records may lie within the bounds of expected natural variation and does not alone confirm permanent site abandonment.

The species is particularly sensitive to habitat loss and degradation arising from drainage, inappropriate grazing regimes (both under- and over-grazing), nutrient enrichment, introduction of invasive alien species (IAS), and physical disturbance. Mechanical operations

and land use change can also directly affect individuals or alter microhabitat conditions to the species' detriment. Therefore, when appraising the potential impacts of the proposed development, it is important to consider all relevant pressure pathways in relation to these sensitivities, including habitat fragmentation, hydrological change, physical disturbance from machinery, and indirect effects on vegetation communities.

Devil's-bit Scabious is recolonising in the proposed wind farm site but, as the peat extraction has only ceased relatively recently (2019), and the existing habitats seem to be in a transition phase, the availability of food plant for Marsh Fritillary larvae is still quite sparse. Considering the species protection (listed in the Annex II of the Habitats Directive (Council Directive 92/43/EEC), this species is considered to be of **International Importance**.

7.8.2.4.5 Other Butterfly species

During the multidisciplinary walkover survey four butterfly species were recorded, including Common Blue (*Polyommatus icarus*), Small Tortoiseshell (*Aglais urticae*), Large White (*Pieris brassicae*), and Meadow Brown (*Maniola jurtina*). All four species are listed as 'Least Concern' under the Ireland Red List of Butterflies (Regan *et al.*, 2010).

Considering the conservation status of the recorded butterfly species, they are considered as being of Local Importance (Lower Value).

7.8.2.5 Invasive Alien Species

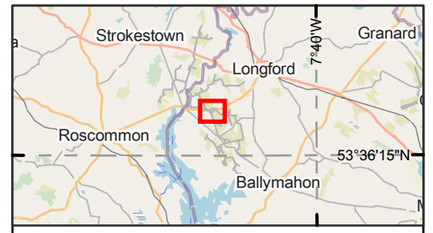
7.8.2.5.1 Invasive Alien Plant Species

Multiple shrubs of Rhododendron (*Rhododendron ponticum*), an IAPS listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011, as amended), were recorded within a Hedgerow (WL2) adjacent to the N63. It is most likely that the shrubs were planted intentionally in the past as they are growing in a linear alignment. No suckers (i.e. smaller plant emerging from the roots of the parent plant) were present, which suggests that there is no current likelihood of this species spreading aggressively throughout the surrounding area.

7.8.2.5.2 Invasive Alien Animal Species

A live sighting of an American Mink (*Mustela vison*) was recorded during the multidisciplinary walkover survey toward the eastern boundary of the proposed wind farm site. American Mink is listed in Part 2 of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I No. 477/2011), and is a species that can move well both on land and in water, and is a significant predator of waterbirds and fish (Roy *et al.*, 2009). As mentioned above, it is not likely the works and activities associated with the proposed development will affect either positively or negatively for the establishment and/or spread of the local American Mink population.

7°56'10"W
7°55'0"W
7°53'50"W
53°40'30"N
53°39'45"N
770000
769000
768000
604500
606000



Legend

- Proposed wind farm site

Whorl Snail Sampling and Findings

- Vertigo antivertigo
- Vertigo pygmaea
- Vertigo substriata
- No observations

0 0.25 0.5
Kilometres

NOTES

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Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.12: Whorl Snail Sampling and Findings (adapted from Appendix 7.7)

Scale @ A3: 1:12,000

Prepared by:	Checked by:	Date:
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Map Ref: 11399-036-Wh.Sn-P.APP.BO-TOB-A

Draft: A

7°54'0"W
7°52'30"W
7°51'0"W
53°39'0"N
53°38'15"N
53°37'30"N
766780
765160
763540
606350
608200
610050

Legend

- Proposed wind farm site
- Devil's-bit Scabious stands
- Marsh Fritillary Larvae

0 250 500
Meters

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Rev	Date	Description	By	Chkd.
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Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.13: Marsh Fritillary Survey: Devil's-bit Scabious Stands Locations and Survey Results

Scale @ A3: 1:14,000

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Map Ref: 11399-037-MF-P.APP.BO-TOB-A

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7.9 Environmental Baseline – Turbine Delivery Route Points of Interest

The existing ecological baseline for the proposed POIs along the TDR has been established through desk studies, scoping and consultations, and field surveys, providing a comprehensive understanding of the ecological conditions to inform the impact assessments.

7.9.1 Desk Study

7.9.1.1 Overview

The POIs for the proposed TDR are located within 3 WFD Subcatchments. Specifically, POIs 1 and 2 are located within the Shannon[Upper]_SC_100 (26G_2); POIs 3, 4 and 5 are within the Hind_SC_010 (26E_5); and POI 6 is located within the Shannon[Upper]_SC_080 (26C_1) (Appendix 7.5). These separate geographic locations entail 3 potential hydrological pathways, whose extent, following the criteria described in Section 7.2.4.3, will be considered until the pathway reached a lentic water body, i.e. the Ree WFD lake water body (IE_SH_26_750a) for POIs 3,4, 5, and 6; and the Derg TN WFD lake water body (IE_SH_25_191a) for POIs 1 and 2 (Table 7.22).

7.9.1.2 Aquatic Environment

The hydrological pathways from the POIs for the proposed TDR include 11 WFD river water bodies. Only one of the WFD river water bodies, the Hind_020, achieved the WFD objectives during the monitoring period 2016-2021, with *the Invertebrate Status or Potential* being the most common limiting element. The failure of the Shannon (Upper)_120 in passing the *Chemical Surface Water Status* due to the concentrations of Benzo(a)pyrene and Mercury, two highly pollutant elements.

7.9.1.2.1 River Water Bodies

Within these sub-basins, there are hydrological pathways from the Points of Interest (POIs) for the proposed TDR to 11 WFD River Water Bodies.

During the 2016–2021 monitoring period, only one of the Water WFD RWB assessed within the study area, Hind_020, achieved its WFD objectives. In contrast, the remaining river water bodies did not meet the required status, with the most frequently cited limiting factor being poor Invertebrate Status or Potential. This biological quality element is a key indicator of ecological health and is often used to reflect broader issues related to water quality, habitat condition, and catchment pressures.

A notable example of WFD failure was observed in the Shannon (Upper)_120 River Water Body, which did not achieve the required Chemical Surface Water Status. This failure was attributed to the presence of elevated concentrations of two priority hazardous substances, Benzo(a)pyrene and Mercury. These substances are known for their persistence in aquatic environments and their potential to bioaccumulate, posing significant risks to aquatic life and overall ecosystem health. Their presence suggests potential contamination sources within the catchment, such as historical industrial activity, diffuse pollution, or legacy land use impacts.

The failure of these water bodies to meet ecological and chemical status under the WFD highlights existing environmental pressures and reinforces the importance of maintaining or improving water quality, particularly in the context of proposed developments within or near these catchments.

7.9.1.2.2 Lake Water Bodies

As mentioned in Section 7.9.1.2above, there are two WFD lake water bodies acting as receptors of the three hydrological pathways from the POI for the proposed TDR. The Ree WFD lake water body (IE_SH_26_750a) also forms part of the hydrological pathway of the proposed wind farm. With regards to the Derg TN WFD lake water body, which WFD water quality status did not reach the WFD objectives for the 2016-2021 period, seems to be influenced by the inflowing Shannon (Upper)_120 contaminant inputs, as it exceeds the concentration limits of the same pollutants (i.e. Benzo(a)pyrene, and Mercury), failing to pass its *Chemical Surface Water Status* (see Table 7.22).

7.9.1.2.3 Groundwater Bodies

The POIs for the proposed TDR are overlay 3 WFD groundwater bodies: POI 1 and 2 are located on the Athlone West (IE_SH_G_014); POI 3, 4 and 5 over the Funshinagh (IE_SH_G_091); and POI 6 over the Inny (IE_SH_G_110). The proposed wind farm is located over the two latter WFD groundwater bodies. With regards to the Athlone West WFD groundwater body, it lies within a limestone aquifer, with an average effective bedrock thickness of 15m, and, although unlikely to hold karstic features, it holds several faults, which enhance the bedrock permeability/transmissivity. Groundwater flow within this groundwater body would be of local nature, with discharges to local springs, streams and/or rivers that intersect it[26].

Table 7.22: WFD Water Quality Status (EPA, 2021) *of Water Bodies in Proximity of the Proposed TDR POIs*

Unassigned | Bad | Poor | Moderate | Good | High

WFD classification*	POIs	Water Body Name	WFD Reference	WFD Water Quality Status	Limiting Element
RWB	1, 2	Shannon (Lower)_010	IE_SH_25S012000	Md**	-
		Shannon (Lower)_020	IE_SH_25S012060	M**	Invertebrate Status or Potential
		Shannon (Lower)_030	IE_SH_25S012350	Md**	-
		Shannon (Upper)_120	IE_SH_26S021800	M**	Chemical Surface Water Status (Benzo(a)pyrene, and Mercury)
		Shannon (Upper)_130	IE_SH_26S021920	Md**	-

[26] Available at https://gsi.geodata.gov.ie/downloads/Groundwater/Reports/GWB/AthloneWestGWB.pdf. Accessed in November 2024

WFD classification*	POIs	Water Body Name	WFD Reference	WFD Water Quality Status	Limiting Element
	3, 4, 5	Jiggy (Hind)_010	IE_SH_26J010090	M**	Invertebrate Status or Potential
		Hind_010	IE_SH_26H010300	M**	Invertebrate Status or Potential
		Hind_020	IE_SH_26H010400	M**	-
		Hind_030	IE_SH_26H010500	M**	Invertebrate Status or Potential
	6	Lough Bannow Stream_010	IE_SH_26L120100	Md**	-
		Shannon (Upper)_100	IE_SH_26S021600	M**	Invertebrate Status or Potential
LWB	3, 4, 5, 6	Ree	IE_SH_26_750a	M**	Hydromorphological conditions
	1, 2	Derg TN	IE_SH_25_191a	M**	Chemical Surface Water Status (Benzo(a)pyrene, and Mercury)
GWB	1, 2	Athlone West	IE_SH_G_014	-	-
	3, 4, 5	Funshinagh	IE_SH_G_091	-	-
	6	Inny	IE_SH_G_110	-	-

* RWB – River Water Body; LWB – Lake Water Body – GWB – Groundwater Body
** M – Monitoring; Md – Modelling

7.9.1.3 European Sites and Nationally Important Sites

7.9.1.3.1 European Sites

7.9.1.3.1.1 Sites of International Importance

The source-pathway-receptor model was used to identify all European sites that could potentially be affected by the activities at the POIs. For context Figure 7.14 shows the European sites in the vicinity of the POIs. The Lough Ree SPA [004064] and Lough Ree SAC [000440] are separated by approximately 350 m and 366 m to the nearest POI, respectively. Given the proximity, there is potential for effects to the European sites. Description of the source-pathway-receptor linkages for the SAC and SPAs is provided in below.

7.9.1.3.1.2 Sites of National Importance

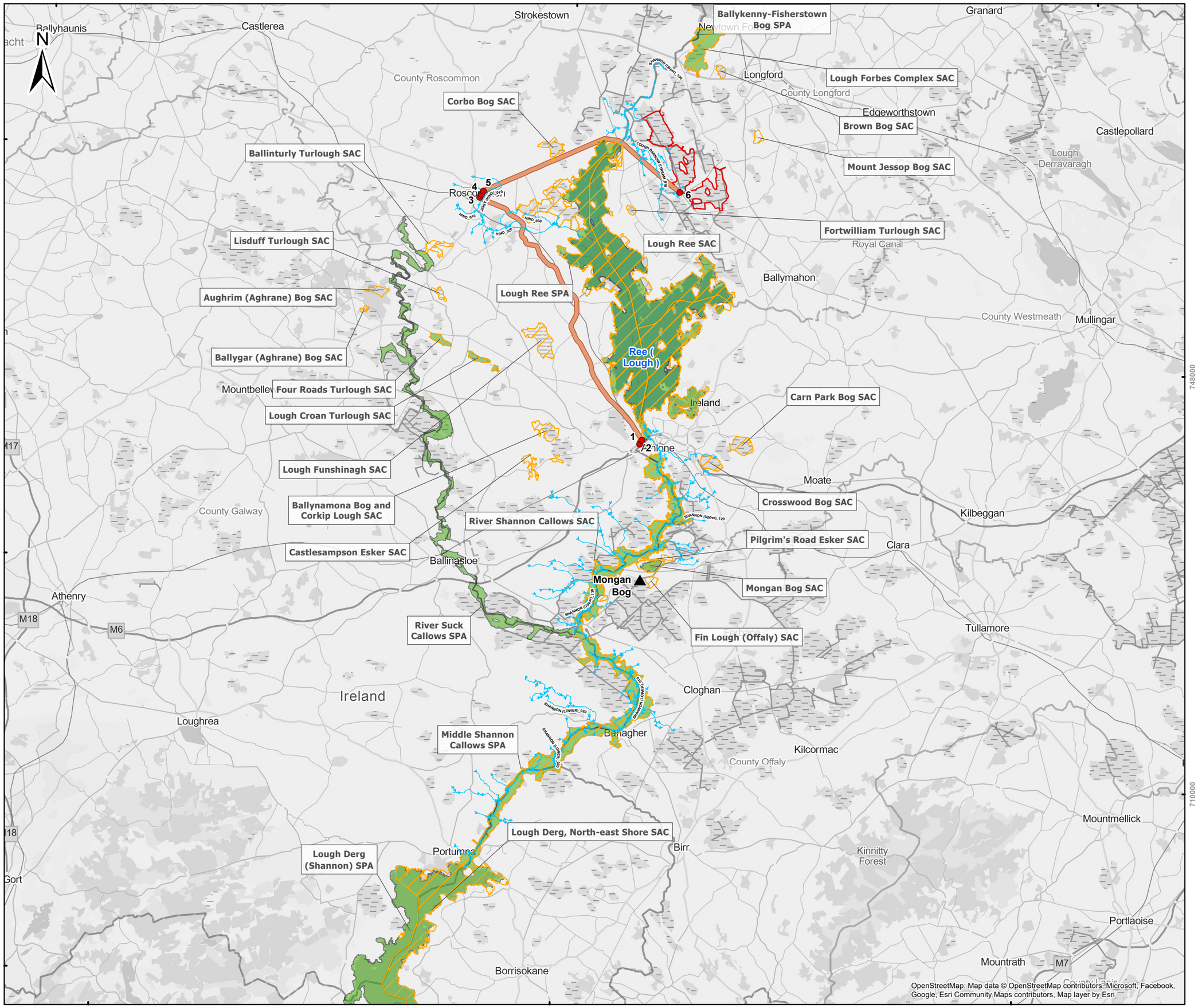
Figure 7.15 shows Nationally important sites around the proposed TDR POIs. The nearest NHA to the proposed TDR is separated by approximately 3.8 km - Forthill Bog NHA [001448]. Given the distance of the NHAs from the POIs and the nature of the works proposed at the POIs, the potential for effects arising from activities at the POIs is considered unlikely and can therefore be screened out.

8°46'20"W 8°3'10"W 7°20'0"W

53°40'25"N 53°20'8"N 52°59'51"N

552000 594000 636000

748000 710000



Legend

- Proposed wind farm site
- Turbine Delivery Route
- Turbine Delivery Route POI
- Ramsar Sites
- Special Areas of Conservation (SACs)
- Special Protection Areas (SPAs)
- WFD - River Water bodies

0 7.5 15
Kilometres

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Rev	Date	Description	By	Chkd.

Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.14: Internationally Important Sites near the Proposed TDR POIs

Scale @ A3:	1:320,000	
Prepared by:	Checked by:	Date:
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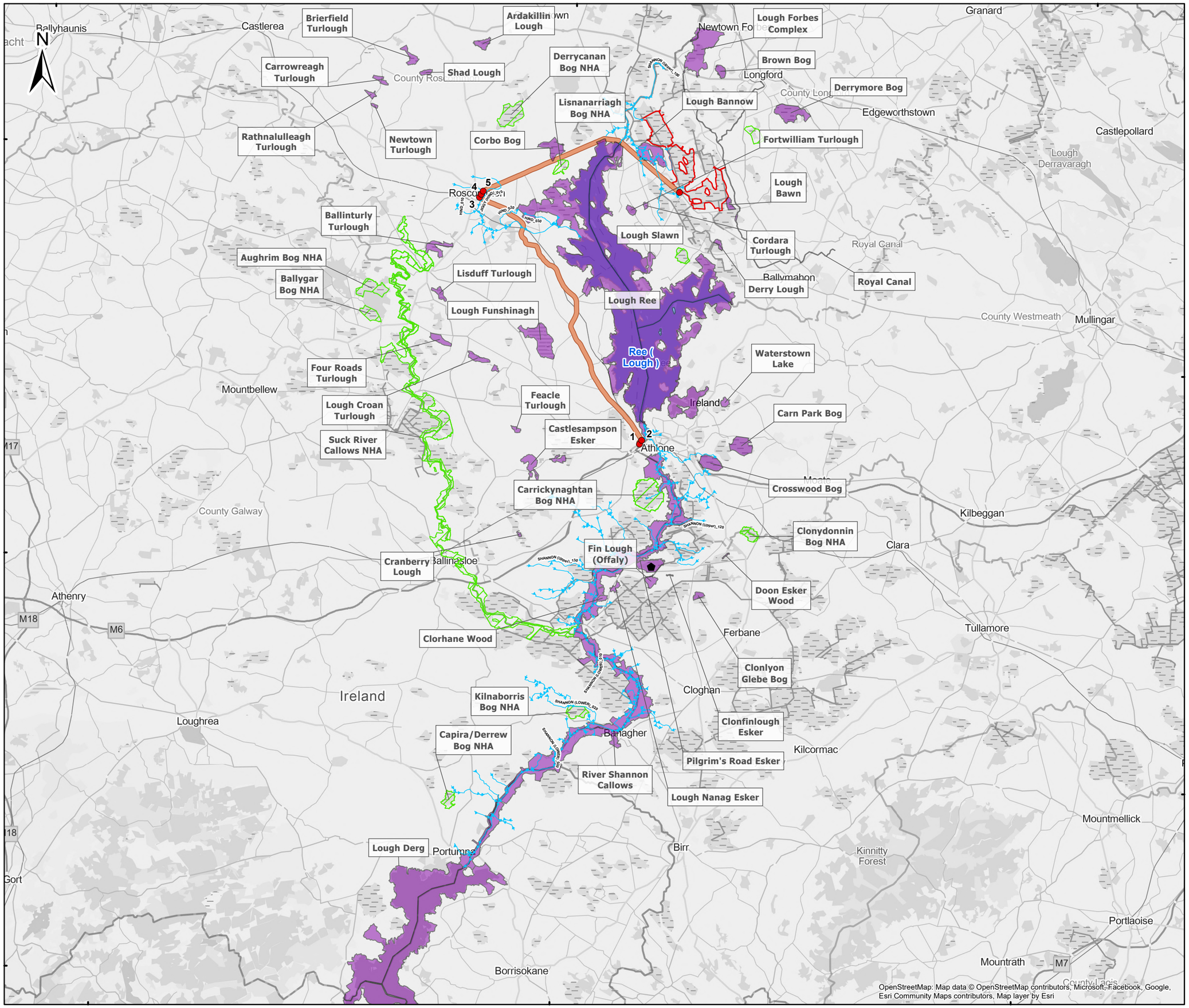
Map Ref: 11399-031-EU.S-TDR-TOB-A

Draft: A



Legend

- Proposed wind farm site
- Turbine Delivery Route
- Turbine Delivery Route POI
- Nature Reserves
- WFD - River Water bodies
- National Heritage Areas (NHAs)
- proposed National Heritage Areas (pNHAs)
- WFD - Lake Water bodies

0 7.5 15
Kilometres

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Rev	Date	Description	By	Chkd.
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Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.15: Nationally Important Sites Within the ZoI of the Proposed TDR

Scale @ A3: 1:320,000

Prepared by:	Checked by:	Date:
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Map Ref: 11399-032-N.S-TDR-TOB-A

Draft: A

7.9.1.4 Protected Species

A review of the NPWS Protected Species Database and the NBDC website for the 1x1 km Irish Grid Squares within which the POIs are located revealed records of several protected species and (see Table 7.23). Specifically, the 1x1 km Irish Grid Squares at the POIs are:

- N0241 - POI1
- N0242 - POI2
- M8764 - POI3, POI4
- M8864 - POI5
- N0564 - POI6

The list of records in Table 7.23 does not include species classified as invasive mammals as it is not likely the works for the proposed TDR would affect their spread. Also, bird species records for the 1x1 km Irish Grid Squares are not included in Table 7.23. Records for bird species are, however, included in Chapter 8 – Ornithology of the EIAR, which presents an assessment of the potential effects and impacts of the proposed development on avian receptors.

Table 7.23: Biodiversity Records from Irish Grid Squares N0241, N0242, M8764, M8864 and N0564

POI	Grid Square	Common Name	Scientific Name	Last Record	Designation
Amphibians					
3, 4	M8764	Common Frog	*Rana temporaria*	19/03/1997	EU Habitats Directive – Annex V; Wildlife Acts
1, 3, 4	N0241, M8764	Smooth Newt	*Lissotriton vulgaris*	31/05/1970	Wildlife Acts
Reptiles					
1	N0241	Common Lizard	*Zootoca vivipara*	01/09/1960	Wildlife Acts
Volant Mammals					
1	N0241	Brown Long-eared Bat	*Plecotus auritus*	08/08/2012	EU Habitats Directive – Annex IV; Wildlife Acts
1	N0241	Common Pipistrelle	*Pipistrellus pipistrellus sensu lato*	06/08/2014	EU Habitats Directive – Annex IV; Wildlife Acts
1	N0241	Soprano Pipistrelle	*Pipistrellus pygmaeus*	06/08/2014	EU Habitats Directive – Annex IV; Wildlife Acts
Non-Volant Mammals					
3, 4	M8764	European Otter	*Lutra lutra*	22/01/1980	EU Habitats Directive – Annex

					II, Annex IV; Wildlife Acts
1, 3, 4, 5	N0241, M8864, M8764	West European Hedgehog	*Erinaceus europaeus*	02/09/2021	Wildlife Acts
Invasive Alien Plant Species					
1	N0241	Japanese Knotweed	*Fallopia japonica*	03/11/2017	Regulation S.I. 477/2011

7.9.2 Field Surveys

Surveys undertaken in 2022 at POIs along the TDR are described here.

Out of the six POIs, the areas associated with the works for the proposed TDR, only one, POI6 is located within the proposed wind farm site, , serving as the main entrance point to the proposed wind farm site (Figure 7.16).

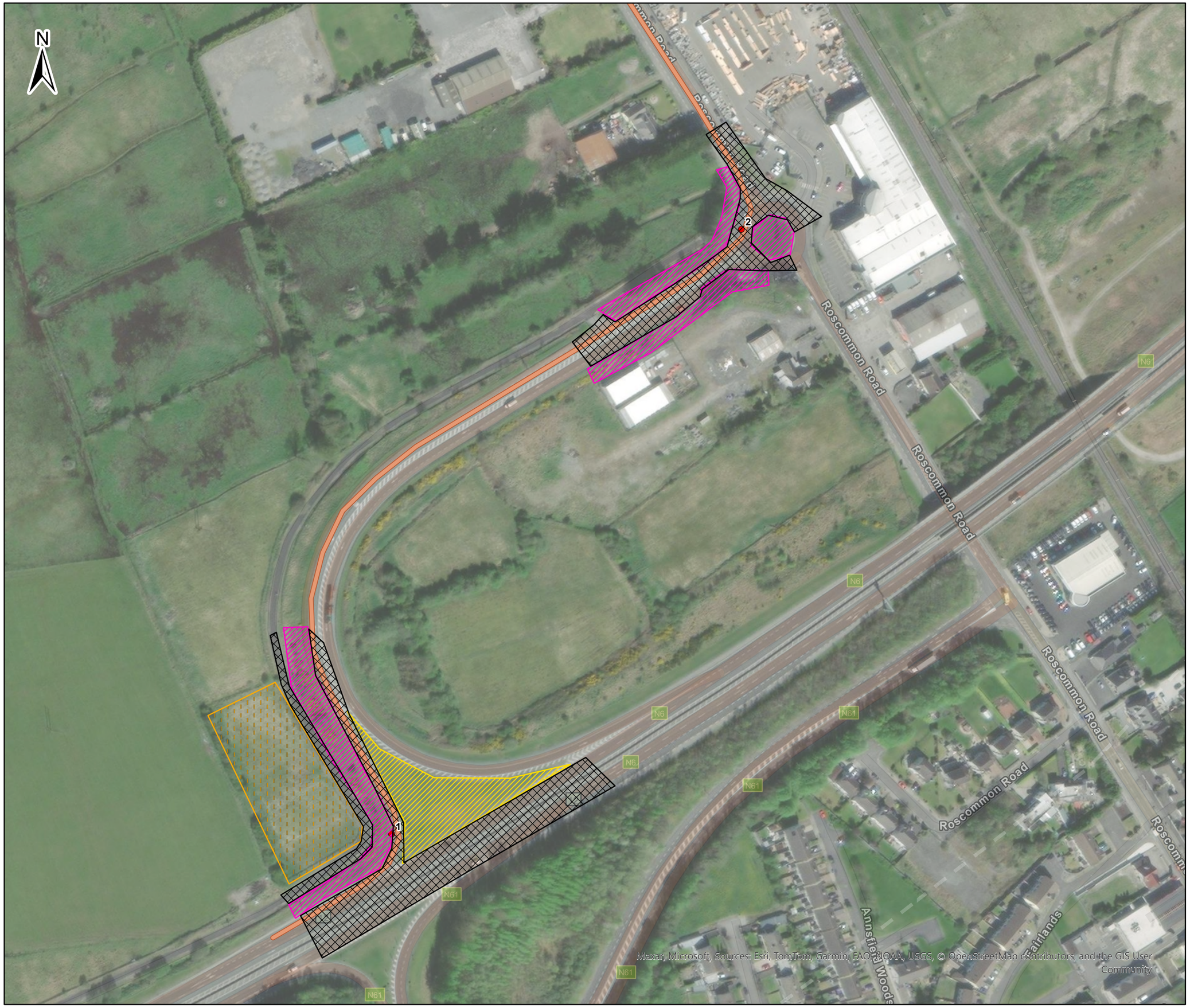
The works for the other five POIs are located along roadways (and their vicinities), separated from the proposed wind farm site (Figure 7.17 and Figure 7.18). The vegetated habitats near built structures, paved surfaces, or urban environments, the habitats affected by the proposed TDR works outside the wind farm site exhibit signs of management. These areas are largely dominated by ruderal and graminoid species, with minimal ecological diversity. Full survey results are presented in Appendix 7.9b. No evidence of the presence of protected animals was found on these areas and their vicinities, including bat roost potential (Section 7.7.2.3.3.1). Considering the aspects of the habitats affected by the works for the proposed TDR outside the proposed wind farm site (i.e. POI1 – POI 5), the large majority of these habitats are considered as of Local Importance (Lower Value), as per criteria set in NRA (2009b), see Table 7.24. The exception is the Treeline habitat (WL2) located around POI2, which, although not consistently structured (displayed several gaps, almost breaking the connectivity within the habitat), is an important and sparse ecological resource in the local context.

