6.1 INTRODUCTION

This Chapter of the Environmental Impact Assessment Report (EIAR) identifies, describes, and assesses the likely significant effects of the proposed project on ecological receptors (including European and national designated sites) and sets out the mitigation measures proposed to avoid or reduce any potential significant effects that are identified. The residual effects on terrestrial and aquatic ecological receptors are then assessed.

The 'proposed project' refers to all elements associated with the construction, operation and decommissioning of the proposed project; a detailed description is provided in **Chapter 2**.

6.1.1 STATEMENT OF AUTHORITY

APEM Group Woodrow personnel involved in the ecological impact assessment (EcIA) within this Chapter of the EIAR are presented in **Table 6-1,** with additional information on each team member presented in **Appendix 6-1** (including staff involved in ecological surveys).

Table 6-1: APEM Group Woodrow personnel involved in the preparation of Chapter 6

Project Team Member	Qualifications	Position (Project Role)	Year of Relevant Experience*	Documents Prepared/Input
Gareth Coughlin	BSc (Hons) Env. Sci., MPhil, C.WEM, CEnv, CSci, FCIWEM, FISEP	Director of Env. Planning (Ireland) (Project Director)	+27 years	All documents associated with Chapter 6
James O'Connor	BSc (Hons) Ag. & Env. Mgmt, MSc Env. Sci., PhD Aquatic Sci.	Project Manager (Technical Lead and Lead Author – Designated Sites, Terrestrial Mammals, Amphibians and Reptiles, Invertebrates and Aquatic Ecology)	+5 years	All documents associated with Chapter 6
Bridget Keehan	BSc (Hons) Botany, ACIEEM.	Principal Senior Ecologist (Technical Lead – Habitats and Flora)	+35 years	Chapter 6 (Habitats and Flora), Appendix 6-3, Appendix 6-6
Brendan Burley	BSc (Hons) Biology and Geography., MSc Env. Mgt.	Peat and Wetland Specialist (Lead Author – Habitats and Flora)	+25 years	Chapter 6 (Habitats and Flora), Appendix 6-3, Appendix 6-6
Jason Guile	BSc in Marine Biology/Oceanography, HND in Coastal Conservation with Marine Biology	Associate Director (Technical Lead – Bats)	+15 years	Chapter 6 (Bats), Appendix 6-4.
Damien McAndrew	BSc (Hons) Env. Sci.	Bat Ecologist (Lead Author – Bats)	4 years	Chapter 6 (Bats), Appendix 6-4, Appendix 6-3, Surveys
Adon McFarlane	BSc (Hons) App. FW & Marine Biology, PhD Aquatic Sci.	Senior Freshwater Scientist (Lead Author – Aquatic Ecology)	+5 years	Appendix 6-5, Aquatic Surveys
Grisel Calcagno	BSc Env. Sci., AdvDip, MSc Env. Sci. (Hons), GradISEP.	Senior EIA Consultant (Quality & Technical Review)	4 years	Chapter 6, Appendix 6-1, Appendix 6-3
Maeve Maher-McWilliams	BSc (Hons) Biological Sci., MSc Evol. & Behav. Ecology, ACIEEM, BWI, BCIreland	Associate Director (Former Technical Review Lead)	+13 years	Chapter 6
*Further details regarding relevant project experience of each Project Team Member are listed in **Appendix 6-1**.				

6.2 SCOPING AND CONSULTATION

6.2.1 SCOPE OF ASSESSMENT

This chapter of the EIAR describes the baseline ecological conditions of the proposed project and evaluates the ecological importance of the flora and fauna (i.e., Biodiversity) within the Zone of Influence (ZoI) of the proposed project. For the context of this chapter, 'ecological features' comprise designated sites, habitats, bats, non-volant mammals (i.e., land-based mammals that cannot fly), particularly otter and badger, herpetofauna (i.e., amphibians and reptiles), as well as aquatic ecology. This chapter does not include ornithology, which is addressed in **Chapter 7**.

The proposed project has been designed to avoid, where practicable, ecologically sensitive species and habitats within the study area (as defined in **Section 6.3.2**). From the outset, the project ecologists collaborated with the design team and provided ecological input to an iterative, constraints-led design process, applying the mitigation hierarchy with a focus on avoiding or reducing ecological effects wherever possible. In line with the Chartered Institute of Ecology and Environmental Management's (CIEEM) *'Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine'* (2018[1]), this approach embedded mitigation by avoidance early in the design stage, prior to detailed impact assessment, as further outlined in **Chapter 3** and **Section 6.6.1**.

This chapter is supported by the following technical ecological appendices:

- **Appendix 6-1: Statement of Competency**
- **Appendix 6-2: Existing Ecological Records**
- **Appendix 6-3: Terrestrial Ecology Baseline Report**
- **Appendix 6-4: Bat Survey Results Report – 2024 & 2026 Active Bat Season**
- **Appendix 6-5: Aquatic Ecology Baseline Report**
- **Appendix 6-6: Habitat Management Plan (HMP)**
- **Appendix 6-7: Triturus Environmental Ltd. – Aquatic Ecology Baseline Report 2026**
- **Appendix 6-8: Bryophyte Survey Report**

6.2.2 CONSULTATION

As part of the assessment, consultation with statutory consultees and relevant stakeholders was undertaken. For biodiversity, these included National Parks and Wildlife Service (NPWS) and Inland Fisheries Ireland (IFI). **Table 6-2** summarises the observations raised during the stakeholder consultations including the topics discussed and outcomes. See **Appendix 1-2** for copies of consultation communications.

[1] The CIEEM guidance published in 2018 was updated to version 1.2 in September 2024. However, the guidance document specifies that it should be cited as CIEEM (2018). For the avoidance of doubt, any reference to "CIEEM Guidelines (2018)" in this Chapter is to version 1.3 from 2024.

Table 6-2: Consultation conducted to inform the proposed project

Consultee	Response Details
An Coimisiún Pleanála (ACP) Pre-Application Consultation	Pre-application meetings were held with ACP on 26 May, 27 July and 31 August 2026. Consultation informed the scope of terrestrial and aquatic ecology assessments, including habitat loss assessment, aquatic ecology, and the development of robust mitigation, monitoring, habitat management and European Site protection measures. The ecological surveys and assessment presented in this chapter were updated having regard to the recommendations raised during consultation.
NPWS Development Applications Unit (DAU)	A meeting was held with the DAU on 19 August 2026. Consultation informed the assessment of Annex I habitats and designated sites, including habitat significance evaluation, mitigation design, and habitat offsetting proposals. The ecological surveys and assessment of Annex I habitats and designated sites were updated having regard to the recommendations raised during consultation with NPWS.

6.3 ASSESSMENT METHODOLOGY

6.3.1 RELEVANT LEGISLATION AND GUIDANCE

6.3.1.1 Legislation

It should be noted that any references to legislation include any amendments. The following European legislation is relevant to the proposed project in the context of this chapter:

- EIA Directive 2011/92/EU as amended by Directive 2014/52/EU
- Renewable Energy Directive (RED III, EU Directive 2023/2413)
- EU Habitats Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora):
- EU Nature Restoration Law - Regulation (EU) 2024/1991:
- Water Framework Directive (WFD) (EU Directive 2000/60/EC):

The following national (Irish) legislation is relevant to the proposed project:

- European Communities (Birds and Natural Habitats) Regulations 2011- 2021
- The European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374 of 2024)
- The Wildlife Act 1976 (as amended) (the Wildlife Acts)
- The Flora (Protection) Order, 2022 (S.I. No. 235 of 2022)
- European Communities (Quality of Salmonid Waters) Regulations 1988 (S.I. No. 293 of 1988)
- European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003) and (Amendment) Regulations 2022 (S.I. No. 166 of 2022).
- European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272/2009) (as amended)
- European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010)
- Both the Habitats and Birds Directives have been transposed into Irish law by Part XAB of the Planning and Development Acts 2000 (as amended) (from a land use planning perspective)

6.3.1.2 Plans and Policies

The following plans, and their policies relevant to biodiversity, were considered in this chapter and the assessment of effects on terrestrial ecology and biodiversity occurring within the proposed project area:

- Mayo County Council (MCC) (2022), *'Mayo County Development Plan 2022-2028'* (hereafter referred to as the "CDP");
- MCC (2026), *'Draft Mayo Biodiversity Action Plan 2026-2031'*;
- Galway County Council (GCC) (2025), *'Galway County Heritage and Biodiversity Plan 2024-2030'*;
- Department of Housing, Local Government and Heritage (DHLGH) (2024), *'National Biodiversity Action Plan 2023-2030'*;
- National Biodiversity Data Centre (2021), *'All-Ireland Pollinator Plan 2021-2025'*;
- NPWS (2008), *'All-Ireland Species Action Plan for Bats'*;
- NPWS and VWT (2022), 'Lesser Horseshoe Bat Species Action Plan 2022 – 2026'; and
- DHLGH (2024), *'Water Action Plan 2024: A River Basin Management Plan for Ireland'*.

6.3.1.3 Guidelines

This assessment has been prepared in accordance with the CIEEM Guidelines (2018), which is the primary resource used by members of CIEEM.

Further input, where relevant, was provided from the following guidance and information documents:

- Environmental Protection Agency EPA (2022) *Guidelines on the Information to be Contained in Environmental Impact Assessment Report*.
- European Commission (2017) *Environmental Impact Assessment of projects. Guidance on the preparation of the Environmental Impact Assessment Report*. (Directive 2011/92/EU as amended).
- National Roads Authority (NRA) (now Transport Infrastructure Ireland (TII)) (2005a) *Guidance for the Treatment of Badgers prior to the Construction of National Road Schemes* (TII Publication no. CC-ENV-01103);
- NRA (2006) *Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes* (TII Publication no. CC-ENV-01104).
- NRA (2009) *Guidelines for the Assessment of Ecological Impacts of National Road Schemes* (Rev 2) (TII Publication no. PE-ENV-01112).
- NRA (2008a) *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (Rev 2) (TII Publication no. PE-ENV-01113).
- NRA (2008b) *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (TII Publication no. PE-ENV-01116).
- TII (2020a). *The Management of Invasive Alien Plant Species on National Roads – Standard* (TII Publication no. GE-ENV-01104).
- TII (2020b). *The Management of Invasive Alien Plant Species on National Roads – Technical Guidance* (TII Publication no. GE-ENV-01105).
- Northern Ireland Environment Agency (NIEA) (2011). *Otters and Development*.
- Fossitt (2000) *A Guide to Habitats in Ireland. Heritage Council, Kilkenny*.
- Smith *et al*. (2011) *Best Practice Guidance for Habitat Survey and Mapping in Ireland*.
- Rodrigues *et al*. (2015): *Guidelines for consideration of bats in Wind Farm projects – Revision 2014.* EUROBATS Publication Series No. 6. UNEP/EUROBATS Secretariat, Bonn, Germany, 133 pp.
- Marnell *et al*. (2022) *Bat Mitigation Guidelines for Ireland. V2.* Irish Wildlife Manuals, No. 134. NPWS, DHLGH. Dublin, Ireland.
- Hinds, J. and Davidson Watts, I. (2022) *Tree Roosting Bats: Understanding Dynamic Roosting Behaviour.* Bat Conservation Trust (BCT).
- Gammell *et al*. (2021) *White-clawed Crayfish Austropotamobius pallipes survey in designated SACs in 2017*. Irish Wildlife Manuals, No. 131. NPWS, DHLGH, Ireland.
- Peay (2003) *Monitoring the White-clawed Crayfish Austropotamobius pallipes.* Conserving Natura 2000 Rivers Monitoring Series No. 1, English Nature, Peterborough.
- JNCC (2015) *Common Standards Monitoring Guidance for Freshwater Fauna (2015).* Joint Nature Conservation Committee, Peterborough.
- Hendry & Cragg-Hine (1997) R*estoration of Riverine Salmonid Habitats – A Guidance Manual.* Fisheries Technical Manual 4.
- Anon (2004) *Margaritifera margaritifera. Stage 1 and Stage 2 Survey Guidelines*. Irish Wildlife Manuals, No. 12. NPWS, Department of Environment, Heritage and Local Government, Dublin.
- Wilson, S. and Fernández, F. (2013). *National survey of limestone pavement and associated habitats in Ireland*. Irish Wildlife Manuals, No. 73. NPWS, Department of Arts, Heritage and the Gaeltacht, Ireland.

- Institute of Environmental Management and Assessment (IEMA) (now Institute of Sustainability and Environmental Professionals (ISEP)) (2024). *Impact Assessment Guidelines: Implementing the Mitigation Hierarchy from Concept to Construction.*
- Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland (NPWS, 2021);
- The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments, Unpublished NPWS report (NPWS, 2025; 2019);
- The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments, Unpublished NPWS report (NPWS, 2025; 2019).

A full list of references is provided in **Section 6.11**.

6.3.1.4 Information Sources

The following sources of information have informed the EcIA:

- NBDC Map Viewer and Datasets[2]
- EPA Map Viewer and Datasets[3]
- NPWS Map Viewer[4]
- NPWS Site Synopses[5]
- EPA Catchments Database[6]
- Irish Vegetation Classification[7]
- Invasive Species Ireland[8]
- Bat Conservation Ireland (BCIreland) Data Request
- Geological Survey of Ireland (GSI) online mapping[9]
- IFI - WFD Rivers Fish Ecological Status 2008-2022[10]
- NPWS Irish Wildlife Manuals[11] and Red Lists[12]
- Botanical Society of Britain and Ireland (BSBI)[13]
- Outline project Description

6.3.2 Study Area

6.3.2.1 Identifying Ecological Features within the Zone of Influence

Information obtained during the desk study and field surveys identifies ecological receptors that have the potential to be affected by the proposed project and as such, occur within the ZoI as described in CIEEM (2018):

> *"The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities."*

[2] NBDC Map Viewer and Datasets. Available at: https://www.maps.biodiversityireland.ie/
[3] EPA Map Viewer and Datasets. Available at: https://gis.epa.ie/EPAMaps/
[4] NPWS Map Viewer: https://experience.arcgis.com/experience/edf34d92e28040fd87d3d14f55d8d95f
[5] NPWS Site Synopses. Available at: https://www.npws.ie/protected-sites
[6] EPA Catchments Database. Available at: https://www.catchments.ie/data/
[7] Irish Vegetation Classification. Available at: https://biodiversityireland.ie/projects/ivc-classification-explorer/
[8] Invasive Species Ireland. Available at: http://www.invasivespeciesireland.com/
[9] GSI online mapping. Available at: https://dcenr.maps.arcgis.com/apps/MapSeries/
[10] IFI. WFD Rivers Fish Ecological Status 2008-2022. Available at: https://data.gov.ie/dataset/water-framework-directive-rivers-fish-ecological-status-2008-20221
[11] NPWS Irish Wildlife Manuals. Available at: https://www.npws.ie/publications/irish-wildlife-manuals
[12] NPWS Red Lists. Available at: https://www.npws.ie/publications/red-lists
[13] BSBI Taxon list of a grid square. Available at: https://database.bsbi.org/reports/sitetaxa.php

The ZoI depends on the type of development taking place, its likely impacts and the presence of ecological connections that enable such impacts to affect sensitive ecological features. In identifying such connections, the assessment follows the Source-Pathway-Receptor (S-P-R) model, in line with the Office of the Planning Regulator (OPR) Practice Notes PN01 (2021a) and PN02 (2021b). The ZoI may extend a great distance (several kilometres) beyond the boundaries of the proposed project, due to the presence of ecological connections with an ecological feature of interest. Similarly, ecological features that have no ecological connection with the proposed project are not within its ZoI, regardless of their proximity to the proposed project, as no pathway for effects exists.

The ZoI will vary for different ecological features depending on their sensitivity to an environmental change. It may therefore be appropriate to identify different zones for different features. The features affected could include habitats, species, and ecosystems and the processes on which they depend.

All ecological and/or hydrological connections which provide pathways for impacts between the proposed project and ecological features in the surrounding area are identified and described in the ecological baseline (refer to **Section 6.4**).

6.3.2.2 Defining the Study Area

The study area was defined as all lands made available for the Rooaunalaghta Green Energy project (see **Figure 6-1**). This included the proposed wind farm site, the Grid Connection Route (GCR), the proposed 110 kV offsite substation and all associated auxiliary works. The study area also included locations outside the proposed project boundary where additional surveys were required to establish the ecological baseline for key ecological features. These areas reflected the ZoI for relevant ecological receptors. The study area also incorporated the Turbine Delivery Route (TDR), with surveys undertaken at locations where potential pinch points were identified.

Extensions of the ZoI beyond the main ecological study area were determined by ecological features with broader functional connectivity, as well as aquatic sensitivities downstream of the proposed project where existing hydrological linkages required consideration.

Table 6-3 provides an overview of the study areas applied for each ecological receptor in accordance with the relevant guidance.

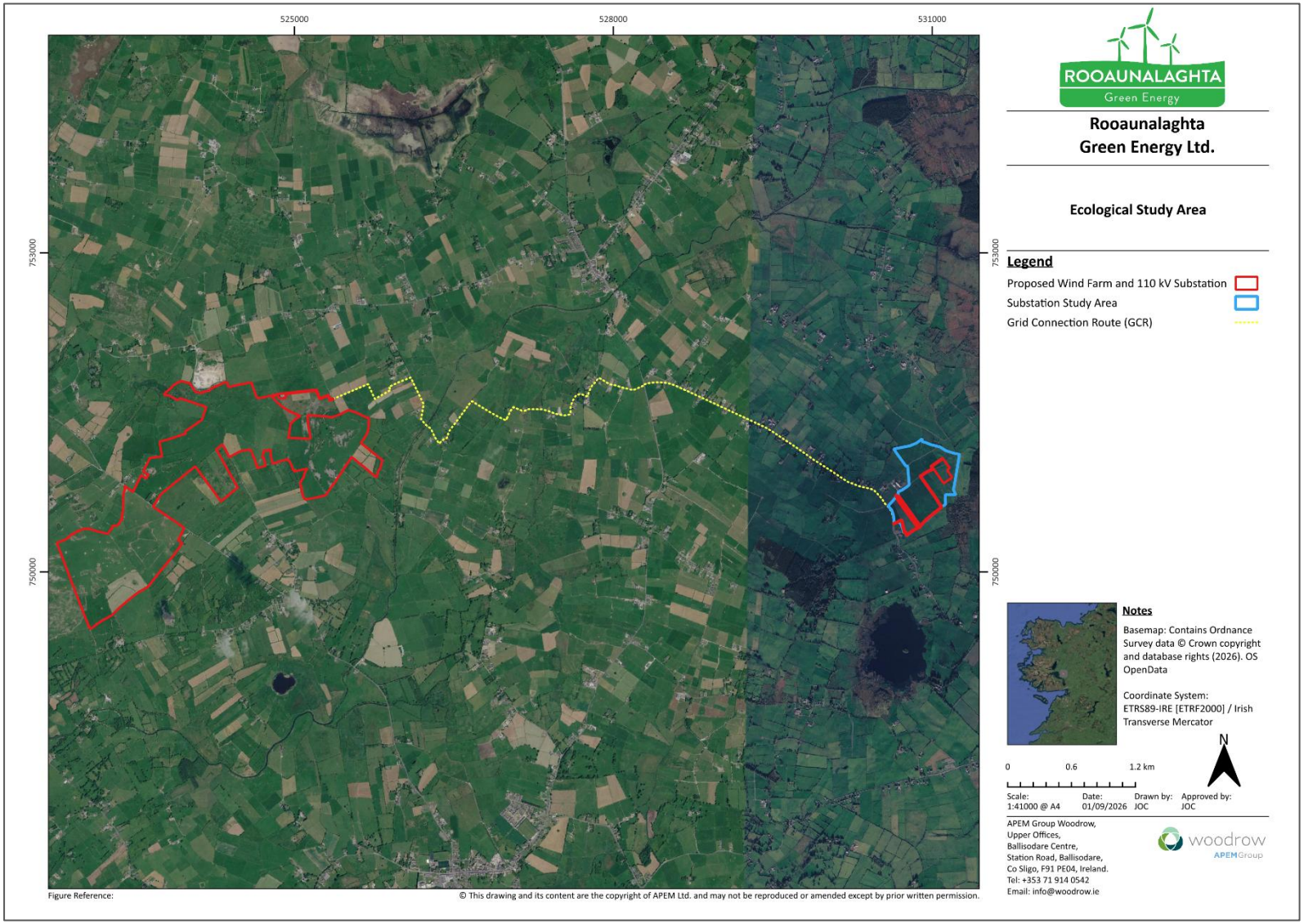


Figure 6-1: Study area, showing the proposed wind farm site, 110 kV substation and GCR

Table 6-3: Summary of the study areas for main ecological receptors

Receptor	Study Area Definition	Rationale	References
Habitats & Flora	Lands within the proposed project boundary, including the GCR which extends beyond the proposed wind farm site, and locations along the TDR where potential pinch point were identified.	Habitats potentially affected by the proposed project, including all lands surveyed to identify habitat constraints and to inform avoidance during the design stage.	Fossitt, 2000; Wilson and Fernandez, 2013; Perrin *et al.*, 2014; Martin *et al.*, 2018; Perrin, 2024.
Badger	Lands within the proposed project boundary and within 50 m of all proposed site infrastructure, extending to 150 m where piling or blasting is proposed.	150 m is the zone of disturbance for badger setts arising from construction activities relating to piling or blasting.	Smal, 1995; NRA (2005a) and NRA (2008a)
Otter	Lands within the proposed project boundary and 150 m (minimum) upstream and downstream of all proposed site infrastructure as well as watercourse crossing points.	150 m is the zone of disturbance for holts arising from construction activities.	NRA (2006) and NRA (2008a)
Other mammals (pine marten, hedgehog, Irish hare, Irish stoat, pygmy shrew, and red squirrel)	Lands within the proposed project boundary, including suitable habitat within 250 m of all proposed site infrastructure in the case of pine marten.	All available and suitable lands surveyed for these wide-ranging and common species.	NRA (2008a); Marnell *et al.,* 2019
Herpetofauna (amphibians and common lizard)	Suitability surveys on lands within the proposed project boundary, including within 250 m of all proposed site infrastructure for breeding smooth newt.	All available land and features assessed for suitability to support amphibians and common lizard.	NRA (2008a); Edgar *et al.*, 2010; Meehan, 2013
Bats	The study area for bats was defined as up to 300 m from turbine locations; however, the ZoI for bat populations extends beyond this and has been assessed using species-specific Core Sustenance Zones (CSZs).	Defined in accordance with NatureScot guidance while adopting a precautionary approach.	EUROBATS (2014); NatureScot (2021); Collins (2023)

Receptor	Study Area Definition	Rationale	References
Aquatic Ecology	Viable watercourses downstream of the proposed project, as well as those intersected by the GCR.	Establish downstream ecological baseline conditions and identify aquatic receptors that may be indirectly affected by the proposed project.	Hendry & Cragg-Hine, 1997; Peay 2003; Maitland, 2003; JNCC, 2015; NRA (2008a); Gammell *et al.* 2021.

6.3.3 Desk Study

6.3.3.1 Existing Ecological Records

A desk study was undertaken between 28 and 30 April 2025 to collate existing ecological information for the proposed project and its surrounding area, with an update search undertaken on 14 August 2026 to consider potential updates on the records. Online datasets from the NBDC, NPWS, EPA IFI, and BSBI were reviewed (see **Section 6.3.1.4**). Records for protected and notable terrestrial species and habitats were obtained for the relevant 10-km grid squares (M24, M25, and M35) and 2-km grid squares (M25F, M24J, M25K and M25Q). Satellite imagery was also examined to support the identification of habitat types and to inform the scope of field surveys.

A review of bat records was completed using data from NBDC and BCIreland in early 2023 and September 2026. This included retrieval of bat species and known roost location records within a 10-km radius (M25) from BCIreland and NBDC records. Habitat suitability classed from very low to very high suitability was also analysed using habitat suitability data from NBDC. These datasets informed survey design and helped identify features requiring further assessment.

For aquatic ecology, a desk study was undertaken in early 2023, prior to completion of the aquatic field surveys. Satellite imagery and EPA mapping were assessed to identify watercourses, surface water pathways and potential hydrological linkages within the catchment. Information from NPWS and NBDC was reviewed to identify protected aquatic species and habitats in the surrounding area and to support the planning of field surveys. In addition, the most recent EPA water quality and ecological status datasets available at the time of writing were reviewed to provide context for the aquatic survey results and to identify longer-term trends within the receiving water environment.

While desk study records provide context, absence of records does not confirm absence of species; field survey data was used to verify site use.

6.3.3.2 Designated Sites

European Sites are considered within this chapter to establish the ecological baseline, identify ecological receptors and determine potential S-P-R linkages. The assessment of likely significant effects on European Sites, including effects on site integrity, is presented separately within the Appropriate Assessment (AA) Screening Report (APEM Group Woodrow, 2026a) and Natura Impact Statement (NIS) (APEM Group Woodrow, 2026b) prepared for the proposed project. This chapter focuses on ecological receptors and protected species relevant to the EIAR,

including Annex IV species, while cross-referring to the findings of the AA screening and NIS where relevant.

Designated sites are those of national and/or international nature conservation importance which are afforded protection as set out in this section. Special Areas of Conservation (SAC) are designated under the EU Habitats Directive. The legislation provides for the protection of certain habitats (listed in Annex I of the Directive) and/or species (listed in Annex II of the Directive) within SACs; these features are termed Qualifying Interests (QIs). Special Protection Areas (SPAs) are designated under the Birds Directive (2009/147/EEC). This allows for the protection of bird species in Annex I of the Directive, regularly occurring populations of migratory species, and important wetland habitats for birds, including within SPAs; these are referred to as the site's Special Conservation Interests (SCIs).

Natural Heritage Areas (NHAs) are designated under the Wildlife Acts to protect habitats, species or geology of national importance. Many of the NHAs in Ireland overlap with European sites. Although numerous NHA designations are not fully in force under this legislation (referred to in the meantime as 'proposed NHAs' or pNHAs), pNHAs are protected on a non-statutory basis by local authorities who have regard for them in planning policies (e.g., County Development Plans) and are sites of significance for wildlife and habitats.

An arbitrary radius of 15 km was selected within which the initial desktop search of designated sites was completed, informed by DoEHLG (2010) guidance which states:

> *"for projects, the distance could be much less than 15 km, and in some cases less than 100 m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects."*

The potential for connectivity with the proposed project followed the Source-Pathway-Receptor (S-P-R) model, in line with the Office of the Planning Regulator (OPR) Practice Notes PN01 (2021a) and PN02 (2021b), utilising publicly available datasets and professional judgement. Shapefiles of designated areas in the Republic of Ireland, including SACs, SPAs, NHAs and pNHAs were downloaded from the NPWS website and imported onto Geographical Information Systems (GIS).

Connectivity to a designated site may extend a significant distance, e.g., where there is hydrological connectivity to a designated site *via* a river network, or where a qualifying feature, such as mobile species, can range and travel over greater distances. Therefore, the ZoI depends on the individual ecological feature being considered. In this instance, no additional designated sites beyond 15 km were identified as being connected to the proposed project through relevant ecological or hydrological pathways.

Designated sites with potential connectivity to the proposed project from an ornithological standpoint (i.e., SPAs), where the ZoI can extend up to 20 km (SNH, 2016) are considered separately in **Chapter 7**.

6.3.4 Field Surveys

Field surveys were conducted across the relevant ecological study areas (see **Section 6.3.2**) that reflected the proposed wind farm site as it existed at the time of each survey. This boundary evolved alongside the proposed project design through an iterative, constraints-led process, with surveys helping to inform design refinements (e.g., the habitat constraints study). All

iterations of the proposed project were covered across the survey programme, ensuring full coverage of the current layout. Surveys were also undertaken at the proposed offsite substation location and along the GCR. In addition, Phase-1 style ecological surveys were completed at identified pinch points along the TDR where temporary works or habitat modification may be required to facilitate turbine component delivery.

Ecological surveys were undertaken between May 2023 and August 2026, which included update surveys that were completed to confirm baseline conditions. A summary of the survey types completed are provided in **Table 6-4**. Incidental observations of other species (e.g., North American mink *Neovison vison*) made during these surveys were also recorded.

Table 6-4: Overview of ecological surveys undertaken at the proposed project

Survey Type	Survey Dates	Surveyors
Habitats & Flora		
Fossitt 2000 Level 3 classification (habitat constraints study)	16-18 July 2024	MC, FM, EV
Annex I assessment along access track	30 August 2024	MC
Control building habitat mapping	14 April 2025	AW
Follow-up assessment of identified Annex I habitats	11 May 2025 23 July 2026	BK
Vegetation quadrat surveys	24 June-02 July 2025	EV
Bryophyte survey of selected stone wall sections (**Appendix 6-8**)	23 July 2026	RH (Nimbosa Ecology)
Mammals		
Walkover survey	07-10 April 2025	AW, BM
Trail camera surveys	10-29 April 2025 10 April-07 May 2025 29 April-08 May 2025	JOC, AW, BM, DMcA
Herpetofauna (amphibians and common lizard)		
Suitability assessment	07-11 April 2025	BM
Lepidoptera (butterflies)		
Walked transects	15 June 2026 25 June 2026 16 July 2026 12 August 2026	DL

Survey Type	Survey Dates	Surveyors
Bats		
Preliminary roost assessment (PRA)	24 January 2024	KOR, BM, PP
Winter roost inspections	24 January 2024	KOR, BM, PP
Roost surveys	03 April 2024 22 April 2024 29 May 2024 06 June 2024 14 April 2026 14 June 2026	KOR, BM, PP, DMcA
Nighttime bat walkover (NBW) surveys	22 April 2024	KOR, BM, PP
Static Acoustic Monitoring	02-22 April 2024 06-25 June 2024 02-17 September 2024	KOR, BM, PP, DMcA
Update to roost assessment	14 April 2026	DMcA, PP
Aquatic Ecology		
Field walkover	15 May 2023	FB
Water quality, macroinvertebrate (Q-value) and fish habitat surveys	23 May 2023	AMcF, GK
Crayfish surveys	15 August 2023	AMcF, JOC
Freshwater pearl mussel Stage 1	24 April 2024	AMcF, JK
Update walkover resurvey	26 November 2025	AMcF, JOC
Updated baseline aquatic surveys including electrofishing and eDNA	20-21 August 2026	Triturus Environmental Ltd.
GCR, TDR & Substation		
GCR aquatic survey	08 April 2025	AMcF, JOC
GCR – Phase 1 style survey	14 April 2025	AW
Substation – Phase 1 style survey	23 April 2025	DMcA
TDR – Phase 1 style survey	20 May 2026	AA

6.3.4.1 Habitats and Flora

The scope of habitat surveys within the Study area were informed by a desk study employing satellite imagery to ascertain broad habitat types. The study area was subsequently walked, ecological features of interest were noted, and habitat classifications followed and were assigned to Level 3 of Heritage Council's A Guide to Habitats in Ireland (Fossitt, 2000) and according to Best Practice Guidance for Habitat Survey and Mapping (Smith *et al.*, 2011). The timing of surveys (refer to **Table 6-4)** was within the optimum period for habitat surveys, i.e., April to September (Smith *et al.*, 2011).

The location of each habitat type was noted and mapped and detailed notes on vegetation assemblages were made in areas of greater species diversity and these are provided in detail in **Appendix 6-3**. Where appropriate, habitat types recorded in the study area were then further cross-referenced with EU Habitats Directive Annex I habitats to see if there is any affiliation with Annex I habitats.

During the habitat surveys, consideration was given to identifying important or protected habitats and habitats that could be used by protected species.

Annex I Habitats

Annex I refers to the Habitats Directive list of habitat types that are considered threatened in the EU. Detailed Annex I habitat assessments were undertaken on areas identified during the Fossitt survey of areas identified as exposed rock, calcareous heath, and grassland during August 2024 and May 2025. The Annex I habitat assessments followed the approach outlined in Wilson and Fernandez (2013) for limestone pavement, Martin *et al.* (2018) for Annex I grasslands and Perrin *et al.* (2014) for upland habitats including heath. The proposed locations of turbines (at the time of the fieldwork) were survey using the Irish Vegetation Classification (IVC) (Perrin, 2024) to collect and analyse quadrat data.

Protected Flora

Botanical surveys within the study area employed a "look-see" methodology (NRA, 2008a) to identify potential habitats for protected flora species. This approach prioritized the search for species listed in:

- The plant species listed in Annex II, IV and V of the EU Habitat Directive;
- Flora Protection Order species (FPO) (2022); and
- Flora species listed in The Irish Red Data Book (Wyse Jackson *et al.*, 2016; Hodgetts and Lockhart, 2025).

Concurrent with habitat surveys, a targeted search was conducted within the study area for the presence of rare or protected flora species. Species listed on the FPO are legally protected under the Wildlife Acts. A bryophyte survey was also conducted along sections of stone wall proposed for removal to check for protected bryophyte species.

Non-Native Invasive Species

The presence of any non-native invasive species was recorded during all habitat surveys conducted within the study area, including the GCR and TDR, with particular attention paid to species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011, as amended). Surveys were based on the best practice guidance methodology (NRA, 2008a).

6.3.4.2 Terrestrial Mammals

Surveys targeted species protected under the Wildlife Acts, species listed in Annex II, Annex IV and Annex V of the Habitats Directive, and Irish Red-listed species. Particular focus was given to detecting badger (*Meles meles*) and their setts, as well as otter (*Lutra lutra*) and their resting places including couches, layups or holts. Based on habitats and species recorded by the NBDC within the study area, surveyors also searched for evidence of other mammal species likely to occur, including pine marten (*Martes martes*), European hedgehog (*Erinaceus europaeus*), Irish hare (*Lepus timidus hibernicus*), Irish stoat (*Mustela erminea hibernica*), pygmy shrew (*Sorex minutus*) and red squirrel (*Sciurus vulgaris*). Trail cameras were deployed at suitable mammal features to support detection and verification of species presence, with details on camera locations provided in **Appendix 6-3.**

Badger

Badger surveys were undertaken in line with CIEEM *Competencies for Species Survey: Badger* (2013) and NRA (2005a). All suitable habitats within the study area were surveyed, including an area extending 50 m from the proposed site infrastructure, or 150 m where piling or blasting are proposed. Hedgerows, scrub and other features were assessed for signs of activity. Sett locations were recorded using ArcGIS Survey123 with geo-referenced photographs, and sett entrances were measured where possible. Activity status (active, inactive or uncertain) was assigned based on established field criteria. Additional signs including hairs, latrines, snuffle holes, footprints and trails were also documented.

Otter

All surface water features and watercourses within the study area were surveyed, including the Black River (EPA Code: 30B02), which flows along the eastern boundary of the proposed wind farm site. This included a linear section of the Black River extending 150 m upstream and downstream of the proposed project. Riparian habitats up to 50 m from the watercourse edge were also surveyed (where accessible) to identify potential holt locations. Surveys involved systematic searches for otter signs such as spraints, anal jelly, couches, slides and footprints, with trails followed where present to assess whether they led to potential holt locations.

Additional otter surveys were undertaken by Triturus Environmental Ltd. in August 2026 (see **Appendix 6-7**) as part of the updated aquatic ecology baseline, comprising searches for otter field signs within and adjacent to aquatic survey locations on the Black River (EPA Code: 30B02), Rooaunalaghta Stream (EPA Code: 30R03), Cloghmoyne Stream (EPA Code: 30C80) and Shancloon Stream (EPA Code: 30S32).

Other Mammals

Mammal surveys also recorded any observations or evidence of other mammals of conservation concern that may be using the study area (e.g., pine marten, hedgehog, Irish hare, Irish stoat, pygmy shrew, and red squirrel).

6.3.4.3 Amphibians and Reptile Suitability Surveys

Amphibian and reptile suitability surveys were undertaken alongside mammal surveys in April 2025. Only three species of herpetofauna have potential to occur within the study area: common frog (*Rana temporaria*), smooth newt (*Lissotriton vulgaris*) and common lizard (*Zootoca vivipara*). Initial walkover surveys did not identify any waterbodies of sufficient permanence or quality to support a breeding smooth newt population; however, targeted habitat suitability assessments were undertaken to rule out the potential for the species to occur within the proposed project. Habitat suitability for smooth newt was assessed using criteria outlined in Meehan (2013) (see **Table 6-5**).

In addition, eDNA surveys were undertaken by Triturus Environmental Ltd. in August 2026 (see **Appendix 6-7**) at selected lacustrine sites to supplement the amphibian baseline.

Common lizard suitability was assessed concurrently, informed by NRA (2008a) criteria in addition to habitat requirements described by Edgar *et al.* (2010). While the study area is largely improved pasture, areas of limestone and rock piles provide some potential for basking and refuge, and NBDC records indicate the species occurs within 2 km of the proposed project. Accordingly, these areas were assessed to determine the overall suitability for common lizard.

Table 6-5: Conditions needed for suitable breeding newt habitat[14]

Criteria	Condition
Water-flow	Very slow-moving or still water (essential).
Vegetation	Some aquatic vegetation present.
Fish	Very few or no fish present.
Age	Sites over five years of age.
Size	Sites of a manageable size (essential - no lakes). Typically, small to medium ponds.

Table 6-6: Habitat features to which common lizard require access[15]

Feature	Description
Basking Sites	South-facing slopes and hedge banks or areas with micro-topographic variation, and with structurally diverse mosaics of vegetation and exposed substrates.
Refuges	Places of shelter including patches of dense vegetation, rock and soil fissures, log piles and mammal burrows.
Foraging areas	Features with a high concentration of prey.
Hibernacula	Free-draining structures, usually with a sunny aspect, including a similar range of features as are used as refuges (above).

[14] Meehan, S.T. (2013) *National Newt Survey 2013 Report*. Irish Wildlife Trust, Dublin.
[15] Adapted from NRA (2008a).

6.3.4.4 Invertebrates

Lepidoptera (butterflies)

Habitat surveys of the proposed wind farm site were undertaken on various dates between July 2024 and July 2025 (see **Table 6-4**). Devil's-bit scabious, the larval food plant of marsh fritillary (*Euphydryas aurinia*), was recorded locally within a mosaic habitat of HD1 dense bracken/GS1 dry calcareous and neutral grassland/HH2 dry calcareous heath (see **Section 6.4.4.1**).

However, the habitat was characterised by extensive bracken and dwarf shrub cover (c. 25%), with evidence of grazing pressure. On this basis and given the localised occurrence of devil's-bit scabious, the area was not considered likely to support significant breeding habitat for marsh fritillary. Consequently, a dedicated habitat suitability assessment and larval web survey were not considered necessary.

Desk study records identified a number of threatened butterfly species within the two 10-km squares encompassing the proposed project (see **Appendix 6-2**). Consequently, targeted butterfly surveys were undertaken to determine the use of potentially suitable habitats that may be affected by the proposed project.

Butterfly transects were undertaken on 15 and 25 June, 16 July and 12 August 2026, following a methodology adapted from the Irish Butterfly Monitoring Scheme (NBDC, 2026a). Surveys focused on habitats considered suitable for butterflies and potentially affected by the proposed project, principally the HD1/GS1/HH2 habitat mosaic surrounding the proposed onsite control building and areas of GS1 mosaic habitat in the vicinity of T5.

Surveys involved walking fixed transects of approximately 1 km (see **Appendix 6-3**) and recording all butterflies observed, together with their abundance, within 2.5 m on either side of the transect. Records were collected as point data. Surveys were typically completed between 11:00 and 17:00 under suitable weather conditions, and when temperatures exceeded 13°C.

6.3.4.5 Bats

Bat Habitat and Potential Roost Assessment

For full descriptions of survey methods, including full methodology, survey dates and locations, and calibration and testing procedures are set out in the **Appendix 6-4**.

NatureScot et al (2021) recommends to further investigate features that could support maternity roosts and significant hibernation and/or swarming sites within 200 m plus rotor radius of the proposed project.

As a precaution, surveyors conducted PRA surveys and ground-level tree assessment surveys within a 300 m radius of the turbine location on 24 January 2024, and 14 April 2026 to identify potential roost features (PRFs) and areas of potential foraging and commuting importance. The survey extents described above represent the core study area for bats; Identification of PRFs informed the assessment of potential disturbance and collision risk impacts on roosting bats.

Surveyors applied the assessment criteria set out in Collins (2023), which provide guidance for assessing the potential suitability of habitat features as bat roosts and as features used by bats for foraging and commuting, in addition to classifying the suitability of PRFs in individual trees.

Roost Emergence Surveys

Dusk emergence surveys were completed on PRFs identified within the proposed project from April to June 2024, with additional dusk emergence surveys undertaken on 14 April and 14 June 2026. Emergence surveys followed the methodology set out in BCT guidance and are considered sufficient to identify roost presence within the study area.

Winter Roost Inspections

A search area of 300 m from proposed turbine locations was applied for hibernation inspections, in line with the precautionary approach undertaken for the PRA surveys based on NatureScot *et al.* (2021). The survey was conducted on 24 January 2024 within the timeframe and conditions in which bats would likely be utilising hibernation roosts. Surveys involved searching for and collecting bat faecal samples, if present, to be sent for DNA analysis, and closer examination of roost potential, with the primary use of an endoscope to inspect classic and non-classic hibernation sites.

Bat Activity Transects/Nighttime Bat Walkover Surveys

A NBW survey was completed on 22 April 2024. NBW surveys were used to supplement static detector data by providing contextual information on flight paths and behavioural use of the proposed wind farm site. NBW surveys were limited to a single event and are therefore considered supplementary to static detector data rather than fully characterising flight behaviour across seasons.

Static Bat Detector Surveys

The locations of the static detector deployment are shown in **Figure 2** of **Appendix 6-4**.

Static bat activity surveys were undertaken using static detectors deployed across the proposed wind farm site during spring, summer and autumn, in accordance with NatureScot *et al.* (2021). In accordance with Collins (2023), bat activity levels were categorised using clearly defined quantitative thresholds. For the purposes of this assessment, activity was classified as low (<5 passes/night), moderate (5–20 passes/night) or high (>20 passes/night), following NatureScot *et al.* (2021). These activity categories were used to inform the evaluation of bat foraging and commuting activity and to support the subsequent assessment of impact significance.

Due to relocation of T13 during the design phase in response to emerging ecological constraints, D.13 was located approximately 190 m west of the final turbine position. D.13 was installed adjacent to a treeline and woodland edge feature, whereas the final turbine location occurs within more open agricultural land. However, the detector was retained within the same local landscape unit and was considered representative of bat activity associated with the turbine location and surrounding habitats. Recorded activity levels at D.13 were therefore considered appropriate for assessing collision risk at T13 on a precautionary basis.

In addition, D.06, D.08 and D.09 were located approximately 340 m, 355 m and 370 m from T6, T8 and T9, respectively. While these distances exceed the survey radius recommended by NatureScot et al. (2021), the detector locations were selected to characterise bat activity within the habitats most likely to support bat foraging and commuting activity in the vicinity of the corresponding turbines. The areas between the detector locations and turbine positions comprise broadly similar agricultural habitats, field boundary features and landscape context. Consequently, the detector locations are considered representative of the bat activity likely to

occur at the corresponding turbine locations and provide a robust basis for collision risk assessment.

Despite variations in detector placement, the overall survey design provided comprehensive spatial coverage of the proposed wind farm site and enabled assessment of activity patterns across all turbine locations. Where detector locations were not coincident with turbine positions, the assessment adopted a precautionary approach by using recorded activity levels from the nearest representative survey location.

Calibration and Testing of Recording Equipment

All bat recording equipment used during the survey programme was calibrated and tested in accordance with NatureScot *et al.* (2021) guidance and Woodrow's standard operating procedures. This included pre-deployment configuration checks and microphone sensitivity testing to ensure data reliability and traceability.

Data Analysis

Analysis of bat sound recordings was undertaken using industry-standard software appropriate to each detector type, with species identification supported by established reference material (e.g., Russ 2012; Middleton *et al.* 2014). All auto-identifications were manually reviewed by Woodrow ecologists to ensure accuracy, and activity levels were assessed using criteria adapted from Mathews *et al.* (2016).

The processed activity data was then used to assign receptor value to bat foraging/commuting habitat and populations using the NatureScot *et al.* (2021) scoring approach, prior to applying the project risk assessment.

Bat Collision Risk Assessment Methodology (NatureScot Staged Approach)

Since there are no specific collision-risk guidelines for the Republic of Ireland, the assessment of collision risk for bat species to wind turbines uses NatureScot *et al.* (2021) guidance. Consideration is also given to NIEA's *Guidance on Bat Surveys, Assessment & Mitigation for Onshore Wind Turbine Developments* (2021) for assessment criteria within an Irish context. This is particularly relevant for Leisler's bat which is a relatively abundant species in Ireland but rare elsewhere within its distribution. Therefore, the Irish population is considered to be of international importance.

Bat collision risk was assessed using the staged approach set out in NatureScot *et al.* (2021). This approach comprises two distinct steps:

- Stage 1 – Habitat Risk and Project Size Screening, which is a precautionary screening tool, and
- Stage 2 – Collision Risk Assessment, which combines the Stage 1 output with site-specific bat activity data to derive turbine-specific collision risk.

Stage 1 habitat risk screening does not represent a detailed assessment of habitat quality or collision risk. Instead, it is used to determine the appropriate level of precaution to be applied, based on factors such as the presence of roost features, potential for bat use of the proposed wind farm site, landscape connectivity and project size.

Although baseline surveys indicate that the proposed wind farm site is characterised by generally low habitat quality and weak linear connectivity, confirmed and potential roost features were identified within the proposed wind farm site. On this basis, and in accordance

with NatureScot *et al.* (2021), a precautionary Moderate habitat risk category was applied at Stage 1 to ensure that collision risk was not underestimated.

Stage 2 collision risk assessment then uses the Stage 1 screening output together with recorded bat activity levels from static detector surveys to calculate turbine-specific collision risk values, which form the basis of the operational collision risk assessment.

To provide ecological context for the assessment, **Table 6-7** summarises the conservation status and relative rarity of bat species in Ireland, based on the most recent population estimates.

Table 6-7: Conservation status of bat species in Ireland

Species	Irish Population Estimate	Rarity in Ireland	Irish Conservation Status
Daubenton's bat *Myotis daubentonii*	81,000-103,000 *(Roche et al., 2014)*	Rarer in Ireland; frequently recorded and widely distributed	Least concern
Whiskered bat *Myotis mystacinus*	Unknown *(Roche et al., 2014)*	Rarest in Ireland; scarce records and very localised distribution	Least concern
Natterer's bat *Myotis nattereri*	Unknown *(Roche et al., 2014)*	Rarer in Ireland; scarce records but widely distributed	Least concern
Leisler's bat *Nyctalus leisleri*	70,000-130,000 *(Roche et al., 2014)*	Rarer in Ireland; frequently recorded and widely distributed	Least concern
Nathusius 'pipistrelle *Pipistrellus nathusii*	10,000-18,000 *(Roche et al., 2014)*	Rarer in Ireland; scarce records and restricted distribution	Least concern
Common pipistrelle *Pipistrellus pipistrellus*	1-2 million *(Roche et al., 2014)*	Common in Ireland; frequently recorded and widely distributed	Least concern
Soprano pipistrelle *Pipistrellus pygmaeus*	0.54-1.2 million *(Roche et al., 2014)*	Common in Ireland; frequently recorded and widely distributed	Least concern
Brown long-eared bat *Plecotus auritus*	64,000-115,000 *(Roche et al., 2014)*	Rarer in Ireland; frequently recorded and widely distributed	Least concern
Lesser horseshoe bat* *Rhinolophus hipposideros*	13,000 *(NPWS, 2019)*	Rarer in Ireland; frequently recorded within a restricted western distribution	Least concern
*Lesser horseshoe bat does not occur in Northern Ireland and the known range is confined to six western counties in Ireland. The population estimate for lesser horseshoe bat is based on a count conducted over 2016-2017, which recorded 12,791 individuals (NPWS and VWT, 2022).			

Certain species of bat are more susceptible to impacts from wind farm developments due to their specific ecology and behaviours. **Table 6-8** summarises the relative collision risk to individual bat species from wind turbines. To support the interpretation of collision vulnerability and the overall sensitivity of bat populations within the study area, **Table 6-9** introduces the scoring system used to evaluate the importance of foraging areas and commuting routes for bats. **Table 6-10** then presents how these scores are interpreted to determine the ecological value of bat sites at different geographic scales. These risk classifications were applied to inform the assessment of collision risk for each species within the proposed project.

Table 6-8: Level of collision risk to individual bats from wind turbines[16] (NatureScot *et al.*, 2021)

Collision risk	
Low risk	High risk
Myotis species	Leisler's bat
Brown long-eared bat	Nathusius' pipistrelle
Lesser horseshoe bat	Common pipistrelle
	Soprano pipistrelle

[16] Sources: Adapted from NatureScot *et al.*, 2021

Table 6-9: Scoring system for valuing sites and foraging areas/commuting routes for bats

Assessment criterion	Description	Score
Species status in Ireland	Common species	2
	Rarer species	5
	Rarest species	20
Bat activity (number of bats recorded)	Individual bats	1
	Small number	3
	Large number or close to protected areas for bats	5
Roosts/ potential roosts nearby	None	1
	Moderate number or not known	4
	Close to or within SAC designated for bats	20
Foraging habitat and commuting features	Site without established vegetation (e.g., urban) and absence of linear features	1
	Suburban areas or intensive agriculture; unvegetated fences and large field sizes	2
	Isolated woodland or less intensive agriculture; walls with gaps, flailed or isolated hedgerows, moderate field sizes	3
	Large, connected woodland blocks or mixed agriculture; well-grown and well-connected hedgerows, small field sizes	4
	Mosaic of pasture, woodland and wetland; complex network of mature hedgerows and rivers/streams	5

Table 6-10: Interpretation of bat site importance based on total score

Importance level	Total score
International	>50
National	41-50
Regional	31-40
County	21-30
Local	11-20
Not important	1-10

Valuation of Bat Populations (NatureScot Scoring Method)

Bat populations recorded within the Proposed project were assigned a nature conservation value using a structured scoring system based on the NatureScot guidance for assessing bats in relation to onshore wind developments (NatureScot *et al.*, 2021).

The scoring approach is based on the quality of foraging habitat and commuting features available within the Proposed project and combines information on habitat type, landscape structure, and the presence and complexity of linear features (e.g., hedgerows, treelines and woodland edges) to derive a relative value for bat foraging and commuting habitat.

For the purposes of this assessment, foraging habitat characteristics and the type and complexity of linear features were scored in accordance with the NatureScot *et al.* (2021) criteria. These habitat-based scores were then applied on a species-by-species basis, taking account of the bat species recorded during baseline surveys, to assign a relative conservation value to the bat populations present. The application of this scoring system, and the resulting conservation values assigned to individual species, are set out in **Table 6-22**.

Spatial Extent of Impacts on Bat Populations

The geographic extent of certain impacts from the proposed project can vary between bat species. This variation is due to the differences in foraging and roosting ecology. One of the most useful methods to examine the potential spatial extent of bat populations in a landscape, and therefore identify the potential impacts on populations, is to assess the CSZ of the species present. This method is particularly useful to assess the impacts around a roost location but also to identify potential impacts on offsite roost locations if known. The CSZ refers to the area around a roost within which habitat availability and quality will have a **significant** influence on the resilience and conservation status of the colony using the roost (BCT, 2016). The CSZ for each species found to be present on the proposed project during the baseline surveys is set out in **Table 6-11.**

Table 6-11: CSZ for each species found to be present on the proposed project[17]

Species	CSZ radius (km)
Brown long-eared bat	3*
Myotis Sp.	4
Common pipistrelle	2
Soprano pipistrelle	3
Nathusius's pipistrelle	3
Leisler's bat	3
Lesser horseshoe bat	2
* Poor confidence in zone size due to insufficient data. See **Section 6.5.2.5** for discussion on brown long-eared bat.	

6.3.4.6 Aquatic Ecology

For full descriptions of survey methods (including figures illustrating the location of survey locations), please refer to **Appendix 6-5**.

Aquatic surveys were conducted in August 2023 and April 2024 along the Black River (EPA Code: 30B02), as well as the Rooaunalaghta (EPA Code: 30R03) and Cloughmoyne streams (EPA Code: 30C80). There are no mapped surface-water features within the main proposed wind farm site, with the exception of minor drainage ditches. The majority of the proposed project is located within the Black (Shrule) sub-catchment (SC_010), which drains to the Black River. Smaller portions of the proposed project area also occur within the Clare (Galway) (SC_060) and Kilmaine (SC_010) sub-catchments. The Black River forms part of the wider Lough Corrib catchment and flows within the Lough Corrib SAC (Site Code: 000297).

Aquatic survey locations were informed by a desk-based assessment and an initial walkover survey undertaken in May 2023, which identified watercourses, habitat suitability and potential survey constraints within the study area. Survey sites were selected to characterise baseline ecological conditions within watercourses hydrologically connected to the proposed project.

The proposed project is situated in close proximity to tributaries which flow into the Black River and the Black River itself. Survey sites were therefore chosen close to the boundary or downstream of the proposed project. The following survey locations were selected (refer to **Figure 1** of **Appendix 6-5**)[18]:

- WQ01 is located on the Rooaunalaghta tributary, c. 200 m southeast of the proposed wind farm site.
- WQ02 is on the Black River c. 200 m downstream of the proposed wind farm site.
- FPM01 is on the Black River in between site WQ02 and WQ03, c. 400 m downstream from the Rooaunalaghta tributary confluence.

[17] CSZs are used to inform the spatial extent of impact assessment for bat populations and are not used to define survey boundaries.
[18] WQ refers to water quality and macroinvertebrate sampling point; WCC to white-clawed crayfish survey reach; FH to fish habitat survey and FPM to freshwater pearl mussel survey reach.

- WQ03, WCC01 and FH01 are on the Black River c. 1 km downstream of the Rooaunalaghta confluence at Moyne Bridge.
- WQ04 and WCC02 are on the Black River within the vicinity of the Cloughmoyne confluence, c. 1.2 km southwest of the proposed wind farm site.
- WQ05 and FH02 are on the Black River at the GCR crossing point c. 500 m upstream of the proposed wind farm site.
- WQ06 and FH03 are on the Shancloon Stream, c. 750 m downstream of the proposed 110 kV substation.

In addition to the aquatic surveys undertaken between 2023 and 2025, further aquatic ecology surveys were completed by Triturus Environmental Ltd. in August 2026 to update and validate the aquatic baseline for the proposed project. Surveys comprised fisheries assessment (electrofishing), fisheries habitat appraisal, white-clawed crayfish (*Austropotamobius pallipes*) surveys, environmental DNA (eDNA) sampling, biological water quality (Q-value) assessment as well as macrophyte and aquatic bryophyte surveys.

Surveys of lacustrine habitats were also completed, where practicable. These included Ballisnahyny Turlough (T1), described in **Section 6.4.4.1**, together with two ponds located outside the proposed project boundary. These comprised pond P2, which was considered suitable for smooth newt (see **Section 6.4.4.3**), and pond P1, which is hydrologically connected to the Rooaunalaghta Stream (EPA Code: 30R03) to the southeast of the proposed wind farm site.

Full details of survey methodologies and locations provided in **Appendix 6-7**.

Water Quality and Macroinvertebrate Surveys

Physico-chemical water quality and macroinvertebrate surveys were undertaken to characterise baseline ecological status within the study area. Water samples were collected for laboratory analysis at four locations in May 2023, situated along the Black River as well as the Rooaunalaghta and Cloughmoyne streams. Macroinvertebrate kick sampling completed in 2023, and again in August 2026, followed standard EPA methodology, with Q values assigned based on the presence and relative abundance of sensitive taxa and the consideration of additional qualifying criteria, as described by Toner *et al.* (2005), to provide an indicative assessment of ecological quality.

Fish and Fish Habitat Surveys

Fish presence was initially determined using existing datasets, including IFI WFD fisheries records collected in 2022 and 2025 (see **Appendix 6-5**). This was supplemented by fish habitat surveys completed in 2023 and updated fisheries habitat appraisals undertaken in August 2026 (see **Appendix 6-7**). Fish habitat surveys followed the methodologies of Hendry and Cragg Hine (1997) and O'Grady (2006), with reference to Maitland (2003), Harvey and Cowx (2003) and Teague *et al.* (2012). The aim of these surveys was to identify habitat suitability for salmonids and lamprey species and to characterise mesohabitat distribution. Surveys assessed channel morphology, substrate composition, flow characteristics and habitat features relevant to key life stages.

Electrofishing surveys were also undertaken in August 2026 under licence from the Department of Climate, Energy and the Environment (DCEE) to update the fisheries baseline. Surveys targeted salmonids, lamprey and European eel (*Anguilla Anguilla*) within the Black River (EPA Code: 30B02), Rooaunalaghta Stream (EPA Code: 30R03), Cloghmoyne Stream (EPA Code: 30C80) and Shancloon Stream (EPA Code: 30S32) (see **Appendix 6-7** for a full detail of methodology).

White-Clawed Crayfish Surveys

Two white-clawed crayfish (*Austropotamobius pallipes*) surveys were undertaken under NPWS licence (Licence No. C112/2023) using standard hand searching techniques, following the methodologies described by Peay (2003), Reynolds *et al.* (2010) and Gammell *et al.* (2021), within suitable habitat patches along the Black River. Survey locations were selected based on habitat suitability and accessibility, with refuges assessed for evidence of crayfish presence.

To update the aquatic baseline, additional crayfish surveys (Licence No. C017/2026) were undertaken in August 2026 at the survey locations selected on the Black River (EPA Code: 30B02), Rooaunalaghta Stream (EPA Code: 30R03), Cloghmoyne Stream (EPA Code: 30C80) and Shancloon Stream (EPA Code: 30S32) (see **Appendix 6-7**). Surveys comprised targeted habitat assessment, hand-searching of suitable refugia and eDNA analysis.

Freshwater Pearl Mussel Survey

A Stage 1 freshwater pearl mussel (*Margaritifera margaritifera*) survey was undertaken under NPWS licence (Licence No. C64/2024) along a suitable reach of the Black River, following the Stage 1 and Stage 2 Survey Guidelines (NPWS, 2004). Survey effort focused on habitats considered potentially suitable for the species, with systematic searching undertaken to identify any live individuals or shell remains. The survey results were carried out to determine the likely presence or absence of freshwater pearl mussel within the study area.

To supplement the 2024 Stage 1 surveys, eDNA sampling for freshwater pearl mussel was undertaken. in August 2026 at selected locations on the Black River (EPA Code: 30B02) (see **Appendix 6-7**).

Macrophytes and Aquatic Bryophyte Surveys

Surveys of macrophyte and aquatic bryophyte communities were undertaken at each survey location to identify any species listed under the Flora (Protection) Order, 2022, the Irish Red Lists (Wyse-Jackson *et al.*, 2016; Hodgetts & Lockhart, 2025), and to assess the potential occurrence of Annex I aquatic habitats.

Lacustrine Assessments

Lacustrine sites P1, P2 and T1 were sampled for macroinvertebrates using standard sweep-netting techniques. Sampling was undertaken across the range of mesohabitats present at each site to obtain a representative sample of the macroinvertebrate community (Cheal *et al.*, 1993). eDNA sampling was also undertaken at P1 and P2 to determine the presence of selected species of conservation interest, including eel, smooth newt and crayfish. A full description of survey methodologies is provided in **Appendix 6-7**.

6.3.4.7 Grid Connection Route and Turbine Delivery Route

As outlined in **Chapter 2**, the GCR forms part of the proposed project. The GCR comprises of a 33 kV underground cable route from the proposed wind farm site to a proposed 110 kV substation in Killamanagh, Co. Galway, connecting to the existing overhead line *via* a loop-in design.

Locations along the GCR from the proposed wind farm site to the proposed 110 kV substation were assessed in April 2025 as part of a multidisciplinary, Phase 1 style survey employing a "look-see" methodology, undertaken on foot, by bicycle and/or vehicle. These surveys were carried out to identify any features of potential relevance along the GCR corridor; see section 6.4.5.1 for habitats recorded

Temporary works are proposed at one location along the TDR, comprising a localised pinch point within Galway City where footpath reinforcement may be required. All potential pinch points along the TDR were initially identified through a review of aerial imagery and were subsequently investigated through targeted field surveys for habitats and mammals in May 2026. The surveys also included an assessment of features with potential to support roosting bats.

Habitats

Locations along the proposed GCR and TDR were assessed for the habitats they supported. This involved surveying the proposed routes on foot and/or by vehicle to record habitats present therein. Consideration was given to identifying important or protected habitats, as well as those that support protected species, in addition to the presence of any invasive alien species that may occur along these routes.

Mammals

Mammal surveys along the GCR and TDR were carried out as part of the general survey effort with particular focus given to badger, otter, and any mammal trails intersecting the proposed route. Where trails were identified, they were followed, where possible, for up to 25 m from the alignment to check for any nearby resting or breeding sites.

Where the GCR involved bridge crossings, targeted otter surveys were completed in accordance with the methodology described in **Section 6.3.4.2**. A dedicated survey was completed at the Black River crossing (EPA Segment Code: 30_1507), assessing the crossing point and associated banks for otter field signs. A separate survey was also carried out at the Shancloon Stream (EPA Code: 30S32), downstream of the proposed 110 kV substation, as far as practicable (see **Section 6.3.6.1**).

Bats

Bat activity surveys were undertaken along the GCR as part of the wider multidisciplinary survey effort to identify PRFs. The route was primarily surveyed by vehicle, with sections assessed on foot where access by vehicle was not possible. Where features with roosting potential were identified, they were assessed from ground level. PRFs were inspected using an endoscope where appropriate, and any features requiring further evaluation were noted for detailed roost emergence surveys. Potential pinch points along the TDR were also assessed as part of the multidisciplinary Phase 1-style survey undertaken in May 2026.

Aquatic ecology

Aquatic surveys at locations where the GCR intersects the Black River were undertaken in April 2025. These surveys also included assessment of the Shancloon Stream (EPA Code: 30S32) downstream of the proposed offsite 110 kV substation. At these locations, water quality parameters were measured in-situ and macroinvertebrate kick samples were collected to support biological water quality assessment. Walkover fish habitat surveys were also undertaken to characterise mesohabitat composition and assess suitability for fish species of conservation interest (i.e., salmonids and lamprey spp.).

To update the baseline, additional aquatic surveys were completed in August 2026. These included the Black River (EPA Code: 30B02), previously assessed in April 2025, together with unmapped drainage channels at survey locations G2 and G3, as well as the Shancloon Stream (EPA Code: 30S32) at survey location G4 (see **Appendix 6-7**).

Surveys were conducted in accordance with the methodology described in **Section 6.3.4.6**, which is presented in full within **Appendix 6-5** and **Appendix 6.7**.

6.3.5 Assessment Methodology

The EcIA methodology used in this chapter is based primarily on the CIEEM Guidelines (2018), which represent the recognised professional standard for Ecological Impact Assessment in Ireland and the UK. While the assessment approach differs from that applied in some of the other EIAR chapters, it has been prepared in a manner that is consistent with the requirements of the EPA (2022) *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*, particularly in relation to the identification, description and assessment of likely significant environmental effects.

In accordance with the CIEEM Guidelines (2018), ecological impacts and effects are characterised using those attributes that are relevant to understanding the ecological consequences of the proposed project and determining the significance of the resulting effect. These attributes may include the direction of change, magnitude, extent, duration, timing, frequency and reversibility, and are described further in **Sections 6.3.5.1** to **6.3.5.3**.

This section outlines the approach used to evaluate the importance of the habitats and species present in the study area and the steps followed for the evaluation and characterisation of potential impacts arising from the proposed project.

6.3.5.1 6.4Evaluating Ecological Features within the Zone of Influence

The importance of the habitats and species present is evaluated using the CIEEM Guidelines (2018). These guidelines provide a structured approach for determining the ecological value of features and for assessing the significance of potential impacts arising from a project.

Ecological features that occur within the ZoI, including designated sites, habitats and species, are assigned a value using a recognised geographical hierarchy that ranges from International, National and County importance to Local importance. Identifying the value of each feature is an essential step in evaluating the significance of potential effects, since significance is determined by the importance of the feature, the type of impact and the magnitude of the impact.

The categories and criteria used for this evaluation are listed in **Table 6-12**.

Table 6-12: Geographic frame of reference used to determine ecological value[19]

Importance	Criteria
International Importance	• 'European Sites' including SACs, Sites of Community Importance (SCIs), or SPAs. • Proposed Special Area of Conservation (pSAC) or proposed Special Protection Area (pSPA). • Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). • Features essential to maintaining the coherence of the Natura 2000 Network. • Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. • Resident or regularly occurring populations (assessed to be important at the national level) of the following: - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or - Species of animals and plants listed in Annex II and/or IV of the Habitats Directive. • Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). • World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). • Biosphere Reserve (UNESCO Man & The Biosphere Programme). • Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). • Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). • Biogenetic Reserve under the Council of Europe. • European Diploma Site under the Council of Europe. • Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
National Importance	• Sites, habitats and species populations of importance in a national context. • Site designated or proposed as a NHA in Ireland. • National or statutory Nature Reserve. • Undesignated site fulfilling the criteria for designation as a NHA, Refuge for Fauna and Flora protected under the Wildlife Acts, and/or a National Park. • Site containing 'viable areas'[20] of habitat types listed in Annex I of the Habitats Directive. • Resident or regularly occurring populations (assessed to be important at the national level in Ireland) of the following: - Species protected under the Wildlife Acts; and/or - Species listed on the relevant Red Data list.

[19] Based on NRA (2009).

[20] A 'viable area' is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change (e.g., as a result of climatic variation).

Importance	Criteria
County/ Regional Importance	• Area of Special Amenity. • Area subject to a Tree Preservation Order. • Area of High Amenity, or equivalent, designated under the CDP. • Resident or regularly occurring populations (assessed to be important at the County level) of the following: - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive - Species protected under the Wildlife Acts Ireland); and/or - Species listed on the relevant Red Data list. • County important populations of species, viable areas of semi-natural habitats, or natural heritage features identified in the National or Local BAP, if this has been prepared. • Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance. • Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. • Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local (Higher) Importance	• Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared. • Resident or regularly occurring populations (assessed to be important at the Local level) of the following: - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; - Species protected under the Wildlife Acts; and/or - Species listed on the relevant Red Data list. • Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality. • Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
Local (Lower) Importance	• Sites containing small areas of semi-natural habitat that are of some local importance for wildlife. • Sites or features containing non-native species that are of some importance in maintaining habitat links.

The status of a species as requiring protection at an international level does not necessarily impose an international conservation value on any single example of that species found within the study area. Approaches to attributing nature conservation value to species have been previously developed for some species groups such as birds and bats. The approach to attributing nature conservation value to bat populations and foraging habitats is adapted from Wray *et al.* (2010).

An 'Important Ecological Feature' (IEF) is defined as a site, designated site, habitat, ecological feature, assemblage of species or individual protected species that may be affected by the proposed project and should be subject to detailed assessment (CIEEM, 2018). IEFs are those which occur within the ZoI and are evaluated as being of Local (Higher) Importance or greater.

6.3.5.2 Identification and Characterisation of Effects

An "impact" is the action that results in changes to an ecological feature, and the effect is the outcome to an ecological feature from an impact. An impact is considered to be ecologically significant if it is predicted to affect the integrity or conservation status of an IEF at a specified geographical scale. When describing ecological impacts and effects, reference should be made to the following characteristics, as described in CIEEM (2018) guidance:

- **Beneficial or Adverse:** *"Impacts and effects should be determined according to whether the change is in accordance with nature conservation objectives and policy".* A beneficial change *"improves the quality of the environment, e.g., by increasing species diversity, extending habitat or improving water quality. This may also include halting or slowing an existing decline in the quality of the environment".* An adverse change *"reduces the quality of the environment, e.g., destruction of habitat, removal of foraging habitat, habitat fragmentation, pollution".*
- **Extent:** *"The extent is the spatial or geographical area over which the impact/effect may occur under a suitably representative range of conditions (e.g., noise transmission under water)."*
- **Magnitude:** *"Magnitude refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms, e.g., the amount of habitat lost, percentage change to habitat area, percentage decline in a species population."*
- **Duration:** *"Duration should be defined in relation to ecological characteristics (such as the lifecycle of a species) as well as human timeframes. […] The duration of an activity may differ from the duration of the resulting effect caused by the activity. […] Impacts and effects may be described as short, medium or long-term and permanent or temporary. These will need to be defined in months/years."*
- **Frequency and Timing:** *"The number of times an activity occurs will influence the resulting effect. For example, a single person walking a dog will have very limited impact on nearby waders using wetland habitat, but numerous walkers will subject the waders to frequent disturbance and could affect feeding success, leading to displacement of the birds and knock-on effects on their ability to survive. The timing of an activity or change may result in an impact if it coincides with critical life-stages or seasons, e.g., bird nesting season."*
- **Reversibility:** *"An irreversible effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it. A reversible effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation. In some cases, the same activity can cause both reversible and irreversible effects."*

The assessment will describe those characteristics that are relevant to understanding the ecological effect and determining the significance, and as such does not need to incorporate all stated characteristics (CIEEM, 2018).

As per EPA Guidance (2022), direct and indirect effect as defined as follows:

- Direct effects are those effects on the environment, which are a direct result of a project, often occurring on the project site (e.g., habitat loss under a development footprint).
- Indirect effects, such as secondary or off-site effects, are those *"effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway."*

6.3.5.3 Significant Effects on Important Ecological Features

For the purpose of EcIA, a "significant" effect is an effect that either supports or undermines biodiversity conservation objectives for those ecological features which have been identified as being an important feature of the proposed project, i.e., IEFs. Conservation objectives may be specific (e.g., for a designated site) or broader at a plan level (e.g., national/local nature conservation policy). As such, effects can be considered significant in a wide range of geographic scales from international to local. Consequently, significant effects are qualified with reference to the appropriate geographic scale (CIEEM, 2018).

6.3.5.4 Assessment of Residual Effects on Important Ecological Features

After characterising the potential impacts of the proposed project and assessing the potential effects of these impacts on the IEFs, avoidance or mitigation measures are proposed to avoid and/or mitigate the identified ecological effects. Once measures to avoid and mitigate ecological effects have been finalised, an assessment of the residual impacts and effects is undertaken to determine the significance of their effects on the IEFs.

6.3.5.5 Assessing Cumulative Effects on Important Ecological Features

Cumulative effects arise where multiple actions, which may be individually small or insignificant, combine over time or space to result in a greater ecological impact. Such effects are particularly relevant to biodiversity assessments, as habitats and species may already be subject to background pressures and may be approaching ecological thresholds beyond which further change could lead to disproportionate or irreversible impacts.