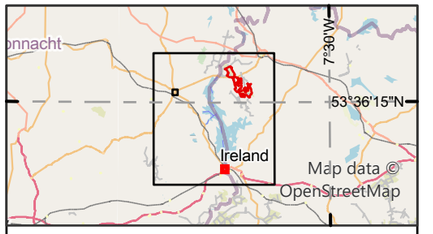
The proposed works for POI6 are located near the margins of, otherwise, ecologically valuable habitats (PB4 and WN7). However, having consideration for the limited extent of the works for the proposed TDR at POI 6 along with the geographical setting (i.e. immediately adjacent to a roadway), the ecological valuation of the habitats within this area is of Local Importance (Lower Value) (see Table 7.24). The linear habitat within POI6 Hedgerows (WL1) (see Table 7.24) are assigned a higher valuation, **Local Importance (Higher Value)**, due to its relative rarity in the local context, its high species diversity, and its role in providing habitat connectivity for protected animal species..

No surface water bodies were identified during the multidisciplinary walkover survey of the proposed TDR POIs, and this lack of surface water features around these locations might be indicative of local drainage management, which is likely to have culverted surface water bodies around these locations, as it is common in urban settings, limiting any potential hydrological connectivity with KERs.

*Table 7.24: Habitat Composition of the Areas at the POIs for the Proposed TDR. KERs highlight in **bold**.*

POI	Habitat (Fossitt, 2000)		Extent (m^2/m)	Ecological Valuation (NRA, 2009a
	Code	Name		
1	BL3	Buildings and artificial surfaces	488m^2	-
	GS2	Dry meadows and grassy verges	878m^2	Local Importance (Lower Value)
	GS4	Wet grassland	73m^2	Local Importance (Lower Value)
2	BL3	Buildings and artificial surfaces	188m^2	-
	GS2	Dry meadows and grassy verges	502m^2	Local Importance (Lower Value)
	WL2	**Treelines**	144m	**Local Importance (Higher Value)**
3	BL3	Buildings and artificial surfaces	563m^2	-
	GS2	Dry meadows and grassy verges	126m^2	Local Importance (Lower Value)
4	BL3	Buildings and artificial surfaces	20m^2	-
	GS2	Dry meadows and grassy verges	111m^2	Local Importance (Lower Value)
5	BL3	Buildings and artificial surfaces	72m^2	
	WS3	Ornamental/non-native shrub	226m^2	Local Importance (Lower Value)
6	PB4	Cutover Bog	2,269m^2	Local Importance (Lower Value)
	WN7	Bog Woodland	556m^2	Local Importance (Lower Value)
	WL1	**Hedgerows**	277m	**Local Importance (Higher Value)**
	FW4	Drainage ditches	122m^2	Local Importance (Lower Value)





Legend

- Proposed wind farm site
- Turbine Delivery Route POI
- Turbine Delivery Route

Habitats

- GS2 - Dry meadows and grassy verges
- GS2/WS1
- GS4/WS1
- BL3 - Buildings and artifical surfaces

0 40 80
Meters

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

A	09/04/2025	First issue	S.P	I.H
Rev	Date	Description	By	Chkd

Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.17: POIs for the Proposed TDR and Associated Habitats Page 1 of 2

Scale @ A3: 1:2,000

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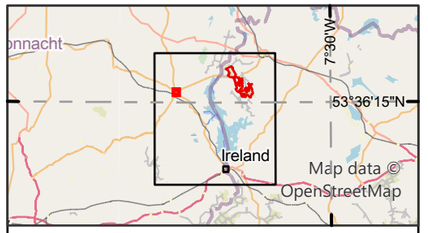

Legend

- Proposed wind farm site
- Turbine Delivery Route POI
- Turbine Delivery Route

Habitats

- GS2 - Dry meadows and grassy verges
- GS2/BL3
- GS2/WS3
- WS3/GS2
- BL3 - Buildings and artifical surfaces

0 60 120
Meters

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Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.18: POIs for the Proposed TDR and Associated Habitats - Page 2 of 2 -

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Map Ref: 11399-038-POIs-P.APP.BO-TOB-A

Draft: A

7.10 KEY ECOLOGICAL RECEPTORS (KERS)

The following provides an overview of the KERs that may be affected by the proposed wind farm development. It lists the relevant habitats, species, and designated sites, including those within the proposed wind farm site and POIs along the proposed turbine delivery route, along with their potential sensitivities to the proposed works. This section also provides a brief description of sites of international and national importance, outlining their ecological significance and the potential impacts they may experience due to the proposed development activities.

7.10.1 Proposed Wind Farm Site

7.10.1.1 Habitats

Key potential source of impact to habitats include:

- Access tracks & roads: Potential habitat fragmentation, soil compaction, and vegetation loss.
- Turbine foundations & hardstands: Will involve land take through excavation, which may lead to localised hydrological disruption and disturbance of peat soils. These works result in permanent loss of habitat within the footprint of the infrastructure, and may also alter drainage patterns, potentially affecting surrounding habitats.
- Drainage systems: Potential changes in water levels and habitat degradation.
- Underground cabling & trenching: Vegetation removal and may result in short-term disruption to habitat connectivity. However, these impacts are considered temporary, as the affected areas will be reinstated following completion of the works, allowing for natural regeneration of vegetation and restoration of habitat connectivity over time.
- Construction compounds & borrow pits: Land take, sedimentation, and pollution risks.
- Lighting & security cabins: Potential disturbance to nocturnal wildlife (e.g., bats).

Table 7.25: Key Ecological Receptors Habitats – Proposed Wind Farm Site

Code	Habitat Name	Ecological Valuation	Sensitivity
Polygon Habitats			
WN7	Bog woodland	Local Importance (Higher Value)	This habitat supports diverse plant species and provides key ecological resources for protected fauna. Potential impacts from wind farm construction include vegetation clearance for access tracks, integration of new drainage with existing drainage infrastructure, and habitat fragmentation.
FL8	Other artificial lakes and ponds	Local Importance (Higher Value)	These habitats regularly flood and serve as a foraging resource for waterfowl. Potential impacts include contamination from construction runoff, changes in hydrology due to access roads, and disturbance to bird species. Importance of this habitat to bird species is assessed in Chapter 8 - Ornithology.
FS1	Reed and large sedge swamps	Local Importance (Higher Value)	Provides shelter, foraging, and breeding habitat for waterfowl. Potential impacts include sedimentation and pollution from construction works, integration

Code	Habitat Name	Ecological Valuation	Sensitivity
			of new drainage with existing drainage infrastructure, and disturbance from turbine operation.
WS1	Scrub	Local Importance (Higher Value)	This transitional habitat offers shelter and foraging for fauna. Potential impacts include direct removal for turbine foundations and access roads, as well as fragmentation reducing habitat connectivity.
PB1	Raised bog	Local Importance (Higher Value)	Bogs are ecologically valuable due to high plant diversity and their role in carbon sequestration. Potential impacts include peat excavation for foundations, drainage modifications, and degradation from access track installation.
WS2	Immature woodland	Local Importance (Higher Value)	Provides shelter and foraging for protected species. Potential impacts include habitat loss from construction activities, dust deposition on vegetation, and disturbance from increased human activity.
PF2	Poor fen and flush	Local Importance (Higher Value)	A wetland habitat of special importance that supports biodiversity. Potential impacts due to integration of new drainage with existing drainage infrastructure, runoff pollution from construction works, and loss of vegetation due to access road development.
GS4	Wet grassland	Local Importance (Higher Value)	This habitat provides resources for protected species and is important for future ecological restoration. Potential impacts include soil compaction from construction vehicles, integration of new drainage with existing drainage infrastructure and disturbance from turbine operation.
GS3	Dry humid acid grassland	Local Importance (Higher Value)	Provides foraging opportunities for protected species. Potential impacts include soil disturbance from turbine construction, vegetation loss, and habitat fragmentation.
WD1	(Mixed) broadleaved woodland	Local Importance (Higher Value)	Located near site boundaries, this habitat contains valuable species for future ecological development. Potential impacts include tree removal for access tracks, noise and dust from construction, and habitat fragmentation.
WN6	Wet willow-alder-ash woodland	Local Importance (Higher Value)	Located in floodplains and acts as an ecological corridor. Potential impacts include altered hydrology from drainage infrastructure, tree removal, and water quality degradation from runoff.

Code	Habitat Name	Ecological Valuation	Sensitivity
GS2	Dry meadows and grassy verges	Local Importance (Higher Value)	Supports pollinators and protected species. Potential impacts include trampling and soil compaction from machinery, disturbance from wind turbine construction, and habitat loss.
Linear Habitats			
FW2	Depositing/low land rivers	County Importance	Important for hydrological connectivity with designated sites. Potential impacts include increased sedimentation due to construction runoff, water contamination from site activities, and barrier effects on aquatic species.
FW4	Drainage ditches	Local Importance (Higher Value)	This artificial habitat supports high plant diversity and acts as an ecological corridor. Potential impacts include contamination from construction materials, changes to drainage systems, and loss of vegetation due to excavation.
WL1	Hedgerows	Local Importance (Higher Value)	Provides ecological corridors for species like bats. Potential impacts include removal for access roads, disruption to foraging routes due to turbine placement, and habitat fragmentation.
WL2	Treelines	Local Importance (Higher Value)	Offers shelter, breeding, and foraging for fauna while connecting important habitats. Potential impacts include tree removal for turbine clearances, disturbance from construction noise, and fragmentation of ecological corridors.

7.10.1.2Species

Key potential impacts to species include:

- Bats: Tree/hedgerow removal, lighting, turbine operation (impacting roosts, commuting routes).
- Badgers: Excavation, drainage, access roads, construction traffic (disturbing setts, collision risks).
- Otter: Watercourse crossings, drainage, noise disturbance, pollution risk (affecting foraging and habitat connectivity).
- Irish Hare: Vegetation clearance, fencing, turbine installation (reducing habitat availability and movement corridors).
- Vertigo Whorl Snails: Drainage changes, peat excavation, borrow pits (modifying moisture conditions in wetland habitats).
- Marsh Fritillary: Grassland loss, excavation, drainage works (impacting food plant availability and larval development).

Table 7.26: Key Ecological Receptors Species – Proposed Wind Farm Site

Species	Ecological Valuation	Rationale	Sensitivity
Leisler's Bat Nathusius' Pipistrelle Natterer's Bat Daubenton's Bat Whiskered Bat Brown Long-eared Bat.	Local to National Importance	Bats rely on hedgerows, treelines, and woodland edges for foraging and commuting. The site may support roosting in mature trees.	Tree and hedgerow removal for access tracks and turbine blade clearance could reduce roosting sites and commuting corridors. Increased lighting from construction compounds and substations may deter bat activity.
Badger (*Meles meles*)	Local Importance (Higher Value)	Badgers use scrub, woodland, and hedgerows for foraging and sett building. The site may support active setts.	Excavation for turbine foundations, drainage works, and access roads could disturb active setts or fragment foraging areas. Increased construction traffic poses a collision risk.
Otter (*Lutra lutra*)	National Importance	The species relies on rivers, lakes, and wetland corridors for foraging and denning. The site may provide connectivity to designated water bodies.	Integration of new drainage with existing drainage infrastructure and construction runoff, and excavation near watercourses could degrade water quality and impact prey availability. Increased noise and disturbance may displace otters from key areas.
Irish Hare (*Lepus timidus hibernicus*)	Local Importance (Higher Value)	Hares use grasslands, scrub, and open bog for foraging and breeding. The species is sensitive to habitat fragmentation.	Soil compaction from construction vehicles, vegetation clearance for turbine hardstands, and fencing for security areas could reduce available foraging and breeding habitat.
Vertigo Whorl Snails (*Vertigo geyeri, V. moulinsiana, V. angustior*)	National to International Importance	These snails depend on wet fen habitats, transition mires, and flushes, which are highly sensitive to hydrological changes.	Drainage modifications, peat excavation, and borrow pit extraction could alter moisture levels, desiccate habitat, and reduce food availability.
Marsh Fritillary (*Euphydryas aurinia*)	International Importance	The species relies on wet grasslands and fens containing Devil's-bit Scabious (*Succisa pratensis*), its larval food plant.	Habitat loss due to access track construction, soil disturbance from excavation, and drainage changes could reduce larval food plant availability and disrupt breeding cycles.

7.10.1.3 Sites of International Importance

The proposed wind farm development was assessed for potential ecological linkages to the following designated European sites:

- Lough Ree SAC (Site Code: 000440)
- Lough Ree SPA (Site Code: 004064)

The key elements of the wind farm development that could influence these sites include construction activities (turbine foundation excavation, roadworks, integration of new drainage with existing drainage infrastructure drainage alterations), operational maintenance, and decommissioning activities.

Table 7.27: Key Ecological Receptors – Sites of International Importance – Proposed Wind Farm Site

Designated Site	Ecological Valuation	Potential Impacts from Wind Farm Development (Sensitivity)
Lough Ree SAC [000440]	International Importance	This SAC is hydrologically linked to the proposed development via drainage pathways and groundwater connectivity. Potential impacts include sediment runoff, hydrological disruption, and pollution from construction activities (e.g., borrow pits, road excavation, drainage works).
Lough Ree SPA [004064]	International Importance	The SPA supports important populations of wintering and breeding waterfowl. The wind farm could affect foraging and roosting behaviour due to noise disturbance, increased human activity, and potential collision risk with turbine blades. The distance from the main wind farm infrastructure reduces risk, but indirect effects from habitat alterations and hydrological changes must be considered. **Effects to bird species are considered in full in Chapter 8 - Ornithology**

7.10.1.4 Sites of National Importance

The sites are considered **Nationally Important** KERs.

- Lough Bawn pNHA [Site code: 001819]
- Lough Bannow pNHA [Site code: 000449]
- Lough Ree pNHA [Site code: 000440]
- Derry Lough pNHA [Site code: 001444]

The proposed wind farm development has the potential to affect several nationally important pNHAs, including Lough Bawn pNHA, Lough Bannow pNHA, Lough Ree pNHA, and Derry Lough pNHA, which host ecologically sensitive wetland, bog, and aquatic habitats. The following key considerations highlight the potential for impacts and the associated risks to these important ecological sites:

- Hydrological Impacts: Construction activities, particularly excavation, road building, and drainage works, have the potential to alter hydrological conditions within and around Lough Bawn pNHA, Lough Bannow pNHA, and Derry Lough pNHA. Changes in surface water flow and groundwater dynamics could affect the wetland habitats and

aquatic ecosystems that depend on consistent water levels. Increased sediment runoff or water contamination from construction activities could disrupt local hydrology, potentially impacting the habitat quality of these areas.

- Pollution Risks: Construction processes associated with the wind farm have the potential to introduce pollutants into the surrounding environment, especially watercourses and wetland habitats. Sediment runoff, fuel spills, or other contaminants from construction equipment and activities could degrade water quality, negatively impacting both aquatic species and the overall ecological integrity of the pNHAs. Poor water quality could also affect the health of plant and animal species dependent on these areas.
- Avian Disturbance: Lough Ree pNHA, which provides critical habitat for various bird species, may experience disturbance due to construction activities and human presence. Noise, vibration, and increased human activity during sensitive periods such as breeding or migration seasons could disrupt bird species using the site. These disturbances could lead to temporary displacement of birds or disrupt nesting and feeding activities, affecting species that rely on the area for foraging or breeding. Effects to bird species are considered in full in Chapter 8 – Ornithology

Table 7.28: Key Ecological Receptors Site of National Importance – Proposed Wind Farm Site

Site	Ecological Valuation	KER	Potential Impacts from Wind Farm Development (Sensitivity)
Lough Bawn pNHA [001819]	National Importance	**Yes**	This site contains wetland and bog habitats of high ecological value, supporting aquatic species, waders, and waterfowl. Potential impacts include hydrological changes due to drainage works, sedimentation from construction activities (e.g., excavation of access roads and borrow pits), and noise disturbance from turbine operation. Mitigation through silt control measures, controlled drainage systems, and buffer zones will be required.
Lough Bannow pNHA [000449]	National Importance	**Yes**	This site supports high-value wetland and bog ecosystems, which could be affected by changes in groundwater flow and surface drainage during turbine foundation excavation and internal road construction. The site also provides habitat for bird species sensitive to disturbance. The implementation of hydrological monitoring and habitat protection measures will be critical to mitigating risks.
Lough Ree pNHA [000440]	National Importance	**Yes**	Lough Ree is an ecologically significant waterbody supporting diverse aquatic flora and fauna, including protected species of birds and fish. Potential risks include sediment runoff and water contamination from construction activities, increased noise disturbance, and habitat fragmentation. Best-practice drainage control and buffer zones will be implemented to minimise effects.

Site	Ecological Valuation	KER	Potential Impacts from Wind Farm Development (Sensitivity)
Derry Lough pNHA [001444]	National Importance	**Yes**	This lake and surrounding wetland habitats provide an important ecological resource. Potential impacts from the wind farm include hydrological changes due to drainage works, disturbance to bird species, and potential pollution from construction activities. The implementation of protective buffer zones, water quality monitoring, and controlled excavation methods will reduce risks.

7.10.2 Proposed Turbine Delivery Route

Works at POI6 will involve limited habitat disturbance, but hedgerows are of particular ecological importance in this location. No watercourses or wetland habitats were observed, reducing concerns about hydrological impacts.

Table 7.29: Key Ecological Receptors Habitats – Proposed TDR POI

Code	Ecological Valuation	Potential Impacts from Wind Farm Development (Sensitivity)
Hedgerows (WL1)	**Local Importance (Higher Value)**	Hedgerow removal or modification for access improvements could reduce habitat connectivity and remove important shelter/foraging resources for local wildlife, including bats and birds. Sensitivity: Medium-High

7.11 Ecological Impact Assessment

Section 7.11.1 below presents an assessment of the projected environmental conditions if the proposed development was not carried out (i.e. the 'Do-Nothing' scenario).

In this scenario the assessment considers the natural progression of environmental conditions at the proposed wind farm site in the absence of the proposed wind farm. The assessment outlines the natural progression of environmental conditions that would occur over time if the wind farm were not constructed, providing a baseline for comparison.

The following section assesses the potential significant effects on Key Environmental Receptors (KERs) during the following phases of the proposed development, should the development be consented:

- Construction Phase (Section 7.11.2): Evaluation of the likely environmental impacts during the construction of the wind farm.
- Operation Phase (Section 7.11.3): Assessment of the environmental effects during the operational phase of the wind farm.
- Decommissioning Phase (Section 7.11.4): Consideration of the environmental impacts associated with the decommissioning of the wind farm at the end of its operational life.

7.11.1 Do-nothing Scenario

7.11.1.1 Overview

The 'do-nothing' scenario is described by the EPA (2022) as "(…) *a general description of the evolution of the key environmental factors of the site and environs if the proposed project did not proceed*".

The 'Do-Nothing' assumes that consent for the proposed development is not granted. In this context, Section 7.11.1.2 assesses the potential environmental outcomes if the development does not proceed. In this case, Bord na Móna would still be required to fulfil its ongoing obligations under the IPC Licence (P0504-01), including continuing to implement the rehabilitation and management strategies outlined in the draft Cutaway Bog Decommissioning and Rehabilitation Plans established for the Derryaroge, Derryadd, and Lough Bannow bogs. These obligations remain in place regardless of the consent process. Section 7.11.1.2 considers the bogs environmental trajectory of the bogs under these proposed draft rehabilitation and management strategies.

7.11.1.2 'Do-Nothing' Scenario

The 'Do-Nothing' scenario assumes that consent for the proposed development is not granted. Nevertheless, Bord na Móna's ongoing obligations under IPC Licence (P0504-01), issued by the Environmental Protection Agency (EPA) in 2000 and updated in 2012, remain in effect. This licence pertains to the Mountdillon Bog Group in County Longford and specifically covers the Derryadd, Derryaroge, and Lough Bannow bogs. A copy of IPC Licence P0504-01 is included in Appendix 7.1.

The purpose of the IPC licence is to regulate and control emissions associated with Bord na Móna's historic peat extraction at these bogs, ensuring compliance with environmental standards and preventing significant adverse environmental impacts. The IPC licence establishes a legally binding framework designed to ensure that all environmental impacts associated with these operations are properly managed and that any rehabilitation of the sites is carried out in a structured, compliant, and environmentally responsible manner. It serves to protect air and water quality, manage surface water discharges, and uphold broader environmental standards in line with national policy and EU legislation.

The site would continue to operate in compliance with its IPC licence requirements (ref. no P0504-01). This involves the continuation of ongoing decommissioning activities associated with the removal of peat stockpiles and all peat extraction machinery, rail infrastructure, structures and materials from the site, and environmental monitoring. Following the successful decommissioning of the site it is intended that the site would be rehabilitated in line with condition 10 of the IPC licence. As part of Condition-10 of this licence, decommissioning and rehabilitation must be carried out on the former peat production areas. These land uses and activities will also continue if the proposed wind farm does proceed.

In fulfilment of Condition 10, Bord na Móna has prepared Draft Cutaway Bog Decommissioning and Rehabilitation Plans for the Derryadd, Derryaroge, and Lough Bannow bogs. These documents, collectively referred to here as the Draft Rehabilitation Plans, are included in Appendix 7.2. The primary objectives of these plans are to stabilise the hydrological function of the bogs, support the natural recolonisation of native peatland vegetation, and improve

biodiversity at the bogs. The plans also address the need to remove, repurpose, or manage any residual infrastructure in a manner that complements the overall rehabilitation goals.

The proposed rehabilitation measures outlined in these draft Rehabilitation Plans are both technical and ecological in nature. Key interventions include the blocking of internal drainage systems to raise water levels, rewetting of the peat surfaces to reduce oxidation and carbon emissions, and the creation of conditions suitable for the re-establishment of typical bog flora and fauna. These actions will not only contribute to the ecological integrity of the sites but also support broader climate action objectives by aiding in the transition from carbon-emitting land use to carbon-sequestering habitat restoration.

Notwithstanding positive short term benefits from proposed rehabilitation under IPC license compliance, eventual changes in habitat through succession, particularly from open areas of bare peat, open water and low vegetation to vegetation with increasing height, emerging denser reedbeds along with scrub cover and woodland evolution on drier areas will represent the habitat change for those species, whilst developing mosaics of Reedswamp and open water will still be present. Birch woodland, which is likely to be a climax ecotope in drier or elevated areas.

In the absence of the proposed development, the environmental trajectory of the site would be shaped primarily by the implementation of these draft Rehabilitation Plans. The 'Do-Nothing' scenario does not deliver the additional benefits associated with the proposed wind farm development, such as renewable energy generation, climate mitigation, or expanded habitat enhancement.