Cumulative effects may occur through additive influences from projects that overlap spatially or temporally, or through connected or phased projects where one activity facilitates another. In assessing these effects, consideration is given to other plans and projects within the relevant ZoI, including proposals awaiting determination, projects that have been consented but not yet completed, and other reasonably foreseeable proposals known at the time of writing.

As outlined in **Chapter 1**, the cumulative assessment considered projects with potential for spatial or temporal overlap with the proposed project. The following search areas were used to identify relevant plans and projects:

- Other wind farm developments within 20 km of the proposed project;
- Other notable development within 20 km of the proposed project, including solar projects, commercial schemes and other energy-related infrastructure; and
- Planning applications within 2 km of the proposed wind farm, primarily domestic dwellings, agricultural sheds and other small-scale proposals.

The 20 km search area for wind farms and other notable aligns with the ornithological assessment (see **Chapter 7**) and reflects published guidance on ecological connectivity for mobile ecological receptors such as birds (SNH, 2016). The 2 km search area was applied to smaller-scale developments, as any cumulative ecological effects associated with such proposals are likely to be restricted to localised impact pathways, including habitat loss, disturbance and local water quality effects.

The cumulative assessment included projects that have been granted consent but are not yet completed, projects under construction, and proposals awaiting determination at the time of writing. Where consented projects appeared, based on available information (including aerial imagery), not to have commenced construction, these were conservatively assumed to have the potential to overlap with the construction phase of the proposed project and were therefore considered in relation to construction phase cumulative effects.

6.3.6 Statement of Limitations

Whilst there were some limitations to the surveys undertaken (as detailed in the following sections), overall, it is not considered that these significantly affected the robustness of the data collected, or the conclusions of the assessment herein.

6.3.6.1 Terrestrial Ecology

As the primary habitat surveys (i.e., quadrat surveys) at the proposed wind farm site were undertaken in late June and July (2025), they occurred outside the flowering period of early flowering plant species (April to June). As such, these plants were identified using vegetative keys where required. Moreover, a separate site visit undertaken in May 2025 to follow up on Annex I habitats identified during the 2024 constraints survey, which represent the primary habitat sensitivity on site, further addressed this limitation. Surveys undertaken across multiple visits also reduced constraints associated with grazing pressure, allowing swards to be assessed in differing conditions. Together, these measures ensured that survey timing did not affect accurate habitat classification.

The overall landscape of the proposed project is characterised by agricultural fields primarily used for livestock grazing. The presence of livestock for the most part did not present an obstacle to conducting ecological surveys; however, in some instances there were access restrictions due to health and safety concerns. In these instances, survey visits were timed so that livestock were not present, and all areas could be adequately surveyed.

The reaches of the Black River (EPA Code: 30B02) to the east of the proposed wind farm site and at the GCR crossing point are naturally confined by limestone bedrock, resulting in steep rocky banks partially covered with scrubby vegetation. These conditions made certain sections of the study area inaccessible due to health and safety considerations. In these areas, banks and instream features such as boulders were observed using binoculars and, where feasible, inspected further by wading instream. Consequently, it is considered that the surveys adequately assessed all suitable otter habitat.

6.3.6.2 Bats

The following limitations were encountered for the static detector survey effort (2024):

- During spring, detectors at D.02 and D.08 recorded for only eight nights due to an unknown detector error or battery issue.
- The detector at D.01 failed to record during summer from the initial deployment date of 6 June and was redeployed immediately on 22 June 2024 and recorded successfully for 22 nights thereafter.
- The detector located at D.04 was moved 80 m northwest for the summer and autumn deployments due to an issue regarding livestock. The detector was moved from an open area to an area containing some scattered trees; therefore, higher activity recorded in summer and autumn at this location may be attributable to the detector being moved to a more favourable foraging habitat.

One limitation was encountered during the roost emergence surveys. An emergence survey undertaken on 3 April 2024 at F.1 was commenced but subsequently abandoned and was therefore not completed. As F.1 was classified as a feature of moderate bat roost potential, two emergence surveys were required in accordance with survey guidance. One completed emergence survey confirmed use of the feature as a transitional roost.

Notwithstanding the limitations described above, these are not considered to materially affect the interpretation of bat activity patterns or the conclusions of the impact assessment. Although reduced survey effort occurred at D.01, D.02 and D.08, sufficient survey data were obtained to characterise the bat assemblage, relative activity levels and seasonal patterns across the proposed wind farm site. The affected detectors remained operational for part of the survey period and therefore continued to contribute site-specific data to the assessment. In addition, the wider detector network provided good spatial coverage across the proposed wind farm site, allowing activity patterns to be interpreted in the context of results from multiple locations rather than relying on any single detector.

The relocation of detector D.04 is acknowledged as a source of potential variation in recorded activity levels at that specific location due to differences in habitat characteristics. However, the change in location was limited in extent and the resulting data have been interpreted with due regard to the habitat differences between the original and revised locations. The assessment is based on activity patterns recorded across the wider study area and not solely on data from D.04. Accordingly, this limitation is not considered to materially affect the collision-risk assessment or the overall conclusions of the impact assessment.

With respect to F.1, bat use of the feature was confirmed through the completed emergence survey, which identified its use as a transitional roost. The assessment has therefore assumed continued use of the feature by roosting bats and has adopted a precautionary approach when considering potential impacts and mitigation requirements. Consequently, the incomplete survey effort at this location is not considered to materially affect the conclusions of the assessment.

6.3.6.3 Aquatic Ecology

Water quality can be variable and will change under different flow and runoff conditions; therefore, a single sample or set of readings can only provide an indication of conditions at that point in time for the survey location. Seasonal differences may also occur as a consequence of biological changes or land use activities within the wider study area. It is therefore advisable to obtain repeat water quality readings before drawing definitive conclusions about water quality within the receiving environment.

The macroinvertebrate survey partially overcomes this limitation by recording a biological component that responds to the full range of physicochemical conditions experienced within the watercourse over a period of several months at the survey locations. In the absence of longer-term site-specific datasets, EPA monitoring data can provide useful contextual information on baseline conditions and longer-term trends within the receiving water environment.

Whilst the white-clawed crayfish survey were completed at selected locations only, and therefore carries an inherent risk of failing to detect the species elsewhere within the ZoI of the proposed project, the complete absence of records during targeted surveys and the eDNA analysis suggests either genuine absence or the presence of very low and localised populations. Notwithstanding the probable absence of white-clawed crayfish within the study area, the species is a QI of the Lough Corrib SAC and has therefore been carried forward as a precautionary receptor within the assessment.

The area selected for the freshwater pearl mussel Stage 1 survey (refer to **Section 6.3.4.6**) was largely accessible, although certain obstacles restricted full coverage. These included fallen trees and woody debris, dense vegetative cover and strong flows within the watercourse. Notwithstanding these constraints, a minimum survey reach of 300 m was achievable.

Additional aquatic surveys undertaken in August 2026 were completed during a period of low flow conditions, with some watercourses dry or partially dry at the time of survey (A5, G2, G3 and G4; see **Appendix 6-7**), limiting fish and biological water quality sampling at these locations. In addition, eDNA sampling at pond P2 was inconclusive due to elevated turbidity and suspended sediment concentrations. These limitations are not considered to have materially influenced the conclusions of the assessment, as the 2026 surveys were undertaken to update an existing baseline, no material changes in land use have occurred since the earlier surveys, and the findings are consistent with available data. Pond P2 continues to be considered suitable for smooth newt and has therefore been assessed on a precautionary basis.

6.4 RECEIVING ENVIRONMENT

This section provides a description of the baseline (current) ecological conditions associated with the proposed project site area. **Sections 6.4.1** to **6.4.3** outline the overall project context. **Section 6.4.4** describes the terrestrial ecology within the proposed wind farm site and the proposed 110 kV substation. **Section 6.4.4.6** summarises the aquatic ecology of watercourses located within the ZoI, while **Section 6.4.5** presents the baseline along the GCR and the TDR.

6.4.1 GENERAL SITE DESCRIPTION

As outlined in **Chapter 2**, the proposed project comprises a 13 no. turbine wind farm located within a rural lowland agricultural landscape. The proposed wind farm site, which covers approximately 209 ha, consists largely of improved grassland fields bounded by stone walls, with scattered hedgerows, treelines, scrub and pockets of woodland. Bedrock is frequently exposed or close to the surface resulting in limestone pavement habitat, and the wider landscape includes karst features such as turloughs and dolines (enclosed depressions). The Black River, as it runs to the east of the proposed wind farm site, forms part of the Lough Corrib SAC; thus, the designated river corridor lies immediately adjacent to the proposed project.

The proposed 110 kV substation and GCR lie within similar lowland agricultural terrain. No watercourses occur within the substation footprint, although agricultural drains are present within surrounding fields. The GCR traverse improved agricultural grasslands bounded by stone walls at the western end from the proposed windfarm site before following the route of public roads to the proposed 110 kV substation to the east. The route section following the road network (including the L21044 and L2104) crosses one major watercourse (the Black River), with remaining surface water features comprising unmapped roadside drainage ditches (see **Figures 4** and **5** of **Appendix 6-3**). Other semi-natural habitats present included roadside stone walls and occasional hedgerows. These hydrological features ultimately drain toward the wider Lough Corrib catchment. Overall, the ecological baseline along the GCR reflects a managed agricultural landscape with limited semi-natural habitat.

6.4.2 EXISTING ECOLOGICAL RECORDS

The proposed project lies within three 10-km grid squares (Counties Mayo and Galway: M24, M25 and M35). **Appendix 6-2** contains a summary of the existing records for all protected and notable terrestrial, bat and aquatic species and habitats listed in datasets from NBDC, NPWS, EPA, IFI and BCIreland. Additionally, **Appendix 6-2** contains a summary of existing invasive species recorded in the BSBI database within the 10-km squares relevant to the proposed project.

6.4.3 DESIGNATED SITES

There are no sites designated for nature conservation within the proposed project. There are a limited number of internationally and nationally designated sites within the surrounding environs of the proposed project, including one that adjoins the proposed wind farm site and another that occurs within close proximity (i.e., 147 m).

Table 6-13 provides a list of the designated sites assessed as being within the potential ZoI of the proposed project. It summarises the Qualifying Interests (QIs) and other features of designation associated with each site and identifies any relevant S-P-R connections. Only those

designated sites with the potential to be affected by the proposed project, as outlined in **Table 6-13**, have been taken forward for further consideration within this chapter. These sites are also illustrated in **Figure 6-2** and **Figure 6-3**.

Table 6-13: Designated sites, reasons for designation, distances and summary of connectivity to the proposed project

Site name [site code]	Reasons for designation/QIs [21]	Potential S-P-R connectivity considered (i.e., proximity of the feature[22] or hydrological connectivity[23])	S-P-R identified and considered further within this assessment? Yes/No
Special Areas of Conservation			
Cloughmoyne SAC [000479]	Limestone pavements [8240]	Direct S-P-R connectivity given that this SAC, comprising limestone pavement, is located immediately adjacent to the western boundary of the proposed project.	Yes
Lough Corrib SAC [000297]	Oligotrophic waters containing very few minerals of sandy plains *(Littorelletalia uniflorae)* [3110] Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto Nanojuncetea* [3130] Hard oligo mesotrophic waters with benthic vegetation of *Chara* spp. [3140] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho Batrachion* vegetation [3260] Semi natural dry grasslands and scrubland facies on calcareous substrates *(Festuco Brometalia)* (*important orchid sites*) [64] *Molinia* meadows on calcareous, peaty or clayey silt laden soils *(Molinion caeruleae)* [6410] Active raised bogs [7110]	Located 147 m from the proposed project its nearest point, and 675 m *via* hydrological connection. S-P-R connectivity may occur *via* surface runoff draining the proposed project, as well as through potential deterioration of groundwater quality given the high level of surface–groundwater interaction and the overall groundwater vulnerability across the proposed project, particularly at the proposed wind farm site.	Yes

[21] Qualifying features of a SAC are called QIs
[22] Measured in a straight line between the proposed project (including GCR) and the closest point of the European Site boundary.
[23] Hydrological connections indicated in river kilometres, 'rkm'.

Site name [site code]	Reasons for designation/QIs [21]	Potential S-P-R connectivity considered (i.e., proximity of the feature[22] or hydrological connectivity[23])	S-P-R identified and considered further within this assessment? Yes/No
	Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the *Rhynchosporion* [7150] Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210] Petrifying springs with tufa formation *(Cratoneurion)* [7220] Alkaline fens [7230] Limestone pavements [8240] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] Bog woodland [91D0] Freshwater Pearl Mussel (*Margaritifera margaritifera*) [1029] White-clawed Crayfish (*Austropotamobius pallipes*) [1092] Sea Lamprey (*Petromyzon marinus*) [1095] Brook Lamprey (*Lampetra planeri*) [1096] Salmon (*Salmo salar*) [1106] Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303] Otter (*Lutra lutra*) [1355] Slender Naiad (*Najas flexilis*) [1833]		

Site name [site code]	Reasons for designation/QIs [21]	Potential S-P-R connectivity considered (i.e., proximity of the feature[22] or hydrological connectivity[23])	S-P-R identified and considered further within this assessment? Yes/No
	Slender Green Feather-moss (*Hamatocaulis vernicosus*) [6216]		
Shrule Turlough SAC [000525]	Turloughs [3180]	Located c. 1.8 km to the north of the proposed project. While no direct surface water connection has been identified, part of the proposed project occurs within the same groundwater body and regionally important karstified aquifer as Shrule Turlough SAC. On a precautionary basis, a potential hydrogeological linkage cannot be excluded (see **Chapter 9**).	Yes
Mocorha Lough SAC [001536]	Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]	Located c. 2.7 km to the north of the proposed project. Based on the findings of **Chapter 9, Section 9.4.2.1**, no surface water or groundwater connectivity has been identified between the proposed project and Mocorha Lough SAC. The SAC is associated with a different aquifer setting to that underlying the proposed project, and has no identified surface water connection. Given the differing hydrogeological setting and absence of a direct hydrological pathway, no plausible S-P-R linkage has been identified.	No
Clyard Kettle-Holes SAC [000480]	Turloughs [3180] Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]	Located c. 6.8 km to the north of the proposed project. There is no surface or groundwater hydrological connectivity to the proposed project and thus no S-P-R linkage.	No

Site name [site code]	Reasons for designation/QIs [21]	Potential S-P-R connectivity considered (i.e., proximity of the feature[22] or hydrological connectivity[23])	S-P-R identified and considered further within this assessment? Yes/No
Kildun Souterrain SAC [002320]	*Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]	Located c. 7.5 km to the west of the proposed project Boundary. Considering the separation distance[24] and the known functional requirements of the QI (e.g., core foraging ranges), there is not considered to be any ecological connectivity with this SAC and thus no S-P-R linkage.	No
Gortnandarragh Limestone Pavement SAC [001271]	Limestone pavements [8240]	Located c. 8.8 km to the south of the proposed project. There is no direct or indirect S-P-R connectivity, whether *via* terrestrial, hydrological, air pathways or otherwise.	No
Ardkill Turlough SAC [000461]	Turloughs [3180]	Located c. 10.4 km to the north of the proposed project. There is no hydrological connectivity to the proposed project and thus no S-P-R linkage.	No
Skealoghan Turlough SAC [000541]	Turloughs [3180]	Located c. 10.6 km to the north of the proposed project. There is no hydrological connectivity to the proposed project and thus no S-P-R linkage.	No
Greaghans Turlough SAC [000503]	Turloughs [3180]	Located c. 10.6 km to the north of the proposed project. There is no hydrological connectivity to the proposed project and thus no S-P-R linkage.	No

[24] The foraging range (CSZ) for lesser horseshoe bats is generally considered to be c. 2.5 km from maternity roosts, with movements between summer and winter roosts typically occurring over distances of 5–10 km (Collins, 2016).

Site name [site code]	Reasons for designation/QIs [21]	Potential S-P-R connectivity considered (i.e., proximity of the feature[22] or hydrological connectivity[23])	S-P-R identified and considered further within this assessment? Yes/No
Lough Carra/Mask Complex SAC [001774]	Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto Nanojuncetea* [3130] Hard oligo mesotrophic waters with benthic vegetation of *Chara* spp. [3140] European dry heaths [4030] Semi natural dry grasslands and scrubland facies on calcareous substrates (*Festuco Brometalia*) (important orchid sites) [6210] Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210] Alkaline fens [7230] Limestone pavements [8240] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno Padion*, *Alnion incanae*, *Salicion albae*) [91E0] *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303] *Lutra lutra* (Otter) [1355] *Hamatocaulis vernicosus* (Slender Green Feather moss) [6216]	Located c. 11.5 km to the northwest of the proposed project. Considering the separation distance, intervening land use, the functional requirements of the QIs including wider ranging species such as otter[25] and lesser horseshoe bat[24], and the absence of any hydrological pathway, there is no S-P-R linkage with this SAC.	No

[25] Although male otters are capable of occupying substantially larger linear home ranges, female otters typically maintain much smaller ranges of c. 7.5 km ± 1.5 km SD (Ó Néill *et al.*, 2009).

Site name [site code]	Reasons for designation/QIs [21]	Potential S-P-R connectivity considered (i.e., proximity of the feature[22] or hydrological connectivity[23])	S-P-R identified and considered further within this assessment? Yes/No
Kilglassan/Caheravoostia Turlough Complex SAC [000504]	Turloughs [3180]	Located c. 11.4 km to the north of the proposed project. There is no hydrological connectivity to the proposed project and thus no S-P-R linkage.	No
Ross Lake and Woods SAC [001312]	Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. [3140] *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]	Located c. 12.3 km to the south of the proposed project. There is no direct or indirect S-P-R connectivity, whether *via* terrestrial, hydrological, air pathways or otherwise.	No
Ballymaglancy Cave, Cong SAC [000474]	Caves not open to the public [8310] *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]	Located c. 12.8 km to the west of the proposed project. Considering the separation distance and the known functional requirements of the QI (e.g., core foraging ranges), there is not considered to be any ecological connectivity with this SAC and thus no S-P-R linkage.	No
Natural Heritage Areas			
Oughterard District Bog NHA [002431]	Peatlands [4]	Located c. 13.8 km to the southwest of the proposed project. There is no direct or indirect S-P-R connectivity, whether *via* terrestrial, hydrological, air pathways or otherwise.	No
Proposed Natural Heritage Areas			
Cloughmoyne pNHA [000479]	Cloughmoyne is located approximately 5 km northwest of Headford in Co. Mayo. The site lies on the southwest slope of a low limestone ridge and spreads southwards to include a fen and lake. The site is situated in the townland of Ballisnahyny (just west of the Cloughmoyne townland).	Direct S-P-R connectivity given that this site is located immediately adjacent to the western boundary of the proposed project.	Yes

Site name [site code]	Reasons for designation/QIs [21]	Potential S-P-R connectivity considered (i.e., proximity of the feature[22] or hydrological connectivity[23])	S-P-R identified and considered further within this assessment? Yes/No
Lough Hacket pNHA [001294]	The main habitat of this site is the lake itself, which is surrounded to the west by reedswamp, areas of freshwater marsh as well as lowland wet grassland. The eastern side of the lake has improved grassland. The site is an area of ornithological importance for wintering wildfowl, including golden plover.	Located c. 1.0 rkm to the south of the proposed project (at the proposed GCR). A small hydrological connection occurs at the GCR element of the proposed project, giving rise to an indirect S-P-R linkage.	Yes
Shrule Turlough pNHA [000525]	Large, highly oligotrophic turlough, with thick marl and peat deposits. There is no above-ground outflow from the turlough. The turlough floods regularly and it seems to show little modification due to the drainage efforts. Peat cutting no longer occurs but cattle graze on reclaimed peat margins and around the swallow holes.	Located c. 1.8 km to the north of the proposed project. While no direct surface water connection has been identified, part of the proposed project occurs within the same groundwater body and regionally important karstified aquifer as Shrule Turlough SAC. On a precautionary basis, a potential hydrogeological linkage cannot be excluded (see **Chapter 9**).	Yes
Rostaff Turlough pNHA [000385]	The importance of Rostaff Turlough is primarily ornithological with nationally important numbers of Greenland white-fronted geese and shoveler. The site also has a number of notable populations of breeding birds. The site is a bird sanctuary.	Located c. 2.8 rkm to the southeast of the proposed project. Indirect S-P-R connectivity may arise *via* surface and groundwater pathways. Turloughs are typically groundwater-fed, but the adjacent Black River may episodically overtop into the turlough during high flows, providing an intermittent hydrological link.	Yes
Mocorha Lough pNHA [001536]	Mocorha Lough includes a large area of fen vegetation that is dominated by great fen-sedge (*Cladium mariscus*). The scarce moss *Drepanocladus cossonii* has been recorded in the north of the site. The site supports locally important numbers of wetland birds, especially snipe and mallard.	Located c. 2.7 km to the north of the proposed project. In the absence of any surface or groundwater hydrological connectivity, no direct or indirect S-P-R linkage occurs *via* terrestrial, hydrological, air or other pathways.	No
Turlough O'Gall pNHA [000331]	Turlough O'Gall is distinct in vegetational terms in having large areas of both sedge heath and limestone grassland -	Located c. 2.7 km to the east of the proposed project, with the proposed offsite 110 kV substation being the closest element of the project.	No

Site name [site code]	Reasons for designation/QIs [21]	Potential S-P-R connectivity considered (i.e., proximity of the feature[22] or hydrological connectivity[23])	S-P-R identified and considered further within this assessment? Yes/No
	the rock outcrops and pools add habitat diversity. Its unmodified drainage adds to its conservation value.	In the absence of any surface or groundwater hydrological connectivity and given the distance of c. 8 km from the proposed wind farm site, no direct or indirect S-P-R linkage occurs *via* terrestrial, hydrological, air or other pathways.	
Castle Hackett Souterrain pNHA [002038]	This site consists of a man-made, stone, underground passageway which dates from between 500 and 1200 A.D. Bats have been seen at this site each winter since 1985. As well as being a regular hibernation area, this site is notable as it is one of the few lesser horseshoe bat sites in County Galway.	Located c. 3.6 km to the southeast of the proposed project (at the proposed offsite substation). Although this component of the proposed project lies within the typical 5–10 km separation distance recorded between summer and winter roosts of lesser horseshoe bat[24], it comprises only the substation (no turbines) and is located outside the species' CSZ. Accordingly, no ecological connectivity occurs and no S-P-R linkage is identified.	No
Turlough Monaghan pNHA [001322]	Turlough Monaghan is basically a dry turlough with little physical variation except for the outcrops of bedrock. The vegetation, however, is quite diverse, with ten community types in a relatively small area. The site is of local scientific and conservation value.	Located c. 4.1 km to the southeast of the proposed project (at the proposed offsite substation). There is no direct or indirect S-P-R connectivity, whether *via* terrestrial, hydrological, air pathways or otherwise.	No
Knockmaa Hill pNHA [001288]	Knockmaa hill is of interest because it is a good example of deciduous woodland on thin limestone soil. Similar sites are rare in this part of the country. The occurrence of species-rich limestone pavement vegetation at the top of the hill adds significantly to the interest of the site.	Located c. 4.7 km to the southeast of the proposed project (at the proposed offsite substation). There is no direct or indirect S-P-R connectivity, whether *via* terrestrial, hydrological, air pathways or otherwise.	No
Turloughcor pNHA [001788]	Turloughcor is located in a lowland karstic limestone area. A small lake, Doolough is the centre of the site. The main interest of this site is ornithological. In excess of 500 wigeon graze the grassland around the turlough, with	Located c. 5.5 km to the south of the proposed project (at the proposed substation).	No

Site name [site code]	Reasons for designation/QIs [21]	Potential S-P-R connectivity considered (i.e., proximity of the feature[22] or hydrological connectivity[23])	S-P-R identified and considered further within this assessment? Yes/No
	lesser numbers of teal and mallard. Mute swan, mallard and lapwing breed at the site.	In the absence of any surface or groundwater hydrological connectivity, no direct or indirect S-P-R linkage occurs *via* terrestrial, hydrological, air pathways or otherwise. For ornithological receptors, the proposed project lies outside the core foraging range of the species that graze and/or breed at this site, and as the proposed wind farm lies a greater distance to the northwest, there is no disturbance or collision risk and therefore no S-P-R connectivity (see **Chapter 7**).	
Lough Corrib pNHA [000297]	The shallow, lime-rich waters of the southern basin of Lough Corrib support one of the most extensive beds of stoneworts (charophytes) in Ireland. These *Chara* sp. beds are an important source of food for waterfowl. Lough Corrib is also an internationally important site that regularly supports in excess of 20,000 wintering waterbirds including an internationally important population of wintering pochard (10,107).	Located c. 11.1 rkm to the southwest of the proposed project. A hydrological connection exists between the proposed project and this pNHA, and thus an indirect S-P-R linkage is present.	Yes
Killower Turlough pNHA [000282]	This turlough is situated in an area of carboniferous limestone, with large amounts of Marl underlying thin soils. The main habitats are the turlough itself, as well as lowland grassland, wet, dry and improved, heath and reedswamp. The designation of this site as an NHA rests purely on its regional importance for waterfowl.	Located c. 5.7 km to the east of the proposed project (at the proposed offsite substation). In the absence of any surface or groundwater hydrological connectivity, no direct or indirect S-P-R linkage occurs *via* terrestrial, hydrological, air pathways or otherwise. Although located c. 5.7 km from the proposed substation, the nearest turbines lie over 11 km away. Considering the core foraging ranges of wintering waterfowl, together with the low availability of suitable habitat within the proposed project, no ecological connectivity is anticipated and therefore no S-P-R linkage occurs (see **Chapter 7**).	No

Site name [site code]	Reasons for designation/QIs [21]	Potential S-P-R connectivity considered (i.e., proximity of the feature[22] or hydrological connectivity[23])	S-P-R identified and considered further within this assessment? Yes/No
Belclare Turlough pNHA [000234]	Belclare turlough shows considerable diversity, with a range of plant communities from the oligotrophic northeastern corner to the eutrophic southeast. Further habitat diversity is introduced with the presence of scrub. The birdlife, including wintering wildfowl and Greenland white-fronted goose, adds to the scientific and conservation value of the site.	Located c. 5.9 km to the east of the proposed project (at the proposed substation). In the absence of any surface or groundwater hydrological connectivity, no direct or indirect S-P-R linkage occurs *via* terrestrial, hydrological, air pathways or otherwise. Although located c. 5.9 km from the proposed substation, the nearest turbines lie over 11 km away. Considering the core foraging range of Greenland white-fronted goose[26], and other wintering waterfowl, together with the low availability of suitable habitat within the proposed project, no ornithological connectivity is anticipated and therefore no S-P-R linkage occurs (see **Chapter 7**).	No
Clyard Kettle-Holes pNHA [000480]	This site comprises a number of small lakes and turloughs developed between stony hillocks in the jumbled topography of the moraines west of Kilmaine, Co. Mayo. The main plant community in the kettle-holes at Clyard townland is Cladium fen, dominated by great fen-sedge (*Cladium mariscus*), with black bog-rush (Schoenus nigricans) and slender sedge (*Carex lasiocarpa*).	Located c. 6.8 km to the north of the proposed project. There is no direct or indirect S-P-R connectivity, whether *via* terrestrial, hydrological, air pathways or otherwise.	No
Gortnandarragh Limestone Pavement pNHA [001271]	The site consists of an exposed limestone plateau flanked with scrub. Parts of the pavement exhibit a well-developed system of clints and grykes, while other parts are shattered, with much loose rock. Gortnandarragh is valuable as an example of limestone pavement and because the bog on the site is the type locality and only known station for *Entoloma jennyi*.	Located c. 8.8 km to the south of the proposed project. There is no direct or indirect S-P-R connectivity, whether *via* terrestrial, hydrological, air pathways or otherwise.	No

[26] Scottish National Heritage, now NatureScot - SNH (2016). Assessing Connectivity with Special Protection Areas (SPAs). SNH Guidance Note.

Site name [site code]	Reasons for designation/QIs [21]	Potential S-P-R connectivity considered (i.e., proximity of the feature[22] or hydrological connectivity[23])	S-P-R identified and considered further within this assessment? Yes/No
Rathbaun Turlough pNHA [000215]	Rathbaun turlough has a simple topography and, as a result, contains large areas of three plant communities: dry *carex nigra*, species poor *Potentilla repens* community and Wet Annuals which contains both red goosefoot (*Chenopodium rubrum*) and Northern yellow-cress (Rorippa islandica), two rare plant species.	Located c. 9.0 km to the north of the proposed project. In the absence of any surface or groundwater hydrological connectivity, no direct or indirect S-P-R linkage occurs *via* terrestrial, hydrological, air pathways or otherwise.	No
Greaghans Turlough pNHA [000503]	Greaghans Turlough is notable for the occurrence of a large area of vegetation dominated by annual plant species. Turloughs are listed on Annex I of the E.U. Habitats Directive and are of conservation significance. The presence of the rare Northern yellow-cress (*Rorippa islandica)* and of a large flock of wintering whooper swan add significantly to the importance of the site.	Located c. 9.6 km to the north of the proposed project. In the absence of any surface or groundwater hydrological connectivity, no direct or indirect S-P-R linkage occurs *via* terrestrial, hydrological, air pathways or otherwise. Given the core foraging ranges of most wintering waterbird species, and the relatively low availability of suitable habitat within the proposed project, no ornithological connectivity is identified (see **Chapter 7**).	No
Ardkill Turlough pNHA [000461]	The variation in topography/hydrology creates a good diversity of vegetation types within a small area. The site contains common meadow-rue (*Thalictrum flavum*), a species known only from this site in Co. Mayo, as well as a number of other uncommon species. A species of parasitic wasp (*Mesoleptus hibernica*) has been described as new to science from Ardkill Turlough. Taken together, all these features combine to make it a site of high conservation value.	Located c. 9.8 km to the north of the proposed project. In the absence of any surface or groundwater hydrological connectivity, no direct or indirect S-P-R linkage occurs *via* terrestrial, hydrological, air pathways or otherwise.	No

Site name [site code]	Reasons for designation/QIs [21]	Potential S-P-R connectivity considered (i.e., proximity of the feature[22] or hydrological connectivity[23])	S-P-R identified and considered further within this assessment? Yes/No
Skealoghan Turlough pNHA [000541]	The vegetation of the turlough is quite diverse, several pairs of lapwing breed at the site and some wintering waterfowl are likely to visit the turlough. Skealoghan Turlough is of conservation interest for its diversity of vegetation types, particularly the oligotrophic (nutrient-poor) sedge communities.	Located c. 10.5 km to the north of the proposed project. In the absence of any surface or groundwater hydrological connectivity, no direct or indirect S-P-R linkage occurs *via* terrestrial, hydrological, air pathway otherwise. Given the core foraging ranges of most wintering waterbird species, and the relatively low availability of suitable habitat within the proposed project, no ornithological connectivity is identified (see **Chapter 7**).	No
Kilglassan/Cahe ravoostia Turlough Complex pNHA [000504]	This site comprises two turloughs separated by a rise of land which includes a pond and a small floating fen. It is of interest as it is a relatively large turlough complex with considerable habitat diversity. The wetness of the site and the lack of grazing in the central parts provides good habitat for breeding waders. The extensive area of wetland vegetation that occurs in the turlough basins is notable.	Located c. 10.6 km to the north of the proposed project. In the absence of any surface or groundwater hydrological connectivity, no direct or indirect S-P-R linkage occurs *via* terrestrial, hydrological, air pathways or otherwise.	No
Lough Carra/Mask Complex pNHA [001774]	This site has good examples of nine habitats listed on Annex I of the E.U. Habitats Directive, four of which are listed with priority status. Some of these habitats are amongst the best examples of their kind in the country. It is also selected for two Annex II mammal species and an Annex II moss. The site is of ornithological importance for both wintering and breeding birds. A relatively large number of rare or localised plant and animal species occur, including the glacial relict Arctic char.	Located c. 11.5 km to the west of the proposed project. Considering the separation distance, intervening land use, the ecological requirements of the conservation features, and the lack of any hydrological pathway, no S-P-R linkage occurs with this pNHA. Given the core foraging ranges of most wintering waterbird species, and the relatively low availability of suitable habitat within the proposed project, no ornithological connectivity is identified (see **Chapter 7**).	No

Site name [site code]	Reasons for designation/QIs [21]	Potential S-P-R connectivity considered (i.e., proximity of the feature[22] or hydrological connectivity[23])	S-P-R identified and considered further within this assessment? Yes/No
Ballymaglancy Cave, Cong pNHA [000474]	Ballymaglancy Cave is a linear stream cave which supports a population of lesser horseshoe bat. As 50 bats have been recorded hibernating here, this is a site of international importance. Ballymaglancy is the most suitable hibernation site for bats in the Cong district, as it offers a number of low, dry passageways near the cave entrance.	Located c. 12.3 km to the west of the proposed project. Considering the separation distance[24] and the known functional requirements of the QI (e.g., core foraging ranges), there is not considered to be any ecological connectivity with this SAC and thus no S-P-R linkage. As such, there is no direct or indirect S-P-R connectivity, whether *via* terrestrial, hydrological, air pathways or otherwise.	No
Ross Lake And Woods pNHA [001312]	The main habitat on this site is a medium-sized lake which has a limestone bed covered by deposits of precipitated marl and a shoreline of marl-encrusted limestone boulders. The site is of importance because it contains a good example of a hard water lake, and for the internationally important population of lesser horseshoe bat, which occurs. The presence of otter and breeding common gull is also of note.	Located c. 12.9 km to the south of the proposed project. Considering the separation distance, intervening land use, the functional requirements of the QIs including wider ranging species such as otter[25] and lesser horseshoe bat[24], and the absence of any hydrological pathway, there is no S-P-R linkage with this SAC. As such, there is no direct or indirect S-P-R connectivity, whether *via* terrestrial, hydrological, air pathways or otherwise.	No
Oughterard National School pNHA [002082]	This site consists of a two-storey primary school which is used as a nursery site by approximately 300 Leisler's bats. The bats roost in two sites in the roof. This probably the largest Leisler's nursery colony in Ireland and possibly in Europe. Although the Leisler's bat is considered common in Ireland, the number of safe nursery roosts are small.	Located c. 13.2 km to the west of the proposed project. No direct or indirect impact pathway to the qualifying interest of the pNHA has been identified. While Leisler's bats are capable of travelling considerable distances between roosting and foraging habitats, there is no evidence that the proposed wind farm site forms part of the supporting habitat associated with the Oughterard National School colony. The proposed project would not affect the maternity roost for which the pNHA is designated, nor has any ecological pathway been	No

Site name [site code]	Reasons for designation/QIs [21]	Potential S-P-R connectivity considered (i.e., proximity of the feature[22] or hydrological connectivity[23])	S-P-R identified and considered further within this assessment? Yes/No
		identified through which the conservation interest of the pNHA could be affected.	
Altore Lake pNHA [000224]	The site is underlain by limestone with a thin covering of free-draining sandy boulder clay. This site is of importance because of the occurrence of Greenland white-fronted geese and the presence of otters. The site also provides habitat diversity with a small area otherwise surrounded by improved grassland.	Located c. 14.6 km to the north of the proposed project. There is no direct or indirect S-P-R connectivity, whether *via* terrestrial, hydrological, air pathways or otherwise. Considering the core foraging range of Greenland white-fronted goose (NatureScot (formerly Scottish Natural Heritage) (2016)), and other wintering waterfowl, together with the low availability of suitable habitat within the proposed project, no ornithological connectivity is anticipated and therefore no S-P-R linkage occurs (see **Chapter 7**).	No
* Denotes an Annex I priority habitat			