7.11.2 Construction Phase

7.11.2.1 Proposed Wind Farm Site

7.11.2.1.1 Internationally Important Sites

As outlined in Section 7.10.1.3 above the proposed wind farm site is hydrologically connected Lough Ree SAC. The SAC site is designated for the following QIs;

- Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150]
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]
- Active raised bogs [7110]
- Degraded raised bogs still capable of natural regeneration [7120]
- Alkaline fens [7230]
- Limestone pavements [8240]
- Bog woodland [91D0]
- Alluvial forests with *Alnus glutinosa* and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]
- *Lutra lutra* (*Otter*) [1355]

Without mitigation, the construction phase of the proposed development could result in in-situ effects (i.e. impacts occurring to QIs within the boundaries of the European sites), as well as ex-situ effects (i.e. impacts occurring to QIs outside the European sites through ecological or hydrological linkages) to the following QIs of the Lough Ree SAC:

- *Lutra lutra* (*Otter*) [1355]
- Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150]

For Otter, potential in-situ and ex-situ effects may arise from contamination by pollutants, disturbance from construction activities, and the risk of direct mortality (e.g. from vehicle collisions).

In contrast, potential effects on the lake habitat [3150] (Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation) are strictly in-situ, with contamination from surface water runoff carrying pollutants during construction to the SAC being the primary impact pathway.

During the construction phase, the potential contamination of surface waters draining to the SAC with toxic and bioaccumulative substances, such as hydrocarbons, and construction-related particulates, including bentonite slurry and concrete washout, may adversely affect Otter. In the absence of effective mitigation and control measures, these pollutants could lead to both in-situ impacts to the SI species within the SAC and ex-situ effects on individuals from the SAC that may occur at proposed wind farm site. Potential impacts include reduced prey availability (e.g. fish biomass) due to water quality degradation, and direct toxicity within aquatic habitats. Although foraging quality for Otter within the proposed wind farm site is considered limited, the construction phase may still pose a risk of ex-situ effects to Otters from the SAC that

use the site for movement, primarily through the potential degradation of water quality. Additionally, the movement of vehicles, machinery, and the activities of workers pose a risk of disturbance and mortality, representing another ex-situ disturbance effects if Otters from the SAC traverse areas within the proposed development site for commuting, or dispersal. While the proposed development lies outside the SAC and is removed from the key aquatic features, the precautionary assessment recognises potential risks to Otter.

Table 7.30: Description of Potential Effects on Lough Ree SAC During the Construction Phase

KER	Descriptor	Effect
Contamination (in situ and ex situ effects)		
Otter *Lutra lutra* [1355]	***Quality of Effects***	Negative
	Significance	Significant
	Extent and Context	Proposed wind farm site and SAC
	Probability	Likely
	Duration	Long-term
Disturbance (ex situ effects)		
Otter *Lutra lutra* [1355].	***Quality of Effects***	Negative
	Significance	Significant
	Extent and Context	Proposed wind farm site
	Probability	Likely
	Duration	Long-term
Mortality (ex situ effects)		
Otter *Lutra lutra* [1355].	***Quality of Effects***	Negative
	Significance	Significant
	Extent and Context	Proposed wind farm site
	Probability	Likely
	Duration	Permanent
Contamination (in situ effects)		
Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150]	***Quality of Effects***	Negative
	Significance	Significant
	Extent and Context	Hydrologically linked European Site
	Probability	Likely
	Duration	Long-term

7.11.2.1.2 Nationally Important Sites

Also, as mentioned above the proposed wind farm site is connected with four Nationally important sites:

- Lough Bawn pNHA [001819]

- Lough Bannow pNHA [000449]
- Lough Ree pNHA [000440]
- Derry Lough pNHA [001444]

Although these Nationally important sites are not entirely similar to the Internationally important sites appraised in Section 7.11.2.1.1 the potential effects associated with hydrological and vector pathways (i.e. contamination) are of similar nature than those identified for International important sites.

Also similarly to the consideration in the appraisal of Internationally important sites, because Rhododendron seeds may spread from the action of dispersal vectors (animal or human, attaching to clothing, equipment, etc - Higgins, 2008), the potential dispersal extent includes all habitats of Nationally important sites as potentially becoming affected.

Therefore, Table 7.31 includes the classification of the potential significant effects on Nationally important sites descriptors.

Table 7.31: Description of Potential Effects on Nationally Importance Sites During the Construction Phase

KER	Descriptor	Effect
Contamination		
Lough Bawn pNHA [0001819] Lough Bannow pNHA [000449] Lough Ree pNHA [000440] Derry Lough pNHA [001444]	***Quality of Effects***	Negative
	Significance	Significant
	Extent and Context	Hydrological Pathway
	Probability	Likely
	Duration	Long-term
Spread of IAPS		
Considering the dispersal potential through human vectors, it could affect the habitats of Nationally important sites.	***Quality of Effects***	Negative
	Significance	Significant
	Extent and Context	All inland Nationally important sites through human vector dispersal
	Probability	Likely
	Duration	Long-term

7.11.2.1.3 Aquatic Ecology

With regards to the assessment of potential effects on aquatic ecology from the Construction Phase of the proposed wind farm, it is important to reiterate that the proposed wind farm site is located within three bogs where peat extraction ceased in 2019, and its drainage features (e.g. drains, existing IPC settlement/silt ponds) are still operational.

Furthermore, these drainage features are still maintained and managed under IPC licence P0504-01 Mountdillon Bog Group by Bord na Móna and are regulated/monitored by the EPA through the IPC Licence P0504-01. The continued management of these drainage features is important for capturing surface runoff from the proposed wind farm site. While not entirely eliminating the risk, compliance with the requirements of the IPC Licence is expected to

significantly reduce the potential for siltation of receiving water bodies during the Construction Phase. This includes adherence to suspended solids emission limits (e.g. 35 mg/l), helping to ensure effective control of waterborne pollutants and reduce the risk of siltation of receiving water bodies as a consequence of the Construction Phase of the proposed wind farm. In addition, temporary construction settlement ponds will be implemented to capture and treat surface water runoff during the Construction Phase. These settlement ponds will help to settle out suspended solids and other contaminants, further reducing the risk of siltation in receiving water bodies. Regular monitoring of water quality, as required by the IPC Licence, will ensure that the pond operates effectively to meet the specified discharge limits, mitigating potential impacts on local watercourses. The proposed wind farm site is intersected by three WFD river water bodies (i.e. Lough Bannow Stream_010; Shannon (Upper)_100; and Ballynakill_010, and if unconstrained there is potential for silt laden runoff from the proposed wind farm site into these surface water bodies at these intersecting locations. However, the implementation of temporary construction settlement ponds will help capture and treat runoff, reducing the risk of siltation and ensuring that water quality standards are maintained in these river water bodies during the Construction Phase

In any case, the potential effects on aquatic ecology from the Construction Phase of the proposed development are associated with two different factors: 1) water quality; and 2) water quantity.

Effects on water quality refer to any changes in the chemical, hydromorphological and/or ecological characteristics (i.e. floodplain habitats, aquatic species) of the receiving water bodies prompted by the proposed development Construction Phase.

Effects on water quantity relate to any water abstractions carried out to facilitate the proposed works that could reduce the amount of water available to habitats and species.

7.11.2.1.3.1 Water Quality Effects

Section 3.6 of Chapter 3 of the EIAR includes a description of the proposed drainage system to be implemented during the Construction Phase of the proposed development, while a summary of the drainage features proposed for the wind farm is presented in Table 7.32. The existing site drainage will not be changed, including the discharge rates and locations. The integration of proposed features in Table 7.35 with the existing drainage network drainage system will direct surface water to temporary construction settlement ponds within the site during the Construction Phase reducing the sediment loading before reaching the existing IPC settlement/slit ponds near its boundary. The drainage design described in Appendix 7.3 further proposes that runoff water would run through a grassed filter strip before entering the drainage system, which would likely further augment the settlement capacity of the temporary drainage features. This proposed drainage system will likely prevent that silt laden runoff originated by the construction activities at the proposed wind farm site could potentially clog the drainage system, avoiding the necessity for a more frequent drainage network maintenance. However, the Construction Phase of the proposed development still may give rise to significant effects on water quality, which are appraised herein.

Table 7.32: Proposed Drainage Features for the Proposed Wind Farm (Appendix 7.3)

Type of feature	Temporary Drainage Feature	Total Number (approximate)	Total Length
Linear	Interceptor Drain	87	11.1 km
	Road drainage	118	27.8 km
	Total	**205**	**39 km**
Discrete	600mm Interceptor Drainage Culvert Pipe	61	-
	1200mm Culvert Pipe	40	-
	Temporary Construction Settlement Pond	53	-
	Total	**154**	

7.11.2.1.3.1.1 Siltation

The Construction Phase of the proposed wind farm will include the provision of approximately 154 discrete and 205 linear structures which might appear capable of generating a higher sediment release than the drainage system settling capacity. However, the efficiency of this water management network that is operational at the proposed wind farm site (e.g. drains, water pumps, settlement ponds, regular monitoring and maintenance) which has been designed by Bord na Móna to be able to accommodate the settlement of sediment generated by peat extraction activities throughout the whole site, is demonstrable by the fact that no exceedances to the Suspended solids (SS) limit have been reported over 12 years. Therefore, it can be confidently concluded that the existing drainage system, in particular the settlement ponds, is sufficient to retain the discrete amounts of sediment/silt generated during the Construction Phase, limiting the significance of any siltation effects to receiving river water bodies within the hydrological pathway from the proposed wind farm site Table 7.33.

Table 7.33: Description of Potential Siltation Effects on Aquatic Ecology During the Construction Phase

KER	Description	Effect
Aquatic Ecology (Siltation)	***Quality of Effects***	Neutral
	Significance	Not Significant
	Extent and Context	-
	Probability	Likely
	Duration	-

7.11.2.1.3.1.2 Dust Effects

Dust dispersion from a typical wind farm construction site is influenced by a range of environmental and operational factors, including soil type, prevailing weather conditions, particularly wind speed and direction. Construction activities such as excavation, earthworks, vehicle movement, and the construction of access and amenity tracks have the potential to

generate levels of airborne dust, particularly during dry and windy conditions. These activities disturb surface soils and create loose particulate matter that can become airborne due to wind action or the movement of construction machinery. The creation of unpaved access tracks further increases dust generation, especially with repeated traffic from heavy vehicles and equipment. During the installation of infrastructure such as access tracks, light to moderate dust deposition can typically occur within a range of approximately 100 to 250 metres beyond the immediate work areas.

In aquatic ecosystems, dust settling on water surfaces can contribute to increased turbidity, reducing light penetration and negatively impacting aquatic plant photosynthesis. Additionally, dust may introduce nutrients or other contaminants into water bodies, leading to nutrient enrichment (eutrophication), which can disrupt the ecological balance, promote algal blooms, and reduce oxygen levels. These effects can hinder the feeding, breeding, and movement of fish, amphibians, aquatic invertebrates, and other organisms.

Table 7.34: Description of Potential Dust Effects on the Biodiversity during the Construction Phase

KER	Descriptor	Effect
Aquatic Habitats (Dust Effects)	***Quality of Effects***	Negative
	Significance	Significant
	Extent and Context	Localised, via hydrological and airborne pathways
	Probability	Likely
	Duration	Medium-term

7.11.2.1.3.1.3 Contamination

During the construction phase of the proposed development there are multiple activities outlined in Chapter 3 (Description of Proposed Development) that present a risk of contaminant release to nearby water bodies. These include:

- Refuelling at the Construction Compounds;
- Storage of contaminants at the Construction Compounds (e.g. hydrocarbons);
- Refuelling with mobile bowser;
- Machinery and vehicle movement;
- Use of bentonite in drilling or trenchless installation activities; and
- Concrete washout and handling during turbine base construction and civil works.

The use of mobile bowsers and onsite fuel storage poses a risk of hydrocarbon spills at unconfined or sensitive locations, potentially leading to contamination of surface water features. Likewise, improper handling or containment of bentonite slurry, a common lubricant and support fluid in drilling operations, can result in suspended solids entering nearby streams or wetlands, increasing turbidity and reducing oxygen levels, which may impair aquatic life.

Additionally, if concrete washout is not managed in a designated, lined area, alkaline runoff rich in lime and other caustic substances may leach into the surrounding soils or watercourses. Such discharges can significantly elevate pH levels, causing chemical burns to aquatic organisms, disrupting microbial communities, and degrading water quality.

These contaminants, particularly hydrocarbons, bentonite fines, and alkaline concrete washout, can have acute and chronic effects on aquatic species. Hydrocarbons are known to be bioavailable and can bioaccumulate in organisms (Sekhar et al., 2003; Li et al., 2009), while their persistence in sediments can prolong exposure (McGrath et al., 2019; Wu et al., 2019). Without adequate mitigation, such pollutants may alter the ecological integrity of receiving waters.

Therefore, the potential contamination effect during the Construction Phase of the proposed development is appraised as significant and long-term to the aquatic ecology (Table 7.35).

Table 7.35: Description of Potential Contamination Effects on the Aquatic Ecology during the Construction Phase

KER	Descriptor	Effect
Aquatic Ecology (Contamination)	***Quality of Effects***	Negative
	Significance	Significant
	Extent and Context	Hydrological Pathway
	Probability	Likely
	Duration	Long-term

7.11.2.1.3.1.4 Hydromorphology/habitat

The drainage design (Appendix 1-2, Drawings 20852-NOD-01-XX-DR-C-08001 to 20852-NOD-01-XX-DR-C-080015 and 20852-NOD-ZZ-DR-C-08001 to 20852-NOD-ZZ-DR-C-08005) proposes two types of culverts to be built during the Construction Phase of the proposed development:

- 600 mm interceptor drainage culvert pipe – approximately 61 structures; and
- 1200 mm culvert pipe – approximately 40 structures.

Culverts can fragment populations by acting as barriers to the movement of organisms, breaking the continuity a river or stream provides (i.e. the *River Continuum Concept* - Vannote *et al.*, 1980). Box and pipe culverts are often associated with barrier effects that can disrupt natural flow conditions, potentially affecting fish communities and a variety of other organisms (Clarke *et al.*, 1999; Peay, 2002; Kemp *et al.*, 2008; Cocchiglia *et al.*, 2012; Anderson *et al.*, 2014; Brunen *et al.*, 2020; Riley *et al.*, 2020; Kelly-Quinn *et al.*, 2022). This type of culvert usually fills rapidly after rainfall, leading to pooling and deposition in its upstream entrance, while increasing flow velocity and erosion downstream (NRA, 2006). Appendix 7.3 outlines that both types of culverts proposed for the proposed development are of box/pipe type. However, in terms of hydromorphological effects to the aquatic ecology, the construction of culverts within the proposed wind farm site will likely have limited significance. The proposed culverts will only be

placed within the drainage ditches forming the drainage network, which is formed by artificial channels, with rare bank vegetation cover, likely used opportunistically by mammals, amphibians and insects. As described in Section 7.8.2.3 these channels do not hold sustainable fish communities, and the macroinvertebrate assemblages are likely to be dominated by tolerant/opportunistic taxa. Therefore, it is unlikely the Construction Phase of the proposed development will produce hydromorphological effects with higher significance than "Slight" (Table 7.36).

Table 7.36: Description of Potential Hydromorphological Effects on the Aquatic Ecology during the Construction Phase of the Proposed Wind Farm

KER	Descriptor	Effect
Aquatic Ecology (hydromorphology)	***Quality of Effects***	Negative
	Significance	Slight
	Extent and Context	Onsite drainage network
	Probability	Likely
	Duration	Long-term

7.11.2.1.3.2 Water Abstraction

The bogs have an existing drainage and water management system provided with 13 water pumps (Appendix 7.3). Despite the site drainage for the proposed wind farm site it is anticipating no alterations to the current water management during the Construction Phase of the proposed wind farm (Appendix 7.3), Section 10.3.3 of Chapter 10 (Hydrology and Hydrogeology) describes the requirement of temporary pumping to facilitate the excavation of borrow pits, turbine foundations, substation, BESS and construction compounds, as well as the abstraction flow rate for the proposed groundwater well (Section 3.9.8). Section 10.3.3 also estimates the drawdown distances for each of the abstraction types, which are summarised in Table 7.37.

Table 7.37: Drawdown Distances Associated with Water Abstraction during Construction Phase (Section 10.4.4.3)

Construction Phase Element		Abstraction Flow Rate (m^3/day)	Drawdown Distance
Borrow Pits		1,800 - 2,300	200m
Turbine Foundations	T01, T02, T04, T05, T07, T08, T09, T10, T11, T12, T13, T14, T16, T17, T18, T19, T20	-	100m
	T3, T6, T15, T21	-	25m
Substation		-	50m
BESS			
Construction Compound			
Groundwater Well		1	-

The calculated drawdown zones have relatively restricted extents, and do not intersect any WFD river water body. Construction elements are located at sufficient distances from the

closest water body, reducing the likelihood of any significant impacts on aquatic ecology from water abstraction during the construction phase of the proposed development.. Therefore, no significant effects to aquatic ecology are anticipated from water abstraction for these elements of the Construction Phase of the proposed wind farm.

With regards to the proposed groundwater well, although Section 10.4.4.3 does not include an estimate of its drawdown zone, considering the distance to the nearest surface water body is approximately 450m (to the Lough Bannow Stream_010 WFD river water body), it is not considered likely the WFD river water body flow will be affected by this abstraction, nor its aquatic ecology.

Therefore, the potential effects during the Construction Phase of the proposed wind farm from water abstraction are appraised as neutral and imperceptible to aquatic ecology (Table 7.38).

Table 7.38: Description of Potential Water Abstraction Effects on Aquatic Ecology during the Construction Phase of the Proposed Wind Farm

KER	Descriptor	Effect
Aquatic Ecology (Water Flow)	***Quality of Effects***	Neutral
	Significance	Imperceptible
	Extent and Context	Hydrological pathway
	Probability	Likely
	Duration	-

7.11.2.1.4 Habitats

7.11.2.1.4.1 Habitat Loss

During the Construction Phase of the proposed development, an area of approximately 210 ha and an extent of approximately 1,200 m of semi-natural habitats will be removed to accommodate the infrastructure and construction activities[27] (Table 7.39). That area (and extent) encompasses 16 habitats evaluated as 'Local Importance (Higher Value)' and the ecological effects from the removal of areas/extents will require assessment. Tree replanting will be implemented to help mitigate these impacts; however, replanting will not be carried out on habitats of ecological importance. It will be limited to areas such as bare peat.

Table 7.40 details the assessment of effects from habitat loss, having regard to the transitional nature of the habitats' profile at the proposed wind farm site in a post-peat extraction decades long period. It is also important to note the works during the Construction Phase of the proposed wind farm will not be intersecting the areas occupied by habitats designated in Annex I of the Habitats Directive.

Groundwater-dependent terrestrial ecosystems (GWDTEs) are defined as habitats/species that are dependent on groundwater to maintain the environmental support conditions required to sustain that habitat/or species (Kilroy *et al.*, 2008). Habitats such as active raised bog, fen and transitional mires are examples of GWDTE. The relative groundwater contribution is a term that generally describes the percentage of water in the GWDTE habitat that relies on groundwater.

[27] Also includes the proposed TDR works at POI 6, located within the proposed wind farm site

Sensitivity to changes in groundwater levels can also vary amongst sites of the same habitat. Further details on GWDTE are included in Chapter 10 Hydrology and Hydrogeology.

Table 7.39: Habitat Loss Area/Length During Construction Phase

Habitat	Ecological Valuation	Area/Length	% of habitat loss for the respective habitat of the proposed wind farm site
WN7 - Bog woodland	**Local Importance (Higher Value)**	52.5ha	12.70%
FL8 - Other artificial lakes and ponds	**Local Importance (Higher Value)**	5.6ha	7.32%
WS2 - Immature woodland	**Local Importance (Higher Value)**	5.4ha	26.80%
WS1 - Scrub	**Local Importance (Higher Value)**	4.9ha	14.51%
PB1 - Raised bog	**Local Importance (Higher Value)**	2.0ha	6.56%
GS3 - Dry-humid acid grassland	**Local Importance (Higher Value)**	1.2ha	38.49%
GS2 - Dry meadows and grassy verges	**Local Importance (Higher Value)**	0.5ha	82.37%
GS4 - Wet grassland	**Local Importance (Higher Value)**	0.3ha	3.66%
FS1 - Reed and large sedge swamps	**Local Importance (Higher Value)**	0.2ha	0.59%
PF2 - Poor fen and flush	**Local Importance (Higher Value)**	0.2ha	4.08%
WN6 - Wet willow-alder-ash woodland	**Local Importance (Higher Value)**	619m^2	5.37%
WD1 - (Mixed) broadleaved woodland	**Local Importance (Higher Value)**	442m^2	2.77%
FW2 - Depositing/lowland rivers	**Local Importance (Higher Value)**	20m	
FW4 – Drainage ditches	**Local Importance (Higher Value)**	57,570m*	
WL1 - Hedgerows	**Local Importance (Higher Value)**	354m	
WL2 - Treelines	**Local Importance (Higher Value)**	808m	

*** Estimate made upon Appendix 7.3**

Table 7.40: Description of Potential Effects from the Construction Phase of the Proposed Development on Habitats Evaluated as 'Local Importance (Higher Value)

KER	Descriptor	Effect	Rationale
WN7 - Bog woodland	***Quality of Effects***	Negative	Although not reaching the classification for the priority habitat 91D0 listed in the Annex I the Habitats Directive (Council Directive 92/43/EEC), the loss of ~13% of this habitat in the proposed wind farm site could be very significant considering its species diversity within a mostly degraded surrounding habitat context. However, this habitat is estimated to become highly abundant in the site (as a consequence of the implementation of the Rehabilitation Plans), which would reduce the significance of the effect of Bog woodland habitat to 'Slight', and short-term duration.
	Significance	Slight	
	Extent and Context	52.5ha/12.70%	
	Probability	Likely	
	Duration	Short-term	
FL8 - Other artificial lakes and ponds	***Quality of Effects***	Negative	Historical drainage activities have degraded most of the habitats in the local setting. The loss of this habitat area would likely add to the already poor onsite water quality and could represent a significant effect to local biodiversity. However, considering the development of the habitats' profile at the proposed wind farm site with the implementation of the Rehabilitation Plans it is unlikely the loss of FL8 habitat would represent effects of higher significance that 'Slight', and longer duration than 'short-term'.
	Significance	Slight	
	Extent and Context	5.6ha/7.32%	
	Probability	Likely	
	Duration	Short-term	
WS2 - Immature woodland	***Quality of Effects***	Negative	Although of relative ecological importance, this habitat (i.e. habitat with broadleaved trees of 2-4m high) could re-establish in a short-term (1-7 years), even if unmanaged. The impact would then be of modest significance.
	Significance	Moderate	
	Extent and Context	5.4ha/26.80%	
	Probability	Likely	
	Duration	Short-term	
WS1 - Scrub	***Quality of Effects***	Negative	

KER	Descriptor	Effect	Rationale
	Significance	Moderate	This is a habitat that is colonising the proposed wind farm site since the cessation of the peat extraction activities. Although the Construction Phase of the proposed development would represent the loss of a significant portion of this habitat in the local context, the likely increase in the occurrence of this habitat resource within the proposed wind farm site in time, combined with the rapid growth of its dominant species (e.g. Bramble, Gorse, Blackthorn), would reduce the significance of this habitat area loss.
	Extent and Context	4.9ha/14.51%	
	Probability	Likely	
	Duration	Short-term	
PB1 - Raised bog	***Quality of Effects***	Negative	Although the Construction Phase of the proposed development would represent the loss of a highly diverse and rare habitat in the local context, the relatively minor area and proportion of this habitat loss, along with the transient nature of the proposed wind farm site determine the low significance of the ecological effects of this habitat area loss
	Significance	Slight	
	Extent and Context	2.0ha/6.56%	
	Probability	Likely	
	Duration	Permanent	

KER	Descriptor	Effect	Rationale
GS3 - Dry-humid acid grassland	*Quality of Effects*	Negative	The potential effects from the loss of GS3 and GS2 habitats would be of similar significance, as both are relatively rare habitats within the proposed wind farm site and, although composed of species of reasonably rapid growth, these habitats hold a significant diversity in the local context. However, considering the general decreasing trend of the area occupied by this habitat within the proposed wind farm site in the future, it is not considered the loss of this relatively small area of these grassland habitats would amount to effects with higher significance than 'Slight'.
	Significance	Slight	
	Extent and Context	1.2ha/38.49%	
	Probability	Likely	
	Duration	Permanent	
GS2 - Dry meadows and grassy verges	*Quality of Effects*	Negative	
	Significance	Slight	
	Extent and Context	0.5ha/82.37%	
	Probability	Likely	
	Duration	Permanent	
GS4 - Wet grassland	*Quality of Effects*	Negative	Considering the habitat area that would be lost within the proposed wind farm site is low and also taking account the general transitional trend of this habitat within the proposed wind farm site, it is not considered the loss of this grassland habitat would represent a significant effect.
	Significance	Slight	
	Extent and Context	0.3ha/3.66%	
	Probability	Likely	
	Duration	Permanent	
FS1 - Reed and large sedge swamps	*Quality of Effects*	Negative	Although the potential effects would be of permanent duration and the relative importance of the habitat in the local context, the FS1 habitat loss from the Construction Phase of the proposed development would be at several discrete and scattered locations in the proposed wind farm site, which would reduce its significance.
	Significance	Moderate	
	Extent and Context	0.2ha/0.59%	
	Probability	Likely	
	Duration	Permanent	
PF2 - Poor fen and flush	*Quality of Effects*	Negative	The area of this habitat to be lost as a consequence of the Construction Phase of the proposed wind farm perhaps would not warrant a high significance conferred to this effect, especially considering the future development of the habitats' profile at the proposed wind farm site (i.e. ~59% of the site developing into wetland).
	Significance	Slight	
	Extent and Context	0.2ha/4.08%	
	Probability	Likely	
	Duration	Permanent	

KER	Descriptor	Effect	Rationale
WN6 - Wet willow-alder-ash woodland	*Quality of Effects*	Negative	Although this habitat is currently establishing an important ecological corridor along the Lough Bannow stream_010 WFD river water body, this habitat is estimated to become highly abundant in the site (as a consequence of the implementation of the Rehabilitation Plans), which would reduce the significance of the potential fragmentation of this existing woodland habitat.
	Significance	Significant	
	Extent and Context	619m^2/5.37%	
	Probability	Likely	
	Duration	Permanent	
WD1 - (Mixed) broadleaved woodland	*Quality of Effects*	Negative	Although a relatively valuable habitat in the local context, the area likely to be lost during the Construction Phase of the proposed wind farm is quite limited, not warranting a higher significance for this potential effect.
	Significance	Moderate	
	Extent and Context	442m^2/2.77%	
	Probability	Likely	
	Duration	Permanent	
FW2 - Depositing/lowland rivers	*Quality of Effects*	Neutral	No instream-works are anticipated at the Lough Bannow stream_010 WFD river water body, nor any riparian vegetation removal is included in Chapter 3 (Description of the proposed development)
	Significance	Imperceptible	
	Extent and Context	-	
	Probability	-	
	Duration	-	
FW4 – Drainage ditches	*Quality of Effects*	Positive	Drain-blocking and peatland rewetting have been appointed as main targeted rehabilitation actions within the National Peatlands Strategy (NPWS, 2016g; Department of Housing, Local Government and Heritage, 2023), and the loss/fragmentation of this linear habitat feature would likely improve the site's rehabilitation efforts. Although being the habitat type displaying the highest diversity within the proposed wind farm site, the beneficial hydrological/hydrogeological effects from its removal are likely to substantially outweigh this biodiversity loss in the long-term.
	Significance	Moderate	
	Extent and Context	Estimated at approximately 50km of habitat to be lost. Hydrological effects extend to the whole proposed wind farm site	
	Probability	Likely	
	Duration	Permanent	

KER	Descriptor	Effect	Rationale
WL1 - Hedgerows	***Quality of Effects***	Negative	Despite the very low occurrence of these habitats within the proposed wind farm site, they form a significant ecological resource. The removal of the ecological connectivity resource these habitats provide to, amongst others, protected faunal species would warrant the significance assessment.
	Significance	Significant	
	Extent and Context	354m	
	Probability	Likely	
	Duration	Permanent	
WL2 - Treelines	***Quality of Effects***	Negative	
	Significance	Significant	
	Extent and Context	808m	
	Probability	Likely	
	Duration	Permanent	

7.11.2.1.4.2 Dust Effects

Construction works, especially earthworks and vehicle use on unpaved tracks, can generate high levels of airborne dust, particularly in dry, windy conditions, due to soil disturbance and machinery movement.