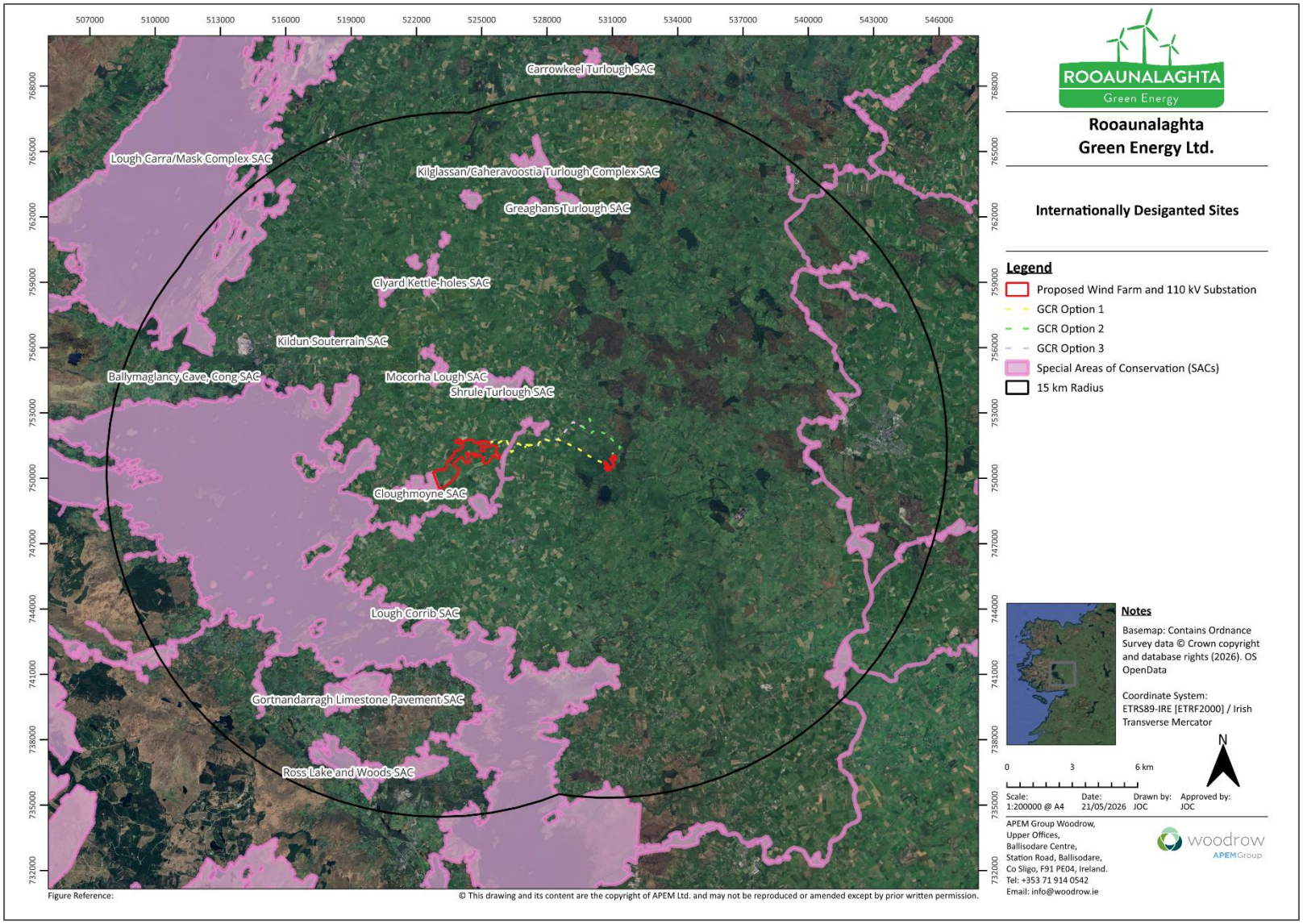


Figure 6-2: Special Areas of Conservation (SACs) within the vicinity of the proposed project

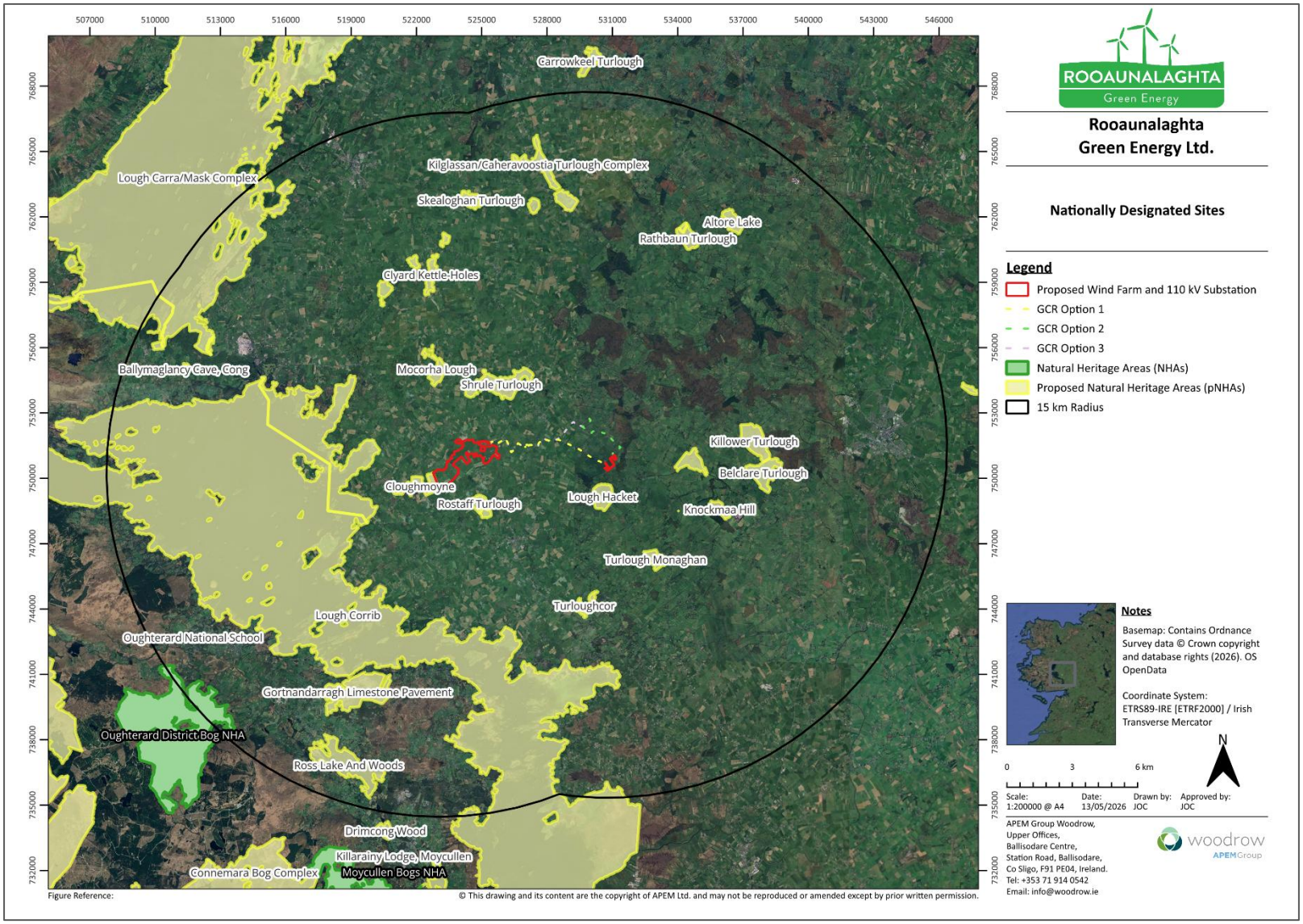


Figure 6-3: Natural Heritage Areas and proposed Natural Heritage Areas within the vicinity of the proposed project

6.4.4 TERRESTRIAL ECOLOGY

6.4.4.1 Habitats and Flora

All habitats identified within the study area were classified using the descriptions and codes as per Fossitt (2000) and these are described in **Appendix 6-3**. This includes those habitats valued as Local (Lower) Importance, such as GA1 improved agricultural grasslands, the most abundant and widespread habitat type within the study area that covers approximately 175 ha. The distribution of all habitats is presented in **Figure 6-4** and **Figure 6-5** and summarised in **Table 6-14**. The description of habitats that have been valued as Local (Higher) ecological importance and above are summarised in the following sections.

Table 6-14: Habitats recorded within the study area

Habitat Code	Habitat Classification
BL1	Stone walls and other stonework
BL3	Buildings and artificial surfaces
ED2	Spoil and bare ground
ED3	Recolonising bare ground
ED4	Active quarries and mines
ER2	Exposed calcareous rock
ER2/GS1	Exposed calcareous rock/Dry calcareous and neutral grassland mosaic
ER2/WN2	Exposed calcareous rock/Oak-ash-hazel woodland mosaic
FL6	Turloughs
FW4	Drainage ditches
GA1	Improved agricultural grassland
GA2	Amenity grassland (improved)
GS1	Dry calcareous and neutral grassland
GS2	Dry meadows and grassy verges
HD1/GS1/HH2	Dense bracken/Dry calcareous and neutral grassland/Dry calcareous heath mosaic
HD1/WS1	Dense bracken/Scrub mosaic
WL1	Hedgerows
WL2	Treelines
WN2	Oak-ash-hazel woodland
WS1/WN2	Scrub/Oak-ash-hazel woodland mosaic

Desk Study Results - Habitats

The review of NPWS Article 17 datasets showed the occurrence of Annex I habitat [8240] limestone pavement* within the study area. Field surveys indicated the presence of further Annex I habitats, as described in the following field study results section.

Desk Study Results - Protected flora

The desktop review encompassed an examination of data repositories maintained by the NBDC and NPWS. The search specifically targeted plant species listed in Annex II, IV and V of the EU Habitats Directive, those protected under the FPO, and those included in The Irish Red Data Book (Wyse Jackson *et al.*, 2016; Hodgetts and Lockhart, 2025). Protected flora from this list recorded within the last 10 years is presented in **Appendix 6-2**; these include two species listed in the Flora (Protection) Order (2022) - limestone fern (*Gymnocarpium robertianum*) and wood bitter-vetch (*Vicia orobus*) with the most recent records for both species dated 2019. A further three species are identified as near threatened in the Ireland Red List (Wyse Jackson *et al.*, 2016) - spring gentian (*Gentiana verna*), autumn lady's-tresses (*Spiranthes spiralis*) and greater knapweed (*Centaurea scabiosa*).

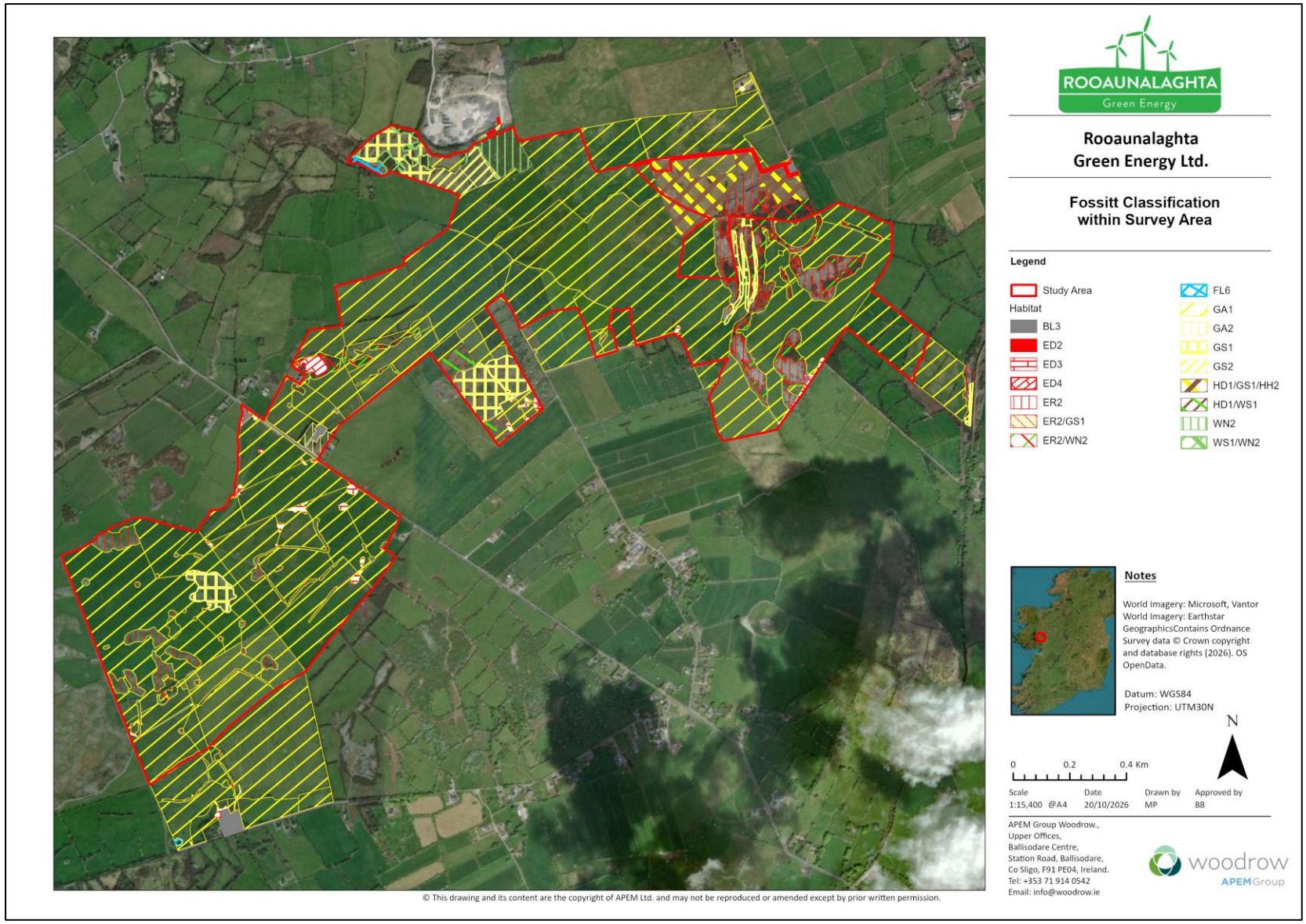


Figure 6-4: Overview of habitats recorded within the study area (not including linear habitats)

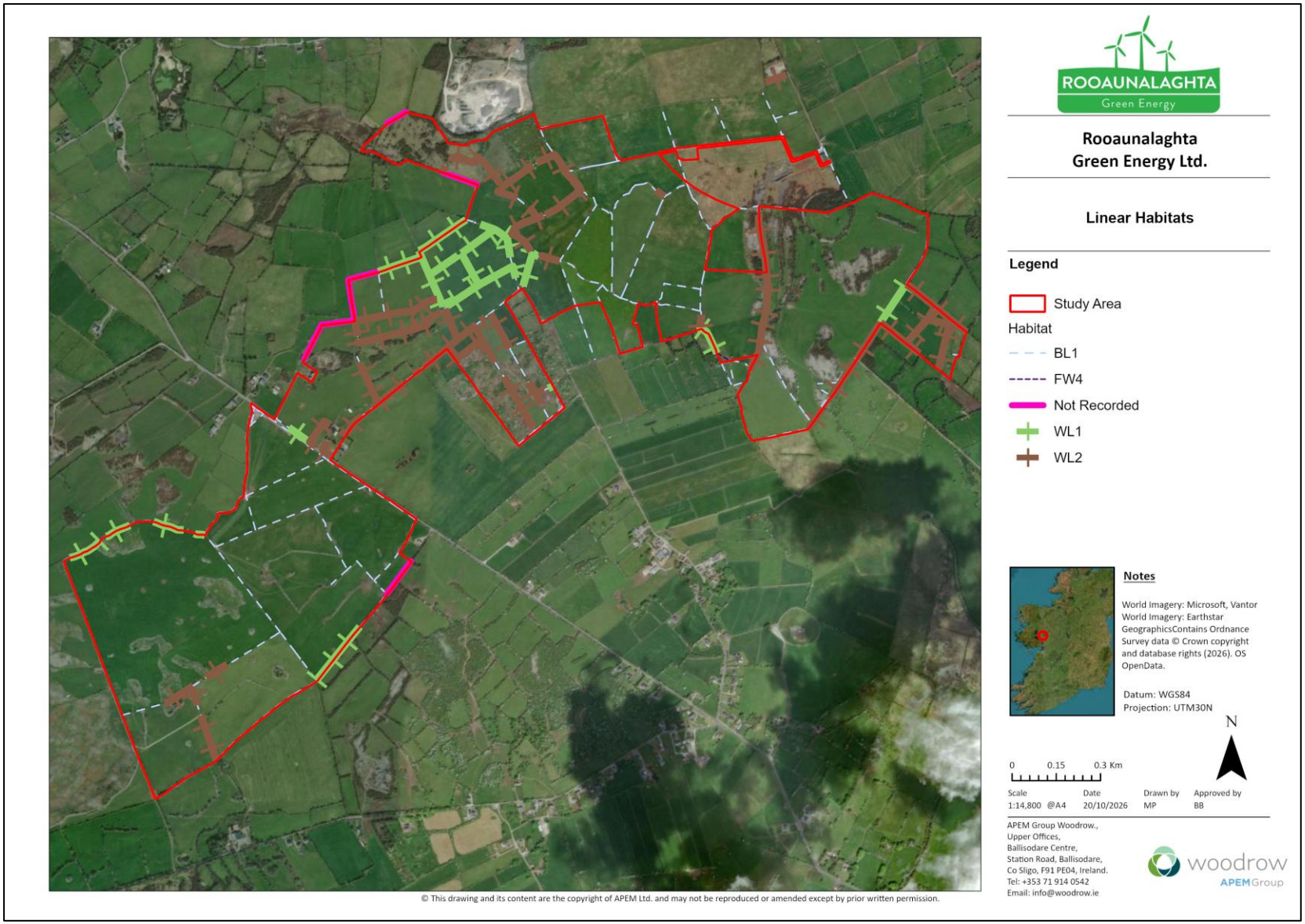


Figure 6-5: Overview of linear habitats recorded within the study area

Field Study Results

The habitats recorded within the Study area that have been valued as Local (Higher) ecological importance and above are summarised in the following sections and described in more detail in **Appendix 6-3**.

BL1 Stonewalls and Other Stonework

Traditional dry stonewalls are used to delineate field boundaries across the study area and are composed of locally-sourced limestone. Stone walls may support a diverse flora potentially with abundant lichens, bryophytes and ferns. A total of 50 species of bryophyte (43 mosses and 7 liverworts) were identified across 31 stone wall sections surveyed, primarily consisting of typical common species of lowland limestone stone walls (refer to **Appendix 6-8** for full details). The species richness varied greatly across the walls surveyed depending on a range of factors including exposure, shading, level of disturbance and size, variety and shape of the rocks that make up the wall. 25 species were recorded from the most species-rich wall surveyed, while only five species were recorded from the most species-poor wall, with species-richness averaging at 11 species per wall. Six walls were found to support 15 or more species of bryophyte.

None of the species recorded are included within the Flora (Protection) Order (2022) or on the most recent bryophyte Red Data list (Hodgetts and Lockhart, 2025). Two species listed as Nationally Scarce in Ireland were found to occur, namely lesser striated feather-moss (*Plasteurhynchium striatulum*) and elegant grimmia (*Schistidium elegantulum*).

While stone walls can generally be reconstructed following disturbance, newly constructed or rebuilt walls may take time to develop the structural complexity, vegetation and associated ecological functions of long-established walls. Stone walls are considered to have moderate sensitivity to change.

ER2 Exposed Calcareous Rock

This habitat type occurs as areas of limestone pavement scattered throughout the proposed wind farm site either in its own, or as part of a habitat mosaic with either GS1 dry calcareous and neutral grassland or WN2 oak-ash-hazel woodland and scrub (described in a later section). This habitat can be found in the area proposed for T1-4, T5 and T10 – T13. Two different types of limestone pavement occur based on their morphology: shattered pavement with areas of loose rubble; and block pavement with well-defined structure of clints (loose stone flags) and grikes (vertical fissures) (Wilson and Fernandez, 2013).

Species recorded within this habitat type included the grasses blue moor-grass (*Sesleria caerulea*), sweet vernal-grass (*Anthoxanthum odoratum*), quaking-grass (*Briza media*) and crested dog's-tail (*Cynosurus cristatus*). Sedges included glaucous sedge (*Carex flacca*), while ferns included wall-rue (*Asplenium ruta-muraria*), maidenhair spleenwort (*Asplenium trichomanes*), hart's-tongue fern (*Asplenium scolopendrium*) and black spleenwort (*Asplenium adiantum-nigrum*). Broadleaved herbs included fairy flax (*Linum catharticum*), lady's bedstraw (*Galium verum*), wild thyme (*Thymus drucei*), wood sage (*Teucrium scorodonia*), broad-leaved helleborine (*Epipactis helleborine*), early purple-orchid (*Orchis mascula*), common milkwort (*Polygala vulgaris*), harebell (*Campanula rotundifolia*), common bird's-foot trefoil (*Lotus corniculatus*) and carline thistle (*Carlina vulgaris*).

This habitat type corresponds to the Annex I priority habitat [8240] limestone pavements*. The vegetation composition of the exposed limestone pavement in the eastern part of the proposed

wind farm site includes frequent positive indicator species, indicating that the quality of the habitat is high; as such it was assessed as Annex I Limestone pavements* in 'Favourable' condition. Limestone pavement in favourable condition is of National ecological importance. In the western part of the proposed wind farm site where grazing pressures are much higher he species diversity of the limestone pavement habitat is significantly reduced. As such, the limestone pavement in the west of the proposed wind farm site was assessed as Annex I limestone pavements* in 'Unfavourable' condition. However, as the causes of the unfavourable habitat condition could be addressed through changes to land management practices these habitat areas are also considered to be a feature of National ecological importance for the impact assessment.

The limestone pavement has a very high sensitivity to change, in particular related to direct physical disturbance. The physical limestone substrate cannot practicably be recreated following removal. The associated vegetation is also dependent upon the particular soil conditions and, where applicable, continuation of an appropriate management regime. The habitat is therefore considered to have a very limited capacity to accommodate direct physical change without alteration of its characteristic structure and ecological functions.

ER2 Exposed Calcareous Rock/ GS1 Dry calcareous and neutral grassland

Exposed calcareous rock also occurs in a mosaic with dry calcareous and neutral grassland, with areas of more continuous grass sward and was recorded to the south of T9. The species composition was similar to those described above for ER2 Exposed calcareous rock.

This habitat type corresponds to the Annex I priority habitat [8240] limestone pavements*. The vegetation composition of the exposed limestone pavement in the east of the proposed wind farm site includes frequent positive indicator species, indicating that the quality of the habitat is high; as such it was assessed as Annex I Limestone pavements* in 'Favourable' condition. Limestone pavement in favourable condition is of National ecological importance.

This mosaic habitat is considered to have very high sensitivity to change, principally associated with physical disturbance, nutrient enrichment and substantial changes in land management. The habitat has a relatively low capacity to accommodate changes without alteration of its characteristic composition and ecological functions.

ER2 Exposed Calcareous Rock/ WN2 Oak-ash-hazel woodland

Areas of woodland on limestone pavement were classified and assessed as 'limestone pavement (wooded)' following NPWS guidance (Wilson and Fernandez, 2013) and recorded as a mosaic of ER2 Exposed calcareous rock and WN2 Oak-ash-hazel woodland. Most of this habitat occurs to the north of the access track from the R334 towards T5 and near T10 – T13. In addition to the species recorded in ER2 Exposed calcareous rock (listed above), this mosaic habitat also featured relatively abundant hazel (*Corylus avellana*), along with frequent hawthorn (*Crataegus monogyna*), rowan (*Sorbus aucuparia*), holly (*Ilex aquifolium*), silver birch (*Betula pendula*). Ground flora included blue moor grass, dog violet (*Viola riviniana*), wild thyme, common milkwort, wood sorrel (*Oxalis acetosella*) and wild strawberry (*Fragaria vesca*).

This habitat type corresponds to the Annex I priority habitat [8240] limestone pavements*. The vegetation composition in wooded limestone pavement at the proposed wind farm site includes frequent positive indicator species. indicting the quality of the habitat is high and as such will likely be assessed as Annex I Limestone pavements* in 'Favourable' condition.

The exposed calcareous rock and oak-ash-hazel woodland mosaic is considered to have very high sensitivity to change. The habitat comprises a structurally diverse mosaic associated with calcareous bedrock and semi-natural native woodland. The physical limestone substrate cannot practicably be recreated following removal or substantial modification, while the woodland component develops over long timescales and has limited recoverability following direct loss.

FL6 Turloughs

This habitat type occurs just within and extending out beyond the northern boundary of the study area 310 m from the closest construction activity, and the hydrology of the habitat is therefore also influenced by land outside of the study area. Although the species assemblage was not diverse within the waterbody it did include species such as creeping bent (*Agrostis stolonifera*), carnation sedge (*Carex panicea*), pondweed (*Potamogeton* sp.) and common spike-rush (*Eleocharis palustris*).

This habitat type corresponds to the Annex I priority habitat [3180] turloughs*.

As groundwater-dependent wetlands whose characteristic ecological communities are intrinsically linked to the prevailing hydrological regime turloughs are considered to have very high sensitivity to environmental change. The habitat is also sensitive to changes in groundwater and surface-water quality, as well as to direct physical loss or disturbance.

FW4 Drainage Ditches

The field boundaries at the proposed substation location are defined by FW4 drainage ditches, which are artificial or heavily modified linear channels, typically c. 1–1.5 m wide, with soft, silty substrates. Although some are mapped as 1st order watercourses, these features have been extensively altered for agricultural drainage, resulting in slow-flowing, intensively managed channels with dense vegetation dominated by coarse grasses and reeds, with occasional scrub along the bank tops.

A short section of similar drainage ditch also occurs within the proposed wind farm site, hydrologically connected to the wider surface water network and ultimately draining to the Rooaunalaghta Stream (EPA Code: 30R03).

These habitats are generally artificial features which are subject to periodic disturbance and maintenance and, where supporting relatively common vegetation, have a comparatively high capacity for recovery following temporary disturbance. Drainage ditches are therefore considered to have low to moderate sensitivity to change.

GS1 Dry calcareous and neutral grassland

Dry calcareous and neutral grassland occurs as a habitat in its own right, and as part of a mosaic with other habitat types near T2, T5 T10 and the north of the study area near the quarry. These swards are typically species-rich, with grasses contribute to 50% of the sward, with a good diversity of flowering plants throughout the sward as well as a well-developed bryophyte layer. Component species included glaucous sedge, fairy flax, lady's bedstraw, wild thyme, harebell and common bird's-foot trefoil.

Due to the presence of a high number of positive indicator species listed in the Annex I criteria, this area of dry calcareous and neutral grassland likely corresponds to Annex I habitat [6210] semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) in 'Favourable' condition.

Species-rich calcareous grassland is considered to have high sensitivity to physical disturbance, nutrient enrichment and substantial changes in management.

GS2 Dry meadows and grassy verges

Dry meadows occur in the north of the study area, between Lydon Quarry to the north and the deposition and borrow pit areas between T6 and T7 to the south. These swards are typically species-rich, with grasses contribute to 50% of the sward, with a good diversity of flowering plants throughout the sward as well as a well-developed bryophyte layer. The sward included two high-quality indicator species (Martin *et al.*, 2018) – yellow rattle *(Rhinanthus minor*) and common bird's-foot-trefoil. A number of other positive indicator species occurred, including common knapweed (*Centaurea nigra*), meadow vetchling (*Lathyrus pratensis*), tufted vetch (*Vicia cracca*), meadow buttercup (*Ranunculus acris*) and red clover (*Trifolium pratense*).

*Due to the presence of a high number of positive indicator species listed in the Annex I criteria, this area of dry meadow corresponds to Annex I habitat [6510] Lowland hay meadows (*Alopecurus pratensis*,* Sanguisorba officinalis*) in 'Favourable' condition.*

The species-rich meadow habitat supports semi-natural grassland vegetation and is dependent upon the continuation of an appropriate management regime including cutting and grazing, as well as low nutrient inputs. Substantial changes cush as nutrient enrichment or reseeding would significantly alter the sward composition. This habitat is therefore considered to have a high sensitivity to change.

HD1 Dense Bracken/GS1 Dry calcareous and neutral grassland/HH2 Dry calcareous heath mosaic

Dense growth of bracken (*Pteridium aquilinum*) were recorded in the northeastern area of the proposed wind farm site to the east of T8, where it formed a mosaic with GS1 Dry calcareous and neutral grassland and HH2 Dry calcareous heath. Dwarf shrub cover was *c.* 25% but the shrubs are stunted suggestive of grazing. As such the vegetation is quite grassy with a diverse forb component indicative of the underlying calcareous bedrock. The heathland component of the vegetation corresponds with the Annex I habitat [4030] European dry heaths and the grassland potentially aligns to the semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) [6210]. Significant expanses of bracken intrude into the habitat mosaic, but these areas were not mapped separately as dense bracken because overall cover does not exceed 50%. As bracken is not listed as a negative indicator in the assessment criteria for Annex I habitat [4030] - European dry heaths, it is simply considered here as a component of the heathland habitat (Wilson and Fernandez 2013). No limestone intrusions were noted within the heathland habitat.

Species recorded within this habitat type include heather (*Calluna vulgaris*), sweet vernal grass, false oat grass (*Arrhenatherum elatius*), sheep's-fescue (*Festuca ovina*), purple moor-grass (*Molinia caerulea*), heath bedstraw (*Galium saxatile*), lady's bedstraw, bird's-foot trefoil, tormentil (*Potentilla erecta*), glaucous sedge, wild thyme, devil's-bit scabious (*Succisa pratensis*), heath spotted-orchid (*Dactylorhiza maculata*), common spotted orchid (D*actylorhiza fuchsii*), common knapweed, heath milkwort (*Polygala serpyllifolia*), eyebright (*Euphrasia officinalis*), ox-eye daisy (*Leucanthemum vulgare*).

In the context of the local environment, primarily in the form of intensive agricultural grasslands and exposed calcareous rock limestone pavement, this mosaic habitat of dense bracken/ dry

calcareous and neutral grassland/ dry calcareous heath is considered to be a habitat of limited occurrence in the wider area.

Although dense bracken has relatively low sensitivity and a high capacity for regeneration, the semi-natural grassland and heath components are more sensitive to physical disturbance, nutrient enrichment and changes in management. The dense bracken, dry calcareous and neutral grassland and dry calcareous heath mosaic is considered to have high sensitivity to change. These habitats are dependent upon the underlying soil and geological conditions and an appropriate grazing regime, and substantial disturbance or nutrient enrichment could result in long-term changes in species composition.

HD1 Dense Bracken/WS1 Scrub mosaic

Dense bracken also occurs in a mosaic with scrub near T5. The scrub is dominated by a diverse shrub layer with canopy heights less than 4 m. Species recorded within this habitat type include hazel, hawthorn, rowan, holly and silver birch.

Both dense bracken and scrub typically comprise relatively robust vegetation capable of colonising or regenerating following disturbance, and consequently have a comparatively high capacity for recovery. However, the structural architecture of scrub may take a number of years to replace, therefore this mosaic habitat would be considered to have moderate sensitivity to change.

WL1 Hedgerows

The total length of hedgerows growing within the study area was recorded as approximately 2.5 km, including boundaries near T1, T4, T6, T10 and T12. Hedgerow species are dominated by hawthorn, hazel and blackthorn (*Prunus spinosa*). Hedgerows across the proposed wind farm site are largely associated with stonewalls and act as field boundaries.

The network of hedgerow field boundaries within the study area, supports biodiversity that would otherwise be limited given the agricultural nature of the surrounding area. Hedgerows provide a key ecological feature for fauna including shelter for a range of birds, small mammals and invertebrates, and also provide a foraging habitat for bats which feed on the flying insects associated with such features.

Although typically managed habitats, established hedgerows provide woody habitat and ecological connectivity within the wider landscape. Direct removal would result in immediate loss of these functions and, while replacement planting is practicable, a newly planted hedgerow would require time to develop the structural complexity of an established feature. Hedgerows are considered to have moderate sensitivity to change.

WL2 Treelines

Treelines are greater than 5 m in height but less than 4 m wide at the base and typically occurs along field or property boundaries and includes tree-lined roads and overgrown hedgerows that are dominated by trees. The total length of treelines growing within the study area was recorded as approximately 6.0 km and these occurred across the study area. Treelines across the proposed wind farm site include species similar to those present in the hedgerows, such as ash (*Fraxinus excelsior*), hazel, hawthorn and blackthorn.

The treelines and hedgerows within the study area combine to form a network of field boundaries, supporting biodiversity that would otherwise be limited given the agricultural

nature of the surrounding area. These linear tree and shrub features provide valuable habitats including shelter for a range of birds, small mammals and invertebrates, and provide a foraging habitat for bats which feed on the flying insects associated with such features.

Treelines are considered to have moderate sensitivity to change. Their sensitivity is primarily associated with the age and maturity of constituent trees and their function as linear ecological features. Treelines may also provide important connectivity between woodland and other semi-natural habitats. Their ability to recover from direct removal is therefore limited, particularly where mature or veteran trees are present.

WN2 Oak-ash-hazel woodland

This habitat type occurs in distinct woodland parcels which have been somewhat protected from sheep grazing by stone walls towards the northern part of the proposed wind farm site, near the access track to the quarry, T7 and the borrow pit area. There is evidence of browsing from cattle within woodland parcels. The woodland canopy reaches a height of c. 4-5 m tall and as such is somewhat stunted as it lacks the upper canopy which is usually formed in this habitat type by mature ash and pedunculate oak (*Quercus robur*). The canopy is closed and as such the ground flora is typical of that found in woodland habitats. In addition, the highly shaded conditions allow for a well-developed bryophyte layer which covers the limestone boulders.

Species recorded within this habitat type include hazel, ash, hawthorn, holly, blackthorn, Atlantic ivy (*Hedera hibernica*), bramble (*Rubus fruticosus* agg.), dog violet (*Viola spp.*), wood sorrel, wood avens (*Geum urbanum*), herb-Robert (*Geranium robertianum*), primrose (*Primula vulgaris*), lords-and-ladies (*Arum maculatum*), hairy brome (*Bromopsis ramosa*), Common tamarisk-moss (*Thuidium tamariscinum*), fox-tail feather-moss (*Thamnobryum alopecurum*).

Although this woodland category is not an annexed habitat, it is very limited in extent in Ireland and should be regarded as being of conservation importance (Fossitt, 2000).

Semi-natural woodland develops over relatively long timescales and its ecological structure and functions depend upon the combined presence of the woodland canopy, understorey, ground flora, deadwood and associated woodland soils. Direct removal would result in the immediate loss of these features, while newly planted woodland would require an extended period to develop comparable structure and ecological functionality. The habitat is also susceptible to fragmentation, changes in woodland microclimate, soil disturbance and inappropriate changes in management. Mature, long-established woodland with a diverse ground flora could justify high sensitivity to change, whereas relatively recent hazel-dominated secondary woodland might be considered moderate-high.

WN2 Oak-ash-hazel woodland/WS1 Scrub mosaic

This habitat type is confined to the north of the proposed project, to the west of T7 and north of T6, 260 m from the closest construction activity, where grazing pressure is somewhat reduced. The scrub is dominated by a diverse shrub layer with canopy heights less than 4 m. The canopy is open and as such the ground flora is more representative of dry calcareous grassland than woodland flora. Exposed limestone outcrops are frequent. Pockets of scrub on limestone pavement were classified and assessed as 'limestone pavement (wooded)' following NPWS guidance (Wilson and Fernandez, 2013).

Species recorded within this habitat type include Hazel, hawthorn, rowan, holly, silver birch, blue moor grass, dog violet, wild thyme, crested dog's-tail, common milkwort, wood sorrel, wall lettuce (*Mycelis muralis*), quaking grass, bird's-foot trefoil, wild strawberry.

The oak-ash-hazel woodland and scrub mosaic is considered to have high sensitivity to change. Although the scrub component has a relatively high capacity for regeneration, the semi-natural woodland component has developed over substantially longer timescales and has limited recoverability following direct loss.

Protected flora

No species listed within Annex II, IV and V of the EU Habitat Directive, the Flora (Protection) Order (2022) statutory instrument or listed in The Irish Red Data Book (Wyse Jackson *et al.,* 2016; Hodgetts and Lockhart, 2025) were recorded during the field surveys. The two Flora Protection Order species identified in the desk study (i.e., wood bitter-vetch (*Vicia orobus*) and limestone fern (*Gymnocarpium robertianum*)) were not recorded.

Non-native Invasive Species

No terrestrial or aquatic, non-native invasive species were recorded within the proposed wind farm site or at the proposed 110 kV substation.

Summary of Habitats

The geographic extent and ecological importance of IEF habitats within the study area is provided in **Table 6-15.** Other habitats that are not IEF are present including GA1 improved agricultural grassland which was the most widespread and abundant habitat covering approximately 175 ha.

Table 6-15: Evaluation of habitats within the study area

Habitat Classification	EU Annex I Affiliation (* indicates priority habitat)	Approx. area [ha] or length [km] within the study area	Ecological Evaluation & Basis of Evaluation	IEF? Yes/No
BL1 Stone walls and other stonework	No	20.98 km	Local (Higher) Importance Limestone stone walls marking field boundaries supporting lichens and bryophytes.	Yes
ER2 Exposed calcareous rock	8240 - Limestone pavements*	11.44 ha	Good condition – National Importance Unfavourable condition recoverable to good condition with changes to management – National Importance 'Exposed' limestone pavements are both geologically and biologically important resources. However, species diversity on limestone pavement is significantly reduced where grazing pressures are much higher. EU Annex I affiliation.	Yes
ER2 Exposed calcareous rock/ GS1 Dry calcareous and neutral grassland mosaic	8240 - Limestone pavements* 6210 - Semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*)	0.07 ha	Good condition – National Importance Limestone pavements are both geologically and biologically important resources. 'Exposed' limestone pavement in a mosaic with species-diverse calcareous grassland. EU Annex I affiliations	Yes
ER2 Exposed calcareous rock/ WN2 Oak-ash-hazel woodland mosaic	8240 - Limestone pavements*	6.06 ha	Good condition – National Importance Unfavourable condition recoverable to good condition with changes to management – National Importance 'Wooded' limestone pavement with a canopy of scrub and trees covering the pavement. Limestone pavements are both geologically and biologically important resources. EU Annex I affiliation.	Yes

Habitat Classification	EU Annex I Affiliation (* indicates priority habitat)	Approx. area [ha] or length [km] within the study area	Ecological Evaluation & Basis of Evaluation	IEF? Yes/No
FL6 Turloughs	3180 – Turloughs*	0.39 ha	National Importance Ephemeral waterbody occupying basin or depression in limestone areas, and where water levels fluctuate markedly during the year. EU Annex I affiliation.	Yes
FW4 Drainage ditches	No	0.39 km	Local (Higher) Importance Network of ditches at the substation, while the grid connection route crosses and is adjacent to drainage ditches.	Yes
GS1 Dry calcareous and neutral grassland	6210 - Semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*)	8.56 ha	National Importance The grassland sward is species-rich, with a high number of positive indicator species listed in the Annex I assessment criteria. EU Annex I affiliation.	Yes
GS2 Dry meadows and grassy verges	6510 - Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)	2.10 ha	National Importance Grasslands surrounding residential property. Low diversity. EU Annex I affiliation.	Yes
HD1 Dense bracken/ GS1 Dry calcareous and neutral grassland/ HH2 Dry calcareous heath mosaic	4030 - European dry heaths 6210 - Semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*)	1.37 ha	County/ Regional Importance Mosaic habitat with dry calcareous heath with approximately 25% dwarf shrub cover, with dry calcareous grassland vegetation that is quite grassy but with a diverse forb component as well as dense bracken. EU Annex I affiliations.	Yes

Habitat Classification	EU Annex I Affiliation (* indicates priority habitat)	Approx. area [ha] or length [km] within the study area	Ecological Evaluation & Basis of Evaluation	IEF? Yes/No
HD1 Dense bracken/ WS1 Scrub mosaic	No	1.11 ha	Local (Higher) Importance Mosaics with dense bracken as well as woody scrub.	Yes
WL1 Hedgerows	No	2.51 km	Local (Higher) Importance Network of hedgerows. This habitat will likely support breeding birds, mammals, foraging and commuting bats.	Yes
WL2 Treelines	No	6.00 km	Local (Higher) Importance Mature species-rich treelines. This habitat is likely to support breeding birds, mammals, foraging and commuting bats.	Yes
WN2 Oak-ash-hazel woodland	No	2.32 ha	Local (Higher) Importance This habitat is likely to support breeding birds, mammals, foraging and commuting bats.	Yes
WS1 Scrub/ WN2 Oak-ash-hazel woodland mosaic	No	0.74 ha	Local (Higher) Importance This habitat is likely to support breeding birds, mammals, foraging and commuting bats.	Yes
BL3 Buildings and artificial surfaces	No	1.24 ha	Local (Lower) Importance Various agricultural buildings and abandoned structures. Note: buildings were assessed separately for suitability as bat roosts.	No

Habitat Classification	EU Annex I Affiliation (* indicates priority habitat)	Approx. area [ha] or length [km] within the study area	Ecological Evaluation & Basis of Evaluation	IEF? Yes/No
ED2 Spoil and bare ground	No	0.12 ha	Local (Lower) Importance Bare ground associated with access tracks. Note: utilisation by reptiles and amphibians assessed separately.	No
ED3 Recolonising bare ground	No	1.59 ha	Local (Lower) Importance Previous bare ground that is re-vegetated with herbaceous species.	No
ED4 Active quarries and mines	No	0.48 ha	Local (Lower) Importance Two open quarries where levels of disturbance inhibit colonisation by plants.	No
GA1 Improved agricultural grassland	No	175.03 ha	Local (Lower) Importance Improved and grazed agricultural grassland sward. Low diversity.	No
GA2 Amenity grassland (improved)	No	0.61 ha	Local (Lower) Importance Grasslands surrounding residential property. Low diversity.	No

6.4.4.2 Terrestrial Mammals

Desk study results

A desk study of the study area (28 – 30 April 2025) and the grid squares it encompasses, identified records of six protected terrestrial mammal species within 2 km of the proposed project. These species are listed in **Table 6-16**. The invasive non-native American mink (*Neogale vison*), classified as a high impact invasive species in Ireland, has also been recorded within the wider area.

Table 6-16: Terrestrial mammal species recorded in the study area and their conservation status

Species	Conservation Status
Eurasian badger (*Meles meles*)	Least Concern
Eurasian otter (*Lutra lutra*)	Least Concern
Irish hare (*Lepus timidus hibernicus*)	Least Concern
Irish stoat (*Mustela erminea hibernica*)	Least Concern
Pine marten (*Martes martes*)	Least Concern
West European hedgehog (*Erinaceus europaeus)*	Least Concern
American mink (*Neogale vison*)	Not protected, high impact invasive species

Evidence of five of the six species listed in **Table 6-16** was recorded during the field surveys, primarily through field signs, although direct sightings were also made. A summary of the survey results is presented in this section. **Appendix 6-3** provides images illustrating mammal presence and activity within the study area. All native terrestrial mammals in Ireland are protected under the Wildlife Acts.

Badger

With the exception of the offsite substation, relatively low levels of habitat use by badger were recorded within the study area. Within the main proposed wind farm site, badger activity was limited to a small number of trails, one latrine and one isolated single-entrance setts that showed only occasional use. A second single entrance sett was recorded, incidentally, outside the study area, c. 390 m from the proposed project.

In contrast, higher levels of activity were recorded at the proposed 110 kV substation location, where a main sett comprising six entrances was recorded c. 102 m northeast of the proposed substation (see **Appendix 6-3** for details). An additional entrance was found 123 m of the proposed substation and is considered likely to be connected. A local population of badger was confirmed using the sett following trail camera monitoring. The group consisted of at least seven individuals, including cubs, confirming that it functions as a breeding sett. A return visit in March 2026 recorded fresh discarded bedding material, confirming that the sett remained active and in continued use.

Otter

Otter activity within the study area was mostly confined to the Black River (EPA Code: 30B02), with records limited to field signs such as spraints (otter droppings), although one direct sighting was made incidentally to the east of the proposed project during a routine bird survey.

Additional otter surveys undertaken in August 2026 recorded otter spraints at four locations along the Black River (EPA Segment Codes: 30_1502, 30_1506, 30_1507 and 30_1407), further confirming regular use of the river corridor by foraging and commuting otter. An additional old spraint was recorded on the Cloghmoyne Stream (EPA Code: 30C80), indicating occasional or seasonal use of this tributary.

No resting or breeding sites were identified along the stretches of the Black River (EPA Code: 30B02) surveyed; however, monitoring is challenging at some locations due to steep, rocky banks and scrub cover, particularly where historical arterial drainage works have created deeply incised, gorge-like sections through blasted limestone bedrock. In any case, and following the iterative design process, the proposed project boundary currently lies >150 m from the Black River, while the nearest proposed site infrastructure is a minimum of c. 280 m away. Survey results (see **Appendix 6-3** and **Appendix 6-7**) suggest that the Black River and its associated riparian habitats form part of a wider home range used for commuting and foraging by a regularly occurring otter population associated with the Lough Corrib SAC.

Other mammals

Pine marten (Martes martes)

Although no pine marten records exist within the 2-km grid squares encompassing the proposed project, a 2021 record occurs approximately 2 km to the south-east of the proposed wind farm site. No direct observations were made during field surveys, although small pockets of woodland and treeline offer limited suitable habitat. Trail cameras did not capture any evidence of the species, and only one suspected scat was recorded on a stone wall within the study area. No dens or denning signs were identified, and most trees lack the cavities or hollows typically used for resting sites. While occasional shared use of badger setts is possible, no such evidence was recorded.

Hedgehog (Erinaceus europaeus)

Previous desktop records indicate hedgehog in the wider area, although none were detected during onsite surveys. Habitat types within the study area provide suitable resting and breeding opportunities, particularly within field margins and areas of dense vegetation.

Irish hare (Lepus timidus hibernicus)

Irish hare were directly observed within the study area, with most sightings recorded incidentally during habitat and bird surveys. Three encounters occurred during targeted mammal surveys in April 2025, including two along the south-west boundary. The study area provides suitable resting and breeding habitat for this species.

Irish stoat (Mustela erminea hibernica)

No field signs of stoat were recorded during targeted surveys; however, two incidental observations were made. The first occurred in June 2024 during static bat detector deployment when an individual was seen pursuing rodent prey. The second sighting took place during aquatic surveys of the GCR in April 2025 (see **Section 6.4.5.2**).

Pygmy shrew (Sorex minutus)

Although no evidence of pygmy shrew was observed, suitable small mammal habitat was noted in areas with dense ground cover, particularly along hedgerow and heath margins.

Red squirrel (Sciurus vulgaris)

No evidence of red squirrel was recorded, and suitable habitat was absent. The limited woodland present does not support the extensive, connected canopy typically required by the species.

Non-Native Invasive Species

One American mink (*Neogale vison*) was incidentally observed emerging from a stone wall within the proposed wind farm during a walkover bird survey. This non-native species is classified as invasive in Ireland and is known for its adverse ecological impacts, particularly on ground-nesting birds, small mammals, and aquatic species. Mink are opportunistic predators and have contributed to the decline of vulnerable native fauna.

6.4.4.3 Amphibians and Reptiles

Appendix 6-3 provides descriptions of amphibian and reptile suitability within the study area. Desktop records for smooth newt were absent, and all assessed waterbodies were of poor to below-average suitability except two adjacent ponds on the southern periphery, which were rated suitable despite some livestock access. As these ponds lie >250 m from the proposed site infrastructure with no surface water connectivity, targeted dusk surveys were not considered necessary.

Additional eDNA surveys completed in August 2026 did not detect smooth newt within pond P1, a small pond connected to the Rooaunalaghta Stream (EPA Code: 30R03). Results from pond P2, the waterbody considered most suitable for smooth newt during habitat suitability surveys completed in April 2025, were inconclusive due to sample inhibition associated with elevated turbidity and suspended sediment concentrations (see **Appendix 6-7**). No smooth newt were recorded elsewhere within the study area.

Common frog tadpoles were also recorded in one of these ponds (P2). Although no additional field signs were observed, desktop records and local habitat suitability indicate that the species is likely to occur within the wider area.

For common lizard, desktop records occur within 2 km of the proposed project, but no individuals were observed during herpetofauna suitability surveys or incidental walkovers across three years of surveying the study area. Suitable habitat was limited to small pockets of rock piles, stone walls and scattered limestone outcrops; the remainder of the study area comprises tightly grazed improved agricultural grassland (GA1), offering restricted structural diversity and limited invertebrate prey.

6.4.4.4 Invertebrates

Lepidoptera (butterflies)

Desk study records indicated that dingy skipper (*Erynnis tages*), grayling (*Hipparchia semele*), marsh fritillary (*Euphydryas aurinia*), small heath (*Coenonympha pamphilus*) and dark green fritillary (*Speyeria aglaja*) have been recorded within the two 10-km squares encompassing the proposed project during the last ten years (see **Appendix 6-2**).

Site-specific surveys recorded a total of 10 butterfly species across the four survey visits. These comprised meadow brown (*Maniola jurtina*), painted lady (*Vanessa cardui*), speckled wood (*Pararge aegeria*), common blue (*Polyommatus icarus*), red admiral (*Vanessa atalanta*), small heath, small tortoiseshell (*Aglais urticae*), ringlet (*Aphantopus hyperantus*), small white (*Pieris rapae)* and small copper (*Lycaena phlaeas*).

Of these, only small heath is currently considered Near Threatened on the Irish Red List (Regan et al., 2010), with the remaining species classified as Least Concern. Small heath was recorded on eight occasions across two survey visits, with a single record obtained on 25 June 2026 and the remaining records obtained on 16 July 2026. The majority of records occurred within a mosaic of HD1 dense bracken, GS1 dry calcareous and neutral grassland, and HH2 dry calcareous heath habitats surrounding the proposed onsite control building.

6.4.4.5 Bats

Desk Study Results

The desk study data identified records of nine bat species (NBDC, 2025 and BCI, 2026) within a 10 km radius of the proposed wind farm site. These include common pipistrelle, soprano pipistrelle, Nathusius pipistrelle, Leisler's bat, brown long-eared bat, Daubenton's bat, Natterer's bat, whiskered bat and lesser horseshoe bat. All species are listed under Annex IV of the EU Habitats Directive, with lesser horseshoe bat also listed under Annex II. Records are primarily associated with roost sites and incidental observations, with several species indicating high to very high habitat suitability within the wider landscape based on NBDC habitat suitability indices, as shown in **Table 6-17**.

Table 6-17: Bat species records within a 10 km search radius of the proposed project

Species name	Roost records within 10 km	Habitat Directive	Irish Red List Status	NBDC habitat suitability index (level)[27]
Common pipistrelle	3	Annex IV	Least concern	High (39)
Soprano pipistrelle	6	Annex IV	Least concern	Very High (43)
Nathusius's pipistrelle	1	Annex IV	Least concern	Very Low (6)
Leisler's bat	2	Annex IV	Least concern	Very High (46)
Brown long eared bat	6	Annex IV	Least concern	Very High (44)
Daubenton's bat	5	Annex IV	Least concern	High (34)
Natterer's bat	2	Annex IV	Least concern	Very High (40)
Whiskered bat	2	Annex IV	Least concern	Very Low (10)
Lesser horseshoe bat	19	Annex II Annex IV	Least concern	Moderate (26)

[27] NBDC (2026b). *Bat Habitat Suitability Map based on Lundy et al. (2011).* NBDC. Available at: https://maps.biodiversityireland.ie/Map [Last accessed: February 2026].

Bat Habitat Suitability

A project-specific assessment of bat habitat suitability was undertaken within the proposed wind farm site on 24 January 2024.

The proposed wind farm site comprises a relatively open and feature-poor landscape for bats, characterised by improved grassland grazed by sheep, limestone pavement, and ER2/WN2 habitat, HD1/GS1/HH2 habitat and WN2/WS1 habitat areas which had low hazel, silver birch and holly species present. Tree cover is limited and there are few well-developed linear features. Field boundaries are defined primarily by a network of dry-stone walls, approximately 1.5–2.0 m in height, with occasional crevices and voids within the stonework. Hedgerows generally follow these stone walls and form field boundaries. The dry-stone wall network and associated hedgerows provide limited structural connectivity across the proposed wind farm site and function as low-quality foraging and commuting features within an otherwise open agricultural landscape.

In line with Collins (2023), landscapes of low bat habitat suitability are typically characterised by open agricultural land with limited tree cover, a scarcity of well-developed linear features, and an absence of features capable of supporting significant roosts. The proposed wind farm site reflects these characteristics, with limited roosting opportunities and weak linear connectivity, and is therefore considered to be of low suitability for bats.

Preliminary Roost Assessment

A PRA was undertaken to identify the presence of features within the proposed wind farm site that could provide potential roosting opportunities for bats.

The dry-stone wall network, approximately 1.5 – 2.0 m in height, was identified as offering limited potential for use by roosting bats on a transitional or opportunistic basis, for example through crevices or voids within the stonework. No evidence of bat roosting was recorded during the survey, and the walls are not considered likely to support maternity or hibernation roosts.

A total of seven PRFs (F.1–F.7) were identified within the proposed wind farm site, comprising a small number of buildings and trees with features assessed as being of moderate or high roost suitability, and several features of low suitability (PRF-I). The locations of these PRFs are shown in **Figure 3** in **Appendix 6-4**.

Each of the PRFs identified (F.1 – F.7) were inspected using an endoscope under licence (DER/BAT 2024-27). There were no bats present at the features on the day of inspection. Full survey details can be seen in **Appendix 6-4**.

Table 6-18: PRFs identified within the study area

Feature ID	Feature Description	PRF Suitability
F.1	Farm shed	Moderate
F.2	Dry-stone farm shed	Moderate
F.3	Large barn	Negligible

Feature ID	Feature Description	PRF Suitability
F.4	Willow tree with crevice	PRF-I
F.5	Dead hazel tree with crevice	PRF-M
F.6	Hollow branch on elder tree	PRF-M
F.7	Derelict house	Moderate

Roost Emergence and Roost Inspection Surveys

Multiple roost emergence surveys were completed withing the 2024 active bat seasons. **Table 6-19** shows the date, location, feature surveyed and outcome of each survey. Roost surveys established the existence of a transitional soprano pipistrelle roost (two individual bats) at F.1and a transitional roost at F.7, where four bats were recorded emerging during the April 2026 survey. Based on bat activity recorded in the area these individuals were considered most likely to be common pipistrelle, although species confirmation was not possible. No other roosts were confirmed within the study area. Full survey details can be seen in **Appendix 6-4**. Location of roost features compared to turbine locations are also shown in **Figure 3** of **Appendix 6-4**.

Table 6-19: Summary of emergence surveys and results at each PRF location

Feature ID	Feature	PRF classification	Distance to nearest turbine	Survey type and dates	Conclusion
F.1	Lambing shed	Moderate	245m to T3	03 April 2024	No emergence observed. The building is not subject to direct loss or modification as part of the proposed wind farm layout.
F.2 and F.3	Dry-stone farm shed and large barn	Moderate	360m to T6	22 April 2024	No emergence observed. Soprano pipistrelle foraging within large barn. The building is not subject to direct loss or modification as part of the proposed wind farm layout.
F.1	Lambing shed	Moderate	245m to T3	29 May 2024	Emergence observed – soprano pipistrelle (2). The building is not subject to direct loss or modification as part of the proposed wind farm layout.
F.2	Dry-stone farm shed	Moderate	360m to T6	06 June 2024	No emergence observed. The building is not subject to direct loss or modification as part of the proposed wind farm layout.
F.4	Willow tree with crevice	PRF-I	100 m – T13	06 June 2024	No emergence observed. The feature is not subject to direct loss or modification as part of the proposed wind farm layout
F.5	Dead hazel	PRF-M	160 m – T8	06 June 2024	No emergence observed.

Feature ID	Feature	PRF classification	Distance to nearest turbine	Survey type and dates	Conclusion
	tree with crevice				The feature is not subject to direct loss or modification as part of the proposed wind farm layout
F.6	Hollow branch on elder tree	PRF-M	350 m – T3	06 June 2024	No emergence observed. The feature is not subject to direct loss or modification as part of the proposed wind farm layout
F.7	Derelict house	Moderate	630m to T6	14 April 2026	Emergence observed –four individuals. No works proposed in this area. The building is not subject to direct loss or modification as part of the proposed wind farm layout.
F.5	Dead hazel tree with crevice	PRF-M	160 m – T8	14 June 2024	No emergence observed. The feature is not subject to direct loss or modification as part of the proposed wind farm layout
F.6	Hollow branch on elder tree	PRF-M	350 m – T3	14 June 2024	No emergence observed. The feature is not subject to direct loss or modification as part of the proposed wind farm layout
F.7	Derelict house	Moderate	630m to T6	14 June 2026	No emergence observed. The building is not subject to direct loss or modification as part of the proposed wind farm layout.

Winter Roost Inspections

No hibernating bats were found during winter hibernation surveys and genetic samples of potential bat droppings were inconclusive, likely due to environmental degradation of samples. No further samples were available for analysis. On this basis, no evidence of hibernating bats was identified. Full survey details can be found in **Appendix 6-4**.

Static Bat Detector Surveys

Bat activity was recorded for at least seven species; however, calls assigned to *Myotis spp.* could not be identified to species level and may represent more than one *Myotis* species occurring in Ireland. Detailed static detector results, including a breakdown of bat activity by species, detector location and survey season, are provided in **Appendix 6-4**. A summary is provided below, and in **Table 6-21.**

A total of 58,927 bat passes were recorded across all detector locations and seasons. Activity was dominated by Leisler's bat (25,092 passes; 42.6%), followed by common pipistrelle (16,522 passes; 28.0%) and soprano pipistrelle (15,010 passes; 25.5%). Other species, including *Myotis* species, brown long-eared bat, Nathusius's pipistrelle and lesser horseshoe bat, collectively, accounted for less than 5% of total activity.

Leisler's bat was recorded widely across the proposed wind farm site, with activity at several detector locations including D.01, D.05, D.06, D.10 and D.13. Activity occurred in seasonal

peaks, particularly during summer, and was associated with both habitat features and more open areas during favourable weather conditions, as seen in **Appendix 6-4**. As a fast-flying species known to forage at turbine rotor height, Leisler's bat represents the principal collision-risk receptor for the proposed wind farm site (BCI, 2026). Common and soprano pipistrelle were also widely distributed, with highest activity recorded at D.12, D.08 and D.13. Activity patterns are consistent with foraging and commuting use of hedgerows, woodland edges and agricultural field networks.

Lesser horseshoe bat was recorded at low levels (142 passes) across multiple detector locations. Activity was spatially dispersed and did not indicate concentrated use or roost adjacency within the turbine envelope.

Interpretation of static detector data by location and season (refer to **Appendix 6-4**) indicates regular commuting and foraging use of agricultural and edge habitats within the proposed project footprint, consistent with Bat Conservation Ireland Onshore Wind Farm guidance (BCI, 2026). No confirmed maternity or hibernation roosts were identified. Activity levels of Leisler's bat were higher than those of other species and are addressed separately in the collision risk assessment.

Table 6-20: Summary of static bat detector surveys by turbine location

Turbine (Detector)	Leisler's Bat	Common Pipistrelle	Soprano Pipistrelle	Other Species
T1 (D.01)	Moderate summer, High autumn	Low throughout	Low throughout	Myotis low throughout; Nathusius' and lesser horseshoe absent spring, low summer/ autumn
T2 (D.02, D.03 for context)	Low throughout	Low throughout	Moderate autumn; otherwise low	Myotis low throughout; Nathusius' absent spring then low; lesser horseshoe absent at turbine location
T3 (D.03)	Low overall, increasing in summer/autumn	Low throughout	Increased from low spring levels to higher activity in summer/ autumn	Myotis very low throughout; Nathusius' negligible summer only; lesser horseshoe very low autumn only
T4 (D.04)	Moderate summer/autumn	Low throughout	Low throughout	Myotis low throughout; Nathusius' and lesser horseshoe absent spring, low summer/autumn
T5 (D.05)	High summer; Moderate autumn	Moderate summer; Low spring/ autumn	Moderate summer; Low spring/autumn	Myotis, Nathusius' and lesser horseshoe all recorded at low levels throughout

Turbine (Detector)	Leisler's Bat	Common Pipistrelle	Soprano Pipistrelle	Other Species
T6 (D.06)	High summer; Moderate autumn	Low throughout	Low throughout	Myotis and Nathusius' low throughout; lesser horseshoe not recorded
T7 (D.07)	Moderate summer/autumn	Low throughout	Low throughout	Myotis low throughout; Nathusius' low summer only; lesser horseshoe not recorded
T8 (D.08)	Higher activity in summer/ autumn than spring	Low spring; higher summer/ autumn	Low spring; higher summer/autumn	Myotis low throughout; Nathusius' low spring/summer only; lesser horseshoe low throughout
T9 (D.09)	Low spring; increased summer/autumn	High summer; Moderate autumn	High summer; Moderate autumn	Myotis, Nathusius' and lesser horseshoe all recorded at low levels throughout
T10 (D.10)	High summer	Moderate summer; Low spring/ autumn	Low throughout	Myotis low throughout; Nathusius' low spring/summer only; lesser horseshoe low autumn only
T11 (D.11)	High summer; Low spring/ autumn	Low throughout	Low throughout	Myotis low throughout; Nathusius' low spring/summer only; lesser horseshoe low throughout
T12 (D.12)	High summer	Moderate to High spring/ autumn	Moderate to High spring/autumn	Myotis low throughout; Nathusius' low spring/summer only; lesser horseshoe low throughout
T13 (D.13)	High summer	High spring/ autumn	High spring/autumn	Myotis low throughout; Nathusius' low summer only; lesser horseshoe absent spring, low summer/autumn

Valuing Bat Populations

The habitats within the proposed wind farm site comprise isolated woodland and areas of less intensive agriculture, together with a network of dry-stone walls and hedgerows of variable quality. These habitats provide opportunities for bat commuting and foraging, particularly along linear features.

With the exception of Nathusius' pipistrelle and lesser horseshoe bat, the bat species recorded within the proposed wind farm site are considered common and widespread in an Irish context. A small number of calls attributed to *Myotis spp.* were recorded; however, these could not be reliably resolved to species level using static acoustic data. While whiskered bat may occur locally at low densities, the NBDC habitat suitability index classifies the proposed wind farm site as being of low suitability for this species. On this basis, and in line with standard practice where species-level identification is uncertain, *Myotis* activity is considered at genus level only (*Myotis spp.*) for the purposes of this assessment.

6.4.4.6 Aquatic Ecology

This section presents a summary of the findings of aquatic ecology surveys undertaken between May 2023 and November 2025 for the proposed project; full results of all aquatic ecology surveys are provided in **Appendix 6-5**.

Desk Study Results

The aquatic desk study completed in early 2023, highlighted that the proposed project lies in close proximity to the Lough Corrib SAC (refer to **Table 6-13**). Fish presence was determined using existing datasets, including fisheries records from IFI's WFD monitoring. In this dataset, the reach of the Black River at Kilshanvy Bridge (EPA Segment Code: 30_3561), c. 11 km upstream of the proposed project was recorded as having "Good" ecological status based on the most recent survey in 2022. The species recorded from this survey included brown trout (*Salmo trutta*), salmon (*Salmo salar*) and three spined stickleback (*Gasterosteus aculeatus*). A survey of the River Cullagh (no EPA Code), which enters the Black River c. 800 m downstream of the proposed wind farm, also recorded lamprey spp. in 2020. White-clawed crayfish have been recorded throughout the Lough Corrib catchment (Department of Culture, Heritage and the Gaeltacht, 2019), while freshwater pearl mussel have been recorded on the Owenriff River (EPA Code: 30O02), located to the west of Lough Corrib. However, neither species have been previously recorded on the Black River.

Receiving Environment

While some interaction with surface waters will occur at the proposed 110 kV substation location, there are no mapped surface water features within the proposed wind farm site itself, with the exception of field drains. As a result, the aquatic ecology assessment was centred on the potential for downstream effects on the Black River (EPA Code: 30B02) and its tributaries, including the Rooaunalaghta (EPA Code: 30R03) and Cloughmoyne streams (EPA Code: 30C80) streams, which converge with the main channel before flowing in a generally westerly direction towards Lough Corrib. The Black River forms part of the Lough Corrib SAC and therefore represents a direct hydrological pathway between the proposed project and this European Site.

As the SAC is designated for a range of freshwater QIs, including freshwater pearl mussel, white-clawed crayfish, salmon and lamprey spp., these species are therefore assumed to be present within the receiving catchment even where not directly recorded during site specific surveys. Desk based and field assessments confirmed that all watercourses within the study area are typical of lowland to transitional systems draining agricultural landscapes, with additional influence from limestone geology and peat further upstream in the catchment.

The surveyed river reaches, assessed between 2023 and 2026 (see **Appendix 6-5** and **Appendix 6-7**), were characterised by a combination of glide, run and occasional riffle habitats, although

low flow conditions were recorded during the August 2026 survey programme. Watercourses were predominantly bordered by improved agricultural grassland, with some riparian tree and scrub cover associated with the Black River (EPA Code: 30B02). Several of the larger watercourses, particularly the Black River, have been extensively modified through historical arterial drainage works, resulting in deeply incised channels with steep banks and, at some locations, gorge-like sections cut through blasted limestone bedrock.

Substrate composition was typically dominated by limestone bedrock, cobble and boulder, with more localised areas of gravel, sand and silt, including silt overlays along channel margins and other lower-energy areas. Localised siltation was observed at some locations, potentially associated from cattle access points. Macrophyte growth was locally abundant within lower energy reaches and included species such as *Apium nodiflorum*, *Ranunculus* spp., *Sparganium* spp., *Schoenoplectus lacustris* and *Nuphar lutea*, while aquatic bryophytes such as *Fontinalis antipyretica* were associated with rocky substrates. No protected or notable macrophyte or aquatic bryophyte species were identified during the surveys.

Overall, the surveyed watercourses were typical of lowland alkaline channels draining agricultural landscapes, subject to varying levels of hydromorphological modification, nutrient enrichment and low summer flows. While some localised silt deposition was observed, particularly in slower flowing areas, there was no widespread evidence of excessive sedimentation or significant pollution, and the water quality results presented herein, alongside recent EPA WFD assessments, indicate that ecological conditions are variable across the catchment, with the Black River (EPA Code: 30B02) generally supporting higher-quality aquatic habitat than the smaller tributaries and drainage channels.

Water Quality

Physico-chemical water quality across the study area was generally indicative of good baseline conditions at the time of sampling in 2023 (see **Table 6-21**). The main nutrient indicators, including orthophosphate, nitrate, nitrite and ammonia, were within acceptable ranges when compared with their respective standards. Nutrient concentrations along the Black River (EPA Code: 30B02) were generally low, with orthophosphate levels meeting thresholds associated with “High” status under the WFD.

The principal exceptions were WQ01 on the Rooaunalaghta Stream (EPA Segment Code: 30_1503), which drains intensively managed agricultural land, and at WQ02 on the Black River (EPA Code: 30B02), approximately 600 m upstream of the Rooaunalaghta confluence. At WQ01, nitrate concentrations of 8.24 mg/L as N exceeded the guideline value associated with "Good" status (1.8 mg/L as N). Elevated ammonia concentrations were also recorded at WQ02 (0.193 mg/L as N), which may reflect localised agricultural or domestic influences within the upstream catchment. Despite this, in-situ measurements recorded moderate to high dissolved oxygen saturation at most locations, supporting the conclusion that water quality across the wider study area is generally good.

Biological water quality assessment based on macroinvertebrate communities was broadly consistent with the physico-chemical conditions during the 2023 survey programme (see **Appendix 6-5**). Based on WFD intercalibration, Q-values recorded along the River Black typically fell within Q4. Under WFD intercalibration, these correspond to “Good” ecological status reflective of a largely unpolluted system. Upstream sites on tributary watercourses returned lower values of Q3 to Q3-4, suggesting slight to moderate ecological impact consistent

with fine sediment deposition or localised nutrient inputs largely associated with agricultural pressures.

These findings broadly accord with the most recent EPA WFD assessments (2024), whereby the same reach assessed at WQ03 (EPA Segment Code: 30_3722) returned a Q4-5, corresponding to "High" ecological status, while a monitoring station further upstream at Shrule Bridge (EPA Segment Code: 30_3723) returned a Q4, corresponding to "Good" ecological status.

Additional biological water quality surveys undertaken in August 2026 (see **Appendix 6-7**) recorded Q-values ranging from Q3 to Q3-4 within the Black River (EPA Code: 30B02), indicating lower biological water quality than was recorded during the 2023 survey programme and recent EPA WFD assessments. However, the surveys were undertaken during a period of unusually low flow conditions, and several results were considered tentative due to reduced flows and/or the absence of suitable riffle habitat for sampling.

Table 6-21: Laboratory analysis of physico-chemical water quality parameters

Parameter	Unit of Measurement	Reference Value[28]	Site WQ01	Site WQ02	Site WQ03	Site WQ04
Pollution indicators						
Biochemical Oxygen Demand (BOD)	mg/l	1.5	<1	<1	<1	<1
Chemical Oxygen Demand (COD)	mg/l	N/A[29]	<10	<10	<10	<10
Suspended Solids	mg/l	25	3	<2	<2	4
Ammonia as N	mg/l	0.065	0.04	0.193	0.017	0.017
Metals						
Iron, total	ug/l	N/A	<10	180	140	137
Iron, dissolved	µg/l	N/A	<10	81	61	21
Copper, dissolved	µg/l	5	<1	<1	<1	<1
Arsenic, dissolved	µg/l	25	<0.5	<0.5	<0.5	<0.5
Zinc, dissolved	µg/l	50	<5	<5	<5	<5

[28] Reference values are provided for context and comprise surface water quality standards for physico-chemical parameters derived from relevant legislation and guidance. Refer to **Appendix 6-5** for further details on the standards and assessment criteria applied. Readings below the laboratory Limit of Detection (LoD) are highlighted in green.
[29] No directly applicable standard, threshold value or Environmental Quality Standards (EQS) is available for this parameter.