Once airborne, dust can travel beyond the immediate construction footprint and settle on adjacent habitats, vegetation, soil surfaces. During works like access track installation, dust is generally deposited at light to moderate levels within approximately 100–250 metres from active construction areas. If not effectively managed, this dust deposition can lead to localised contamination and ecological degradation. Sensitive habitats such as bogs, heathlands, wetlands, and semi-natural grasslands are particularly vulnerable. Dust can coat the surfaces of vegetation, inhibiting photosynthesis by blocking light and clogging plant stomata, which interferes with gas exchange. Over time, this can reduce plant growth and vitality, alter species composition, and reduce habitat suitability for dependent fauna.

Table 7.41: Description of Potential Dust Effects on the Biodiversity during the Construction Phase

KER	Descriptor	Effect
Terrestrial and Aquatic Habitats (Dust Effects)	***Quality of Effects***	Negative
	Significance	Significant
	Extent and Context	Localised airborne pathways
	Probability	Likely
	Duration	Medium-term

7.11.2.1.4.3Spread of IAPS

Article 49 of the Wildlife Acts, as amended, prohibits the release or dispersal of plant species listed in its Third Schedule. Such is the case of Rhododendron, an IAPS identified at the proposed wind farm site, which spread could be promoted by the works and activities during the Construction Phase.

Rhododendron is a highly invasive species, which can withstand a wide range of environmental conditions, from shade in woodlands, to open conditions in acid soils, and its foliage contains various allelopathic compounds, i.e. inhibits the growth of other plan species. It is important to note that it usually regrows vigorously when cut back (Higgins, 2008; NRA, 2010).

Although the observations during the field study report a low likelihood of Rhododendron spreading due to the absence of suckers, considering the species potential to spread and outcompete native species, particularly in disturbed and transitional habitats such as the proposed wind farm site, its effects can be highly significant. The duration of the effects of the potential spread of this IAPS can potentially be permanent, if left unmanaged.

Table 7.42: Description of Potential Effects from the Construction Phase of the Proposed Development on the Spread of IAPS

KER	Descriptor	Effect
Spread of IAPS	***Quality of Effects***	Negative
	Significance	Significant
	Extent and Context	Proposed wind farm site and wider environment
	Probability	Likely
	Duration	Permanent

7.11.2.1.4.4 Water Abstraction

Beyond the effects to aquatic ecology identified above (Section 7.11.2.1.3), the water abstraction necessary to accommodate for the works during the Construction Phase (see Section 10.4.4.2 of Chapter 10 (Hydrology and Hydrogeology) of the proposed wind farm can also affect water dependent terrestrial habitats.

Due to the overall peatland nature of the proposed wind farm site, and the historic peat extraction activity (which lowered the ground level and, consequently, the distance to groundwater from the surface), most of the area is occupied by terrestrial habitats that either hold large quantities of water (e.g. PB1 – Raised bog), and/or by aquatic habitats (e.g. FL8 - Other artificial lakes and ponds). Thus, the drawdown zones resulting from the water abstraction activities will likely affect five water sensitive habitats within that zone (in total, approximately 4.67ha - Table 7.43) for the duration of the Construction Phase (24-30 months – Section 3.8.1). These habitats have been valuated at 'Local Importance (Higher Value)', thus subject to detailed assessment. Table 7.43 lists each of the water sensitive habitats' extents potentially affected by the water abstraction drawdown zone.

Table 7.43: Water Sensitive Habitats within Drawdown Zone from Construction Phase Excavations

Habitat	Code (Fossitt, 2000; Habitats Directive)	Habitat Area within Drawdown Zone	% of Habitat in Wind Farm Site
Other artificial lakes and ponds	FL8	1.46ha	1.9%
Reed and large sedge swamps	FS1	0.05ha	0.1%
Wet grassland	GS4	0.72ha	8.8%
Raised bog	PB1	0.96ha	3.1%
Poor fen and flush	PF2	1.48ha	30.2%
Total		**4.67ha**	**-**

Of the habitats listed in Table 7.43, only the extents associated with Wet Grassland (GS4) and Poor fen and flush (PF2) are considered significant (i.e. >5% of the habitat area within the proposed wind farm site) - see Figure 7.19 below).

With regards to Wet Grassland (GS4), this habitat is formed on wet or waterlogged, poorly drained soils, regularly subject to flooding (Fossitt, 2000). With water abstraction, the Wet Grassland habitat will likely exhibit a higher occurrence of drier grassland species replacing the reeds, rushes and sedges. However, once the water abstraction will cease, it is likely these areas will return to their natural flooding regime, and the Wet Grassland habitat will re-occur.

For the extent of Poor Fen and Flush (PF2) habitat within the drawdown zone of the water abstractions for the Construction Phase of the proposed wind farm, it is likely that its typical sedge and rush species composition will change towards the occurrence of common grasses (e.g. *Agrostis* spp.), typical of habitats like Dry-humid acid grassland (GS3). Similarly to the habitat GS4 above, it is likely that once the regular hydrological regime will be restored, with water logged soils and regular flooding, the areas where the PF2 habitat currently occur will naturally re-establish.

With regards to the significance of the effects on habitats from the water abstraction during the Construction Phase of the proposed wind farm in the local context, considering the local high occurrence of GS4 and PF2 habitats (Figure 8.8), this effect (on either habitat) is considered to hold a slight significance.

Table 7.44: Description of Potential Effects on Habitats from Water Abstraction during the Construction Phase

KER	Descriptor	Effect
Wet grassland -GS4	***Quality of Effects***	Negative
	Significance	Slight
	Extent and Context	0.72ha
	Probability	Likely
	Duration	Short-term
Poor fen and flush - PF2	***Quality of Effects***	Negative
	Significance	Slight
	Extent and Context	1.48ha
	Probability	Likely
	Duration	Short-term

7°58'0"W
7°56'0"W
53°42'0"N
53°41'15"N
53°40'30"N
772000
770000
602000
604000
606000
N
SHANNON (Upper)_100
SHANNON (Upper)_100
SHANNON (Upper)_100
SHANNON (Upper)_100
BALLYNAKILL_010
BALLYNAKILL_010
LOUGH BANNOW STREAM_010
LOUGH BANNOW STREAM_010
T01
T02
T03
T04
T05
T06
T07
R392
N63
N63
N63
N63
ugh
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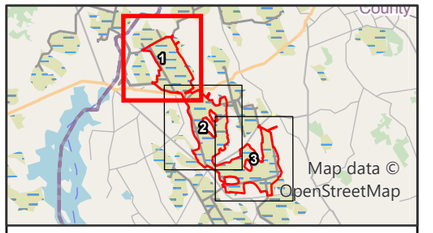

Legend

- Proposed wind farm site
- Site Layout
- Turbine Layout
- River Water Bodies
- Estimated Draw Down Zone

Habitats

- FL8 - Other artificial lakes and ponds
- FS1 - Reed and large sedge swamps
- GS4 - Wet grassland
- PB1 - Raised bog
- PB4 - Cutover bog
- WN7 - Bog woodland

0 0.25 0.5
Kilometres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

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Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.19: Estimated Draw Down Zone (Section 10.4.4) and Water Sensitive Habitats Page 1 of 3

Scale @ A3: 1:16,000

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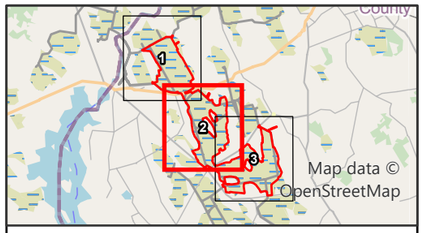
Map Ref: 11399-103-EDDZ-W.Sens.HAB-TOB-A

Draft: A

7°56'0"W
7°54'0"W
53°39'45"N
53°39'0"N
53°38'15"N
768000
766000
604000
606000
608000
N
N63
R392
R398
T08
T09
T10
T11
T12
T13
T14
T15
T17
LOUGH BANNOW STREAM_010
BALLYNAKILL_010
Microsoft, Source: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community



Legend

- Proposed wind farm site
- Site Layout
- Turbine Layout
- River Water Bodies
- Estimated Draw Down Zone

Habitats

- FL8 - Other artificial lakes and ponds
- GS4 - Wet grassland
- PB1 - Raised bog
- PB4 - Cutover bog
- PF2 - Poor fen and flush
- WN7 - Bog woodland

0 0.25 0.5
Kilometres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
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Title: Figure 7.20: Estimated Draw Down Zone (Section 10.4.4) and Water Sensitive Habitats Page 2 of 3

Scale @ A3: 1:16,000

Prepared by:	Checked by:	Date:
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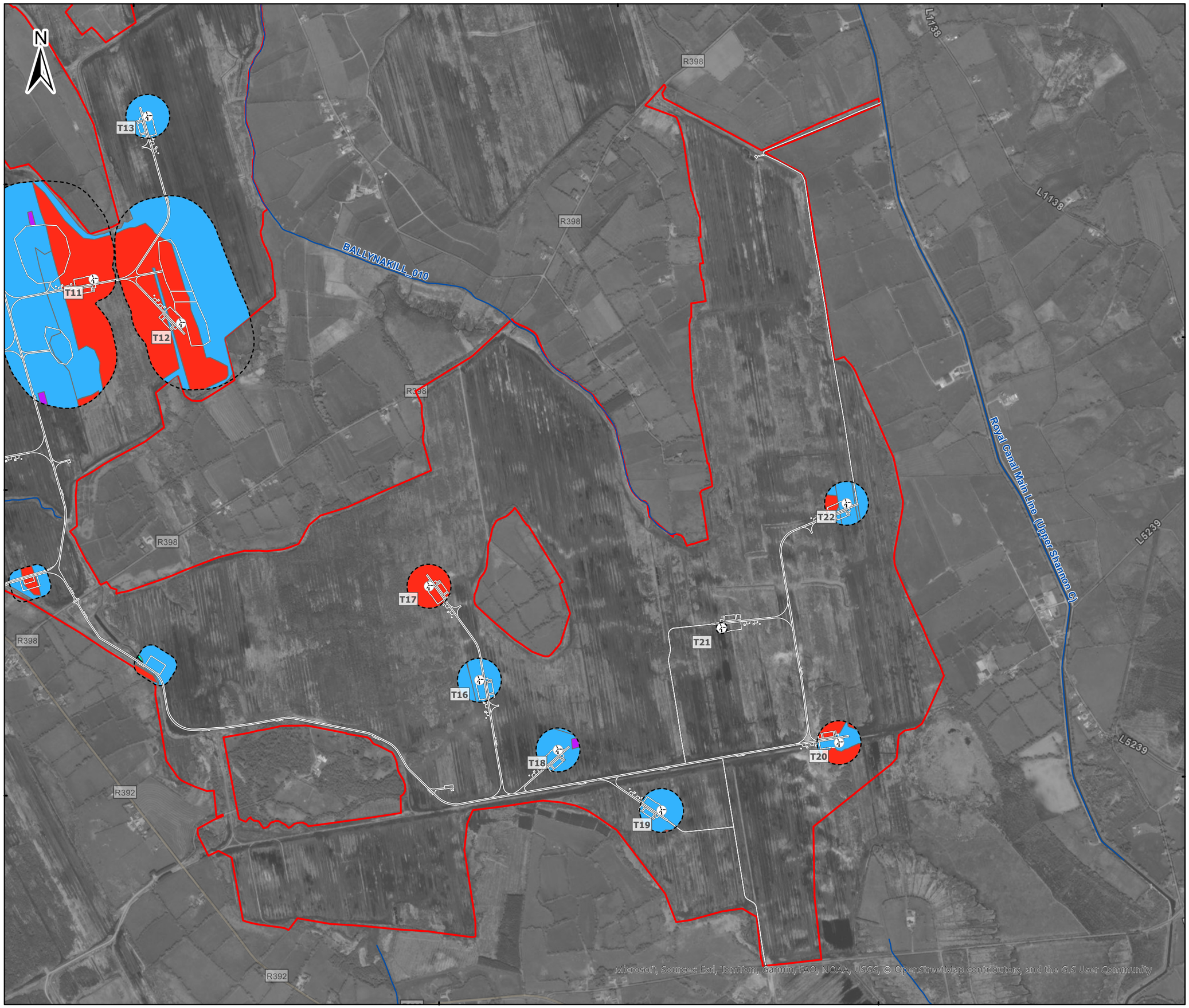
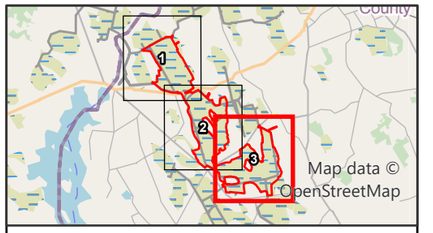
Map Ref: 11399-103-EDDZ-W.Sens.HAB-TOB-A

Draft: A

7°54'0"W
7°52'0"W
7°50'0"W
53°39'0"N
53°38'15"N
53°37'30"N
766000
764000
608000
610000





Legend

- Proposed wind farm site
- Site Layout
- Turbine Layout
- River Water Bodies
- Estimated Draw Down Zone

Habitats

- FL8 - Other artificial lakes and ponds
- PB4 - Cutover bog
- PF2 - Poor fen and flush
- WN7 - Bog woodland

0 0.25 0.5
Kilometres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

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Project: Derryadd Wind Farm

Title: Figure 7.21: Estimated Draw Down Zone (Section 10.4.4) and Water Sensitive Habitats Page 3 of 3

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Map Ref: 11399-103-EDDZ-W.Sens.HAB-TOB-A

Draft: A

7.11.2.1.5 Protected Species

7.11.2.1.5.1 Bats

Potential significant effects during the Construction Phase of the proposed development would be associated with (NatureScot, 2021):

- Loss or damage to commuting and foraging habitat;
- Loss of, or damage to, roosts; and
- Displacement of individuals or populations.

In the specific case of the proposed wind farm site, no bat roosts were found within or in the vicinity of the proposed wind farm site during the surveys (Section 7.8.2.4.1) or trees and hedgerows inspected as part of multidisciplinary survey at TDR POIs (7.7.2.3.3.1)., therefore no significant effects are considered likely in this regard. Concerning the potential effects from loss of habitat and displacement/disturbance of individuals, considering the general landscape favourability for bat species of the proposed wind farm site being considered to be low to medium (Lundy *et al.*, 2011; Appendix 7.14), the limited loss of suitable habitat for commuting bats in the local context, and the timing for vegetation clearance and general works during the Construction Phase of the proposed wind farm (Section 3.8.1), no effects to commuting bats during the Construction Phase are anticipated (Table *7.45*).

It is also likely that temporary lighting will be used during the Construction Phase. Lighting can affect bats' commuting routes, and foraging areas (Marnell *et al.*, 2022). The projection of light on foraging sites can result in the change of feeding/commuting behaviour of bats in the area, resulting in a slight effect considering the local context and bat activity (Table *7.45*).

Table 7.45: Description of Potential Effects on Bats during the Construction Phase of the Proposed Wind Farm

KER		Descriptor	Effect
Bats	Habitat loss	***Quality of Effects***	Negative
		Significance	Not significant
		Extent and Context	Around linear habitat features
		Probability	Unlikely
		Duration	-
	Roosts	***Quality of Effects***	Negative
		Significance	Imperceptible
		Extent and Context	-
		Probability	Unlikely
		Duration	-

KER		Descriptor	Effect
	Displacement/disturbance	*Quality of Effects*	Negative
		Significance	Slight
		Extent and Context	Around linear habitat features
		Probability	Unlikely
		Duration	-
	Lighting	*Quality of Effects*	Negative
		Significance	Slight
		Extent and Context	Around linear habitat features
		Probability	Likely
		Duration	Short-term

7.11.2.1.5.2 Whorl Snail (Vertigo Sp.)

There are three KERs for further assessment (Marsh Whorl Snail, Common Whorl Snail, and Striated Whorl Snail), which favour habitats such as reed beds, wet grasslands, or waterside vegetation with sedges and rushes (Byrne *et al.*, 2009).

The Construction Phase of the proposed wind farm could significantly affect these Whorl Snail species through:

- Habitat loss – if the proposed works will involve the removal of favoured habitat; and
- Effects on hydrological conditions – if the hydrological regime onsite is affected by the Construction Phase.

With regards to habitat loss, it is relevant to note that the infrastructure for the proposed wind farm site does not intersect any of the locations where Whorl Snail species have been identified, being separated by at least 50m. However, the Whorl Snail survey objective relied on establishing presence or absence, and there is the potential that these species may occur elsewhere within the site. However, the restricted loss of habitats such as 'Wet Grassland' (GS4), 'Reed and large sedge swamps' (FS1), and 'Poor fen and flush' (PF2) (Section 7.10.1.1) in relation to their abundance over the proposed wind farm site is likely to not affect significantly the three Whorl Snail species recorded.

With regards to effects on hydrological conditions, although the sensitivity amongst the Whorl Snail species varies, changes to water levels may affect significantly the Whorl Snail populations. The Construction Phase of the proposed wind farm will involve water abstraction to accommodate for the proposed construction works, which will slightly affect the habitats within the consequent drawdown zones. However, considering the limited extent of the habitats likely affected by the water abstraction during the Construction Phase of the proposed wind farm the effects from water abstraction on the Whorl Snail populations is likely to be of modest significance (Table 7.46).

Table 7.46: Description of Potential Effects from Construction Phase of the Proposed Wind Farm on Whorl Snail Species

KER		Descriptor	Effect
Marsh Whorl Snail Common Whorl Snail Striated Whorl Snail	Habitat loss	***Quality of Effects***	Negative
		Significance	Moderate
		Extent and Context	Minimum of 0.7ha (habitat loss areas for GS4, FS1, and PF2 habitats)
		Probability	Likely
		Duration	Short-term
	Hydrological conditions	***Quality of Effects***	Negative
		Significance	Moderate
		Extent and Context	Minimum of 2.3ha (water sensitive habitats FS1, GS4, and PF2 within drawdown zone)
		Probability	Likely
		Duration	Short-term

7.11.2.1.5.3 Marsh Fritillary

As described in Section 7.7.2.4.4, there is a scarce presence of Marsh Fritillary at the proposed wind farm site, although the occurrence of Devil's-bit Scabious is widespread along the site. The locations where Marsh Fritillary webs and larvae were recorded are separated from the proposed infrastructure by a minimum 50m, which is indicative that the Construction Phase of the proposed wind farm is unlikely to cause habitat loss to this designated species. However, because Marsh Fritillary is highly sensitive to habitat drainage (Lavery, 1993), the water abstraction for the Construction Phase could potentially affect the habitats currently used by Marsh Fritillary, and hinder the apparent recovery of the species presence at the site. However, none of the estimated drawdown zones from the water abstraction for the Construction Phase intersects the locations where the species was recorded. Therefore, no likely significant effects to Marsh Fritillary are anticipated from the Construction Phase of the proposed wind farm (Table 7.47).

Table 7.47: Description of Potential Effects from Construction Phase of the Proposed Wind Farm on Marsh Fritillary

KER		Descriptor	Effect
Marsh Fritillary	Habitat loss	***Quality of Effects***	Negative
		Significance	Significant
		Extent and Context	-
		Probability	Unlikely
		Duration	-

KER		Descriptor	Effect
	Water Abstraction	*Quality of Effects*	Negative
		Significance	Significant
		Extent and Context	-
		Probability	Unlikely
		Duration	-

7.11.2.1.5.4 Non-volant Mammals

7.11.2.1.5.4.1 Badger

Although no evidence for active Badger setts was found during the Multidisciplinary Surveys, abundant evidence of Badger activity evidence was found (e.g. tracks, latrines and snuffle holes - Section 7.8.2.4.2.1), demonstrating its local presence. There are three types of potential effects on Badger from the Construction Phase of the proposed wind farm:

1) Direct mortality – Badger individuals could get trampled by the movement of vehicles or machinery during the Construction Phase;
2) Disturbance/displacement - may occur as a result of the movement of machinery and other construction works throughout the site;
3) Habitat loss/Destruction of setts– it may occur, mostly following the removal of fringe habitats for the construction of infrastructure (see Section 7.11.2.1.4).

Direct mortality is highly unlikely as Badger is a nocturnal species (Elliott *et al.*, 2015) and the large majority of the works during the Construction Phase of the proposed wind farm will take place during daytime (Chapter 3 - Description of the Proposed Development).

With regards to Disturbance/displacement, considering the abundance of refuge habitat within the proposed wind farm site not affected by the infrastructure construction, combined with the restricted duration of the Construction Phase (24-30 months - Chapter 3 - Description of the Proposed Development), it is likely this effect would have a modest significance, of limited duration.

Considering the areas of woodland favoured by Badger, that would be lost for the infrastructure construction (approximately 65ha - Section 7.11.2.1.4), it is probable these areas encompass Badger habitat, or even Badger setts built after the Multidisciplinary Surveys. With particular emphasis on the destruction of Badger setts, this effect could be of high significance for the local Badger population, especially if it would be an active and occupied Badger sett to be destroyed. It could constitute a significant and permanent negative effect (Table 7.48).