Parameter	Unit of Measurement	Reference Value[28]	Site WQ01	Site WQ02	Site WQ03	Site WQ04
Hydrocarbons						
Total Petroleum Hydrocarbons (TPH)	µg/l	N/A	26[30]	<20	23 **	<20
Nutrients						
Nitrate as N	mg/l	1.8	8.24	1.83	1.62	1.61
Nitrite as N	mg/l	0.05	<0.017	<0.017	<0.017	<0.017
Orthophosphate (filtered) as P (Low Level)	mg/l	0.035	<0.01	<0.01	<0.01	<0.01
Total Phosphorus as P	mg/l	N/A	<0.05	<0.05	<0.05	<0.05
Others						
Dissolved Organic Carbon (DOC)	mg/l	N/A	1.4	7.17	6.09	5.74
Alkalinity Total by Autotitration	mg/l $CaCO_3$		364	363	349	346

Fish and Fish Habitat Surveys

The most recent IFI fisheries data (2022) indicate that the Black River at Kilshanvy Bridge (EPA Segment Code: 30_3561), located c. 11 km upstream of the proposed wind farm site, supports populations of brown trout (*Salmo trutta*), salmon, lamprey spp., and three-spined stickleback (*Gasterosteus aculeatus*).

One fish habitat survey was completed along the Black River on 23 May 2023 (EPA Segment Code: 30_3722), c. 2.2 rkm downstream of the proposed wind farm site (see **Appendix 6-5** for figures illustrating the location of survey locations). Here, the surveyed reach was characterised mainly by glide and run habitats with occasional riffle and mixed juvenile habitat. Substrate composition was dominated by cobble and boulder, with gravel patches present throughout the channel. Areas of potential salmonid spawning habitat were identified towards the downstream extent of the reach, although these were considered largely suboptimal due to localised siltation. Mixed juvenile habitat was present throughout, and salmonids were observed feeding during the survey, with undercut banks and tunnelled vegetation providing additional cover for adult fish.

Updated fisheries habitat surveys undertaken in August 2026 confirmed that the Black River continues to provide a relatively diverse range of suitable habitats for salmonids. In contrast,

[30] Unknown pattern indicates the presence of naturally forming hydrocarbons in the sample. They cannot be attributed to a hydrocarbon with a known 'fingerprint' such as diesel or kerosene.

the Rooaunalaghta Stream (EPA Code: 30R03), Cloghmoyne Stream (EPA Code: 30C80), Shancloon Stream (EPA Code: 30S32) and several unmapped drainage channels were heavily modified and generally supported lower fisheries value.

Electrofishing survey, also undertaken in August 2026, recorded salmon and brown trout at multiple locations along the Black River (EPA Code: 30B02). Other species recorded included stone loach (*Barbatula barbatula*), three-spined stickleback and ten-spined stickleback (*Pungitius pungitius*), primarily within smaller tributaries and modified drainage channels. The Rooaunalaghta Stream (EPA Code: 30R03) and an adjacent unmapped drainage channel draining the proposed wind farm site supported fish communities comprising stickleback species only. Lamprey and eel were detected through eDNA sampling of the Black River only (see **Appendix 6-7)**. Neither species was recorded during electrofishing surveys. The absence of lamprey records is likely to reflect the limited availability of suitable ammocoete habitat within the surveyed reaches, while the detection of eel through eDNA alone is consistent with the relatively low densities previously reported from the Black River catchment and extensive historical modification of the river channel.

White-Clawed Crayfish Surveys

Two crayfish surveys were undertaken along the Black River (EPA Code: 30B02) *via* hand-searching on 15 August 2023. The survey locations broadly corresponded with the WQ03 (EPA Segment Code: 30_3722) and WQ04 (EPA Segment Code: 30_1406) monitoring locations and are shown in **Appendix 6-5**. No evidence of crayfish was found within the surveyed areas despite there being suitable habitat present, including coarse substrates, stable cobble and boulder refuges. This absence may be attributed to the spread of the crayfish plague, caused by the water mould *Aphonomyces astaci*, which has been recently reported within the wider Lough Corrib catchment (2020/21)[31] and may indicate local loss of the species from this part of the river system.

Additional surveys completed in August 2026, including hand-searching and eDNA sampling, similarly failed to record the species within the study area (see **Appendix 6-7**), supporting the conclusion that it is likely absent from the Black River.

Freshwater Pearl Mussel Survey

A Stage 1 freshwater pearl mussel survey was undertaken on 24 April 2024 along a suitable reach of the Black River upstream of Moyne Bridge at WQ03 (EPA Segment Code: 30_1502), located approximately 2 rkm downstream of the proposed wind farm site. The survey focused on habitats considered potentially suitable for the species. Despite the presence of suitable habitat conditions, no records exist for the Black River and no live individuals or shell remains were recorded during the survey. Freshwater pearl mussel is therefore considered likely to be absent from the Black River, and the proposed project is not hydrologically connected to the known freshwater pearl mussel populations within the Corrib catchment, which are located on the western side of the lake.

This conclusion was further supported by eDNA surveys completed in August 2026, which did not detect freshwater pearl mussel within the Black River (see **Appendix 6-7**).

31 Update on Crayfish Plague in Ireland | Fish Health Unit. Available at: https://www.fishhealth.ie/fhu/index.php/news/update-crayfish-plague-ireland

Lacustrine Assessments

Surveys of lacustrine habitats undertaken in August 2026 included Ballisnahyny Turlough (T1) and two off-site ponds (P1 and P2) (see **Appendix 6-7**). The turlough basin (T1) was completely dry at the time of survey following prolonged summer drought conditions, although it supported a diverse wetland flora and typical macroinvertebrate assemblage, with no protected or notable aquatic species recorded. Pond P1, which is connected to the Rooaunalaghta Stream (EPA Code: EPA Code: 30R03) retained permanent water and supported a moderate diversity of aquatic vegetation and macroinvertebrates, while pond P2 was characterised by elevated turbidity, nutrient enrichment and extensive algal growth. No protected or Red Listed aquatic species were recorded within any of the standing water habitats surveyed; however, eDNA sampling confirmed the presence of eel within pond P1, while stickleback species were incidentally collected during sweep netting.

6.4.5 Grid Connection Route and Turbine Delivery Route

6.4.5.1 Habitats and Flora

Terrestrial habitats along the GCR primarily comprised GA1 improved agricultural grasslands, with BL1 stone walls and other stonework, BL3 buildings and artificial surfaces, WL1 hedgerows and WL2 treelines occurring intermittently. Two water features are present along the route: a FW4 drainage ditch and the Black River (EPA Code: 30B02), corresponding to FW2 depositing lowland river.

A small number of invasive alien plant species were recorded along the GCR corridor. Rock cotoneaster (*Cotoneaster horizontalis*) occurred on a stone wall along the south side of the road in a 7-8 m stretch, with a smaller patch opposite. Winter heliotrope (*Petasites fragrans*) formed a c. 20 m band along the verge near the proposed entrance to the offsite substation. A long linear stand of cherry laurel (*Prunus laurocerasus*) was also noted within private land adjacent to the road. The distribution invasive alien plant species are presented in **Figure 6-6**.

The proposed TDR follows the existing road network from Galway Docks through Galway City, continuing along the N84 to Headford and the R334 towards Cross. Terrestrial habitats along the TDR are limited to linear roadside features associated with the existing road network, including stone walls, hedgerows and treelines, and grassland verges, all of which are common and of low ecological value. Eight river crossings occur along the route, but no bridge modifications are required. Modelling of the TDR has been undertaken by TOBIN and this has identified one pinch point location in Galway city at the junction of the R336 and the L5034. At this location a footpath needs to be reinforced for the turbine passage. Habitats in the immediate vicinity of these junction are BL3 artificial surfaces such as pavements and GA2 amenity grassland. Otherwise, there is vegetation trimming and demounting of signage/street furniture required at various locations on the route. These areas will be reinstated following completion of turbine component delivery.

Localised occurrences of invasive alien plant species were identified along the TDR. These include butterfly bush (*Buddleja davidii*), including a larger stand in proximity to a derelict structure, and a linear stand of winter heliotrope extending for c. 50 m within an area (Area 13) that may require vegetation removal to accommodate the transport of turbine blades.

6.4.5.2 Terrestrial Mammals

Mammal activity along the GCR and TDR was limited, with three instances of well-defined trails recorded, likely used by species such as fox and/or badger. Along the TDR, a single inactive burrow was recorded near Moyne Bridge (Area 17). Additional otter field signs, including a relatively fresh spraint and a potential slide, were noted along the Shancloon Stream (EPA Code: 30S32) downstream of the proposed offsite substation. An Irish stoat was also observed crossing the road during surveys near the point at which the GCR intersects the Black River (refer to **Figure 8** of **Appendix 6-3**).

6.4.5.3 Bats

PRFs were identified along sections of the GCR route following the additional survey undertaken on 14 April 2026. In addition, a small number of mature trees in close proximity to one of the PRF-M structures were identified as exhibiting features of low to moderate roosting potential.

The route otherwise comprises predominantly open ground and existing road infrastructure, with limited features suitable for bat roosting. No high-suitability roost features were identified during the surveys. The derelict house at F.7 is already subject to regular background disturbance due to its proximity to a public road and use as part of an operational farm.

Along the TDR, two PRFs of moderate suitability (PRF-M) were identified, comprising mature trees near Moyne Bridge and a derelict building at Area 13. These features are located in close proximity to the public road network and are therefore subject to existing background disturbance. No features along the GCR and TDR will be removed or be disturbed as part of the proposed project.

6.4.5.4 Aquatic ecology

An aquatic assessment was undertaken of the location on the Black River where it is crossed by the GCR (EPA Segment Code: 30_1507), along with a single location on the Shancloon Stream (EPA Code: 30S32) downstream of the proposed 110 kV substation. Additional aquatic surveys were completed in August 2026 to update the baseline at the Black River crossing, Shancloon Stream and associated drainage channels crossed by the proposed GCR (see **Appendix 6-7**).

Water Quality

Macroinvertebrate surveys along the GCR indicated variable ecological quality (see **Appendix 6-5**). Site WQ05, where the GCR intersects the Black River, supported a diverse and sensitive macroinvertebrate assemblage and met the WFD threshold for “Good” ecological status. In contrast, Site WQ06, located on the Shancloon Stream downstream of the proposed offsite substation, supported fewer sensitive taxa and a higher proportion of tolerant species, indicating slight pollution impact and a “Moderate” status.

During the survey undertaken in April 2025, the Shancloon Stream at the proposed substation location (EPA Segment Code: 30_1160) was observed to be heavily modified, having been over-deepened and straightened to facilitate land drainage. At the time of survey, the stream was heavily vegetated with grasses, as well as *Equisetum* sp. and *Apium nodiflorum* and exhibited little to no flow.

In-situ water quality (WQ) readings, taken on 08 April 2025, showed a lower dissolved oxygen saturation (<80%) at WQ06 when compared with WQ05, as well as slightly elevated turbidity, which may be attributed to the slow-flowing nature of the watercourse and the dense growth of *Apium nodiflorum* within the channel.

Additional aquatic surveys undertaken in August 2026 included the Black River at the proposed GCR crossing (G1), two unmapped drainage channels associated with the proposed GCR (G2 and G3), and the Shancloon Stream (EPA Segment Code: 30_1160) beside the proposed substation (G4) (see **Appendix 6-7**). G2 and G3 were dry at the time of survey, while G4 exhibited very low flow conditions as noted the year previously, with limited ecological value. Consistent with the broader aquatic baseline, biological water quality within the Black River remained higher than that recorded within smaller tributaries and drainage channels, although Q-values recorded during the 2026 survey programme were generally lower than those recorded previously, reflecting the unusually low flow conditions prevailing at the time of survey.

Fish and Fish Habitat

The section of the Black River (EPA Code: 30B02) surveyed at the GCR crossing supported a good mix of fish habitat types, dominated by glide habitat with riffle, run and mixed juvenile areas also present. Substrates comprised mainly gravel, cobble and boulder, with limited bryophyte and filamentous algal growth. Extensive shading from steep limestone banks and tunnel vegetation limited macrophyte growth, although *Nuphur lutea* and patches of *Ranunculus* sp. were recorded upstream of the bridge, where the GCR intersects the watercourse. Salmonids were observed actively feeding, and three salmonid fry were recovered during a kick sample, indicating the presence of potential nursery habitat. While substrate and flow conditions were potentially suitable for lamprey, no definitive lamprey ammocoete habitat was identified.

Additional fisheries surveys undertaken in August 2026 confirmed the continued presence of salmon and brown trout within the Black River (EPA Segment Code: 30_1507) at the proposed GCR crossing (G1), confirming its continued value as salmonid nursery habitat despite historical channel modification and low summer flow conditions (see **Appendix 6-7**).

In contrast, the Shancloon Stream (EPA Code: 30S32) downstream of the proposed 110 kV substation was of low fisheries value, being dominated by glide and standing water with localised riffle. Substrate was primarily gravel with cobble and silt, and dense growth of *Apium nodiflorum* reflected the prevailing low flow conditions.

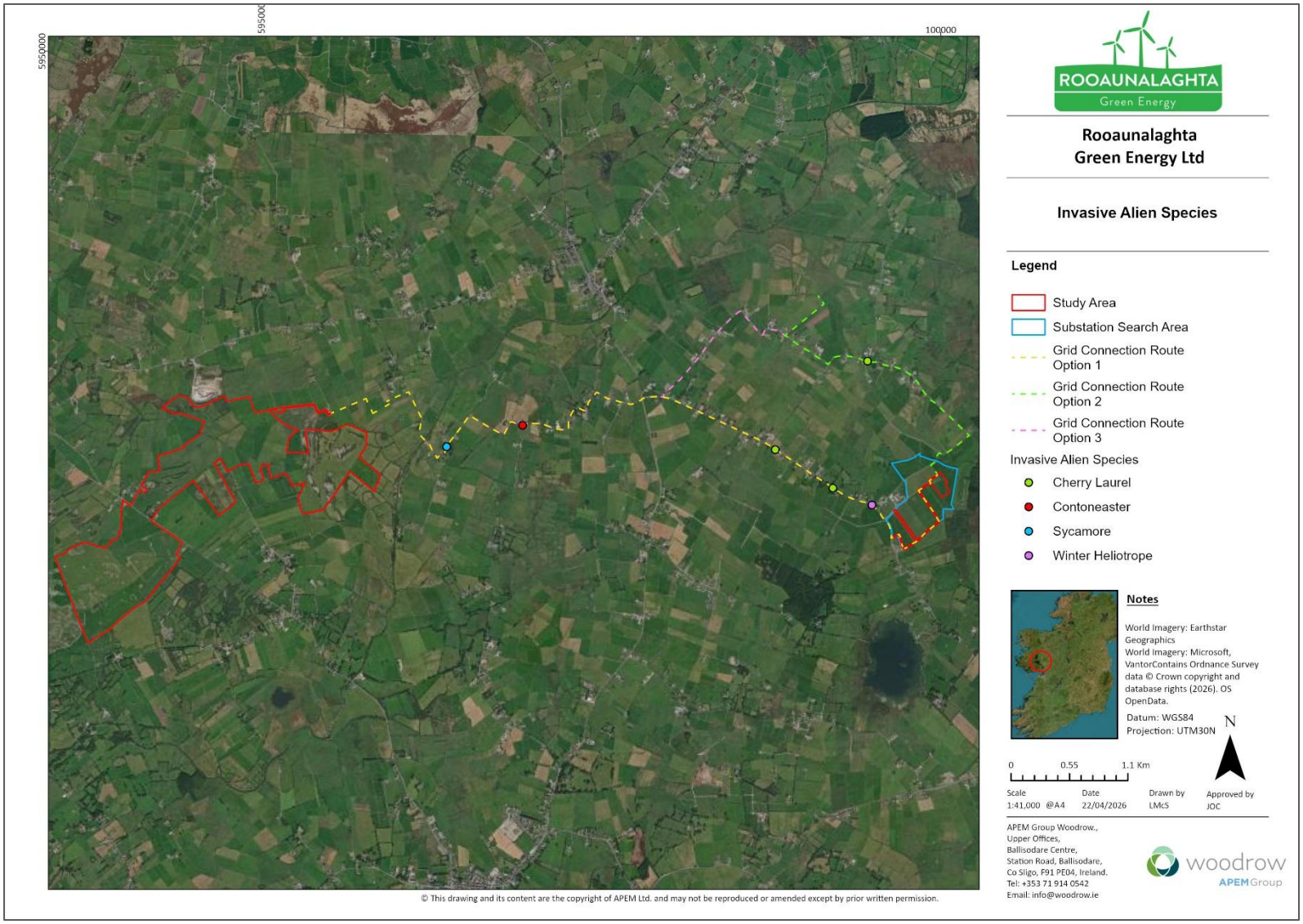


Figure 6-6: Invasive alien plant species recorded along the GCR

6.5 ECOLOGICAL RESOURCE EVALUATION

This section provides a value assessment of the ecological features within the study area, informed by the survey results set out in **Section 6.3.6** and the valuation methodologies outlined in **Section 6.3.5**.

All species and habitats of conservation importance recorded within the study area during surveys, or identified within the 10 km desk study radius, that are considered likely to occur within the study area and to be affected by the proposed project, are assessed in the following sections. Species defined as 'likely to occur' within the study area include ecological features for which baseline data indicate either individuals present, evidence of habitat use, or suitable habitat capable of supporting viable populations. These species are referred to within this chapter as IEFs.

Also considered are European Sites and other designated sites that have biological, hydrological, or other connectivity with the proposed project.

The following sections provide justification and reasoning for the evaluation of the importance of ecological features. A summary of all IEFs is provided in **Table 6-23**.

6.5.1 DESIGNATED SITES

6.5.1.1 Sites of International Importance

The Cloughmoyne SAC (Site Code: 000479), designated for Limestone Pavement, lies immediately adjacent to the south-western boundary of the proposed project. The Lough Corrib SAC (Site Code: 000297), which is delineated by the Black River and associated riparian habitat, lies to the east of the proposed project, occurring <150 m away at its nearest point (see **Section 6.4.3** and **Table 6-13**). A hydrological S-P-R linkage is present due to the SAC's proximity, with both overland and subsurface flows providing a potential pathway between the proposed project and this European Site. Additionally, Shrule Turlough SAC (Site Code: 000525) is located c. 1.8 km north of the proposed project. While no direct surface water connection has been identified, part of the proposed project and the SAC occur within the same groundwater body and regionally important karstified aquifer. Consistent with the conclusions of **Chapter 9**, a potential hydrogeological linkage has therefore been identified and carried forward in the assessment.

In accordance with the NIS prepared for the proposed project (APEM Group Woodrow, 2026b) and the evaluation presented in this chapter, the Cloughmoyne SAC, Lough Corrib SAC and Shrule Turlough SAC are considered to be IEFs of International Importance.

6.5.1.2 Sites of National Importance

The Cloughmoyne pNHA largely overlaps with the Cloughmoyne SAC and is carried forward in the assessment due to its proximity to the proposed project. Likewise, Shrule Turlough pNHA largely overlaps with Shrule Turlough SAC and has been carried forward in accordance with the conclusions of **Chapter 9**, which identified a potential hydrogeological linkage. As a result, both sites are considered IEFs of National Importance.

Downstream of the proposed project, *via* the Black River, are the Rostaff Lake pNHA and the Lough Corrib pNHA. Both lie within the boundary of the Lough Corrib SAC, with Rostaff Lake in

particular known for its ornithological value and described further in **Chapter 7**. Further east of the proposed project is Lough Hacket pNHA which, in addition to its ornithological interest, is known for areas of reedswamp, freshwater marsh, and lowland wet grassland. Given the S-P-R linkages outlined above (also see **Section 6.4.3**, **Table 6-13**), these sites are also considered IEFs of National Importance.

6.5.2 TERRESTRIAL ECOLOGY

6.5.2.1 Habitats

The geographic evaluation of habitats assessed as having the potential to be adversely affected by the proposed project (both directly, i.e., habitat loss and indirectly, i.e., hydrological impact) is presented in **Table 6-15** and it is therefore not repeated herein.

6.5.2.2 Terrestrial Mammals

Badger

Although badger activity is limited across much of the study area, an active main sett is present to the northeast of the proposed substation, in the eastern extent of the proposed project (see **Section 6.4.4.2**). Evidence recorded through monitoring (i.e., the presence of cubs) indicates that breeding is likely to occur at this location. A single additional single-entrance sett was also identified within the main proposed wind farm site. Together, and considering the legal protection afforded to badger under the Wildlife Acts, the badger population within the study area is assessed as an IEF of Local (Higher) Importance.

Otter

As detailed in **Section 6.4.4.2**, otter activity within the study area is primarily associated with the Black River (EPA Code: 30B02), which flows to the east of the proposed project boundary at the proposed wind farm site and is intersected by the GCR further north. Additional evidence of otter was also recorded along the Shancloon Stream, downstream of the proposed 110 kV substation. These watercourses, particularly the Black River, provide suitable riparian habitat offering foraging, resting and commuting opportunities for otter.

The Black River forms part of the Lough Corrib SAC, where the otter population is regarded as one of the strongest and most significant in Ireland. The SAC lies immediately to the east of the proposed project, with the Black River located approximately c. 280 m from the nearest element of the proposed site infrastructure. Given this association, and the clear link between otter recorded within the study area and the otter population of the Lough Corrib SAC, the species is evaluated as an IEF of International Importance.

Other Mammals

As described in **Section 6.4.4.2**, the study area was considered for the presence of several additional non-volant mammal species including pine marten, Irish hare and Irish stoat.

Pine marten (Martes martes)

Pine marten were not directly observed during surveys, and evidence of their presence was limited to a single suspected scat. A 2021 NBDC record approximately 2 km to the southeast of the proposed wind farm site indicates the species' presence within the wider environs. Suitable habitat is confined to small woodland pockets and treelines, and no dens or denning features

were identified. In view of the limited evidence and their protection under the Wildlife Acts, pine marten are considered an IEF of Local (Higher) Importance.

Hedgehog (Erinaceus europaeus)

Hedgehogs were not detected during onsite surveys, although records confirm their presence in the surrounding area. Habitat within the study area provides suitable resting and breeding opportunities, particularly within field margins and areas of dense vegetation. Given this suitability and their protection under the Wildlife Acts, hedgehog are considered an IEF of Local (Higher) Importance.

***Irish hare* (Lepus timidus hibernicus)**

Irish hare were observed within the study area, with multiple direct and incidental sightings during onsite surveys, particularly in the southwestern part of the proposed project within the main proposed wind farm site. Given confirmed presence and protection under the Wildlife Acts, Irish hare are considered an IEF of Local (Higher) Importance.

***Irish stoat* (Mustela erminea hibernica)**

Irish stoat were not recorded during targeted surveys; however, two incidental observations confirm their presence within the study area. Given these sightings, suitable habitat availability, and their protection under the Wildlife Acts, Irish stoat are considered an IEF of Local (Higher) Importance.

***Pygmy shrew* (Sorex minutus)**

Pygmy shrew were not recorded during surveys; however, suitable small-mammal habitat occurs within the study area, particularly where dense ground cover is present. Despite the absence of direct evidence, pygmy shrew are protected under the Wildlife Acts and are therefore considered an IEF of Local (Higher) Importance.

6.5.2.3 Amphibians and Reptiles

Smooth newt and common frog

Smooth newt were not recorded during surveys, and no suitable permanent waterbodies occur within the proposed project boundary. The only suitable breeding ponds lie >250 m outside the proposed site infrastructure with no hydrological connection. Common frog tadpoles were recorded in one of these ponds, and habitat within the wider area is suitable for the species. Although overall evidence is limited, both species may occasionally traverse the study area when moving between suitable habitats. On a precautionary basis, smooth newt and common frog are considered IEFs of Local (Higher) Importance.

Common lizard

No common lizard were observed during the wider herpetofauna suitability surveys, nor were any incidental sightings made during walkover or habitat surveys over the three-year study period. However, desktop records indicate the species occurs within 2 km of the proposed project. Suitable habitat within the study area is limited mainly to small pockets of rock piles and scattered limestone outcrops that may provide occasional refuge or hibernacula. On a precautionary basis, and due to the presence of these features, common lizard are considered an IEF of Local (Higher) Importance.

6.5.2.4 Invertebrates

Lepidoptera (butterflies)

Small heath was the only butterfly species recorded during the targeted surveys that is currently classified as Near Threatened on the Irish Red List. While the species is not afforded specific legal protection in Ireland, its conservation status indicates that it is undergoing decline at a national level. On a precautionary basis, and in recognition of its unfavourable conservation status, the small heath population recorded within the study area is considered an IEF of Local (Higher) Importance.

6.5.2.5 Bats

Bat surveys recorded several species within the proposed wind farm site, including Leisler's bat, common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, *Myotis* species, brown long-eared bat and lesser horseshoe bat. Bat activity was spatially variable and was most frequently associated with linear landscape features such as hedgerows, stone walls and woodland edges, which function as commuting and foraging corridors within the wider agricultural landscape. Lower levels of activity were generally recorded across more open pasture areas.

The nature conservation value of bat populations using the proposed wind farm site for commuting and foraging has been evaluated with reference to the distribution of recorded activity, the availability and connectivity of supporting habitats, and the conservation status of species present, as set out in **Table 6-9** and **Table 6-10** and detailed in **Appendix 6-4**. Species-specific receptor importance has been assigned using these data and is presented in **Table 6-22**. Leisler's bat is classified as a high-risk species in relation to wind turbines as it can fly higher than other species, often up to 100 m, and can travel considerable distances (up to 13.4 km has been recorded in Ireland (Shiel *et al*, 1999)) between roosts and foraging areas. It is also less reliant on linear features for commuting and can fly through the open air. Leisler's bat has been assigned a County-level receptor importance reflecting its higher recorded activity levels and its sensitivity to collision and barotrauma risk at wind energy developments. Although no maternity or hibernation roosts were identified within the proposed wind farm site, the species' fast-flying (up to 40 km/h), open-air foraging behaviour increases its vulnerability to turbine collision. There were also no roosts confirmed for Leisler's' bats during emergence surveys. This species is a tree roosting species and like to switch between tree roosts every two and ten days. There remains a likelihood that bats will still use the PRFs within the trees transitionally for roosting. Hinds and Davidson-Watts (2022) highlight that tree-roosting bats exhibit fission and fusion behaviour, frequently switching roosts or congregating in one roost. This roost-switching is influenced by factors such as microclimate, seasonal changes, and parasite avoidance, making it difficult to confirm bat presence during specific surveys. Graphs in **Appendix 6-4** (see **Appendix 7**) show early activity before sunset. This could suggest roosting nearby as Leisler's bats are an earlier emerging species, who can be active before and/or at dusk. On this basis, Leisler's bat is treated as a County-level receptor for collision-risk assessment purposes, notwithstanding that the proposed wind farm site functions primarily as a commuting and foraging resource.

Although a high number of bat passes were recorded across the proposed wind farm site (in excess of 57,000 passes), these data reflect repeated use of commuting and foraging routes by mobile individuals rather than the presence of large roosting populations or population centres

within the proposed wind farm site. No maternity, hibernation or other high-importance roosts were identified, and bat activity was dominated by common and widespread species utilising linear features within a working agricultural landscape.

With the exception of Nathusius' pipistrelle and lesser horseshoe bat, the species recorded are considered common and widespread in an Irish context. Lesser horseshoe bat is a species of higher conservation concern nationally, being also an Annex II protected species; however, activity levels recorded within the proposed wind farm site were low and no roosts or key population centres were identified. Activity is primarily associated with commuting and foraging rather than roosting or population support within the proposed wind farm site. In accordance with the receptor valuation presented in **Table 6-22**, lesser horseshoe bat has been assigned County-level importance; however, the functional role of the proposed wind farm site for the species is limited to low levels of commuting and foraging activity.

Leisler's bat habitat suitability was 'Very high' and results of activity from surveys was higher. On a precautionary basis, this species has been considered of County or Regional importance in the collision risk assessment. Notwithstanding this, the use of the proposed wind farm site by Leisler's bat is primarily for commuting and foraging rather than for roosting or population support.

On the basis of the above, and taking account of species composition, activity patterns, absence of significant roosting resources and the functional role of the proposed wind farm site within the wider landscape, the assemblage of bat species using the proposed wind farm site for commuting and foraging is considered to be of Local (Higher) importance for the purposes of this assessment, notwithstanding the County-level importance assigned to individual species for specific impact pathways.

Table 6-22: Conservation value of bat species recorded within the proposed wind farm site based on NatureScot evaluation criteria

Species	Rarity	No. of Bats	Roosts/ PRFs	Foraging and Commuting Habitat	Total Score (Importance)
Common Pipistrelle	2	5	3	6	16 (Local)
Soprano pipistrelle	2	5	4	6	17 (Local)
Leisler's bat	2	10	3	6	21 (County)
Nathusius's Pipistrelle	5	5	1	6	17 (Local)
Myotis spp.	5	5	3	6	19 (Local)
Brown long-eared bat	2	5	4	6	17 (Local)
Lesser horseshoe bat	20	5	3	6	34 (County)

6.5.3 AQUATIC ECOLOGY

The only mapped watercourse within the proposed project is the Shancloon Stream, located at the offsite substation and crossed by an associated access road. No EPA-registered surface water features occur within the proposed wind farm site other than drainage ditches, which

ultimately connect to the Rooaunalaghta Stream (EPA Code: 30R03), which enter the Black River downstream of the proposed project. The Black River is crossed by the GCR and is hydrologically connected to the Shancloon Stream (EPA Code: 30S32), which drains the offsite substation.

Water quality within the receiving waters connected to the proposed project is relatively good, particularly along the Black River, where conditions indicate the absence of significant pollution pressures. Water quality in the tributary streams of the Rooaunalaghta and Shancloon is slightly more variable, influenced by local agricultural activity, including nutrient inputs and fine sediment, together with naturally lower flow conditions, and periods of drought.

Existing fisheries information indicates that the Black River supports QI fish species of the Lough Corrib SAC, including salmon and lamprey spp. The Black River provides a relatively diverse range of habitats suitable for salmonids, including spawning, nursery and holding habitat. Although no lamprey were recorded during targeted electrofishing surveys completed in 2026, lamprey were detected through eDNA sampling of the Black River.

The absence of lamprey records is likely to reflect the limited availability of suitable ammocoete habitat within the surveyed reaches. While river lamprey (*Lampetra fluviatilis*) and sea lamprey (*Petromyzon marinus*) are QIs of the Lough Corrib SAC, barriers downstream of the study area are likely to preclude these anadromous species from occurring within the Black River, such that any lamprey detected through eDNA are likely to comprise resident brook lamprey (*Lampetra planeri*). Notwithstanding this, river lamprey and sea lamprey remain relevant downstream receptors within the Lough Corrib SAC. Given their conservation status, role as QIs of the SAC and the S-P-R connectivity between downstream waterbodies and the proposed project, salmon and lamprey spp. are evaluated as IEFs of International Importance.

Brown trout represent an important component of the local aquatic community and were recorded at multiple locations during the 2026 survey programme. Similarly, eel was detected through eDNA sampling within the Black River catchment, although the species was not recorded during electrofishing surveys and is likely to occur at relatively low densities. While not afforded the same level of protection as Annex II fish species, eel is classified as Critically Endangered and occurs within the ZoI of the proposed project. Accordingly, brown trout and eel are evaluated as IEFs of Local (Higher) Importance.

Although no white-clawed crayfish were recorded during the current study and there are no known previous records for the Black River, the species is a QI of the Lough Corrib SAC and occurs elsewhere within the wider catchment. On a precautionary basis, white-clawed crayfish are evaluated as an IEF of International Importance.

Stage 1 freshwater pearl mussel surveys and eDNA sampling confirmed that no mussels or shell evidence were present on the Black River, and there are no historical records for this species within the surveyed reaches. Known freshwater pearl mussel populations within the Corrib catchment, including the population on the Owenriff River, are not hydrologically connected to the proposed project and are therefore not considered further in this assessment.

6.5.4 Summary of Important Ecological Features

Table 6-23 summaries IEFs that have been identified during ecological surveys within the study area. IEFs are valued as Local (Higher) Importance or above, as per the criteria set out in **Table 6-12**.

Table 6-23: Summary of IEFs in relation to the infrastructure of the proposed project

Feature	Highest Evaluation/ Importance	IEF?
Designated Sites		
European Sites (SACs/SPAs)	International Importance	Yes
National Sites (NHAs/pNHAs)	National Importance	Yes
Habitats		
BL1 Stone walls and other stonework	Local (Higher) Importance	Yes
ER2 Exposed calcareous rock	Good condition – National Importance Unfavourable condition recoverable to good condition with changes to management – National Importance	Yes
ER2 Exposed calcareous rock/GS1 Dry calcareous and neutral grassland mosaic	Good condition – National Importance	Yes
ER2 Exposed calcareous rock/WN2 Oak-ash-hazel woodland mosaic	Good condition – National Importance Unfavourable condition recoverable to good condition with changes to management – National Importance	Yes
FL6 Turloughs	National Importance	Yes
FW2 Depositing/ lowland rivers	Local (Higher) Importance	Yes
FW4 Drainage ditches	Local (Higher) Importance	Yes
GS1 Dry calcareous and neutral grassland	National Importance	Yes
GS2 Dry meadows and grassy verges	National Importance	Yes
HD1 Dense bracken/GS1 Dry calcareous and neutral grassland/HH2 Dry calcareous heath mosaic	County/ Regional Importance	Yes
HD1 Dense bracken/WS1 Scrub mosaic	Local (Higher) Importance	Yes
WL1 Hedgerows	Local (Higher) Importance	Yes
WL2 Treelines	Local (Higher) Importance	Yes
WN2 Oak-ash-hazel woodland	Local (Higher) Importance	Yes
WN2 Oak-ash-hazel woodland/WS1 Scrub mosaic	Local (Higher) Importance	Yes
Terrestrial Mammals		
Badger	Local (Higher) Importance	Yes

Feature	Highest Evaluation/ Importance	IEF?
Otter	International Importance	Yes
Other mammals (e.g., pine marten, hedgehog, etc.)	Local (Higher) Importance	Yes
Amphibians & Reptiles		
Smooth newt and common frog	Local (Higher) Importance	Yes
Common lizard	Local (Higher) Importance	Yes
Invertebrates (Lepidoptera)		
Small heath	Local (Higher) Importance	Yes
Bats		
Common pipistrelle	Local (Higher) Importance	Yes
Soprano pipistrelle	Local (Higher) Importance	Yes
Leisler's bat	County/Regional Importance	Yes
Nathusius' pipistrelle	Local (Higher) Importance	Yes
Myotis spp.	Local (Higher) Importance	Yes
Lesser horseshoe bat	Local (Higher) Importance	Yes
Brown long-eared bat	Local (Higher) Importance	Yes
Aquatic Ecology (Black River)		
Atlantic salmon and their habitats	International Importance	Yes
Lamprey spp. and their habitats	International Importance	Yes
White-clawed crayfish and their habitats	International Importance	Yes
Brown trout and their habitats	Local (Higher) Importance	Yes
European eel and their habitats	Local (Higher) Importance	

6.6 ASSESSMENT OF EFFECTS

Section 6.3.1.3 sets out the criteria and approach to the EcIA that follows CIEEM (2018) guidelines. Likely significant effects have been assessed for IEFs only, that is features that are valued as Local (Higher) ecological importance or above, as listed in **Table 6-23**.

6.6.1 EMBEDDED MITIGATION

The design team has integrated measures into the project design and construction methodology (referred to as embedded mitigation) to avoid or reduce potential effects on ecological receptors. These measures are inherent to the proposed project and are described in **Chapter 2** of the EIAR (**Sections 2.6** to **2.8**), together with the Grid Construction Methodology (see **Appendix 2-5**)

6.6.1.1 Mitigation by Avoidance

The fundamental mitigation measure applied throughout the proposed project is the avoidance of sensitive ecological receptors where practicable through project design. This principle, referred to as "mitigation by avoidance", has informed the iterative, constraints-led design of the proposed wind farm layout, including turbines and associated infrastructure.

The final layout represents the optimal design to avoid or reduce potential impacts on IEFs identified within the study area, including ER2 limestone pavement, as well as other sensitive habitats as far as practically possible. For example, the location of T5 hardstanding was modified through the design process to avoid species-rich grassland; the location of the proposed substation was modified to avoid a badger sett; and the alignment of access tracks and associated turbine hardstanding areas in the east of the proposed wind farm site was refined during the design process to avoid direct impacts on areas of ER2 limestone pavement. The design has also been refined to maintain appropriate setback distances from habitats suitable for protected species, including otter, smooth newt, badger and bats, as well as associated features, insofar as practicable.

In addition, buffer zones informed by water quality and hydrological considerations (as described in **Chapter 9**) have been incorporated into the design to protect water-dependent ecological receptors and associated habitats. No turbines are located within 50 m of mapped watercourses and a 50 m surface water buffer has been applied to EPA-mapped streams, rivers and lakes for major infrastructure (hardstands, substation, compounds, etc.). In addition, a 30 m buffer has been applied to identified dolines and karst features, while a precautionary 300 m groundwater protection buffer approach has been adopted where relevant (i.e. turloughs), as outlined in the Hydrology and Hydrogeology Assessment (see **Chapter 9**).

6.6.1.2 Mitigation by Design

Mitigation by design has been incorporated through the integration of Sustainable Drainage Systems (SuDS) into the proposed project layout (see **Chapter 9**). These measures aim to reduce potential adverse effects on water quality and associated downstream ecological receptors.

SuDS will be employed at the operational phase to attenuate runoff, reduce discharge rates and improve the quality of surface water runoff generated within the site. The design incorporates a treatment train approach to surface water management, facilitating the collection,

attenuation and controlled redistribution of runoff in a manner that mimics greenfield conditions.

These systems are designed to promote infiltration, diffuse discharge and natural filtration processes, thereby maintaining or improving water quality and reducing potential downstream effects on aquatic habitats and species.

6.6.2 Future Baseline Scenario

The future baseline describes the likely evolution of the receiving environment in the absence of the proposed project under a 'do-nothing' scenario. Under this scenario, baseline conditions within the study area would be expected to broadly continue as they are at present, characterised primarily by ongoing agricultural land use. Grassland management practices such as livestock grazing, particularly sheep grazing, and the application of fertilisers would be expected to persist and may intensify over time. In addition, existing quarrying activities in the wider area are likely to continue, with potential for future intensification or expansion.

In the absence of the proposed project, environmental conditions would not be expected to change significantly in the short to medium term. However, external pressures unrelated to the proposed project may influence baseline conditions over time. In particular, climate-driven changes, including increased rainfall intensity and frequency, may elevate flood risk within the Black River catchment, potentially resulting in increased surface runoff, riverbank erosion, and the transport of sediments and nutrients, with implications for aquatic systems both locally and downstream, including Rostaff Lake and Lough Corrib. Ash dieback, a serious disease of ash trees caused by the fungal pathogen *Hymenoscyphus fraxineus* (previously known as *Chalara fraxinea*) is a common occurrence in the west of Ireland, and is likely to impact ash in hedgerows and treelines as well as woodland areas.

Under Article 11 of the EU Directive on the conservation of Habitats, Flora and Fauna (92/43/EEC), each member state is obliged to undertake surveillance of the conservation status of the natural habitats and species in the Annexes and under Article 17, to report to the European Commission every six years on their status and on the implementation of the measures taken under the Directive. In August 2025, Ireland submitted the fourth assessment of conservation status for 59 habitats, including the five Annex I habitats recorded at the proposed wind farm site.

The overall status for 8240 Limestone pavements* is assessed as Inadequate due to continuing area losses associated with conversion to agricultural land and housing construction, as well as scrub encroachment caused by undergrazing. The trend is stable. This is unchanged since the 2019 assessment. Future prospects are categorised as Unfavourable-Inadequate (NPWS, 2025).

Despite a number of conservation-focused farming schemes which bring about localised and regional improvements, the Overall Status of 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) is assessed as Bad with a deteriorating trend due to on-going habitat losses mainly associated with unsuitable grazing regimes, agricultural intensification causing loss of species-rich communities, and abandonment of farmland resulting in succession to scrub. This result is unchanged from 2019. Future prospects are categorised as Unfavourable-Bad (NPWS, 2025).

The Overall Status of 4030 European dry heaths is assessed as Bad, as in the last two reporting periods, but the trend is now reported as deteriorating, down from stable in 2019. This is due to continuing losses in area recorded in the current reporting period and a high proportion of the habitat being in bad condition. Future prospects are categorised as Unfavourable-Bad (NPWS, 2025).

The Overall Status for 3180 turoughs* is assessed as Inadequate with a stable trend, unchanged from 2019. Future prospects are categorised as Unfavourable-Inadequate (NPWS, 2025).

Overall, it is anticipated that the study area would continue to support the IEFs under the future baseline scenario. However, the combined influences of ongoing agricultural land use, potential quarry activity, and climate-related pressures may, over time, lead to gradual changes in habitat condition and a potential reduction in suitability for certain IEFs. In addition, under the do-nothing scenario, the proposed project's contribution to national renewable energy generation, decarbonisation and energy security objectives would not be realised.

6.6.3 Likely Significant Effects – Construction

During the construction phase, potential effects on biodiversity will largely arise from vegetation removal, habitat loss and disturbance associated with the proposed project. These potential direct and indirect effects are summarised in the following sections. For clarity, **Sections 6.6.3.2** to **6.6.3.7** address the construction of the proposed wind farm site and the 110 kV substation. A separate assessment of the GCR and the TDR is provided in **Section 6.6.3.8**, which focuses on the key ecological pathway associated with these elements.

Potential sources of direct effects during the construction phase include:

- Permanent habitat loss and clearance of vegetation to accommodate site tracks, hardstands, turbine foundations, borrow pit extraction and substation construction;
- Removal of soil and rock for access tracks, hardstands and turbine bases, including blasting;
- Permanent habitat loss and clearance of hedgerows and treelines around turbines to implement bat feature buffers;
- Temporary habitat loss for the creation of temporary infrastructure such as construction compounds, blade set down areas and crane pads, as well as trampling or vehicle movement adjacent to major infrastructure areas;
- Permanent loss of nesting, roosting and resting places due to habitat loss and vegetation clearance; and
- Excavation of trenches for cable ducting and storage of materials along the GCR;
- Temporary vegetation removal along the TDR.

Potential sources of indirect effects during the construction phase include:

- Surface water runoff containing suspended sediments (runoff and erosion from stockpiling of materials on site);
- Surface water runoff containing an accidental pollution spill (e.g., hydrocarbon spill);
- Surface water runoff containing wastewater from welfare facilities provided for construction personnel;
- Dust related adverse effects arising from construction works;
- Temporary lighting adverse effects;
- Spreading of invasive plant species; and
- Disturbance and displacement of fauna due to construction activity and noise.

Along the GCR, works will involve underground cabling within the public road corridor, including excavation for cable trenches and associated reinstatement works. The works program is similar in scope to local road works programs and progresses in 50-100 m increments with limited local disturbance. Along the TDR, works will be limited to selective tree and hedge trimming and the temporary removal of street furniture to facilitate turbine component deliveries.

The construction phase of the proposed project is anticipated to take place over a 24-month period with a 2-month commissioning period proposed. The timing of construction works has the potential to influence both the type and magnitude of ecological effects, reflecting the seasonal sensitivity and seasonal presence of certain species occurring within and adjacent to the proposed project. Accordingly, the assessment considers the indicative construction programme alongside species-specific ecological sensitivities.

6.6.3.1 Designated Sites

Potential S-P-R links of connectivity have been identified between the proposed project and European and national designated sites (refer to **Table 6-13**).

Potential effects on European sites and national sites would largely arise during the construction phase and would include indirect effects associated with hydrological changes and impacts on downstream water quality that are likely to affect aquatic receptors and their associated habitats. Indirect effects may also arise from changes to surface water management, which have the potential to alter local soil conditions within the proposed project where sensitive terrestrial habitats occur, including the potential for localised nutrient enrichment of nutrient-poor habitats. In addition, dust deposition generated during construction activities may temporarily affect vegetation within adjacent habitats through the accumulation of fine particulate matter on plant surfaces and exposed substrates.

Where European sites are considered, this chapter summarises the assessments made on European sites in relation to the proposed project, with the full site assessment contained in the standalone AA Screening Report and the NIS prepared for the proposed project.

European Designated Sites

As outlined in **Section 6.3.3.2**, European Sites are considered within this chapter to establish the ecological baseline, identify ecological receptors and determine potential S-P-R linkages. The assessment of likely significant effects on European Sites and their conservation objectives is presented separately within the AA Screening Report (APEM Group Woodrow, 2026a) and NIS (APEM Group Woodrow, 2026b) and only summarised herein.

Cloughmoyne SAC (Site Code: 000479) occurs immediately adjacent to the proposed project boundary. As outlined in **Section 6.6.1.1**, the proposed wind farm layout was refined through the iterative design process to avoid direct impacts on ER2 limestone pavement within the proposed wind farm site. As such, no direct loss of ER2 limestone pavement will occur as a result of the proposed project. Furthermore, the ER2 limestone pavement present within the proposed project area does not form part of Cloughmoyne SAC.

While no direct habitat loss within the SAC will occur, the immediate proximity of construction activities means that indirect pathways require consideration. In particular, localised overland flow from active construction areas, together with dust deposition arising from excavation, rock

breaking and blasting activities, have the potential to affect adjacent limestone pavement habitats in the absence of mitigation.

Lough Corrib SAC (Site Code: 000297) has been identified as having hydrological connectivity to the proposed project *via* surface water and groundwater pathways. Shrule Turlough SAC (Site Code: 000525) is located c. 1.8 km north of the proposed project. While no direct surface water connection has been identified, both the proposed project and the SAC occur within the same groundwater body and regionally important karstified aquifer. Having regard to the conclusions of the hydrology assessment (**Chapter 9**), potential hydrogeological connectivity has been considered within the AA Screening Report and NIS.

On the basis of the assessment presented in the NIS (APEM Group Woodrow, 2026b) and taking account of the mitigation measures incorporated into the proposed project, no adverse effects on the integrity of Cloughmoyne SAC, Lough Corrib SAC, Shrule Turlough SAC, or any other European Site, are predicted, either alone or in combination with other plans or projects, having regard to their conservation objectives.

Nationally Designated Sites

No S-P-R connectivity was identified between the proposed project and any NHAs. However, four pNHAs were identified, most of which are noted for their ornithological importance (see **Chapter 7**). Three of these, Rostaff Lake pNHA and Lough Corrib pNHA (both within the Lough Corrib SAC boundary) and Lough Hacket pNHA, are hydrologically connected to the proposed project *via* downstream pathways. Rostaff Lake and Lough Corrib are connected *via* the Black River, occurring approximately 2.8 rkm and 11.1 rkm downstream of the proposed project, respectively. Lough Hacket pNHA is hydrologically linked along the GCR, where construction activities will be limited in extent and duration.

Likewise, Shrule Turlough pNHA has been carried forward due to the potential for hydrogeological connectivity, having regard to the conclusions of the hydrology assessment (see **Chapter 9**) and the presence of a shared regionally important karstified aquifer.

While construction-related runoff or accidental contamination could reach these nationally designated sites *via* indirect hydrological pathways, the distances involved and the limited nature of works along the GCR, means that any such impacts would be largely confined to connected watercourses. Likewise, while Shrule Turlough pNHA has been carried forward on a precautionary basis due to the potential for hydrogeological connectivity, the site is located c. 1.8 km from the proposed project and no direct surface water connection has been identified. Accordingly, in the absence of mitigation, the resulting effects on these nationally designated sites would be adverse, short-term in duration (i.e., limited to the period during which suspended solids or pollutants remain within the receiving waters), of minor to moderate magnitude, and considered likely **significant** at a county/regional geographical scale.

Cloughmoyne pNHA largely overlaps with the SAC of the same name and is designated for limestone habitats. Given its proximity to the proposed project boundary, construction activities have the potential to influence the local environmental conditions that support this habitat across much of the proposed project. As with the SAC, and in the absence of mitigation, any localised changes to soils or fissure conditions may persist beyond the active construction period but would be expected to recover over time. Accordingly, the resulting effect would be adverse, medium-term, of minor to moderate magnitude, and likely **significant** at a national geographical scale.

6.6.3.2 Habitats and Flora

The majority of habitat occurring within the proposed project is improved agricultural grassland which have been evaluated as Local (Lower) ecological importance; therefore, agricultural grassland is not brought forward to the impact assessment stage as it is not considered to be an IEF. Agricultural habitats will be reinstated, and current land uses will resume following the construction phase where land taken temporarily.

The following habitats (with the Fossitt classification for the habitat type provided in brackets) have been identified as IEFs either for their species richness, semi-natural characteristics, and/or limited occurrence and distribution at a geographical scale:

- Stone walls and other stonework (BL1);
- Exposed calcareous rock (ER2);
- Exposed calcareous rock (ER2)/ Dry calcareous and neutral grassland (GS1) mosaic;
- Exposed calcareous rock (ER2)/ Oak-ash-hazel woodland (WN2) mosaic;
- Turloughs (FL6);
- Drainage ditch (FW4);
- Dry calcareous and neutral grassland (GS1);
- Dense bracken (HD1)/ Dry calcareous and neutral grassland (GS1)/ Dry calcareous heath (HH2) mosaic;
- Dense bracken (HD1)/ Scrub (WS1) mosaic;
- Hedgerows (WL1);
- Treelines (WL2);
- Oak-ash-hazel woodland (WN2); and
- Oak-ash-hazel woodland (WN2)/ Scrub (WS1) mosaic.

Habitats that occur within the study area at wind farm infrastructure locations are provided in **Table 6-24** (refer to **Figure 6-7** to **Figure 6-10**), and those within turbine buffer areas for bats are provided in **Table 6-25**. Impacts on the identified IEF habitats are addressed in the following sections.

Table 6-24: Summary of the habitats impacted by the infrastructure associated with the proposed project

Habitat	Infrastructure	Temporary habitat loss	Permanent habitat loss
BL1 Stone walls and other stonework	Blade Area; Hardstanding; Internal Access Roads; Turbine Foundations; Substation Access Roads.	Not applicable	0.68 km
BL3 Buildings and artificial surfaces	Internal Access Roads; Substation OHL; Substation Access Roads; Offsite Substation; Construction Buffer.	0.04 ha	0.19 ha
ED2 Spoil and bare ground	Internal Access Roads; Construction Buffer.	0.02 ha	0.06 ha
ED3 Recolonising bare ground	Internal Access Roads; Deposition Areas; Construction Buffer.	0.14 ha	0.31 ha
ER2 Exposed calcareous rock	Internal Access Roads.	Not applicable	None

Habitat	Infrastructure	Temporary habitat loss	Permanent habitat loss
FW4 Drainage ditches	Offsite Substation; Substation Access Roads.	Not applicable	0.34 km
GA1 Improved agricultural grassland	Blade Area; Borrow Pit; Compounds; Deposition Areas; Hardstanding; Internal Access Roads; Meteorological Mast; Turbine Foundations; Turning Head; Substation OHL; Offsite Substation; Substation Access Roads; Construction Buffer.	6.47 ha	14.18 ha
GS2 Dry meadows and grassy verges	Internal Access Roads; Construction Buffer.	0.11 ha	None.
HD1/ GS1/ HH2 Dense bracken/ Dry calcareous and neutral grassland/ Dry calcareous heath	Control Building; Internal Access Roads; Construction Buffer.	0.06 ha	0.22 ha
WL1 Hedgerows	Blade Area; Hardstanding; Internal Access Roads.	Not applicable	0.20 km
WL2 Treelines	Hardstanding; Internal Access Roads.	Not applicable	0.16 km
WN2 Oak-ash-hazel woodland	Internal Access Roads.	0.02 ha	None.

Table 6-25: Summary of the main habitats impacted by the manipulation of habitats to mitigate impact on bats

Habitat	Turbine no.	Habitat management	Habitat extent change
ED3 Recolonising bare ground	T5, T10, T11	Maintenance of a short sward.	No change.
ER2 Exposed calcareous rock	T1, T2, T3, T4, T5, T10, T11	Scattered tree and shrub clearance.	Increase in area by 0.89 ha (from area currently ER2/ WN2).
ER2/WN2 Exposed calcareous rock/Oak-ash-hazel woodland	T11, T13	Dense tree and shrub clearance.	Loss of 0.89 ha (becoming ER2).
GA1 Improved agricultural grassland	T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11, T12, T13	Maintenance of a short sward.	No change.
GS1 Dry calcareous and neutral grassland	T2, T5, T10	Maintenance of a short sward and scattered scrub clearance.	No change.
HD1/ WS1 Dense bracken/ Scrub	T5	Scrub and bracken clearance and restoration to GS1 Dry	Reduction in area by at least 0.51 ha.

Habitat	Turbine no.	Habitat management	Habitat extent change
		calcareous and neutral grassland	
WL1 Hedgerows	T1, T4, T6, T10, T12.	Additional hedgerow removal to facilitate the creation project infrastructure to be retained as permanent habitat loss to reduced landscape connectivity close to turbines to reduce suitability for commuting and foraging bats. New hedgerows to be created and selected existing hedgerow lengths to be enhanced.	Losing 0.12 km (but adjacent stone wall to be retained).

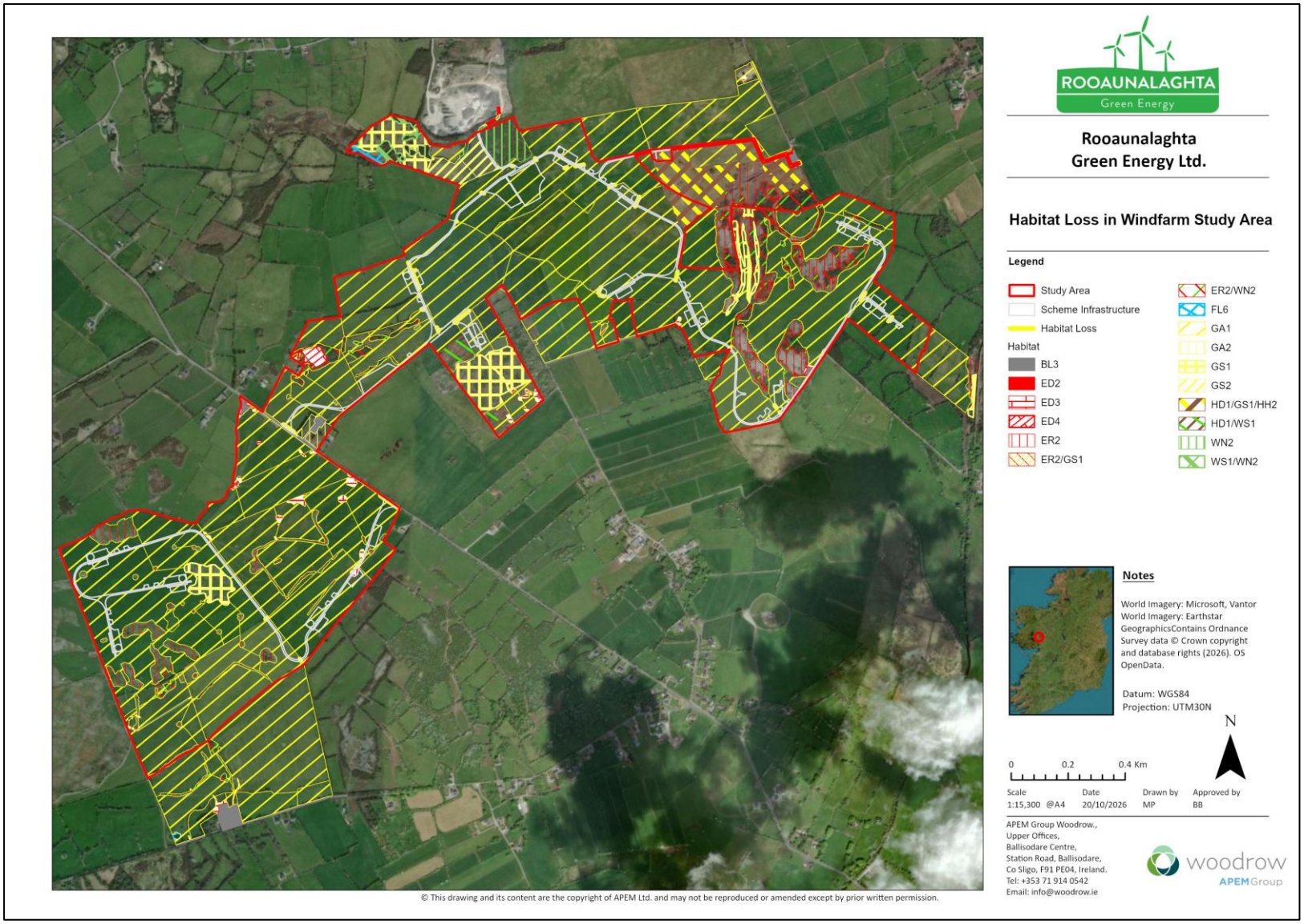


Figure 6-7: Habitat loss at the proposed wind farm site

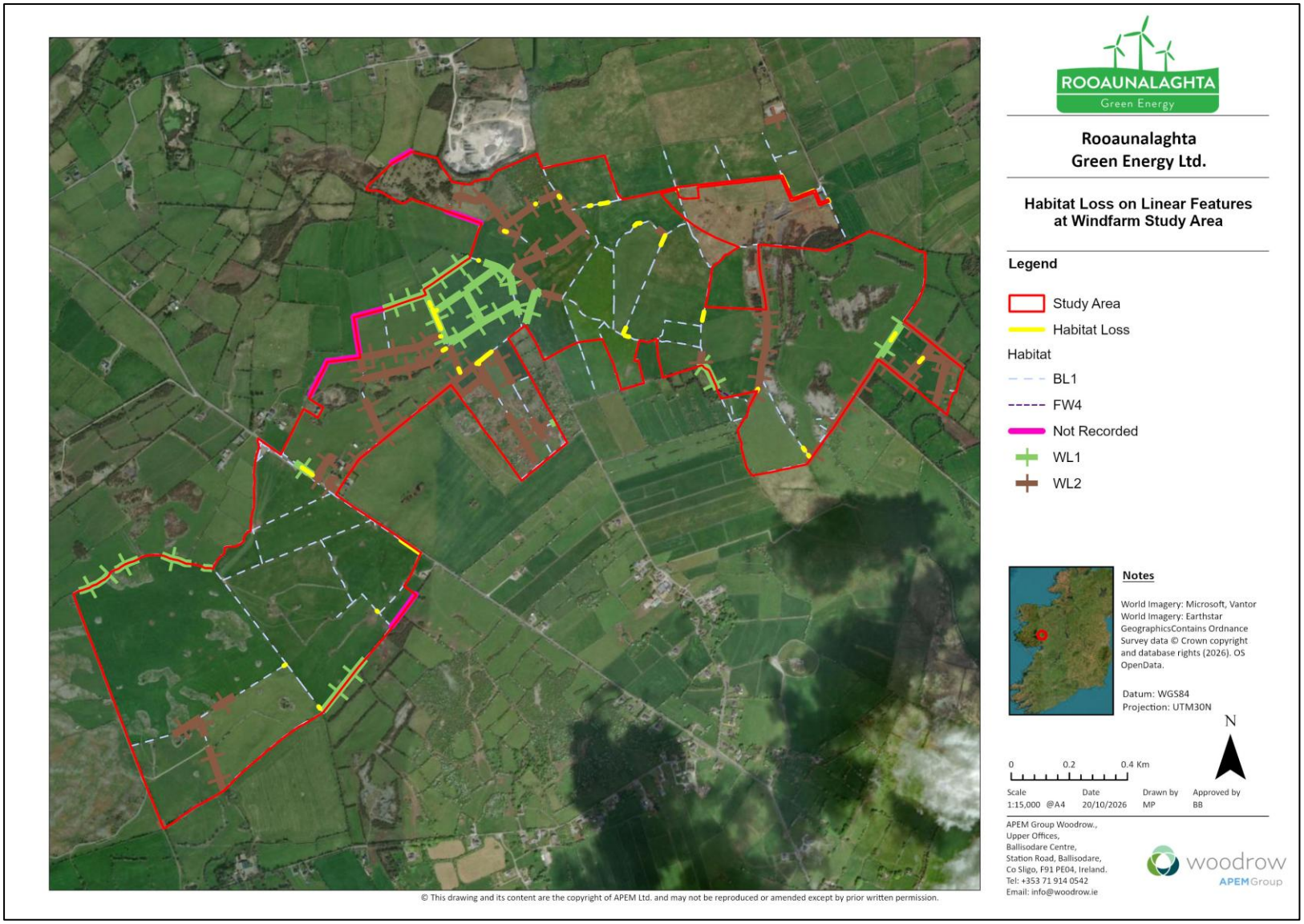


Figure 6-8: Habitat loss of linear features at the proposed wind farm site

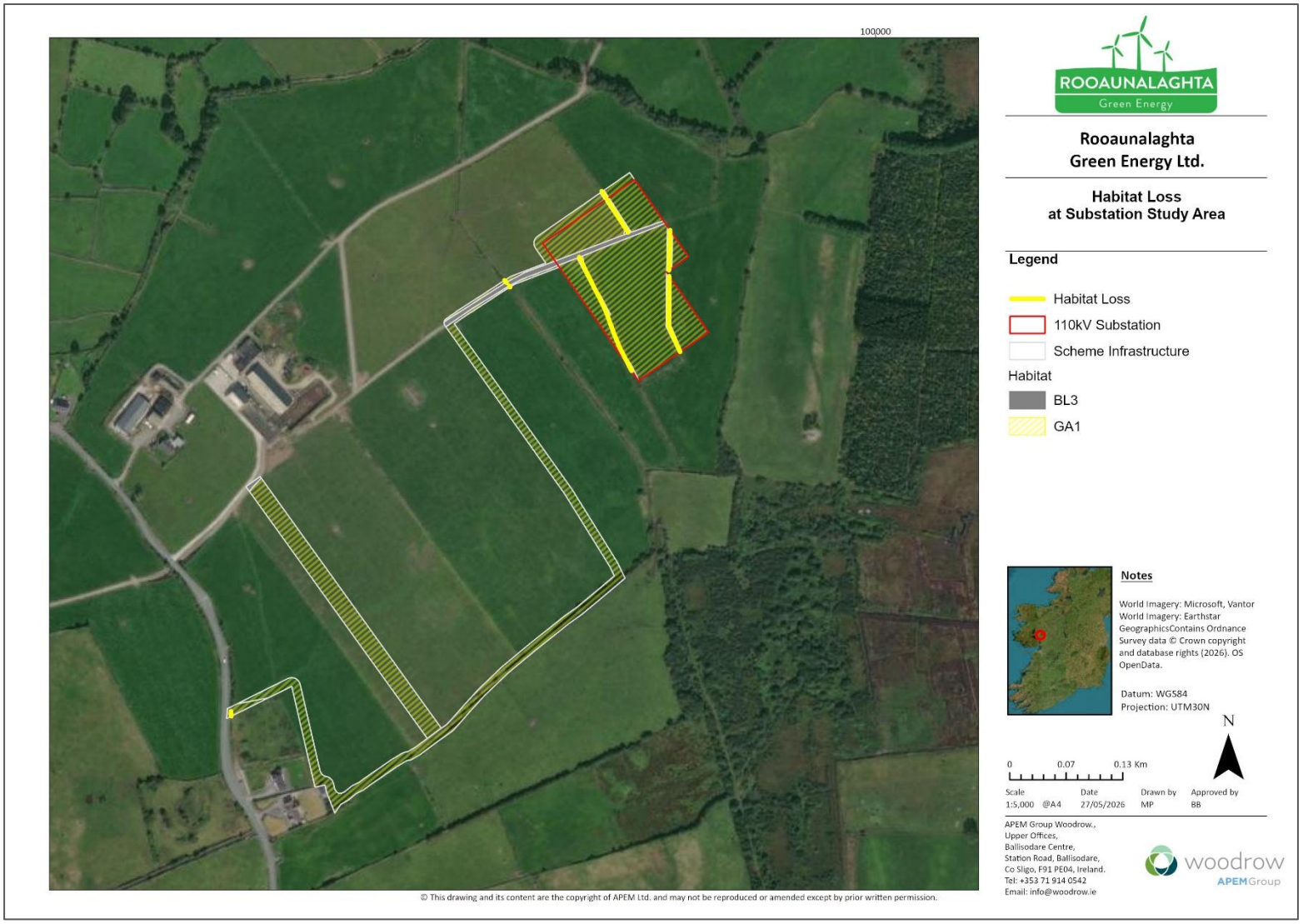


Figure 6-9: Habitat loss at the proposed 110 kV substation



Figure 6-10: Habitat loss of linear features at the proposed 110 kV substation

BL1 Stone walls and other stonework

Loss of Habitat

A total length of approximately 20.98 km of stone walls is within the study area. Several sections of stone walls, totalling approximately 0.68 km, will be removed to facilitate the infrastructure associated with the proposed project. This habitat loss is to facilitate the construction of turbine foundations and associated hardstands, turbine assembly, access roads, and spoil deposition areas and will result in permanent habitat loss at these locations. This loss equates to *c.* 3% of the existing stone wall habitat within the study area. However new stone wall lengths will be created in other locations within the study area using the stone from the walls that will be lost totalling 0.44 km.

While sections of stone walls will be removed resulting in habitat loss, the function of the retained features as an ecological corridor is expected to continue; this, in part, is due to the wider structure and function of the stone wall network in the surrounding agricultural landscape.

In the absence of mitigation, there will be a permanent adverse effect on stone walls that is likely **significant** at a local geographical scale.

Dust Deposition

Dust will be generated during the construction phase where conditions of prolonged dry weather persist and may arise from exposed soils resulting from the excavation of turbine bases, hardstands, access tracks, borrow pits, uncovered material deposition areas and additional infrastructure such as the temporary construction compounds, and the 110 kV substation. The movement and transporting of soils/materials will contribute to further dust generation within the EIAR study area. **Chapter 14** provides further details on the generation of dust during the construction phase. There is potential for dust produced during these activities to become deposited on stonewalls, particularly where these habitats occur adjacent to access tracks. In these cases, dust deposition can cause degradation of habitat condition by suppressing lower plants such as bryophytes and lichens by smothering reducing photosynthetic activity and affect the long-term integrity of habitats if effects persist over time.

Table 14.8 in **Chapter 14** sets out that where the receptor sensitivity is low, then the sensitivity of the area to ecological impacts from the source is low within 20 m. Approximately 4.68 km of stone walls occur within 20 m of infrastructure associated with the proposed project. Dust deposition arising from construction phase activities such as earthworks and soil storage has the potential to negatively affect this habitat where it occurs adjacent to any construction works and where access tracks are sited in close proximity to stone walls. In these cases, dust impacts can cause degradation of habitat condition by smothering photosynthetic activity and suppressing plant growth and affect the long-term integrity of habitats if effects persist over time.

In the absence of mitigation, there is potential for an adverse, short-term, moderate effect on stone walls arising from dust deposition suppressing photosynthesis, which is likely **significant** at a local geographical scale.

ER2 Exposed calcareous rock

This habitat is included with the priority Annex I habitat Limestone pavements [8240] (outside of designated sites of international importance).

Loss of Habitat

A total area of approximately 11.44 ha of exposed calcareous rock occurs as limestone pavement within the study area. However, following the application of mitigation by avoidance (as outlined in **6.6.1.1**), none of this habitat will be directly lost to the proposed project and is therefore **not significant** at any geographical scale.

Minor shrub clearance will be undertaken to reduce the risk of bat collision and barotrauma as a result of the turbine operation (refer to **Section 6.6.4.5** and **6.7.2.4** for further details) within 109 m of T1 to T5 and T10, but as this will not result in habitat loss, no adverse effect is anticipated.

Dust Deposition

Limestone pavements are characterised by very thin or absent soils on clints and shallow, discontinuous soils in grikes, making them highly sensitive to external nutrient inputs, including inputs from dust deposition. The likely outcomes of sustained dust-driven enrichment on limestone pavement could include increased fertility in grikes and soil pockets, a shift toward more competitive species with the potential loss of lichens, bryophytes, and stress-tolerant specialists, as well as increased scrub or grass vigour where grazing pressure is low. As described above, the dust deposition also has the potential to suppress photosynthesis.

Table 14.8 in **Chapter 14** sets out that where the receptor sensitivity is high, then the sensitivity of the area to ecological impacts from the source is high within 20 m and medium within 50 m. Areas of limestone pavement occur immediately adjacent to infrastructure associated with the proposed project at the eastern end of the proposed wind farm site, and 0.43 ha of the habitat (*c.* 4% of the habitat extent within the study area) occurs within 20 m of infrastructure associated with the proposed project, and as this in an Annex I habitat, 2.22 ha (*c.* 19% of the habitat extent within the study area) within 50 m. In the absence of mitigation, dust deposition has the potential to result in a direct, short-term adverse effect on exposed calcareous rock that is likely **significant** at a local geographical scale.

ER2 Exposed calcareous rock/GS1 dry calcareous and neutral grassland mosaic

This habitat is included with the priority Annex I habitat Limestone pavements [8240] (outside of designated sites of international importance).

Loss of Habitat

A total area of approximately 0.07 ha (782 m^2) of exposed calcareous rock/dry calcareous and neutral grassland mosaic occurs within the study area. However, as no habitat loss or degradation will occur, no adverse effect is anticipated and is therefore **not significant** at any geographical scale.

Dust Deposition

Table 14.8 in **Chapter 14** sets out that where the receptor sensitivity is high, then the sensitivity of the area to ecological impacts from the source is high within 20 m and medium within 50 m. None of the mapped extent of exposed calcareous rock/ dry calcareous and neutral grassland mosaic occurs within 90 m of any infrastructure associated with the proposed project. As no credible pathway for dust deposition exists, any effects are considered negligible and therefore **not significant** at any geographical scale.

ER2 Exposed calcareous rock/WN2 oak-ash-hazel woodland mosaic

This habitat is included with the priority Annex I habitat Limestone pavements [8240] (outside of designated sites of international importance).