Table 7.48: Description of Potential Effects from Construction Phase of the Proposed Development on Badger

KER		Descriptor	Effect
Badger	Direct Mortality	***Quality of Effects***	Negative
		Significance	Significant
		Extent and Context	Within the area affected by the construction works
		Probability	Unlikely
		Duration	Permanent
	Disturbance/ displacement	***Quality of Effects***	Negative
		Significance	Slight
		Extent and Context	Within the area affected by the construction works plus 150m
		Probability	Likely
		Duration	Short term
	Habitat loss/ Destruction of setts	***Quality of Effects***	Negative
		Significance	Significant
		Extent and Context	Within the area affected by the construction works
		Probability	Likely
		Duration	Permanent

7.11.2.1.5.4.2 Otter

In general, Otter population decline has been ruled by four classes of factors (IUCN, 1990): 1) pollution; 2) habitat destruction; 3) Other threats of minor significance; and 4) over hunting. In the case of the Construction of the proposed wind farm, whereas class 4) would not be relevant, the other three classes of factors could potentially affect the local Otter population, as:

1) Pollution – the proposed wind farm Construction Phase is associated with the use and storage of contaminants, which, in the event of a potential leak, could expose Otter directly to sub-lethal toxicity (it is unlikely the volumes of hydrocarbons to be stored onsite would incite lethal effects; sub-lethal effects of hydrocarbons and heavy metals are responsible for neurotoxicity, changes in behaviour and metabolism, endocrine disruption, reproductive failure, immunotoxicity, neoplasia and mortality in Otter (Köhler and Triebskorn, 2013; Garcês and Pires, 2023). Also, even if Otter would not be directly affected, an accidental leak could reduce prey availability and indirectly affect the sustainability of the local Otter population.
2) Habitat loss - Otter commonly disappear from areas where no suitable habitat remains, but tolerate a wide range of habitat typologies (IUCN, 1990; Chanin, 2003). Although Chanin (2003) refers the nuances and difficulties in defining Otter habitat requirements, more recently Weinberger *et al.* (2019) assigns riparian vegetation as of major importance in the long-term recovery of Otter populations, along with good foraging habitat, an unpolluted environment, and safe resting sites. The linear water features (i.e. drainage channels, and the WFD river water bodies that intersect the site) at the

proposed wind farm site are, generally, devoid of a well-structured riparian gallery, or high quality hydromorphological features. Nevertheless, no works involving removal of riparian vegetation are anticipated in Chapter 3 (Description of the Proposed Development), and no significant effects on Otter from habitat loss in general, or removal of breeding and/or resting sites, are likely.

3) Other threats – the other threats to Otter during the Construction Phase of the proposed wind farm are related with disturbance and/or direct mortality from the use of machinery, and movement of vehicles at the site during this period. Although disturbance seems to affect Otter during the reproduction period, its distribution and foraging appear to be unconstrained by anthropogenic presence and activity, even in urban locations (Tolrà *et al.*, 2024). However, considering the recorded Otter activity at the proposed wind farm site, the movement of vehicles during its Construction Phase may cause direct mortality to some individuals – road mortality is one of the most relevant causes of Otter mortality in Europe (Jancke and Giere, 2011).

Therefore, the effects on the local Otter population from the Construction Phase of the proposed wind farm are described in Table 7.49. Also, it should be noted that Otter is likely to be indirectly affected by all effects to aquatic ecology (Section 7.11.2.1.3) as these would reduce prey availability, with similar effect descriptors to 'Contamination' and 'Habitat loss, below.

Table 7.49: Description of Potential Effects from Construction Phase of the Proposed Wind Farm on Otter

KER		Descriptor	Effect
Otter	Pollution	*Quality of Effects*	Negative
		Significance	Very Significant
		Extent and Context	Within the hydrological pathway
		Probability	Likely
		Duration	Long-term
	Habitat loss	*Quality of Effects*	Negative
		Significance	Slight
		Extent and Context	Within the vegetated aquatic habitats
		Probability	Unlikely
		Duration	Long-term -
	Direct Mortality	*Quality of Effects*	Negative
		Significance	Significant
		Extent and Context	Proposed wind farm site
		Probability	Likely
		Duration	Permanent

7.11.2.1.5.4.3 Other non-volant mammals

Despite the absence of evidence for other non-volant protected mammals found during the Multidisciplinary Surveys, Eurasian Pygmy Shrew, Eurasian Red Squirrel, Irish Hare, Irish Stoat, Pine Marten, and West European Hedgehog have been reported to occur within the proposed wind farm site wider area. This reported presence within the N06, N07 and N16 10x10km Irish Grid Squares may represent the possibility for their occurrence at the proposed wind farm site, but the absence of evidence for their presence during the field surveys may be indicative of its low likelihood.

Similarly to the effect assessment for Badger there are three types of effects from the Construction Phase of the proposed wind farm on these protected species: 1) Direct mortality; 2) Disturbance/displacement; 3) Habitat loss/Destruction of breeding or resting sites. Although with variable significance and duration, as stated above, these three types of potential effects during the Construction Phase of the proposed development are deemed unlikely (Table 7.50).

Table 7.50: Description of Potential Effects from Construction Phase of the Proposed Wind Farm on Other Non-volant Mammals

KER		Descriptor	Effect
Other non-volant mammals	Direct mortality	***Quality of Effects***	Negative
		Significance	Significant
		Extent and Context	Proposed wind farm site
		Probability	Unlikely
		Duration	Permanent
	Disturbance/displacement	***Quality of Effects***	Negative
		Significance	Slight
		Extent and Context	Within the area affected by the construction works plus 150m
		Probability	Unlikely
		Duration	Temporary
	Habitat loss	***Quality of Effects***	Negative
		Significance	Significant
		Extent and Context	Within the area affected by the construction works
		Probability	Unlikely
		Duration	Permanent

7.11.2.2 Proposed Turbine Delivery Route

As described in Section 7.10.2, the road works proposed to accommodate the transport of the turbines for the proposed development are not located in proximity of any surface water bodies.

This absence of hydrological pathways from these locations to potentially remote KERs implicates that the only KER potentially affected by the proposed TDR is the habitat feature

valuated as 'Local Importance (Higher Value)' – WL2 – Treelines at POI 2 which would warrant an assessment of any potential effects affecting its biodiversity value (the assessment of the effects from the proposed works at POI 6 - i.e. habitat loss - are located within the proposed wind farm boundary, and are included within Section 7.11.2.1.4.1) . However, as the description of the proposed works for the TDR at POI 2 does not include any vegetation removal (Chapter 15 – Traffic and Transportation - Appendix 15-3), it is then concluded that the works for the proposed TDR will not likely affect any KER and, consequently, the local biodiversity value

7.11.3 Operational Phase

During the Operational Phase of the proposed development, beyond the turbines' operation, the only activities anticipated to occur at the proposed wind farm site is the maintenance of the wind turbines (see Section 3.12 of Chapter 3 - Description of the Proposed Development). These maintenance activities are not of a nature, nor amount to a regularity, that is likely to require more intense traffic within the proposed wind farm site than the current scenario, thus not likely to be associated to effects on Biodiversity with a higher significance than imperceptible.

Nevertheless, the turbines' operation can potentially affect some KERs. Whereas likely effects to terrestrial habitats and aquatic ecology will be restricted to the Construction and Decommissioning Phases, the Operational Phase of the proposed development may affect Internationally and Nationally Important Sites, and protected mammals, volant and non-volant.

7.11.3.1 Nationally Important Sites

Considering the activities involved in the Operation Phase of the proposed wind farm (Chapter 3 – Description of the Proposed Development), no sources for likely significant effects on Nationally important sites are identified. Therefore, it is considered the proposed wind farm will not give rise to likely significant effects on this KER.

Table 7.51: Description of Potential Effects on Nationally Importance Sites During the Operation Phase

KER	Descriptor	Effect
Lough Bawn pNHA [0001819] Lough Bannow pNHA [000449] Lough Ree pNHA [000440] Derry Lough pNHA [001444]	***Quality of Effects***	Neutral
	Significance	Imperceptible
	Extent and Context	-
	Probability	-
	Duration	-

7.11.3.2 Protected Species

7.11.3.2.1 Bats

Part of the data analysis for the impact assessment on bats involved a risk assessment for the three High Risk species recorded at the proposed wind farm site (i.e. species with higher collision risk with turbines: Leisler's Bat; Common Pipistrelle; Soprano Pipistrelle - Section 7.8.2.4.1 and

Appendix 7.6). This risk assessment includes an evaluation of project size (i.e. number and size of turbines) and the habitat (e.g. roosting features, diversity), and classified 16 turbine locations of the proposed wind farm as having a Medium (Turbines 1, 5, 7, 9, 12, 13, and 21) to High Risk to bats (Turbines 3, 8, 10, 11, 15, 16, 17, 19, and 22 - Table 7.52).

Table 7.52: Risk Assessment of the Turbine Layout of the Proposed Wind Farm for Bat Species

Overall Assessment	Turbine	Score
Low (0-4)	Turbine 2	3
	Turbine 4	3
	Turbine 6	3
	Turbine 14	3
	Turbine 18	3
	Turbine 20	3
Medium (5-12)	Turbine 1	12
	Turbine 5	9
	Turbine 7	12
	Turbine 9	12
	Turbine 12	9
	Turbine 13	12
	Turbine 21	12
High (15-25)	Turbine 3	15
	Turbine 8	15
	Turbine 10	15
	Turbine 11	15
	Turbine 15	15
	Turbine 16	15
	Turbine 17	15
	Turbine 19	15
	Turbine 22	15

Eight bat species were recorded during the 2021 and 2022 bat surveys of the proposed wind farm site;

Four of these species are considered to be High Risk bat species in relation to wind turbines. The species are Leisler's Bat, Common Pipistrelle, Soprano Pipistrelle and Nathusius' Pipistrelle.

- Leisler's Bat and Nathusius' Pipistrelle were assigned International Importance and County Importance respectively (see Table 7.20) and therefore identified as KER of relevance to the proposed wind farm. Following NRA Guidance (2009a) impact assessment to these KERs is required.

In contrast Common Pipistrelle were Soprano Pipistrelle assigned were ecological value of Local (Lower Value) and were consequently not identified as KERs. Following NRA Guidance (2009a) impact assessment to these species is not required. Four species are considered to be Low Risk in relation to wind turbines. These species are Natterer's Bat, Daubenton's Bat, Whiskered Bat, and Brown Long-eared Bat.

- These species were assigned ecological value of County Importance and thus identified as KERs of relevance to the wind farm. Following NRA Guidance (2009a) impact assessment to these KERs is required

Analysis of static surveillance results and additional analysis was used to assign risk evaluation to turbine locations. The risk evaluations were classified as Low, Medium, and High.

Nine turbine locations are classified as High Risk, primarily due to increased bat activity during Spring and Summer. Additionally, seven turbine locations are assigned a Medium Risk value for local bat populations. These High Risk and Medium Risk turbines are spread across the proposed wind farm site, with a higher concentration in the Derryadd and Lough Bannow Bogs. Due to the widespread presence of bat encounter records across the site and the proximity of bat habitats within 200m of turbine locations and infrastructure routes, impact assessments were carried out for all eight species, following the precautionary principle. Specifically, the impact assessments, which describes the characteristics of potential effects on bats from collision risk, is detailed in Table 7.53.

Table 7.53: Description of Potential Effects from Operational Phase of the Proposed Wind Farm on Bats (Collision Risk)

KER		Descriptor	Effect
Bats	▪ Leisler's bat ▪ Common Pipistrelle ▪ Soprano Pipistrelle ▪ Nathusius' Pipistrelle	***Quality of Effects***	Negative
		Significance	Significant
		Extent and Context	Throughout the proposed wind farm (mostly on Derryadd and Lough Bannow Bogs)
		Probability	Likely
		Duration	Permanent
	▪ Natterer's bat ▪ Daubenton's bat ▪ Whiskered bat ▪ Brown Long-eared bat	***Quality of Effects***	Negative
		Significance	Significant
		Extent and Context	Throughout the proposed wind farm
		Probability	Unlikely
		Duration	Permanent

7.11.3.2.2 Non-volant Mammals

During the Operational Phase of the proposed wind farm, noise and/or vibration generated by turbines operation may disturb and affect the distribution of non-volant mammals. Although it is generally recognised a paucity on scientific studies on terrestrial mammal displacement from wind farm developments (Tolvanen *et al.*, 2023), the available literature resources do not report significant effects associated with turbine noise and/or vibration. Reviews by Schöll and Nopp-Mayr (2021) and Tolvanen *et al.* (2023) refer a total of five studies reporting on potential effects of wind farms on small mammals. With the exception of the displacement of European Hare (*Lepus europaeus*) of up to 700m from operating turbines reported in one study in Poland

(Łopucki *et al.*, 2017; *cited by* Tolvanen *et al.*, 2023), no significant differences on distribution metrics (e.g. abundance, diversity, evenness) have been found. Therefore, it is generally accepted that the impact of wind turbine noise on small non-volant mammals can be assumed to be limited (e.g. Swedish Environmental Protection Agency - Helldin *et al.*, 2012). This appraisal is adopted for the case of the proposed wind farm potential effects on non-volant mammals during its Operational Phase (Table 7.54).

Table 7.54: Description of Potential Effects from Operational Phase of the Proposed Wind Farm on Non-volant Mammals (Disturbance)

KER	Descriptor	Effect
Non-volant mammals	***Quality of Effects***	Neutral
	Significance	Imperceptible
	Extent and Context	-
	Probability	Likely
	Duration	-

7.11.4 Decommissioning Phase

For the Decommissioning Phase of the proposed development the main action will be being the disassembling and transport offsite of the wind turbines. As there are no plans for the construction of new infrastructure, or improvements of existing, during the Decommissioning Phase, these activities, would likely be brief and not likely to hold a significance to the local biodiversity higher than imperceptible (Table 7.55)

Table 7.55: Description of Potential Effects from Decommissioning Phase of the Proposed Wind Farm on Biodiversity

KER	Descriptor	Effect
Non-volant mammals	***Quality of Effects***	Negative
	Significance	Slight
	Extent and Context	-
	Probability	Likely
	Duration	Temporary

7.11.5 Cumulative and In-combination Effect

A search was conducted of planning applications (projects) within the vicinity of the proposed development, using:

- Longford County Council Planning Section[28];
- Roscommon County Council ePlan[29];
- Westmeath County Council ePlan[30];

[28] Available at https://www.longfordcoco.ie/services/planning/. Accessed February 2025
[29] Available at https://www.eplanning.ie/RoscommonCC/searchtypes. Accessed in February 2025
[30] Available at https://www.eplanning.ie/WestmeathCC/searchtypes. Accessed in February 2025

- Department of Housing, Planning and Local Government EIA portal map viewer[31];
- Department of Agriculture, Food and the Marine:
    - Felling Licence Decisions[32];
    - Afforestation Licence Decisions[33].
- An Bord Pleanála[34].

The search was limited to the ten-year period preceding the date of issue of this report. The relevant projects with potential for cumulative effects with the proposed development are detailed in Table 7.56.

Upon review of the relevant documentation publicly available in reference of each of the projects summarised in Table 7.56, the mitigation measures included in the documentation of the projects that were associated with potentially significant effects to biodiversity were considered by the Competent Authorities as sufficient to devoid any residual effects of significance.

However, 16 planning applications (2460132, 18139, 19201, 2275 (ABP-315485-22), 16303 (ABP-249090 - 18), 17320, 2360124, 22225, 22275, 2360108, 19222 (ABP- 305969-20), 1747 (ABP-248470-18), 19546, 18320 (ABP-302597-19), 23342, ABP-309513-21) mentioned the potential for the respective projects to significantly affect the water quality of receiving surface water bodies. Considering that Aquatic Ecology is assessed as a KER that could be significantly affected by the proposed development through potential unmitigated contamination, significant cumulative effects are then deemed as likely, which would be additive to the significance appraised in Section 7.11.2.1.3.1.

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[31] Available online at http://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1. Accessed in February 2025.
[32] Available at https://www.gov.ie/en/collection/f19df-felling-licence-decisions/. February 2025.
[33] Available at https://www.gov.ie/en/collection/123b5-afforestation-licence-decisions/. February 2025.
[34] Available at https://www.pleanala.ie/en-ie/case-search. Accessed in February 2025.

Table 7.56: Summary of Projects Considered for Cumulative Assessment with the Proposed Wind Farm

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
Longford County Council					
2460132	Bord na Mona Energy Limited	Development of a recreational tourism trail, which includes: repurposing of 5.2km on existing former rail bed; 3.1km along existing bog headlands/former high fields; 185m along pre-existing machine access routes; construction of car and/or bicycle parking facilities at seven locations; pavilion structures, totem feature, surface water drainage, and other auxiliar works and structures.	0m	07/01/2025	▪ Works: linear development in nature and is approximately 8.3 kilometres long utilising existing rail bed infrastructure with the inclusion of landscape elements including pavilion structures, 'walker' totem, and a thematic experience comprising a framed structure which will act as a visitor periscope. It includes a maximum of 147 at parking spaces, 127 of which are existing car parking spaces with 20 proposed new car parking spaces; ▪ Potential effects (EcIA Report) – Construction: ▪ Habitats – significant effects from the loss of 'Dry calcareous and neutral grassland/Recolonising bare ground' (GS1/ED3), 'Remnant Raised Bog' (PB1), 'Woodland' (WN7), 'Scrub' (WS1), and 'Open waterbodies' (FL8); ▪ Birds – breeding birds (related with the loss of nesting habitat/destruction of nests and eggs); disturbance to breeding and non-breeding birds ; ▪ Mammals – disturbance at a watercourse crossing (Bats, Otter); habitat loss (Marsh Fritillary). ▪ Operation ▪ Birds – no significant effects anticipated. ▪ Mitigation: ▪ Construction: Habitat Management and Enhancement Plan which includes: management of spoil during construction, material regrading, and scrub mowing; pre-construction survey marking areas of raised bog; restriction of vehicle

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
					movement and material storage at raised bog areas; tree re-planting of 0.5ha, construction of a settlement pond; installation of silt fences; restriction of material storage 50m from wetlands; no wastewater to be discharged on-site; vegetation clearance to be undertaken outside the breading season, or a nesting bird survey and works supervision will be carried out; breeding wader survey at Begnagh; restriction of construction works during the period November to March, inclusive, to avoid the key winter period for wildfowl, imposing the period the period between April and October, inclusive, for the majority of construction works; wintering bird survey preceding any construction works at Begnagh; potential implementation of Ecological Restriction Zones for the avoidance of disturbance to wintering birds; pre-construction Badger survey; camera monitoring of any setts encountered; restriction of works near active setts; pre-construction bat activity survey at the watercourse crossing; installation of 10 new bat boxes; pre-construction Otter survey; avoidance of works at Devi's-bit Scabious locations; ▪ Operation: 1m high screen fencing (to an extent of 1,065m at Begnagh plus 520m at Knappoge) – no screening along Lanesborough to Derryarogue section of the route; signage to highlight potential wintering bird disturbance, habitats, species and general biodiversity; restriction of vegetation

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
					management during the bird breeding season; re-planting of tree and shrub to provide screening along the route; monitoring of wintering an breeding bird populations; ▪ Residual effects: upon implementation of mitigation measures, no residual effects are anticipated.
18139	EirGrid PLC	Refurbishment works on the Cloon to Lanesboro 110 kV Overhead Line (approximately 65 kilometres long).	2km	27/09/2018	▪ Works: replacement of 212 poles. 25 polesets and 1 angle mast; upgrading 21 angle masts; other associated works; ▪ Potential effects (Planning and Environmental Considerations Report - PECR): ▪ Sites of Ecological Importance – no effects on common sites with the proposed wind farm; ▪ Habitats – significant effects on raised bog (total of 196m^2) and cutover bog (total of 168m^2) habitats; ▪ Aquatics – no effects of significance; ▪ Protected Species - no effects of significance. ▪ Mitigation: ▪ Use of low ground pressure machinery; ▪ Delineation of works areas; ▪ Replanting of cut vegetation; ▪ Restriction on material storage; ▪ Silt fence (at 24 locations) and silt trap (at 2 locations) – 9 works locations drain into the Shannon (Upper)_100; ▪ Despite in-stream works being mentioned as not required, mitigation includes construction of clear span bridges (at 22 water features crossings); ▪ 'Best Practice' for pollution control;

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
					▪ Biosecurity measures (use of Virkon®). ▪ Residual effects: upon mitigation, negligible to low significance effects would be expected.
19201	EirGrid PLC	Redevelop the existing 110 kV Air Insulated Switchgear (AIS) substation in Lanesboro.	2km	01/07/2020	▪ Works: re-routing 110kV underground cable (trenching, 600mm wide; 1250mm deep); construction of new substation (15mx15mx54m); construction of roads and parking; other associated works; ▪ Potential Effects (PECR): ▪ Sites of Ecological Importance – Lough Ree SAC (Natural Eutrophic Lakes; Otter); Lough Ree SPA (distribution; prey biomass available; wetland habitat); Lough Ree pNHA ▪ Habitats – no significant effects; ▪ Aquatics – siltation; ▪ Protected Species - no effects of significance. ▪ Mitigation measures: ▪ Works area isolation from watercourses; ▪ Regulating water discharges and stockpiling; ▪ Restriction of concrete pouring near the outfall; ▪ Regulating refuelling operations (50m from watercourses); ▪ 'Best practice' biosecurity measures. ▪ No residual effects of significance are anticipated upon implementation of mitigation measures.

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
2275 (ABP-315485-22)	ESB	Demolition and site reinstatement; followed by Development of grid services within the existing power station boundaries comprising 75MW battery storage; 200MVAR synchronous condenser; other associated works	2km	29/09/2020	▪ Works (Construction, Operation and Decommissioning Phases): Demolition and site reinstatement; followed by development of grid services within the existing power station boundaries comprising: 75MW battery storage; 200MVAR synchronous condenser; other associated works; ▪ Potential Effects (PECR): ▪ Sites of Ecological Importance – Lough Ree SAC (Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation; Otter); Lough Ree SPA (distribution; prey biomass available; wetland habitat); Lough Ree pNHA (deterioration of water quality); Lough Bannow pNHA (deterioration of water quality) ▪ Habitats – no significant effects; ▪ Aquatics – siltation/contamination; ▪ Protected Species – lighting effects on bats; Otter (deterioration of water quality). ▪ Mitigation measures: ▪ Prescription of 'Best practice' methods; ▪ Lighting to be fitted with directional cowls, and of lowest lumen ▪ Monitoring and maintenance of current drainage system; ▪ Dust suppression ▪ Spatial restriction of crushing concrete works; ▪ Sediment barriers (e.g. silt fences); ▪ Regulating stockpiling; ▪ Works area isolation from watercourses; and ▪ Biosecurity measures (use of Virkon®).

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
					▪ No residual effects of significance are anticipated upon implementation of mitigation measures.
16303 (ABP-249090 - 18)	Ronnie Walsh	Decommissioning of existing bovine/porcine agricultural structure; construction of three pig houses	475m	16/05/2018	▪ Works: Construction – 'Best practice' methods; Operation: manure will be collected, stored and transferred to customers for fertilisation; ▪ Potential Effects (EIS): ▪ Sites of Ecological Importance –no significant effects mentioned; ▪ Habitats – no significant effects; ▪ Aquatics – siltation/contamination; ▪ Protected Species – lighting effects on bats; Otter (deterioration of water quality) none identified due to the farm being in operation for several years, and the distance to European sites; ▪ Despite the absence of identified significant effects, mitigation measures are proposed: ▪ 'Best practice' construction methods; ▪ Silt traps or geotextile curtains to be installed at undefined locations; ▪ Protection of riparian and hedgerow habitats; ▪ Undefined primary treatment of surface runoff during operation; ▪ Storage of contaminants in bunded surfaces "well away from watercourses"; ▪ Advise to customers on the fertiliser application.

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
17320	ESB	Increase in the capacity of the operational Ash Disposal Facility to allow for the deposition of 130,000 tonnes of dry ash over and above the 550,000 tonnes permitted until the planning application.	850m	28/03/2018	▪ Works: the development will not include any physical change to the permitted structure, just a continuation of the activity; ▪ Potential Effects (EIAR): ▪ Sites of Ecological Importance –no significant effects mentioned; ▪ Habitats – loss of Bog Woodland habitat (0.87ha) is not considered significant; ▪ Aquatics – emissions are regulated by the EPA through the IPC licence P0610-02, and no significant effects to aquatic ecology are anticipated; ▪ Protected Species – no significant effects are anticipated. ▪ Despite the absence of identified significant effects, mitigation measures are proposed: ▪ Vegetation clearance to be undertaken between September and February. ▪ No residual effects of significance are anticipated upon implementation of mitigation measures.
2360056	EirGrid Plc	Construction of a Gas Insulated Switchgear compound (approximately 4ha)	2km	15/09/2023	▪ Works: Construction of a Gas Insulated Switchgear; redevelopment of existing substation; construction of distribution system operator compound; modify existing drainage system; Ground Investigation works (e.g. boreholes); associated works (roads, ancillary); ▪ Potential Effects (EIAR): ▪ Sites of Ecological Importance – Lough Ree SAC (Naturally Eutrophic Lakes; Otter): deterioration of water quality; disturbance to Otter; Lough Ree SPA: deterioration of water quality

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
					▪ Habitats – no habitats of significant ecological valuation will be removed, thus no significant effects on habitats are considered; ▪ Aquatics – although the risk is considered low, potential significant siltation/contamination effects are considered during construction; ▪ Protected Species – lighting significant effects on roosting bats identified within the site; no significant effects on other species are anticipated given the mentioned abundance of alternative habitats. ▪ Mitigation measures: ▪ Spatial restriction for works and excavation storage; ▪ Silt fence installation for works on banks, excavation storage (with specific instructions); ▪ Pumping any water to areas at least 10m away any watercourse; ▪ Restriction to concrete pouring ▪ 'Check, Clean, Dry' protocol; ▪ Restriction on contaminant use/storage; ▪ 'Best practice' measures (e.g. light shields, directional lighting) for lighting installation; and ▪ Retention of 0.5ha of recolonising bare ground to be seeded with "common native grassland herb species from the locality" as an enhancement measure. ▪ No significant residual effects are anticipated upon implementation of mitigation measures.

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
2360124	EirGrid Plc	Uprate the 110 kV Overhead Line (OHL), consisting of works to a ca. 27.6km section of the OHL at 142 supporting structures	1.7km	17/11/2023	▪ Works: Replacement of existing overhead line, 52 polesets, 4 towers, one angle mast, stay arrangements and crossarms at 27 locations, vibration dampers at 12 locations, and hardware and fittings; installation of insulators at 13 locations; reinstallation of anti-climbing guards and aircraft warning sphere; ▪ Potential Effects (PECR): ▪ Sites of Ecological Importance – Lough Ree SAC (Lake vegetation [3150], Fens [7230], Alluvial forest [91E0] and Otter [1355]): deterioration of water quality); Lough Ree SPA: deterioration of water quality (SCI collision risk with overhead lines dismissed; only effects to Wetlands [A999] considered); Royal Canal pNHA (deterioration of water quality); Lough Bannow pNHA (wet grassland/hedgerow habitats loss); Lough Ree pNHA (similar effect to those for Lough Ree SAC/SPA); ▪ Habitats – direct effects of significance on wetland/raised bog/wet grassland/scrub and hedgerow habitats (tracking of plant and machinery; habitat loss); indirect effects on wetlands similar to those accounted for aquatic ecology; no habitats of significant ecological valuation will be removed, thus no significant effects on habitats are considered. The spread of Japanese Knotweed accounted as potential effect; ▪ Aquatics – potential siltation and contamination effects are considered during construction;

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
					▪ Protected Species – potential effects on Otter (through deterioration of water quality) and birds (loss of nesting habitat). ▪ Mitigation measures: ▪ Silt fence installation at sensitive locations (with specified characteristics); ▪ Installation of silt traps (with specified characteristics); ▪ Primary treatment (i.e. settlement tank system) of any water pumped off to accommodate works; ▪ Delineation of valuable raised bog/wet grassland habitats and ground protection measures (detailed); ▪ Restriction of works between 1st March and 31st August; ▪ Refuelling to be restricted to construction compounds designated area; ▪ Restriction of hydrocarbon storage to designate areas ▪ Concrete batching/production not allowed onsite; ▪ No residual effects are anticipated upon implementation of mitigation measures.
22225	Electricity Supply Board Networks DAC	Integrated constructed wetland over a total area of 5.58ha to provide total treatment of ash leachate, with	600m	14/12/2022	▪ Works: excavation, placement and compaction of earth/soil for the creation of 2 open water cells and 3

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
		a closed loop design			treatment cells; road upgrading; provision of pipework and water pumps (for internal circuit only); ▪ Potential Effects (Planning Report): ▪ Sites of Ecological Importance – Lough Ree SAC (Naturally Eutrophic Lakes; Otter): deterioration of water quality; disturbance to Otter; Lough Ree SPA: deterioration of water quality; ▪ Habitats – no negative effects are identified; ▪ Aquatics – general account of potential effects on aquatic ecology; ▪ Protected Species – no potential effects mentioned. ▪ Mitigation measures: ▪ Spatial restriction for works area; ▪ Setback distance from aquatic receptors; ▪ Refuelling and hydrocarbon storage to be restricted to designated bunded area; ▪ Instructions for clear felling (to opposite direction from drains); ▪ Use and maintenance of brash mats; ▪ Restrictions for soil storage; ▪ Restriction on concrete production onsite; ▪ Spatial and time restrictions for fertilisation. ▪ No residual effects are anticipated upon implementation of mitigation measures.

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
22275	Harmony Solar Longford Ltd	Underground electrical cable and transformer compound which will connect permitted solar farms to the national grid via the proposed transformer compound at Lough Ree Power Station	1.6km	19/05/2023	▪ Works: excavation of 10 trial pit (one 3-4m deep; nine of 1.5-2m deep); Site Investigation (SI) works; construction of transformer compound of 3,800m^2 – excavation to existing 110kv underground cable, temporary construction compound, SI works; construction of Control Module (26.6m^2); construction of transformer unit (including a 8m high lightening mast); excavation to accommodate underground cable; installation of diesel generator; associated works; no instream works required, although there are 5 watercourse crossings; vegetation clearance; ▪ Potential Effects (no EIAR or PECR/EcIA available; information from NIS) - through deterioration of water quality; disturbance/ displacement: ▪ Lough Ree SAC (Natural eutrophic lakes [3150]; Alluvial forests [91E0]; Otter [1355]; ▪ Lough Ree SPA. ▪ Mitigation measures: ▪ Spatial restriction for works area; ▪ Silt traps and silt fencing would be provided at stream crossings; ▪ Spatial restriction for SI works (6m from watercourses); ▪ Compaction and covering of stockpiles; ▪ Restriction to batching wet-cement products onsite; ▪ Restriction on weather conditions for cast-in-place concrete; ▪ Restriction on washing out any plant used in concrete transport or concreting operations;

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
					▪ Area designation for chute cleaning; ▪ Restriction of refuelling to the construction compound; ▪ Designation of exclusion areas of 350m around any nest of Lapwing, Coot or Mallard found in the bog along the development; ▪ No effects on European sites are anticipated upon implementation of mitigation measures.
20263	Michael & Nancy Casserly	Retention of existing extended commercial storage yard, and construction of car park and drainage system	1.9km	07/04/2021	▪ Works: laying a sealed surface across the yard; installation of gullies, by-pass interceptor; construction of car park and loading, storage areas; associated works; ▪ Potential Effects (no EIAR or PECR/EcIA available; information from Screening for AA): deterioration of receiving water quality through inadequate water treatment; sedimentation during construction phase through road traffic; ▪ Assessment: because the application would provide drainage and water treatment, no effects on European sites are predicted.

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
2360108	EirGrid Plc	Replacement of overhead line (9.5km)	2km	27/10/2023	▪ Works: Replacement (involving excavation) of existing overhead line, 21 polesets, 2 towers, stay arrangements (3) and crossarms (6), insulators at 22 locations; reinstallation of anti-climbing guards at 2 locations; vegetation cutting and dewatering; Site Investigation works; associated works; ▪ Potential Effects (PECR): ▪ Sites of Ecological Importance – Lough Ree SAC (Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation [3150], Alkaline Fens [7230], Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0], and Otter [1355]): deterioration of water quality); Lough Ree SPA: deterioration of water quality (SCI collision risk with overhead lines dismissed; only effects to Wetlands [A999] considered). Lough Ree pNHA (similar effects to those described for Lough Ree SAC/SPA); ▪ Habitats – direct effects of significance on wetland/raised bog/wet grassland/scrub and hedgerow habitats (tracking of plant and machinery; habitat loss); indirect effects on wetlands similar to those accounted for aquatic ecology; ▪ Aquatics – potential siltation and contamination effects are considered during construction; ▪ Protected Species – potential effects on Otter (through deterioration of water quality) and birds (loss of nesting habitat).

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
					▪ Mitigation measures: ▪ Spatial restriction for works within 50m of surface water features; ▪ Silt fence installation at 8 sensitive locations (with specified characteristics); ▪ Installation of silt traps at 8 sensitive locations (with specified characteristics); ▪ Primary treatment (i.e. settlement tank system – e.g. Dirtbox) of any groundwater pumped off to accommodate works; ▪ Ground protection maps use at specified locations; ▪ Restriction of hedgerow and scrub vegetation from the 1st of March until the 31st of August; ▪ Refuelling to be restricted to construction compounds designated areas; ▪ Restriction of oil storage to designate areas ▪ Concrete batching/production not allowed on works areas. ▪ No residual effects of significance are anticipated upon implementation of mitigation measures. Local scale disturbance effects to bogland, hedgerow, scrubland and wet grassland habitats are to be expected.

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
16256	Blacksmith Ventures Ltd	Development of a distillery and visitor centre (0.2814ha site)	2.3km	31/01/2017	▪ Works: no details of works are described in the Screening for AA; ▪ Potential Effects (no EIAR or PECR/EcIA available; information from Screening for AA): deterioration of receiving water quality during construction (foul water, hydrocarbons, silt, etc); ▪ Assessment: with the application of 'best practice' methods, no effects on European sites are predicted.
19222 (ABP-305969-20)	Ballykenny Solar Ltd	25 year permission for a solar farm (9MW capacity; 19ha)	7.0km	08/05/2020	▪ Works: no details of works are described; development to include photovoltaic panels mounted on steel frames; single storey building, customer room, control building storage container, HV kiosk, 6 inverter transformer enclosures, etc; ▪ Potential Effects (EcIA): ▪ Construction ▪ Sites of Ecological Importance – Lough Forbes Complex SAC (Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation [3150], Alkaline Fens [7230], Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0], and Otter [1355]): deterioration of water quality; Lough Forbes pNHA (similar to homonymous SAC); Ballykenny-Fisherstown Bog SPA: deterioration of water quality; ▪ Habitats – loss/fragmentation of grassland (low ecological value) and mature trees/hedgerow habitat (75m total extent); ▪ Aquatics – potential siltation and contamination effects are considered during construction;

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
					▪ Protected Species – significant effects on pollinators from habitat/grassland habitat loss; potential effects birds (temporary disturbance), bird nests and foraging habitat (loss), bats (loss of roosting sites); ▪ Operation ▪ Protected Species – disturbance to birds and mammals during maintenance; terrestrial barrier effect from fence; ▪ Mitigation measures: ▪ Spatial restriction for works to be confined to the application site; ▪ 'Best practice' methods; ▪ 10m exclusion zone from the stream for construction works; ▪ 50m exclusion from the stream for stockpiling; ▪ Restriction for washing concrete offsite; ▪ Refuelling and hydrocarbon storage to be carried on bunded areas; ▪ Enhancement – planting of 410m of new hedgerows and 1,835m of existing hedgerows will be enhanced ▪ Residual effects of neutral significant are anticipated upon implementation of mitigation measures.

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
1747 (ABP-248470-18)	Grian PV Ltd.	Ten year permission for a solar farm with an export capacity of 11.1MW	7.9km	22/03/2018	▪ Works: erecting security fence and temporary construction compound; piling frame supports to the ground; affixing mounting frames and panels; concrete base formation for substations and inverters and their construction; cable route trenching (no specific details for construction methods) ▪ Potential Effects (Ecological Appraisal – EA): ▪ Sites of Ecological Importance –Ballykenny-Fisherstown Bog SPA: habitat (grassland) loss – although the loss of potential grazing habitat for geese, the abundance of this type of habitat in the local area is appointed to reduce the significance of this effect to not significant; ▪ Habitats – loss/fragmentation of grassland (low ecological value) and mature trees/hedgerow habitat (75m total extent); ▪ Aquatics – potential siltation and contamination effects are considered during construction; ▪ Protected Species –potential effects birds (breeding and foraging habitat loss), bats (loss of roosting sites), Badger (exclusion from habitats; accidental trapping), Otter (disturbance; damage resting places), Pygmy Shrew and Hedgehog (loss of foraging and shelter habitat), and Common Lizard (loss of shelter habitat). ▪ Mitigation: ▪ Restriction of vegetation clearance to the period outside the birds breeding season (March to August, inclusive);

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
					▪ Before vegetation clearance at the locations identified in the field survey as holding bat roosting features a 'bat roost assessment' should be undertaken; ▪ Enhancement of existing habitats; ▪ Covering excavations to prevent accidental trapping of Badger and/or Otter; ▪ Fence gap of a minimum of 10cm at the bottom. ▪ With the implementation of the mitigation/enhancement measures, the development is expected to represent a positive net gain to local biodiversity.
2074 (ABP-307880-20)	Beacon Assets Ltd	Construction of a residential development of 37 no. dwelling houses	8.5km	14/12/2020	▪ Works: installation of 184,500m^2 of photovoltaic panels, 12 inverter/transformer units and 6 hardstands; drainage and internal tracks (~1.8km); construction of one Main Control Building; internal cabling (underground) and grid connection (intersecting watercourses); associated works; ▪ Potential Effects: none are considered due to small scale and temporary nature of construction works; separation distance to European sites; absence of hydrological connectivity. Although an 'Ecology Report' accompanied the planning application, its scope was the investigation of the presence of IAPS listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011, as amended) – none was identified onsite.

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
21225	Harmony Solar Longford Limited	Ten year permission for a solar farm (34.54ha)	650m	20/10/2021	▪ Works: removal of 10 foundations; construction of new residential development; associated works (no detailed description of construction works is included in the Screening for AA or Ecology Report); ▪ Potential Effects (PECR): ▪ Sites of Ecological Importance – Ballykenny-Fisherstown Bog SPA: there are no records of this Greenland White-fronted Goose since 1990-91; Lough Ree SAC and SPA: as the Whooper Swan core winter foraging range is <5km (SNH, 2016), it was considered the Whooper Swan individuals that could occur at the site were not associated with the SPA population. Also, the construction phase would be of short duration, and there would be enough alternative habitat to devoid any potential disturbance/displacement of significance; the separation distance, dilution effect, and landscape slope would prevent any significant effects from siltation and contamination; no reported connectivity with any sites of National Importance; ▪ Habitats – the habitats that will lie under the solar panels are considered to be altered/enhanced, rather than destroyed; the removal of 10m of Hedgerow habitat is considered a long-term effect of slight significance; the loss of 0.022ha of Wet Willow-Alder Woodland/Bog Woodland habitat under one of the options for the grid connection works is appraised as being a long-term effect of moderate significance;

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
					▪ Aquatics – siltation effects on receiving water courses from construction works (including the placement of culverts on drainage ditches) is considered to be of slight significance; ▪ Protected Species –effects of moderate significance on Kingfisher, Mallard, Meadow Pipit, Skylark (disturbance) and Woodcock (habitat loss - woodland); Effects of moderate significance (disturbance) are likely to affect Badger (6 setts were identified onsite); Moderate effects are predicted for Red Squirrel (loss/destruction of breeding sites), Pine Marten and Irish Stoat (disturbance and/or destruction of den sites within woodland), and Pygmy Shrew and Hedgehog (disturbance or destruction of nesting sites); effects on bats (one of the grid connection options passes through a bridge with roosting features) is appraised as medium-term and significant; due to the potential habitat loss, deterioration of water quality and disturbance, Frog is also appraised as potentially being moderately affected in the short-term; ▪ Mitigation: ▪ Covering excavated material; ▪ 10m exclusion zone for construction works at natural watercourses; ▪ Fencing drainage ditches; ▪ Wheel washing facilities to be provided at the entrance of the site, draining into silt traps (no specifications)

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
					▪ pre-construction mammal surveys; ▪ 'Best practice' methodologies; ▪ Mitigation for the removal of the Wet Willow Alder Woodland/Bog Woodland to be defined at a later stage; ▪ Restriction of trees and hedgerow trimming between 1st of March and 31st of August; ▪ Mitigation for Meadow Pipit, Skylark, Lapwing, and Mallard to be defined at a later stage; ▪ Exclusion of vegetation clearance from March to August, inclusive (for protection of breeding Hedgehog and Pygmy Shrew); woodland felling will only occur between September and December, inclusive (for protection of Red Squirrel); Fence gap of a minimum of 200mm at the bottom, or incorporating a mammal access point (every 100m along the fence); ▪ Habitat enhancement – includes the installation of bat boxes, bird boxes, insect hotels, hedgerow plantation, and log piles, plantation of several types of native species, and enhancement of existing hedgerows.

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
Roscommon County Council					
2390	Michael O'Connor Chairperson St. Dominic's GAA Club	Modifications on sports facility, including provision of tertiary sewerage treatment plan with percolation system	12.8km	02/10/2023	▪ Works: relocation and replacement of fence; realignment of bottom steps of stand; construction of additional car spaces; provision of tertiary sewerage treatment plant and percolation system for dispersal of treated effluent; flood lighting; other associated works; ▪ Potential Effects (no EIAR or PECR/Ecological Impact Assessment (EcIA) available); information from Screening for AA): none are considered due to limited scale of development, and proposal including water treatment.
19546	Irish Water	Upgrade of the Tarmonbarry Wastewater Treatment Plant	4.4km	29/01/2020	▪ Works: excavation (3m deep; 10m wide); importation of stone for backfilling; placement of pre-cast tanks ▪ Potential Effects (no EIAR or PECR/EcIA available; information from Screening for AA): the small scale of the works; the separation distance to the hydrological pathway (172m) and barrier (palisade fence) preclude the potential connectivity with European sites and, consequently, of likely significant effects. ▪ A 'Planner Report' has been submitted with the application, which states "*The construction* (…) *could lead to impacts in relation to surface run-off, potential spillages and dust*", but these potential effects were deemed insignificant.

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
19311	Lough Ree Lanesborough Angling Hub	Convert existing Waterways Ireland storage shed to an outdoor recreational centre/lake access centre facility to Lough Ree	2.3km	12/09/2019	▪ Works: alterations to existing elevators; removal of existing green area; construction of car park; associated works; ▪ Potential Effects (no EIAR or PECR/EcIA available; information from Screening for AA): the "change of use" nature of the development, would preclude any likely significant effects on European sites.
18320 (ABP-302597-19)	EirGrid Plc.	Refurbishment of the existing circuit within County Roscommon of the existing Cloon to Lanesboro 110 kV Overhead Line	2km	19/03/2019	▪ Works: Replacement of 1 angle mast, 212 wooden polesets, crossarms of 5 structures, equipment of 20 structures; foundation upgrades on 19 towers; other associated works; ▪ Potential Effects (no EIAR or PECR/EcIA available; information from NIS): through deterioration of water quality; disturbance/ displacement; and biosecurity: ▪ Lough Ree SAC: no effects considered due to the nature of the application and the 290m separation distance between the works and the SAC; ▪ Lough Ree SPA: no effects considered due to the 290m separation distance between the works and the SPA. ▪ No other effects on European sites common with the proposed development are anticipated (only Camderry Bog SAC was screened in for NIS).

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
23342	EirGrid Plc	Uprate the existing Lanesboro - Sliabh Bawn 100kV overhead line 9.5km)	5km	10/11/2023	▪ Works: Replacement (involving excavation) of existing overhead line, 21 polesets, 2 towers, stay arrangements (3) and crossarms (6), vibration dampers (all locations) insulators at 22 locations; reinstallation of anti-climbing guards at 2 locations; vegetation cutting and dewatering; Site Investigation works; associated works; ▪ Potential Effects (PECR): ▪ Sites of Ecological Importance – Lough Ree SAC (Natural eutrophic lakes with *Magnopotamion* or Hydrocharition - type vegetation [3150], Alkaline Fens [7230], Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0], and Otter [1355]): deterioration of water quality); Lough Ree SPA: deterioration of water quality (SCI collision risk with overhead lines dismissed; only effects to Wetlands [A999] considered); Lough Ree pNHA (similar to Lough Ree SAC and SPA); ▪ Habitats – direct effects of significance on wetland/raised bog/wet grassland/scrub habitats (tracking of plant and machinery; habitat loss; and/or accidental contamination);

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
					▪ the internationally important FL5 and associated habitats have been historically modified and fragmented, while its trophic status is not expected to be altered (i.e. eutrophic). The potential for invasive species spread is also accounted (as a permanent, moderate effect). Nevertheless, potential effects are rated as permanent and moderate in the absence of 'best practice'; ▪ Aquatics – effects from silt-laden runoff and/or contamination on water quality and aquatic environment during construction; ▪ Protected Species - potential effects on Otter (deterioration of water quality) and birds (loss of nesting habitat from hedgerow clearance – although no hedgerow loss was accounted in potential habitats' effects). ▪ Mitigation measures: ▪ Spatial restriction for works within 50m of surface water features; ▪ Ground protection mats will be used during construction; ▪ Site clearance works to take place outside of 1st of March to 31st of August; ▪ Silt fence installation at 8 locations (with specified characteristics); ▪ Installation of silt traps at 8 sensitive locations (with specified characteristics); ▪ Refuelling to be restricted to construction compounds designated areas;

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
					▪ Restriction of hydrocarbon storage to designated areas; ▪ Concrete batching/production not allowed on works areas. ▪ No significant residual effects are anticipated upon implementation of mitigation measures.
22581	Eugene Kiernan	Demolish and dispose of existing structures on site consisting of 21 mushroom houses, an office building and store rooms, and permission to construct 26 houses, service road	2.8km	15/11/2023	▪ Works: no details provided; ▪ Potential Effects (no EIAR or PECR/EcIA available; information from NIS): the limited scale and proposal to discharge to public sewer would preclude any likely significant effects on European sites.
ABP-313750-23	Energia Renewables ROI Ltd	Seven Hills Wind Farm and all associated works (NIS not available from An Bord	22.5km	23/11/2023	▪ Works: 20 wind turbines (blade tip height: 180m); one meteorological mast (100m heigh); one 110kV substation; 15 spoil storage areas; internal and grid connection works; 2 construction compounds; 7 overburden storage areas; site drainage; access and internal road construction ▪ Potential Effects: ▪ Lough Ree SPA (all SCIs except Whooper Swan [A038] and Wetlands [A999]): ex-situ habitat loss; disturbance/displacement; collision risk/barrier effect during operation;

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
		Pleanála website[35])			▪ Mitigation measures: inaccessible NIS for confirmation of specific mitigation measures for the protection of Lough Ree SPA.
Westmeath County Council					
ABP-309513-21	Alanna Roadbridge Developments Ltd	576 no. residential dwellings (285 no. houses, 291 no. apartments), creche and associated works	21.5km	15/06/2021	▪ Works: construction of 285 '2-storey' houses; 18 apartment buildings (291 apartments; max. 5-storey); 2 2-storey crèches; road and associated works; ▪ Potential Effects (EIAR): ▪ Construction ▪ Sites of Ecological Importance – no sites of importance are considered connected with this application; ▪ Habitats – habitat loss of agricultural grassland and disturbed ground (unspecified area) and 990m of hedgerow; ▪ Aquatics – no effects on water quality; ▪ Protected Species – birds (loss of nesting habitat; direct morality: significant and permanent effects. • Operation ▪ Sites of Ecological Importance – no effects considered; ▪ Habitats – loss of ecological corridors/hedgerows considered to give rise to effects of unspecified magnitude nor significance;

[35] Attempted access at https://www.pleanala.ie/publicaccess/EIAR-NIS/313750/Seven%20Hills%20WF%20SID/Natura%20Impact%20Statement/#Natura%20Impact%20Statement%20-%20F%20-%202022.06.03%20-%20190907.pdf?r=874643760539 in February 2025

Planning Application Reference Number	Project/ Applicant Name	Brief Development Description	Approximate Distance from Proposed wind farm site	Date Planning Application Granted	Summary of Respective Assessments Relevant Findings
					▪ Aquatics – imperceptible effects on water quality; ▪ Protected Species – general species (disturbance from human activity, lighting): significant and permanent effects; bats (movement disruption from lighting): significant and permanent effects. ▪ Mitigation measures: ▪ Maintenance and enhancement of existing hedgerows (26% of existing hedgerows will be lost); ▪ Site clearance to take place outside of 1st of March to 31st of August; ▪ Pre-clearance survey for Badger setts, bat roost and/or bird nests; ▪ Implementation of a SuDS scheme; ▪ Surface water runoff to be directed to existing settlement ponds, where unspecified measures will be implemented for its treatment (primary) before discharge to receiving watercourses; ▪ Concrete batching to be carried out offsite; ▪ Pumped-off ground water to be directed to the existing settlement ponds; ▪ Storage of hydrocarbons and other chemicals in bunded hardstand area within an unspecified location; ▪ Refuelling and machinery servicing to be undertaken at a hardstand area, remote from surface water features, at unspecified location. ▪ No long-term residual effects. Given the abundance of hedgerow habitat in the area, its loss is not considered significant in the residual impact assessment.

7.11.6 Summary of Assessment of Potential Effects

A comprehensive assessment of the proposed development—including the Construction Phase (with associated TDR works), Operational Phase, Decommissioning Phase, and cumulative effects as identified that four groups of KERs may be significantly affected during construction, and one group during operation (see Table 7.55). A cumulative assessment was also undertaken to evaluate the potential combined impacts on biodiversity, focusing on habitats, species, and ecological connectivity in the context of other existing and permitted developments in the area. This review considered possible effects such as contamination, disturbance, mortality, habitat loss, and the spread of invasive alien species during both construction and operational phases. With the application of appropriate mitigation measures (see Section 7.12), and taking into account the nature and scale of nearby projects, no significant cumulative impacts on biodiversity are anticipated.

Table 7.57: Summary of Appraised Significant Effects from the Proposed Wind Farm

Phase	KER		Descriptor	Effect
Construction	Lough Ree SAC Otter [1355]	Contamination (in situ and ex situ effects)	***Quality of Effects***	Negative
			Significance	Significant
			Extent and Context	Proposed wind farm site and SAC
			Probability	Likely
			Duration	Long-term
	Lough Ree SAC Otter [1355]	Disturbance (ex situ effects)	***Quality of Effects***	Negative
			Significance	Significant
			Extent and Context	Proposed wind farm site
			Probability	Likely
			Duration	Long-term
	Lough Ree SAC Otter [1355]	Mortality (ex situ effects)	***Quality of Effects***	Negative
			Significance	Significant
			Extent and Context	Proposed wind farm site
			Probability	Likely
			Duration	Permanent
	Lough Ree SAC Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150]	Contamination (in situ effects)	***Quality of Effects***	Negative
			Significance	Significant
			Extent and Context	Hydrologically linked European Site
			Probability	Likely
			Duration	Long-term

Phase	KER		Descriptor	Effect
	Lough Bawn pNHA [0001819] Lough Bannow pNHA [000449] Lough Ree pNHA [000440] Derry Lough pNHA [001444]	Contamination	*Quality of Effects*	Negative
			Significance	Significant
			Extent and Context	Hydrological Pathway
			Probability	Likely
			Duration	Long-term
	Potential dispersal through human vectors affecting habitats of Nationally important sites.	Spread of IAPS	*Quality of Effects*	Negative
			Significance	Significant
			Extent and Context	All inland Nationally important sites through human vector dispersal
			Probability	Likely
			Duration	Permanent
	Aquatic Ecology	Aquatic habitat Contamination	*Quality of Effects*	Negative
			Significance	Significant
			Extent and Context	Hydrological Pathway
			Probability	Likely
			Duration	Long-term

Phase	KER		Descriptor	Effect
	Habitat loss	WL1 - Hedgerows	*Quality of Effects*	Negative
			Significance	Significant
			Extent and Context	354m
			Probability	Likely
			Duration	Permanent
		WL2 - Treelines	*Quality of Effects*	Negative
			Significance	Significant
			Extent and Context	808m
			Probability	Likely
			Duration	Permanent
	Spread of IAPS		*Quality of Effects*	Negative
			Significance	Significant
			Extent and Context	Proposed wind farm site and wider environment
			Probability	Likely
			Duration	Permanent
	Badger	Habitat loss/ Destruction of setts	*Quality of Effects*	Negative
			Significance	Significant
			Extent and Context	Within the area affected by the construction works
			Probability	Likely
			Duration	Permanent

Phase	KER		Descriptor	Effect
	Otter	Pollution, Siltation/ Contamination	*Quality of Effects*	Negative
			Significance	Very Significant
			Extent and Context	Within the hydrological pathway
			Probability	Likely
			Duration	Long-term
		Direct Mortality	*Quality of Effects*	Negative
			Significance	Significant
			Extent and Context	Proposed wind farm site
			Probability	Likely
			Duration	Permanent
Operational	Bats	Direct Mortality (Collision Risk)	*Quality of Effects*	Negative
			Significance	Significant
			Extent and Context	Throughout the proposed wind farm (mostly on Derryadd and Lough Bannow Bogs)
			Probability	Likely
			Duration	Permanent

7.12 Mitigation Measures

All construction works will fully comply with Best Practice/Industry Standards, such as from IFI (2016), Irish Wind Energy Association (Fehily Timoney & Company, 2012), Construction Industry Research and Information Association (CIRIA)[36], and 'Guidance for Pollution Prevention' documents (GPPs)[37], particularly in respect of the protection of water quality, the reduction of emissions, and the prevention of noise, such as:

- CIRIA Report C502 Environmental Good Practice on Site
- CIRIA Report C532 Control of Water Pollution from Construction Sites;
- CIRIA Report C648 Control of Pollution from Linear Construction Project; Technical Guidance;
- CIRIA Handbook C650 Environmental good practice on site;
- CIRIA Handbook C651 Environmental good practice on site checklist;
  - CIRIA Report C609 – SuDS – hydraulic, structural & water quality advice;
  - CIRIA Report C697 – The SuDS Manual;
- GPP 1: Understanding your environmental responsibilities – good environmental practices;
- GPP 2: Above ground oil storage tanks;
- GPP 5: Works and maintenance in or near water;
- GPP 6: Working at construction and demolition sites;
- GPP 8: Safe storage and disposal of used oils;
- GPP 13: Vehicle Washing and Cleaning;
- GPP 21: Pollution incident response planning; and
- GPP 22: Dealing with spills.

This section presents general and specific mitigation measures to reduce or, if possible, eliminate the risk for significant effects to ecological receptors, as identified in Table 7.57, which significance could be further augmented when considering the cumulative effect assessment (Section 7.11.5). To this effect, prior to commencement of the works associated with the Construction Phase of the proposed development, the appointed contractor will comply with the Construction Environmental Management Plan (CEMP) included in Appendix 3.2 of Chapter 3 - Description of the Proposed Development, which contains all the mitigation measures included herein, and ensure they are fully implemented. The CEMP is a live document that will be updated according to changing circumstances on the project, and to reflect activities on site. Furthermore, an Ecological Clerk of Works (ECoW), experienced in the management of peatland habitats, will be employed by the appointed contractor to oversee construction works and monitor any possible sources for impacts. The ECoW will guarantee the Construction Phase of the proposed wind farm will be undertaken in strict agreement with the methods prescribed in the CEMP and will have the power to stop the works in case any activities/works are not compliant with the CEMP and/or the above-mentioned best practise guidelines.

[36] Available at https://www.ciria.org/. Accessed in February 2025

[37] Available at https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/. Accessed in February 2025

7.12.1 Construction Phase

There are five receptors associated with likely significant effects from the Construction Phase of the proposed wind farm, for which mitigation measures are required: Aquatic Ecology, Habitats, IAPS, Badger, and Otter (Table 7.57). To reduce the likelihood (to 'Unlikely') or significance (to lower than 'Significant') of the effects from the Construction Phase on these KERs, the mitigation measures detailed in Table 7.58 are then proposed. It should be noted that the supervision and implementation of all of these mitigation measures will be supervised, noted, and approved by the assigned ECoW.

It should be noted that the suite of mitigation measures outlined in Table 7.58 will not only address impact to the KERs potentially affected by activities during the Construction Phase of the development but may also benefit species that are not directly significantly impacted by the Construction Phase activities. For example, while the assessment showed no likely significant effects on bats from activities proposed during the Construction Phase, and consequently no mitigation measures were required for bats during this phase, some of the proposed mitigation measures to be employed during this phase will still benefit bat species.

7.12.2 Operational Phase

7.12.2.1 Bats

The assessment identified potential impact to bat species during the Operational Phase. Appendix 7.6 includes a detailed description of the mitigation measures proposed for the Operational Phase of the proposed wind farm to reduce the likelihood (to 'Unlikely') or significance (to lower than 'Significant'). The mitigation measures proposed relate to bat roost assessment, habitat clearance and timing of clearance activities are summarised in Table 7.57 below. Table 7.57 also includes a description of the proposed curtailment measures for high risk turbines.

In addition to the mitigation measures Appendix 7.6 also details a monitoring programme to be implemented. This programme will be implemented during the first three years of the Operational Phase, and repeated at Year 10 and Year 20 (as per NatureScot, 2021) The surveillance programme is presented in full in Appendix 7.6 and is summarised as follows:

a. **Bat activity surveillance**
   The level of bat activity should be monitoring for a minimum of 10 nights at each turbine location (ground level). The surveillance periods should be divided into three survey periods to represent the three main periods where bat collisions have been documented: Spring (April/May); Summer (June/July) and Autumn (August/September).
b. **Carcass search**
   During the surveillance periods of specific wind turbines, carcass search is required for a minimum of 1 morning per turbine (i.e. 3/4 mornings in total over the 1 year surveillance i.e. one per surveillance period). For each turbine, the search area should be 100m radius after ideal bat foraging weather conditions (mild, calm and dry weather and greater than 10°C). A scavenger trial is required to facilitate analysis (as per NatureScot, 2021)

c. Protocols and Best Practice Guidelines

For exact protocols consult most up-date best practice guidelines from current research publications/guidelines (e.g. NatureScot, 2021)

Table 7.58: Proposed Mitigation Measures for the Construction Phase of the Proposed Wind Farm

Potential Effect	Proposed Wind Farm Activity	Proposed Mitigation Measure	Further description
Aquatic Ecology - Contamination	Storage of contaminants at the Construction Compounds	Designation of Storage Area	▪ Fuels storage will be minimised onsite; ▪ However, because it might not be practical to refuel all vehicles and machinery offsite, areas will be designated for contaminant storage at each Construction Compound; ▪ The designated areas for contaminant storage will be enclosed, appropriately signaed, and demarked from the remainder areas of the Construction Compounds; ▪ Any diesel, fuel, hydraulic oils, paints or any other type of contaminant that will require to be kept onsite, will be stored in bunded storage tanks, only at the designated areas within each of the four Construction Compounds; ▪ Each bund area will have a volume of at least 110% of the volume of the respective stored contaminant(s); ▪ Each container within the bund area will be appropriately labelled and sealed; ▪ Only authorised and appropriately trained personnel may access the contaminant storage designated area; ▪ The designated area for contaminant storage will be provided with a log book. The log book will be a register of: – the number of containers for each contaminant; – volume of each container; – approximate volume of each contaminant stored; – date/time contaminants are taken off/stored in the designated area, and respective destination; – Signature of the authorised person responsible for the log entry; – Stock of spillage containment material (e.g. spill kits). ▪ The ECoW will make a daily verification of the log books, confirming the accuracy of the information logged in;

Potential Effect	Proposed Wind Farm Activity	Proposed Mitigation Measure	Further description
			▪ The designated contaminant storage areas will also keep a stock of absorbent materials (e.g. oil binder granules), pads/mats, and drip trays to be made available if need.
	Refuelling at the Construction Compounds	Operation	▪ At each Construction Compound, an area will be designated as "Refuelling Area"; ▪ The Refuelling Area will be delineated at an easily accessible location by vehicles and mobile machinery, and in the immediate vicinity of the designated area for contaminant storage; ▪ The Refuelling Area will be appropriately demarked and signed, for easy identification; ▪ When refuelling, drip trays and fuel absorbent mats will be used to capture any potential spills;
	Refuelling with mobile bowser	Specific Characteristics	▪ The mobile bowser will be custom-built, and consist of a double skinned, double-axel fuel bowser; ▪ It will be towed around the site by a 4x4 vehicle to where machinery is located; ▪ It will be re-filled at the designated Refuelling Area at the Construction Compound, or off site; ▪ The 4x4 vehicle will be provided with a log book, where every refuelling operation will be noted: – Date and time; – Refuelled vehicle/machinery unique identification; – Description of any spillages; – Description of containment measures; – Any inspection of the bowser itself.
		Operation conditions	▪ The fuel bowser will be parked on a level area in the construction compound when not in use; ▪ The fuel bowser will be inspected by the ECoW at the end of each day for leaks and fitness for purpose;

Potential Effect	Proposed Wind Farm Activity	Proposed Mitigation Measure	Further description
			▪ The fuel bowser to be used on immobile machinery and/or it will be not possible to move the respective vehicles or machinery to the Construction Compound; ▪ Only designated, trained and competent operatives will be authorised to refuel vehicles and machinery on site; ▪ The 4x4 vehicle will carry fuel absorbent material (e.g. oil binder granules) and pads/mats in the event of any accidental spillages; ▪ While refuelling, drip trays and fuel absorbent mats will be used to capture any spills; ▪ The vehicle logbook will be inspected by the ECoW every day, and any spillage incidents will be verified by the ECoW as soon as possible. The ECoW will determine the efficacy of the containment measures employed, or decide if further measures are required.
	Dust generation and movement associated with excavation, vehicle traffic, access track construction, and material handling near aquatic feature	Integrated dust suppression and control strategy	▪ Water bowsers will be used to suppress dust on exposed soils and haul roads, especially during dry and windy periods; ▪ Works will be phased to minimise disturbed ground area; ▪ Spoil and loose material will be covered where feasible; ▪ Fencing will be established near aquatic features to intercept dust and sediment; ▪ Speed limits and designated access routes will be enforced; ▪ Dust levels will be periodically monitored to assess the effectiveness of dust control measures.
	Machinery and vehicle movement and operation	Regular Maintenance of vehicles and machinery	▪ The ECoW will undertake weekly checks for spillages to all machinery and vehicles used onsite; ▪ The ECoW will maintain a logbook to register all checks undertaken, and required maintenance to eliminate leaks,
		Spill containment equipment	▪ All vehicles and machinery will be provided with emergency drip trays and spill kits

Potential Effect	Proposed Wind Farm Activity	Proposed Mitigation Measure	Further description
Habitat loss	Earth works, excavations, general construction	Creation and management of alternative habitat	▪ As compensation for the loss of Hedgerow and Treelines habitats, the edges of the tracks will be planted with native shrub and tree species, i.e. Blackthorn, Grey Alder, Grey Willow , Elder, Hawthorn, Holly, Hazel; ▪ The new linear habitat should have a minimum extension of 1,200m in total; ▪ These linear habitats will be managed and maintained until the end of the Construction Phase, or until the planted shrubs and trees will be considered sustainable by the ECoW; ▪ No fertilisers will be used.
Dust Effect to Habitats	Dust generation from excavation, vehicle movement, access track construction, and material handling near terrestrial habitats	▪ Integrated dust control and protection of terrestrial habitats	▪ Water bowsers and dust suppressants will be used to minimise airborne dust, particularly during dry and windy conditions; ▪ Stockpiles and loose materials will be covered when not in use to prevent windblown dust; ▪ Speed limits and designated access routes will be enforced to reduce dust from vehicle movement; ▪ Vegetative buffers and silt fencing will be established to intercept dust and prevent deposition on sensitive terrestrial habitats, such as heathlands, bogs, and grasslands; ▪ Construction areas near sensitive habitats will be phased to limit disturbance at any one time; ▪ Dust levels will be monitored to assess the effectiveness of dust control measures.
Spread of IAPS	All construction works in the proximity of the Rhododendron stand	Pre-construction survey	▪ A pre-construction dedicated IAPS survey at the proposed wind farm site will be undertaken by the appointed ECoW, particularly focused to the areas near the Mountdillon Works, where the Rhododendron stand has been identified. All IAPS individual plants/stands present at the site will be identified, counted and georeferenced.
		Biosecurity area	▪ A strict biosecurity demarcation area will be installed by the ECoW within the zone where scheduled IAPS (e.g. Rhododendron) are present - 10m from each stand (unless it is not feasible for Health & Safety reasons – e.g. roadside); ▪ Only works outside the biosecurity area will be allowed to proceed.

Potential Effect	Proposed Wind Farm Activity	Proposed Mitigation Measure	Further description
		ISMP	▪ If any of the proposed works will be required to break the biosecurity area mentioned above, a specific and detailed Invasive Species Management Plan (ISMP) will be developed by the contractor; ▪ The ISMP will detail a strategy of uprooting the Rhododendron plants, currently present at the proposed wind farm site, the most effective management measure for the control of this species (NRA, 2010).
	Vehicles and machinery accessing the site	Vehicle and machinery cleaning	▪ Prior to arrival on site, the contractor's vehicles and equipment will be thoroughly cleaned and then dried using high-pressure steam cleaning, with water >65 °C, in addition to the removal of all vegetative material; ▪ Items difficult to soak/spray will be wiped down with a suitable disinfectant (e.g. solution of 1% Virkon® Aquatic). ▪ The contractor will establish and clearly delineate a bunded cleaning/washing areas at the Construction Compounds, where gravity will not drive untreated washed material towards local drains.
			▪ Evidence that all machinery has been cleaned will be required to be on file for review by the statutory authorities and the appointed ECoW. The level of evidence required of the Contractor will be, registration plates of vehicles onsite and a register of when, how and where each of these were cleaned before they arrived on site. ▪ Spot checks on the adequacy of cleaning will be carried out by the ECoW.
Badger Habitat Loss	Pre-construction	Survey	▪ No more than 10-12 months ahead of any construction works, a survey of Badger setts will be undertaken within 50 m of either side of the construction works area boundary to determine the current status of known badger setts (i.e. active or inactive), and/or to determine the establishment of any new setts; ▪ Badger surveys are most effective when undertaken between November and April, although they can be carried out at any time of the year. However, until mid-January, Badger is less active (i.e. during colder weather) and setts can appear less well-used (NRA, 2009b); ▪ The survey results will be kept on file, in the form of a summary report.

Potential Effect	Proposed Wind Farm Activity	Proposed Mitigation Measure	Further description
	Any construction works	Monitoring, exclusion and/or evacuation	▪ In case a Badger sett is found during the pre-construction survey (or at any time during the Construction Phase), confirmation of its activity will be carried out. Trial camera(s) pointing at the sett entrance(s) will be placed for a minimum of 7 days. ▪ For the setts recorded during the field surveys, or if a sett is recorded during the pre-construction survey, the methodology prescribed by the NRA (2009b) will be followed, in which: ▪ If within the period between July to November (inclusive), and the sett recorded during the pre-construction survey is deemed inactive, the sett will then be 'soft-blocked', i.e. the sett entrance will be lightly blocked with vegetation and a light application of soil. If after a minimum of five days the vegetation and soil have not been moved, the sett will be destroyed using a mechanical digger; ▪ If still in the period between July to November, but the sett recorded during the pre-construction survey is deemed active, the sett will need to be evacuated. One-way gates (system that allows individuals to exit, but not to get in) will be installed at any active entrances for three days, while inactive entrances will be soft (initially) and they hard-blocked (as above); ▪ If a sett is recorded during the period of January to May, or deemed active (upon confirmation with the trial cameras) during this period, any construction works within 150m of the sett will be halted until the end of this period. In the following June, trial camera(s) will be installed to confirm the sett's activity, and one of the procedures detailed above will be followed. ▪ All monitoring, exclusion and/or evacuation actions will be undertaken by the ECoW, who will report any actions and findings to the contractor, and file them in the form of a report.

Potential Effect	Proposed Wind Farm Activity	Proposed Mitigation Measure	Further description
Otter - Pollution, Siltation/Contamination	▪ Refuelling; ▪ Movement of vehicles and machinery; ▪ Contamination .	▪ Similar to measures proposed to prevent effects to aquatic ecology. ▪ Key controls to be implemented include: – Drip trays and absorbent mats to prevent hydrocarbon spills – Movement of vehicles and machinery will be restricted to designated access routes to minimize disturbance and contamination; – - Bentonite slurry and concrete washout will be contained in designated, sealed areas to prevent runoff into nearby watercourses or sensitive habitats; – Spill kits and absorbent materials will be kept on-site to manage any accidental spills of contaminants, including bentonite and concrete washout. – Regular inspections will be carried out to ensure that the containment measures are functioning effectively, and any potential contamination will be addressed immediately	
Otter – Direct mortality	▪ Movement of vehicles and machinery.	Onsite speed limit	▪ A temporary speed limit of 20km/h will be set for all vehicles transiting the proposed wind farm site for the duration of the Construction Phase; ▪ Appropriate signs will be placed at the tracks used by vehicles and machinery, with the following specifications (adapted from Department of Transport, 2024): – Sign reference: RUS 065; – Normal sign diameter: 450mm; – Repeater sign diameter: 300mm; – Spacing between repeaters: 500m.

Potential Effect	Proposed Wind Farm Activity	Proposed Mitigation Measure	Further description
Bats	▪ Collison risk	Buffer Zone around Turbines	▪ A zone of >92.76m around the wind turbines (from the tip of the blade) will be cleared of tall vegetation (shrubs, trees, scrub, etc.) to reduce favourability of this zone for foraging and commuting bats (see Figure 7.22: . The vegetation clearance as a mitigation measure for the prevention of likely significant effects on bats requires further assessment of the significance of the loss of these habitats for bats; ▪ Complete clearance works at least six months prior to installation of wind turbines. Studies have shown that bats are attracted to clear felled forestry areas due to increase insect loading. This has been shown to occur for a period of 3-6 months before the insect loading reduces to pre-cleared felled levels (Kirkpatrick *et al.*, 2017).
		Bat Roost Survey	▪ The ECoW will undertake a Potential Bat Roost (PBR) survey of any trees proposed to be felled.
		Turbine Cut-in speeds	▪ Operate the High Risk wind turbines from 30 minutes prior to sunset to 30 minutes after sunrise at an increased cut-in speed of 5.5 m/s during specified weather conditions and during the active bat season (April to October) when air temperatures are 10oC or more at the nacelle height ▪ Undertake a carcass search for 3 years post operation of the wind farm to determine whether a higher cut-in speed of the blades is required.

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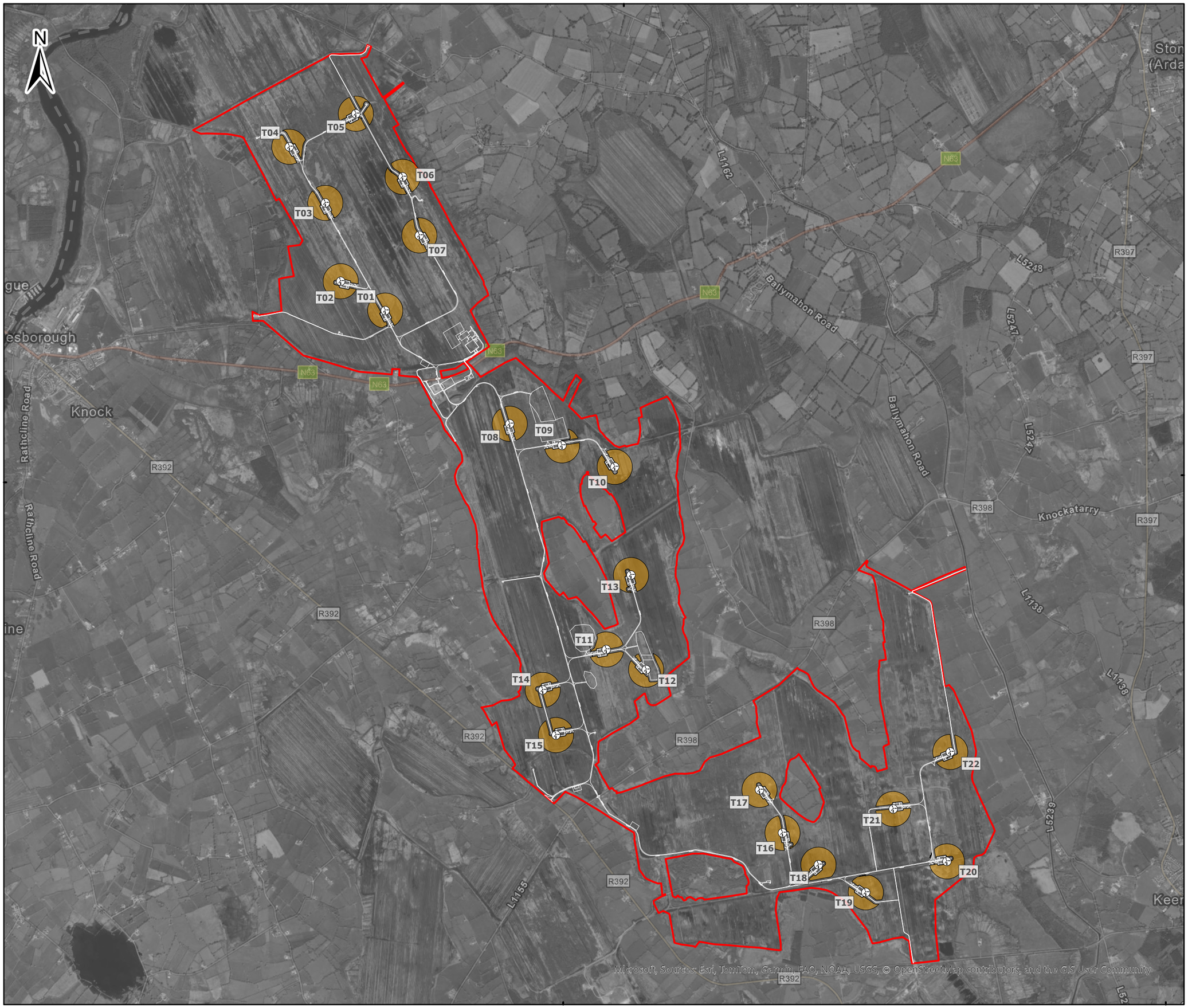

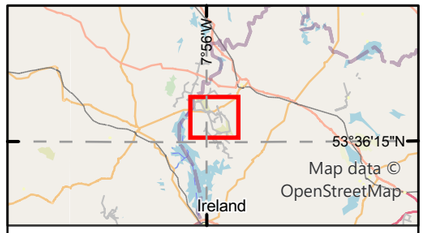

Legend

- Proposed wind farm site
- Turbine Layout
- Site Layout
- Vegetation Clearance

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NOTES

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Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.22: Area Subject to Clearance of Trees and Shrub Vegetation as Part of Mitigation for Bats

Scale @ A3:	1:35,000	
Prepared by:	Checked by:	Date:
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Map Ref: 11399-124-BAT-CLEAR..Mt.M-TOB-A

Draft: A

7.13 RESIDUAL EFFECTS

The proposed development has been assessed as potentially giving rise to the unmitigated significant effects listed in Table 7.57 on the KERs 'International and National Important Sites', 'Aquatic Ecology', 'Habitats', 'Spread of IAPS', 'Badger', 'Otter', and 'Bats'. The significance of these effects has also been assessed as potentially being cumulatively augmented by other developments, assessed in Section 7.11.5. To this effect, several mitigation measures have been proposed with the objective or avoiding and/or reducing the likelihood and significance of each of those effects.

One of the prescribed mitigation measures for the avoidance of likely significant effects on bats is the vegetation clearance of a zone of 92.76m or larger around the wind turbines, following NatureScot (2021) guidance (Appendix 7.6). This vegetation clearance of the shrub and tree *strata* will constitute the loss of these habitats, which could represent a significant residual effect of the proposed wind farm.

7.13.1 Habitat Loss due to Mitigation Measures

To assess the potential habitat loss effects associated with the bat mitigation measures, the areas subject to this mitigation measure where calculated, attending to:

- Rotor diameter: 165m; and
- Buffer radius: 92.76m from the tip of the turbine blade.

Therefore, a buffer with a radius of 175.26m (i.e. 82.5m - half of the rotor diameter - plus 92.76m) was projected, and the habitats' classification (i.e. habitats encompassing subcanopy and canopy levels) and extents that are beyond the areas assessed for the potential effects from habitat loss during the Construction Phase. Effects are identified in Table 7.59. Should the proposed development receive planning consent, all necessary permissions and regulatory requirements related to tree removal will be fully complied with. In particular, a Tree Felling Licence will be obtained from the authority prior to the commencement of any felling activities. This ensures that tree removal is conducted in accordance with legislation and best practice guidelines, including any conditions related to replanting, environmental protection, and biosecurity. The licence process also provides an opportunity to assess and mitigate any potential ecological impacts associated with tree felling, particularly in relation to protected species and habitat connectivity.

It is relevant to note that, although the habitat 'WN6 - Wet willow-alder-ash woodland' is located within the buffer subject to vegetation clearance for bats' mitigation (for Turbine 15), this habitat is part of the ecological corridor formed by the Lough Bannow Stream_010 river water body. Considering the nature of habitats surrounding the river and riparian gallery habitats near Turbine 15 (mostly, PB4 – Cutover bog), it is unlikely commuting bats will divert from the route created by these habitats towards open habitats like cutover bog. Therefore, habitat 'WN6 – Wet willow-alder-ash woodland' will not be cleared as part of the measures to avoid likely significant effects on bats.

When accounting for the total habitat loss associated with the proposed wind farm (i.e. habitat loss to accommodate the construction of infrastructure; habitat loss to mitigate potential significant effect on bats), the loss of the habitats 'WN7 - Bog woodland', and 'WS2 - Immature

woodland', 'WS1 – Scrub' would have a *Moderate* significant residual effect. However, the loss of 'WN2 - Oak-ash-hazel woodland', due to its ecological valuation would constitute a *Significant* residual effect, for which additional mitigation measures are proposed (Section 7.13.2).

Table 7.59: Habitat Loss Due to Bat Mitigation Measures

Habitat	Ecological Valuation	Area (ha)	Habitat Loss Area for Infrastructure	Proportion of habitat loss (i.e. infrastructure + bats mitigation) of the respective total habitat extent in the proposed wind farm site
WN7 - Bog woodland	**Local Importance (Higher Value)**	59.25ha	52.5ha	27.0%
WS2 - Immature woodland	**Local Importance (Higher Value)**	1.42ha	5.4ha	33.8%
WS1 – Scrub	**Local Importance (Higher Value)**	0.66ha	4.9ha	16.5%
WN2 - Oak-ash-hazel woodland	**County Importance**	0.28ha	-	47.4%
WN6 - Wet willow-alder-ash woodland	**Local Importance (Higher Value)**	0.13ha	0.06	17.0%

Table 7.60: Description of Potential Residual Effects from the Habitat Loss Associated with the Mitigation Measures

KER	Descriptor	Effect	Rationale
WN7 - Bog woodland	***Quality of Effects***	Negative	Although the loss of ~27% of this habitat in the proposed wind farm site this habitat is estimated to become highly abundant in the site), which would reduce the significance of the effect of Bog woodland habitat to 'Moderate', and short-term duration.
	Significance	Moderate	
	Extent and Context	111.75ha/27.0%	
	Probability	Likely	
	Duration	Short-term	
WS2 - Immature woodland	***Quality of Effects***	Negative	Although of relative ecological importance, this habitat (i.e. habitat with broadleaved trees of 2-4m high) can re-establish within the proposed wind farm site in a short-term (1-7 years), even at unmanaged areas. The impact would then be of moderate significance, and short-term.
	Significance	Moderate	
	Extent and Context	6.82ha/33.8%	
	Probability	Likely	
	Duration	Short-term	
WS1 - Scrub	***Quality of Effects***	Negative	This is a habitat that is colonising the proposed wind farm site since the cessation of the peat extraction activities. However, the likely increase in the occurrence of this habitat resource within the proposed wind farm site in time, combined with the rapid growth of its dominant species (e.g. Bramble, Gorse, Blackthorn), would reduce the significance of this habitat area loss.
	Significance	Moderate	
	Extent and Context	5.56ha/16.5%	
	Probability	Likely	
	Duration	Short-term	

KER	Descriptor	Effect	Rationale
WN2 - Oak-ash-hazel woodland	***Quality of Effects***	Negative	This habitat is part of the Derryarogue mineral island subsite within the Derryaroge bog. Although its species composition and distinctiveness are responsible for its ecological valuation as 'County Importance'. However, considering that this habitat is likely to become much more abundant at the proposed wind farm site with the implementation of the Rehabilitation Plans the loss of ~47% of 'Oak-ash-hazel woodland' is likely to be of Significant.
	Significance	Significant	
	Extent and Context	0.28ha/47.4%	
	Probability	Likely	
	Duration	Long-term	
WN6 - Wet willow-alder-ash woodland	***Quality of Effects***	-	This habitat will not be cleared as part of the bats mitigation.
	Significance	-	
	Extent and Context	-	
	Probability	-	
	Duration	-	

7.13.2 Additional Measures

To reduce the *Significance* from the loss of approximately 0.28ha of 'WN2 - Oak-ash-hazel woodland' habitat due to the vegetation clearance for the mitigation of effects on bats from the proposed wind farm (Table 7.60) mitigation measures, in addition to those prescribed in Section 7.12, are proposed herein. Therefore, an alternative area of approximately 3.23ha within the proposed wind farm has been selected to be replanted as a compensatory habitat (more than 11 times the area of WN2 habitat to be lost - Figure 7.23).

The location of this alternative area was selected as to afford enough separation from the turbine locations to prevent bat collision risk (92.76m would suffice, following Table 7.57), and to be separated from the nearest turbine – T22 – by a minimum of 500m to prevent bird collision risk (Chapter 8 – Ornithology).

As described in Section 7.11.1 under the 'do-nothing' scenario, the habitats of the proposed wind farm site are under the management of the IPC Licence P0504-01, following the prescriptions of the Draft Cutaway Bog Decommissioning and Rehabilitation Plans (Appendix 7.2). One of the measures included is the natural re-vegetation of the site, which, in time, will contribute, to the site's habitat re-profiling towards the scenario illustrated in the series of 'Potential Future Map' for the Derryaroge, Derryadd, and Lough Bannow Bogs, presented in Appendix 7.2. In the 'Future Habitat Standard Map' in (Lough Bannow Bog - Appendix 7.2c), there is one area to be occupied in the future by the habitat 'Oak-Ash-Hazel woodland (WN2)', which is currently occupied by four habitats, such as: WD1 – (Mixed broadleaved woodland); WN7 – Bog woodland; PB4 – Cutover bog; and GS3 – Dry-humid acid grassland. This area is illustrated in Figure 7.23.

As additional mitigation to reduce the significance of the loss of 'WN2 – Oak-ash-hazel woodland', active habitat management actions in this area are then proposed, such as:

- Only Pedunculate Oak (*Quercus robur*), Ash (*Fraxinus excelsior*), and Hazel (*Corylus avellana*) trees will be planted;
- All planting material must be derived from seed sources within Ireland, and accompanied by a Plant Passport attesting the good health status of the plant(s), compliant to the EU Plant Health Regulation (2016/2031). This measure is of particular importance in view of the control of the Ash dieback disease (DAFM, 2022);
- However, if it is not possible to source planting material from within Ireland, acceptable plant origins must follow the order of preference set by the Department of Agriculture, Food and the Marine (DAFM, 2024b, sec. 2.7.1);
- The planting material (bare-rooted trees - whips) will be 0.45 to 100cm tall;
- The planting procedure will be a simple process, consisting of:
    - Digging a hole sufficiently large and deep (i.e. planting depth is indicated by the soil on the root collar) as to allow the whole root of the plant to be spread out evenly. Topsoil will be placed aside; and
    - Place the soil over the roots ensuring no roots or bark are damaged.
- If the location of the hole for plantation is occupied by ruderal scrub species (e.g. Holly, Bramble), these plants will be cleared before the tree plantation;
- No other trees and/or vegetation will be cleared to accommodate the tree plantation;
- No herbicides and/or fertilisers will be used;

- A minimum tree planting spacing of 3m x 3m will employed (as per DAFM, 2024b);
- Trees will be planted between December to February (following Oak and Ash optimal period - DAFM, 2024a); and
- Every year, between October to February, the area will be monitored by the ECoW (during the Construction Phase of the proposed wind farm), and/or by a Bord na Móna ecologist (during the Operation Phase of the proposed wind farm). If the understory will comprise dense ruderal species cover (e.g. Holly, Bramble), thinning of the understory will be employed.

It is believed that, with the yearly management of the understory cover (that could impede the growth of the tree species), a sufficiently well-structured woodland, with significant cover of Oak-Ash-Hazel habitat would constitute a biodiversity gain in relation of the significant effects on biodiversity from the loss of habitat WN2 to accommodate for the mitigation measures for bats.

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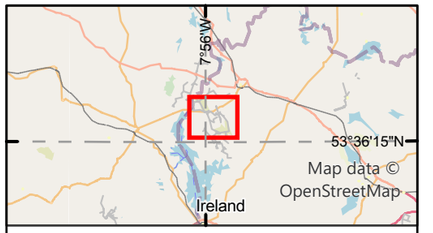

Legend

- Proposed wind farm site
- Turbine Layout
- Site Layout
- Additional Mitigation Measures

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NOTES

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Rev	Date	Description	By	Chkd.
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Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.23: Additional Mitigation Measures

Scale @ A3:	1:35,000	
Prepared by:	Checked by:	Date:
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Map Ref: 11399-125-CLEAR..Mt.M-ADD-TOB-A

Draft: A

7.13.3 Conclusions of the Residual Effect Assessment

Upon the implementation of the mitigation measures described in Sections 7.12, and Section 7.13.2 it is considered that any negative effects from the proposed development, alone and/or cumulatively with other projects, is either unlikely or not significant (Table 7.61: Summary of Residual Effects from the Proposed Wind Farm).

Table 7.61: Summary of Residual Effects from the Proposed Wind Farm

Phase	KER		Descriptor	Effect
	Lough Ree SAC Otter [1355]	Contamination (in situ and ex situ effects)	***Quality of Effects***	Negative
			Significance	-
			Extent and Context	Proposed wind farm site and SAC
			Probability	Unlikely
			Duration	Long-term
	Lough Ree SAC Otter [1355]	Disturbance (ex situ effects)	***Quality of Effects***	Negative
			Significance	Not significant
			Extent and Context	Proposed wind farm site
			Probability	Likely
			Duration	Long-term
	Lough Ree SAC Otter [1355]	Mortality (ex situ effects)	***Quality of Effects***	Negative
			Significance	-
			Extent and Context	Proposed wind farm site
			Probability	Unlikely
			Duration	Permanent
	Lough Ree SAC Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150]	Contamination (in situ effects)	***Quality of Effects***	Negative
			Significance	-
			Extent and Context	Hydrologically linked European Site
			Probability	Unlikely
			Duration	Long-term
	Lough Bawn pNHA [0001819] Lough Bannow pNHA [000449] Lough Ree pNHA [000440] Derry Lough pNHA [001444]	Contamination	***Quality of Effects***	Negative
			Significance	-
			Extent and Context	Hydrological Pathway
			Probability	Unlikely
			Duration	Long-term

Phase	KER		Descriptor	Effect
	Potential dispersal through human vectors affecting habitats of Nationally important sites.	Spread of IAPS	*Quality of Effects*	Negative
			Significance	-
			Extent and Context	Inland Nationally important sites through human vector dispersal
			Probability	Unlikely
			Duration	Permanent
	Aquatic Ecology	Contamination	*Quality of Effects*	Negative
			Significance	-
			Extent and Context	Hydrological Pathway
			Probability	Unlikely
			Duration	Long-term
	Habitat loss	WL1 - Hedgerows	*Quality of Effects*	Negative
			Significance	Not Significant
			Extent and Context	354m
			Probability	Likely
			Duration	Permanent
		WL2 - Treelines	*Quality of Effects*	Negative
			Significance	Not Significant
			Extent and Context	808m
			Probability	Likely
			Duration	Permanent
		WN2 – Oak-Ash-Hazel woodland	*Quality of Effects*	Positive
			Significance	Significant
			Extent and Context	3.23ha (2.95ha of net gain)
			Probability	Likely
			Duration	Permanent
	Spread of IAPS		*Quality of Effects*	Negative
			Significance	-
			Extent and Context	Proposed wind farm site and wider environment
			Probability	Unlikely
			Duration	Permanent

Phase	KER		Descriptor	Effect
	Badger	Habitat loss/ Destruction of setts	*Quality of Effects*	Negative
			Significance	-
			Extent and Context	Within the area affected by the construction works
			Probability	Unlikely
			Duration	Permanent
	Otter	Pollution, Siltation/ Contamination	*Quality of Effects*	Negative
			Significance	-
			Extent and Context	Within the hydrological pathway
			Probability	Unlikely
			Duration	Long-term
		Direct Mortality	*Quality of Effects*	Negative
			Significance	
			Extent and Context	Proposed wind farm site
			Probability	Unlikely
			Duration	Permanent
Operational	Bats	Direct Mortality (Collision Risk)	*Quality of Effects*	Negative
			Significance	-
			Extent and Context	Throughout the proposed wind farm (mostly on Derryadd and Lough Bannow Bogs)
			Probability	Unlikely
			Duration	Permanent

7.14 ENHANCEMENT MEASURES

Habitat enhancement measures are recommended to increase the biodiversity value of the proposed wind farm site. The recommended enhancement measures are compliant with the objectives of the Longford County Development Plan 2021-2027 (LCC, 2021), as well as adhering to targets for plans by 2030 set in Ireland's 4th National Biodiversity Action Plan 2023-2030 (NPWS, 2024).

7.14.1 Habitat Management

To increase the diversity of future habitats occurring onsite, seven zones have been selected for enhancement (Figure 7.24). These zones have been selected as they are removed from the turbine locations by 500m, to prevent turbine collision risk for birds (Chapter 8 – Ornithology) and bats (i.e. away from the vegetation clearance zone of 92.76m), as well as not encompassing any future wetland habitat.

7.14.1.1 Hedgerows

All the seven areas for enhancement in Figure 7.24 are bounded by the proposed wind farm site boundary and/or by infrastructure (i.e. access tracks). However, there are three of these areas that do not hold any bounding linear habitat, and, beyond the plantation of the hedgerows as part of mitigation measures, three other hedgerows will be planted at these locations (Figure 7.25). The enhancement measures for this habitat will comprise:

- Hedgerows identified in Figure 7.25 will be planted with native shrub and tree species, i.e. Blackthorn, Grey Alder, Grey Willow , Elder, Hawthorn, Holly, Hazel;
- The new linear habitat will have a total extension of 1,337m in total:
  - H1 – 272m;
  - H2 – 228m; and
  - H3 – 837m.
- These linear habitats are managed and maintained until the end of the Construction Phase, or until the planted shrubs and trees will be considered as fully established by the ECoW;
- No fertilisers will be used.

7.14.1.2 Grassland

It is considered that the creation of grassland habitat areas would add biodiversity value to the proposed wind farm site, favouring particularly for terrestrial invertebrates (e.g. Marsh Fritillary) and birds (covered in Chapter 8 – Ornithology) - O'Neill *et al.* (2013). To this effect, the current habitats 'GS2 – Dry meadows and grassy verges', 'GS3 – Dry/humid grassland', and 'PB4 – Cutover bog' within the enhancement zones are selected for the enhancement of grassland habitat (Figure 7.25), which sum up to approximately 100ha (Table 7.59)

Table 7.62: Total Area Assigned for Grassland Enhancement

Enhancement Zone	Area for Grassland Enhancement
Zone A	27.5
Zone B	34.2
Zone C	8.8
Zone D	19.9
Zone E	9.6
Total	**100.1**

The following actions will then be conducted within each of these areas, following rehabilitation in line with McCorry *et al.* (2012):

- Any scrub will be cleared from these areas. No vegetation will be cleared outside the areas in Figure 7.25:
- Scrub clearance will be undertaken yearly, in September;
- In the first year, the scrub clearance will be undertaken with the use of an excavator (for larger shrubs/trees), and chainsaw (form smaller plants);
- Felled scrub will be placed in existing onsite drains, and on the boundaries of the plots;
- The clearance works will be carried out under the supervision of the ECoW, during the Construction and Operation Phases of the proposed wind farm. The ECoW/ecologist will identify the plants to be removed, direct the excavator/chainsaw operator, and the staff transporting the felled scrub to the drains and boundaries; and
- The Bord na Móna ecologist will also confirm the requirement of the excavator use in subsequent years, having in consideration that manual/chainsaw clearance would be a preferable method to avoid ground disturbance.

It is expected that these enhancement measures will produce similar results as those reported by McCorry *et al.* (2012), i.e. increase in the occurrence of breeding wader birds. Furthermore, it is also expected that the placement of felled scrub on the boundaries of the plots will provide habitat for breeding and hibernating pollinators (Gowen *et al.*, 2023), while the positioning of felled scrub in the drainage ditches will promote the site's water retention, contributing for the site's hydrological balance.

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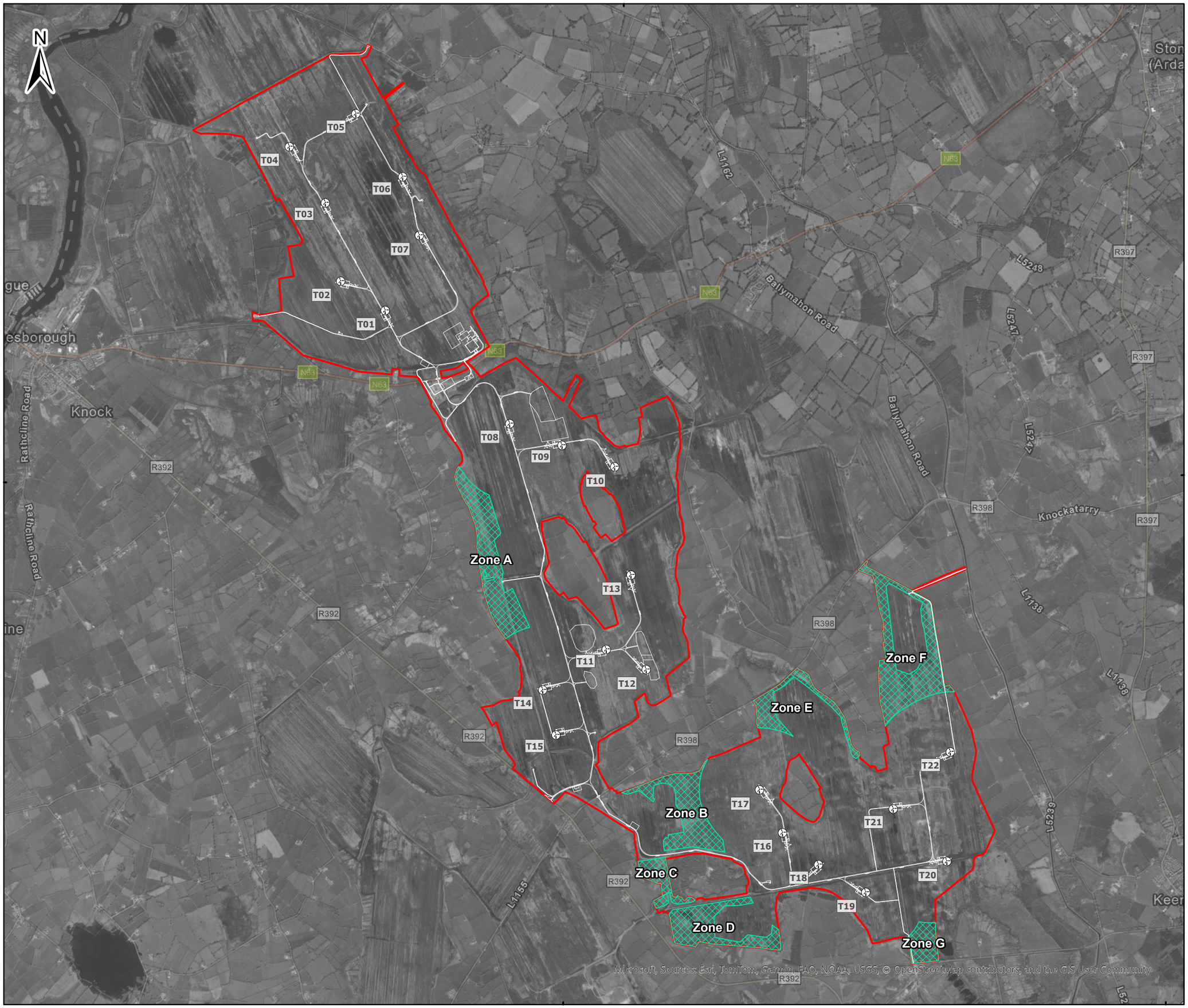

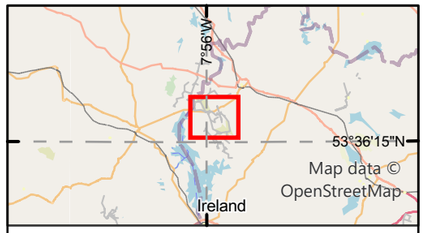

Legend

- Proposed wind farm site
- Turbine Layout
- Site Layout
- Zones for enhancement measures

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Rev	Date	Description	By	Chkd.
A	09/04/2025	First issue	S.P	I.H

Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.24: Zones for Enhancement Measures

Scale @ A3: 1:35,000

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Map Ref: 11399-126-EnH.M-P.APP.BO-TOB-A

Draft: A

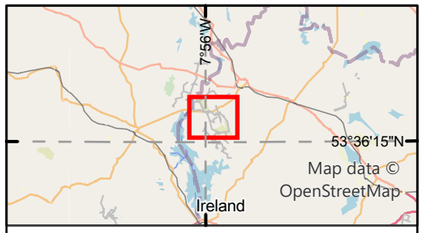
7°54'0"W

53°36'40"N

768000

606000

612000



Legend

- Proposed wind farm site
- Turbine Layout
- Site Layout

Enhancement Measures

- Hedgerows
- Grasslands

0 1 2
Kilometres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
A	09/04/2025	First issue	S.P	I.H

Client: Bord na Móna

Project: Derryadd Wind Farm

Title: Figure 7.25: Hedgerow and Grassland Enhancement Areas

Scale @ A3: 1:35,000

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Draft: A

7.15 CONCLUSION

This Chapter presents an evaluation of the potential ecological effects of the proposed development on biodiversity, and details appropriate mitigation measures to avoid or reduce the significance of potential effects. The residual effects assessment, post implementation of the proposed mitigation and additional measures, concludes that the proposed development, either individually or cumulatively with other projects, will not result in significant effects on any of the identified KERs. Furthermore, this Chapter also includes the prescription of enhancement measures, expected to benefit the biodiversity value of the proposed wind farm site.

Overall, it can be concluded, the proposed development will not have significant negative effects on biodiversity at any geographic scale. In fact, with the inclusion of the proposed enhancement measures, it is expected the proposed development will have a significant positive effect on the local biodiversity.

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