Loss of Habitat

A total area of approximately 6.06 ha of exposed calcareous rock/ oak-ash-hazel woodland mosaic occurs within the study area; **none** of this habitat will be directly lost to the infrastructure associated with the proposed project. However, tree clearance will be undertaken to reduce the risk of bat collision and barotrauma as a result of the turbine operation (refer to **Section 6.6.4.5** and **6.7.2.4** for further details) within 119 m of T10, T11 and T13. This will result in a change in the habitat from a wooded limestone pavement (ER2/WN2) to an exposed limestone pavement habitat (ER2), but it will still represent examples of limestone pavement* Annex I habitat. Sensitive habitat management practices are set out in **Appendix 6-6**. While the area of this mosaic habitat will be reduced this will result in the habitat being reclassified as ER2 exposed calcareous rock. Therefore, no loss of limestone pavement habitat will occur. As there will be no direct loss of limestone pavement habitat, there is no effect and is therefore **not significant** at any geographical scale.

Dust Deposition

As described for exposed calcareous rock, these limestone pavement habitats can also be susceptible to nutrient enrichment as a result of dust deposition in addition to the impact on plant photosynthesis. **Table 14.8** in **Chapter 14** sets out that where the receptor sensitivity is high, then the sensitivity of the area to ecological impacts from the source is high within 20 m and medium within 50 m. Areas of exposed calcareous rock/ oak-ash-hazel woodland mosaic habitat occurs less than 2 m from to infrastructure associated with the proposed project, with approximately 0.31 ha occurring within 20 m (*c.* 5% of the habitat extent within the study area) and as this in an Annex I habitat, 0.83 ha (*c.* 14% of the habitat extent within the study area) within 50 m. In the absence of mitigation, dust deposition has the potential to result in a direct, short-term adverse effect on the habitat that is likely **significant** at a local geographical scale.

FL6 Turloughs

This habitat is included with the priority Annex I habitat Turloughs [3180]* (outside of designated sites of international importance).

Loss of Habitat

A total area of approximately 0.39 ha of turlough occurs within the study area; however, as of this habitat will be directly lost to the proposed project. As such, there is no effect and is therefore **not significant** at any geographical scale.

Dust Deposition

Table 14.8 in **Chapter 14** sets out that where the receptor sensitivity is high, then the sensitivity of the area to ecological impacts from the source is high within 20 m and medium within 50 m. As none of the mapped extent of the turlough habitat occurs within 310 m of any infrastructure associated with the proposed project, no credible pathway exists, and thus any effect will be negligible and **not significant** at any geographical scale.

Water Quality Deterioration

Section 9.5.1.1 in **Chapter 9** identified 50 m buffer areas for surface water and 300 m for groundwater. The Turlough habitat is located beyond the groundwater buffer zone and is separated from construction activities by over 300 m. The vegetated habitats between the proposed project and the turlough area will act as a buffer to suspended sediments, accidental pollutions spills or wastewater being transported in surface flow, trapping/absorbing pollutants before these reach turlough habitats in the unlikely case of a pollution event. The potential for adverse effects on the habitat is considered negligible and **not significant** at any geographical scale.

Hydrological Impacts

The hydrogeological assessment (within **Chapter 9**) acknowledges that the site is underlain by a Regionally Important Karstified (Conduit) Aquifer (Rkc) with predominantly extreme groundwater vulnerability. Extensive site investigation, including boreholes, groundwater monitoring wells, trial pits, geophysics and karst walkovers, was undertaken to characterise baseline conditions. While karstified limestone bedrock is present, no significant karst conduits or major karst features were encountered within planned infrastructure locations. The identified dolines are shallow features developed within glacial deposits and do not exhibit swallow-hole functionality.

No turbines are located within 50 m of mapped watercourses and that a 50 m surface water buffer has been applied to EPA-mapped streams, rivers and lakes for major infrastructure (hardstands, substation, compounds, etc.). In addition, a 30 m buffer has been applied to identified dolines and karst features, while a precautionary 300 m groundwater protection buffer approach has been adopted where relevant (i.e., turloughs), as outlined in the Hydrology and Hydrogeology Assessment (see **Chapter 9**). No turbine foundation, hardstand or borrow pit infrastructure is located within mapped dolines or enclosed depressions. No karst cavities were encountered during drilling.

Furthermore, settlement ponds and infiltration features are not located within identified dolines, swallow holes, sinking streams or turlough features. Hydrogeological supervision throughout the works will ensure that the drainage infrastructure operates as designed and does not create a direct pathway to groundwater. Further details on the drainage is provided below. The potential for adverse effects on the habitat is considered negligible and **not significant** at any geographical scale.

FW4 Drainage ditches

Loss of Habitat

A total length of approximately 0.39 km of drainage ditches occurs within the study area, with nearly all at the proposed 110 kV offsite substation location, within an area of GA1 Improved agricultural grassland. **Section 9.5.3.2** of **Chapter 9** sets out that the drainage ditches at the proposed offsite substation will require alteration resulting in the loss of 0.34 km of the existing drainage ditch network. Drainage ditches will be fenced off and drainage diverted around the proposed offsite substation. However, in the absence of mitigation the overall effect, while short-term, is considered adverse, and likely **significant** at a local geographical scale.

Dust Deposition

The ditch locations are surrounded by improved agricultural grassland therefore any nutrient enrichment from dust deposition would be expected to be of limited impact. **Table 14.8** in **Chapter 14** sets out that where the receptor sensitivity is low, then the sensitivity of the area to ecological impacts from the source is low within 20 m. In the absence of mitigation, there is potential for an adverse, short-term but minor effect, which is considered **not significant** at any geographical scale.

GS1 Dry calcareous and neutral grassland

This habitat is included with the Annex I habitat semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometea*) [6210] (outside of designated sites of international importance).

Loss of Habitat

A total area of 8.56 ha of dry calcareous and neutral grassland occurs within the study area; however, none of this habitat will be directly lost to the proposed project. As no habitat loss or degradation will occur, there is no effect and it is therefore **not significant** at any geographical scale.

Dust Deposition

Table 14.8 in **Chapter 14** sets out that where the receptor sensitivity is high, then the sensitivity of the area to ecological impacts from the source is high within 20 m and medium within 50 m. Areas of exposed calcareous rock/ dry calcareous and neutral grassland occurs within 7 m of infrastructure associated with the proposed project near T2, with approximately 0.08 ha of the habitat occurring within 20 m (*c.* 1% of the habitat extent within the study area) and as this in an Annex I habitat, 1.02 ha (*c.* 12% of the habitat extent within the study area) within 50 m. In the absence of mitigation, dust deposition has the potential to result in a short-term adverse effect of moderate magnitude, which is likely **significant** at a local geographical scale.

GS2 Dry meadows and grassy verges

This habitat is included with the Annex I habitat lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510] (outside of designated sites of international importance).

Loss of Habitat

A total area of 2.10 ha of dry meadow occurs within the study area, and 0.11 ha will be lost to the construction of an access road from Lydon Quarry to the proposed wind farm development. Creation of this access road will reduce the distance material has to be moved in comparison to travelling along the local road network and associated environmental impacts. In the absence of mitigation habitat loss will result in a permanent adverse effect that is likely **significant** at a county/regional geographical scale.

Dust Deposition

Table 14.8 in **Chapter 14** sets out that where the receptor sensitivity is high, then the sensitivity of the area to ecological impacts from the source is high within 20 m and medium within 50 m. Areas of dry meadows occur immediately adjacent to infrastructure associated with the proposed project with the access track between Lydon Quarry and the proposed windfarm development, with approximately 0.27 ha of the habitat occurring within 20 m (c.13% of the habitat extent within the study area) and as this in an Annex I habitat, 0.65 ha (c. 31% of the

habitat extent within the study area) within 50 m. In the absence of mitigation, dust deposition has the potential to result in a short-term adverse effect of moderate magnitude, which is likely **significant** at a local geographical scale.

HD1 Dense bracken/GS1 dry calcareous and neutral grassland/HH2 dry calcareous heath mosaic

This habitat included the Annex I habitat European dry heaths [4030] and potentially semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometea*) [6210] (outside of designated sites of international importance).

Loss of Habitat

A total area of approximately 1.37 ha of dense bracken/ dry calcareous and neutral grassland/ dry calcareous heath mosaic habitat occurs within the study area. The majority of this habitat will be unaffected by construction works; however, approximately 0.28 ha of this habitat will be lost to accommodate the control building and access towards T7 and T8. **Section 3.3.5.10.4** within **Chapter 3** sets out the rationale for having to place this infrastructure on the Annex I habitat. Location criteria included a requirement for a location on the eastern boundary of the site, near existing or proposed internal access tracks, and be at least 150 m from a turbine location. These criteria limited the available land options. This loss equates to c. 20% of the total dense bracken/ dry calcareous and neutral grassland/ dry calcareous heath mosaic habitat within the study area.

Re-instatement of any areas of the construction buffer to GS1 dry calcareous and neutral grassland and habitat restoration of retained areas of this habitat is set out in **Appendix 6-6** to improve the condition of the retained habitat. In the absence of mitigation there will be a permanent adverse effect that is likely **significant** at a county/regional geographical scale due to the mosaic habitat comprising a mixture of higher and lower value habitats.

Dust Deposition

Table 14.8 in **Chapter 14** sets out that where the receptor sensitivity is high, then the sensitivity of the area to ecological impacts from the source is high within 20 m and medium within 50 m. In addition to direct habitat loss further habitat extent occurs immediately adjacent to infrastructure associated with the proposed project, with approximately 0.13 ha of this habitat occurring within 20 m of the proposed project (*c.* 10% of the habitat extent within the study area) and as this includes Annex I habitat, 0.35 ha (*c.* 26% of the habitat extent within the study area) within 50 m. In the absence of mitigation, dust deposition has the potential to suppress photosynthesis and contribute to nutrient enrichment within this habitat, resulting in a short-term, moderate adverse effect that is likely **significant** at a local geographical scale

HD1 Dense bracken/WS1 scrub mosaic

Loss of Habitat

A total area of approximately 1.11 ha of dense bracken/scrub mosaic occurs within the study area, none of which will be directly lost to the infrastructure associated with the proposed project. However, active habitat management (as described in **Appendix 6-6**) is required for bats near T5 to lower the vegetation height and therefore increase the separation distance to turbine blade tips (refer to **Section 6.6.4.5** and **6.7.2.4**). Active management of the scrub and conversion of this habitat to permanent grassland will result in a reduction in the area of this habitat by at least 0.51 ha, with a resultant increase in permanent grassland area. In the absence of mitigation,

habitat management for bats will result in a permanent adverse effect that is likely **significant** at a local geographical scale.

Dust Deposition

Table 14.8 in **Chapter 14** sets out that where the receptor sensitivity is low, then the sensitivity of the area to ecological impacts from the source is low within 20 m. Areas of bracken/scrub mosaic habitat occurs immediately adjacent to infrastructure associated with the proposed project at T5. Approximately 0.13 ha of this habitat occurs within 20 m of the proposed project (*c.* 12% of the habitat extent within the study area). Dust deposition has the potential to result in a short-term, adverse but minor effect on this habitat that is **not significant** at any geographical scale.

WL1 Hedgerows

Loss of Habitat

A total length of approximately 2.51 km of hedgerows are present within the study area.

Several sections of hedgerows, totalling approximately 0.20 km, will be removed to facilitate the proposed project. This habitat loss is to facilitate the construction of turbine foundations and associated hardstands, turbine assembly, access roads. This loss equates to *c.* 8% of the existing hedgerow habitat within the study area.

To reduce the risk of bat collision and barotrauma as a result of the turbine operation (refer to **Section 6.6.4.5** and **6.7.2.4** for further details) one hedgerow length north of T4 beyond the infrastructure footprint but within the construction footprint will be removed (but the adjacent stone wall retained). This would result in the loss of an additional 0.12 km of hedgerow.

While sections of hedgerows (and treelines) will be removed during construction, the function of the remaining features as an ecological corridor is expected to continue; this, in part, is due to the wider structure and function of the hedgerow and treeline network in the surrounding agricultural landscape.

In the absence of mitigation, the proposed project will result in a permanent loss of hedgerow habitat totalling a length of 0.32 km (*c.* 13% of the total hedgerow length); as such, there will be a permanent, adverse and likely **significant** effect on hedgerows at a local geographical scale.

Dust Deposition

Table 14.8 in **Chapter 14** sets out that where the receptor sensitivity is low, then the sensitivity of the area to ecological impacts from the source is low within 20 m. Approximately 0.34 km of hedgerows occur within 20 m of the proposed project (*c. 14%* of the habitat extent within the study area). Dust deposition arising from construction phase activities such as earthworks or exposed areas/soils has the potential to adversely affect this habitat where it occurs adjacent to any construction works and where access tracks are sited in close proximity to hedgerows. In these cases, dust impacts can cause degradation of habitat condition by smothering photosynthetic activity and suppressing plant growth and affect the long-term integrity of habitats if effects persist over time. In the absence of mitigation, there is potential for dust deposition to suppress photosynthesis within hedgerow vegetation, resulting in an adverse, short-term and moderate effect that is likely **significant** at a local geographical scale.

WL2 Treelines

Loss of Habitat

A total length of approximately 6.00 km of treelines are present within the study area.

Several sections of treeline, totalling approximately 0.16 km, will be removed to facilitate the construction of the proposed project. This habitat loss is to facilitate the construction of turbine foundations and associated hardstands, turbine assembly, access roads and spoil deposition areas. This loss equates to c. 3% of the existing treelines habitat within the study area.

While sections of treelines (and hedgerows) will be removed during construction, the function of the remaining features as an ecological corridor is expected to continue; this, in part, is due to the wider structure and function of the hedgerow and treeline network in the surrounding agricultural landscape.

In the absence of mitigation, the proposed project will result in a permanent loss of treeline habitat totalling a length of 0.16 km; as such, there will be a permanent, and likely **significant** effect at a local geographical scale.

Dust Deposition

Table 14.8 in **Chapter 14** sets out that where the receptor sensitivity is low, then the sensitivity of the area to ecological impacts from the source is low within 20 m. Approximately 1.50 km of treeline occur within 20 m of the proposed project (c. 25% of the habitat extent within the Study Area). Dust deposition arising from construction phase activities has the potential to adversely affect this habitat where it occurs adjacent to any construction works and where access tracks are sited in close proximity to treelines. In these cases, dust impacts can cause degradation of habitat condition by smothering photosynthetic activity and suppressing plant growth and affect the long-term integrity of habitats if effects persist over time.

In the absence of mitigation, there is potential for dust deposition to suppress photosynthesis within treeline vegetation, resulting in an adverse, short-term and moderate effect that is likely **significant** at a local geographical scale.

WN2 Oak-ash-hazel woodland

Loss of Habitat

A total area of approximately 2.32 ha of oak-ash-hazel woodland occurs within the study area; with approximately 0.02 ha of the habitat to be lost to the proposed project to create an access track to the quarry to the north of the study area. This loss equates to c. 2% of the total oak-ash-hazel woodland habitat within the study area.

6.6.4.5**6.7.2.4**In the absence of mitigation, there will be a permanent, adverse but minor effect on oak-ash-hazel woodland habitat that is **not significant** at any geographical scale.

Dust Deposition

Table 14.8 in **Chapter 14** sets out that where the receptor sensitivity is medium, then the sensitivity of the area to ecological impacts from the source is medium within 20 m and low within 50 m. In addition to direct habitat loss further habitat extent occurs immediately adjacent to infrastructure associated with the proposed project, with approximately 0.38 ha of this habitat occurring within 20 m of the proposed project (*c.* 16% of the habitat extent within the study area). In the absence of mitigation, dust deposition has the potential to result in a short-

term, moderate and adverse effect on oak-ash-hazel woodland that is likely **significant** at a local geographical scale.

WN2 Oak-ash-hazel woodland/ WS1 scrub mosaic

Loss of Habitat

A total area of approximately 0.74 ha of oak-ash-hazel woodland/ scrub mosaic occurs within the study area. As no habitat loss or degradation will occur, no adverse effect is anticipated and is **not significant** at any geographical scale.

Dust Deposition

Table 14.8 in **Chapter 14** sets out that where the receptor sensitivity is medium, then the sensitivity of the area to ecological impacts from the source is medium within 20 m and low within 50 m. As none of the mapped extent of oak-ash-hazel woodland/scrub mosaic occurs within 190 m of any infrastructure associated with the proposed project, no credible pathway for dust deposition effects has been identified. Therefore, no adverse effect is anticipated and is **not significant** at any geographical scale.

Annex I Habitats

Outside of designated sites of international importance, five Annex I habitats corresponding to the Fossitt (2000) classifications are present within the survey area: the priority habitats Turloughs* [3180], Limestone pavements* [8240], Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometea*) [6210]* and the non-priority Annex I European dry heaths [4030] and Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510].

The priority habitat Turloughs* [3180] is located over 300 m from the nearest proposed wind farm infrastructure and c. 400 m from the nearest turbine (T6), beyond the precautionary groundwater buffer zone applied in the Hydrology and Hydrogeology Assessment (**Chapter 9, Section 9.5.1.1**). Due to this spatial separation, the potential for direct or indirect adverse effects on this habitat is considered negligible and not significant at any geographical scale.

The priority Annex I habitat limestone pavements* [8240] are included in the Fossitt classification ER2 exposed calcareous rock, ER2/GS1 exposed calcareous rock/dry calcareous and neutral grassland and ER2/WN2 exposed calcareous rock/oak-ash-hazel woodland. None of this habitat will be directly lost to infrastructure. Habitat management to reduce the risk of bat collision and barotrauma will retain the areas as limestone pavement but reduce the tree and shrub cover but maintain the limestone pavement extent, reducing the extent of wooded limestone pavement (ER2/WN2) and increasing the extent of exposed limestone pavement (ER2). For exposed or grassy limestone pavement areas, no direct loss or degradation will occur as a result of the proposed project. Therefore, no adverse effect is anticipated and is therefore **not significant** at any geographical scale.

While the Annex I habitat is occurring outside of an International designated site the habitat management practices adopted will be in line with good practice applied to European designated sites in Ireland (DHLGH, 2023), any tree and shrub removal within areas of limestone pavement will be undertaken by hand to avoid physical damage. Indirect impacts from dust deposition could impact 0.74 ha of this habitat within 20 m, and as a potentially sensitive receptor, 3.05 ha within 50 m. Due to the relatively high sensitivity of the exposed limestone

pavement, dust deposition has the potential to result in a direct, short-term, moderate adverse effect that is likely **significant** at a local geographical scale.

European dry heaths [4030] and potentially semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometea*) [6210] are included in the Fossitt classification HD1/GS1/HH2 dense bracken/dry calcareous and neutral grassland/dry calcareous heath mosaic habitat. 0.28 ha of this mosaic habitat will be lost to the construction of the control building (including 0.06 ha construction buffer area). Habitat enhancement of retained areas of this habitat are set out in **Appendix 6-6** to improve habitat condition. In the absence of mitigation there will be a permanent, adverse and likely **significant** effect at a county/regional geographical scale due to the mosaic habitat comprising a mixture of higher and lower value habitats.

Within the EIAR study area indirect impacts from dust deposition could impact 0.13 ha within 20 m and 0.35 ha within 50 m, however this habitat is present within these buffer areas but outside of the study area. In the absence of mitigation, dust deposition has the potential to suppress photosynthesis and contribute to nutrient enrichment within the dense bracken/dry calcareous and neutral grassland/dry calcareous heath mosaic habitat, resulting in a direct, short-term, moderate adverse effect that is likely **significant** at a local geographical scale.

Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometea*) [6210] corresponds to the GS1 dry calcareous and neutral grassland habitat onsite. No direct footprint loss of this Annex I priority habitat will occur from the construction of the proposed wind farm or proposed offsite 110 kV substation and associated connection. Potential indirect impacts such as physical degradation or compaction during scrub management have been evaluated. In line with good practice (DHLGH, 2023), any shrub removal will be undertaken strictly by hand. With these measures implemented, the residual adverse effects on the habitat are **not significant** at any geographical scale. Conversely, proposed habitat restoration targeting areas of dense bracken and scrub encroachment to re-establish calcareous grassland is expected to yield a permanent, beneficial, and likely **significant** effect at the county/regional scale.

Indirect impacts from dust deposition could impact 0.08 ha within 20 m and 1.02 ha within 50 m. In the absence of mitigation, dust deposition has the potential to suppress photosynthesis and contribute to nutrient enrichment within this habitat, resulting in a direct, short-term, moderate adverse effect that is likely **significant** at a local geographical scale. Defoliation by grazing animals has the potential to reduce the effects of nutrient enrichment.

Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510] is included in the Fossitt (2000) habitat type GS2 dry meadows and grassy verges. 0.11 ha of this habitat will be directly lost to the construction of the access track linking Lydon Quarry to the north with the proposed wind farm development to facilitate the transportation of stone from the quarry. The inclusion of this access route will reduce the wider environmental impacts of transporting stone from the quarry using longer distances routes to the proposed wind farm development using the existing road network. In the absence of mitigation there will be a permanent, adverse and likely **significant** effect at a county/regional geographical scale. Within the EIAR study area, indirect impacts from dust deposition could impact 0.27 ha within 20 m and 0.68 ha within 50 m. This includes areas of the habitat also within 50 m of Lydon Quarry. In the absence of mitigation, dust deposition has the potential to suppress photosynthesis and contribute to nutrient enrichment

within the lowland hay meadow habitat, resulting in a direct, short-term, moderate adverse effect that is likely **significant** at a local geographical scale.

Non-native Invasive Species

Although no instances of non-native invasive plant species were recorded within the proposed wind farm site or offsite substation, in the absence of appropriate biosecurity measures, there is potential risk of introducing non-native invasive species into the proposed project *via* construction vehicles/heavy machinery, which can have an adverse effect on sensitive habitats. If non-native invasive species were to enter the proposed project, their introduction and spread can directly impact habitats within the proposed project. This constitutes an adverse effect that is likely **significant** at the local geographical scale.

6.6.3.3 Terrestrial Mammals

Badger

Loss of Foraging Habitat

Permanent loss of foraging habitat for badger will arise from the construction of access tracks, turbine hardstands, borrow pits, the onsite control building and the proposed 110 kV substation, resulting in the loss of c. 14.18 ha of grassland habitat, and c. 0.21 km of hedgerows. For context, 14.18 ha represents c. 7.6% of the total grassland habitat recorded within the proposed project (c. 187.64 ha; comprising predominantly GA1 improved agricultural grassland (c. 175.03 ha), as well as smaller areas of species-rich grassland, e.g., GS1 and mosaic grassland, e.g., HD1/GS1/HH2).

Additionally, suitable foraging habitat for badger will be temporarily lost to working areas and temporary construction compounds during the construction phase, amounting to c. 6.47 ha of grassland habitat (GA1).

Activity at the main sett was high; however, there is extensive suitable foraging habitat available to badger across the proposed project and the surrounding landscape. Grassland habitats at temporary construction compound locations will also be reinstated following construction, further limiting any long-term loss of resource.

As such, any effects on foraging badger habitat during the construction phase are considered minor and **not significant** at any geographical scale.

Disturbance and Displacement

Construction noise (including blasting and pile driving), increased machinery use and construction personnel presence, and temporary artificial lighting at construction compounds during the construction phase of the proposed project may alter badger behaviour in the vicinity of works, particularly where more invasive activities are concentrated around turbines and borrow pits. Blasting/piling within 150 m of an active badger sett is considered to be within the ZoI of such damaging activities (NRA, 2005a).

A single entrance outlier badger sett, with infrequent activity, was recorded within the northwest of the proposed wind farm site, c. 55 m from the proposed borrow pit footprint, c. 78 m from the temporary turbine assembly area at T7, and c. 98 m from the turbine hardstand at T7. Blasting is proposed for the construction of the turbine hardstand and for excavation of the borrow pit. Badger are sensitive to disturbance and there is therefore potential for significant noise disturbance and vibration impacts, which can lead to displacement.

Construction noise and human activity associated with construction operations have the potential to result in short-term displacement of foraging and resting badger, including individuals associated with the outlier sett identified. If inappropriately timed, such disturbance could also result in the displacement of breeding badger from adjacent areas of habitats.

While the main badger sett, located at the proposed 110 kV substation, lies within 150 m of the proposed site infrastructure (at a distance of c. 102 m from the substation footprint), no blasting or piling is proposed at this location. The remaining single-entrance badger sett, which was recorded incidentally, is situated outside the study area, c. 390 m from the proposed project and therefore lies outside the ZoI for general construction works, with no risk of direct disturbance. However, there will be a degree of general disturbance on the local badger population due to the increased presence of machinery and personnel during the construction phase.

In the absence of mitigation, there would be an adverse, short-term effect of minor magnitude on the local badger population arising from short-term displacement and disturbance. This would be limited to periods of blasting associated with the borrow pit and foundation works at T7 and would occur during daytime working hours only. The potential displacement relates to a single-entrance outlier sett that is sporadically used, with no effects anticipated on the main sett. Given the temporary and localised nature of these works, the resulting effect is considered likely **significant** at a local geographical scale.

Otter

Disturbance and Displacement

Otter disturbance buffers typically include 30 m for a holt or couch and 150 m for a natal den, in line with appropriate NRA (2008a) and NIEA (2011) guidance. Along the Black River (EPA Code: 30B02), one location showed potential suitability for a holt, although this could not be verified due to the ephemeral nature of the channel during high flows and limited accessibility, which made monitoring challenging. The Black River provides ample foraging and commuting opportunities for otter. The watercourse lies closest to the proposed wind farm along the eastern extent of the site where it is located c. 280 m from the nearest proposed infrastructure at its closest point.

The Lough Corrib SAC, for which otter is a QI species, lies c. 250 m from the nearest element of the proposed project. Given these distances, the absence of confirmed holts or natal dens within the relevant disturbance buffers, and the fact that construction activities will generally be limited to daytime hours, no disturbance to resting or breeding places is anticipated.

In Ireland, otter have been recorded with home ranges of c. 7.5 km ± 1.5 km for females, with males ranging from c. 10 km up to c. 19 km, although this is primarily associated with river corridors and the immediate riparian zone (Ó Néill *et al.*, 2009). The immediate ZoI of the proposed project consists of agricultural land offering limited suitability for otter, with extensive high-quality habitat available along the Black River. The Rooaunalaghta Stream may be used occasionally for commuting, but signs of use were limited, with only one old spraint recorded. Moreover, this waterbody was found to be dry during the summer period of 2026. At the proposed substation location, the Shancloon Stream has been extensively modified and is more characteristic of a managed drainage ditch. As such, it is considered unsuitable for otter due to limited prey availability and the intensive management of the surrounding land.

Temporary lighting associated with construction compounds may give rise to some limited disturbance; however, this would be localised and temporary in nature and would be restricted to the construction phase.

In the absence of mitigation, and taking account of the distance to more suitable habitat along the wider watercourse (namely the Black River), the localised nature of works, and the absence of permanent lighting or habitat loss, construction activities have the potential to give rise to a temporary disturbance effect on commuting and foraging otter. No resting places, holts or natal dens have been identified within the appropriate buffers. In the absence of mitigation, the magnitude of this effect would be adverse, short-term and of minor to moderate, and is therefore considered likely **significant** at a local geographical scale.

Water Quality Effects

Water quality deterioration arising from surface water runoff and/or pollution events during the construction phase has the potential to reduce prey availability for otter. Increased suspended solids in downstream habitats can affect salmonids, lamprey and crayfish, which form an important component of otter diet. More critically, indirect impacts, such as a fish kill following an extreme pollution event, has the potential to result in an adverse effect on otter by reducing fish biomass and overall prey availability. A reduction in prey abundance would limit the extent and quality of foraging habitat available to otter within the Black River (EPA Code: 30B02), which is located c. 182 m from the proposed project and is hydrologically connected *via* groundwater pathways and a drainage network linking to the Rooaunalaghta Stream, and connected reaches. This could temporarily reduce the effective foraging range of individuals using this part of the Corrib catchment.

Considering the potential reduction in prey biomass following a major water pollution event affecting the Black River, the effects on otter would be adverse, short to medium-term, and of minor to moderate magnitude. Any reduction in prey availability would be temporary, with effects diminishing as aquatic communities recover, and otter are likely to adapt through short-term changes in foraging behaviour, reflecting the species' wide dietary and spatial niche. Notwithstanding this, as otter are a QI of the Lough Corrib SAC and therefore a feature of international importance, the resulting effect is considered likely **significant** at a county/regional geographical scale.

Pine marten

Disturbance and Displacement

Pine marten were not observed within the study area and only one suspected scat was recorded within the proposed wind farm site. While some pockets of suitable habitat exist, most trees within the study area do not contain cavities or hollows typically used by pine marten for denning, although pine marten are known to occasionally share dens with badger.

Considering that there will be no disturbance to wooded areas and that habitat connectivity and continuity for pine marten will be preserved, the risk to this species is considered negligible to minor. As such, effects on pine marten are considered minor and **not significant**.

Due to the largely nocturnal behaviour of pine marten, temporary artificial lighting at temporary construction compounds has the potential to cause some disturbance during the construction phase. However, the proposed site infrastructure is predominantly within open agricultural land that pine marten are unlikely to use regularly, and more suitable foraging and commuting

habitat exists in the wider area. On this basis, effects arising from temporary artificial lighting are considered minor, and therefore **not significant** at any geographical scale.

Other Mammals

Risk of Death

Irish hare were recorded on several occasions within the study area, and although Irish stoat was not detected during targeted mammal surveys, two incidental sightings in the wider area confirm its local presence. Other small mammals, including hedgehog and pygmy shrew, are also known to occur in the wider landscape and may utilise the study area. For these species, there is a potential risk that individuals could enter open excavations, including trenches and turbine foundations, during the construction phase, where they could become trapped and suffer injury or mortality.

In the absence of mitigation, this represents an adverse effect that would be short-term (i.e., restricted to the construction period) and of minor to moderate magnitude, as any losses of Irish hare, Irish stoat, hedgehog or pygmy shrew are unlikely to affect national populations of these species, accidental injury or mortality of individuals associated with the local populations within and surrounding the proposed project cannot be ruled out. Accordingly, in the absence of mitigation, this effect is considered likely **significant** at a local geographical scale.

Loss of Habitat

The proposed project primarily comprises GA1 improved agricultural grassland (c. 175.03 ha), with boundary features consisting of vegetated hedgerows, treelines and extensive lengths of unvegetated stone walls. Suitable habitat for Irish hare occurs mainly within the wider study area, and although a proportion of GA1 grassland will be removed to accommodate the proposed site infrastructure, Irish hare is a highly mobile and generalist species (Helldin *et al.*, 2012), and this level of habitat loss is not expected to influence the local population. Habitat suitable for Irish stoat is largely confined to boundary features, with GA1 grassland offering limited refuge. Given the species' generalist and mobile nature (Helldin *et al.*, 2012), and the availability of similar habitat in the surrounding study area, habitat loss associated with the proposed site infrastructure was not expected to affect the local population.

Suitable habitat for hedgehog and pygmy shrew is present throughout the study area, particularly along stone walls, vegetated boundaries and small areas of scrub that provide foraging opportunities and cover. Habitat loss affecting these species will comprise both permanent loss where site infrastructure is installed and temporary loss associated with construction compounds, access routes and other temporary works areas. The extent of habitat loss is limited, and extensive suitable habitat remains available in the surrounding landscape, allowing displaced individuals to disperse into adjacent areas.

The overall effect of habitat loss on Irish hare, Irish stoat, hedgehog and pygmy shrew is assessed as being of negligible to minor magnitude and **not significant** at any geographical scale.

Disturbance and Displacement

Disturbance from noise, vibration and the movement of machinery and personnel during the construction phase had the potential to displace foraging and breeding Irish hare. Irish hare do not rely on a fixed den but rest in temporary forms in vegetation, and young hare are born fully furred and mobile shortly after birth, with nursing females visiting only once daily at dusk. These

behavioural traits mean that both adults and young are relatively mobile and less exposed to short-term disturbance effects associated with construction activity.

Construction activity also has the potential to disturb Irish stoat, hedgehog and pygmy shrew. While hedgehog and pygmy shrew may temporarily avoid areas of active works, all three species are capable of moving through the surrounding landscape to utilise alternative foraging and refuge habitat within boundary features and adjacent habitats. Irish stoat, in particular, is highly mobile and readily able to avoid localised disturbance associated with construction compounds, access tracks, hardstanding areas and the proposed substation.

Given the mobility of Irish hare, Irish stoat, hedgehog and pygmy shrew, the temporary and localised nature of construction disturbance and the widespread availability of suitable habitat within the wider study area, disturbance and displacement effects are assessed as being of negligible to minor magnitude and **not significant** at any geographical scale.

6.6.3.4 Amphibians and Reptiles

Smooth Newt and Common Frog

Loss of Habitat

Suitable habitat for amphibians within the proposed project is limited. The pond assessed as suitable for smooth newt is located outside the proposed project (c. 220 m away and >600 m from the nearest proposed infrastructure). Although eDNA results from this pond were inconclusive due to elevated turbidity and suspended sediment concentrations, the physical separation between the pond and proposed infrastructure, means that no effects on this habitat are predicted.

Within the proposed project, occasional wetted areas and drains may offer limited suitability primarily for common frog. Drainage diversion works associated with the offsite substation will result in the loss of sections of the existing drainage network and associated habitat, although replacement drainage habitat will be created as part of the diversion works. In addition, a pollution incident of sufficient magnitude could indirectly reduce habitat suitability within these drains during the construction phase by degrading water quality and affecting spawning and tadpole development. The resulting effects on common frog would be adverse, short-term and of minor to moderate magnitude, and therefore **significant** at a local geographical scale.

Common Lizard

Disturbance and Displacement

Common lizard were not recorded within the study area; however, suitable habitat occurs within the proposed project, primarily in the form of rock piles, limestone outcrops and stone walls, which provide potential refugia, basking opportunities and hibernacula. Foraging potential within the proposed project is limited due to close grazing. Construction of access tracks and hardstanding areas may occur in the vicinity of suitable rock piles, with works anticipated to be as close as c. 10 m. Rock piles and known hibernacula will be retained; however, approximately 1.3 km of stone walls, which constitute an important microhabitat for common lizard, will be removed to facilitate the proposed project.

During the active season (March–October), individual lizards may be displaced from basking or sheltering locations in or close to active working areas due to increased human presence, noise and vibration. While the removal of stone walls represents a permanent loss of some marginal

habitat, extensive similar habitat remains available within the surrounding landscape, and key hibernation features will be retained. As such, effects are likely to relate primarily to temporary disturbance and displacement rather than the loss of critical habitat features.

In the absence of mitigation, disturbance and displacement during the active season would result in an adverse, short-term effect of minor to moderate magnitude, which is considered **significant** at a local geographical scale.

Risk of Death

Direct mortality may occur during vegetation clearance, scrub removal, ground preparation or excavation works undertaken during the active season when common lizard are above ground and using refugia. Removal of small scrub patches, scattered stones, loose surface rock or log piles used for temporary cover could harm individuals if undertaken without appropriate measures in place. Rock piles and hibernacula will not be removed. However, works may occur within c. 10 m of these features, and while higher suitability hibernacula will be retained, accidental injury or death to individuals sheltering in smaller features near working areas remains a risk if clearance occurs during peak activity.

Given the limited availability of suitable habitat within the proposed project and the absence of recorded common lizard sightings within it, the potential for direct mortality during vegetation removal and excavation works is considered low. In the absence of mitigation, any such mortality would result in an adverse, short-term effect (i.e., restricted to the construction period) of minor magnitude. However, as common lizard are a protected species and any mortality would affect individuals associated with the local population, the effect is considered **significant** at a local geographical scale.

6.6.3.5 Invertebrates

Lepidoptera (butterflies)

Loss of Habitat

Approximately 0.28 ha (c. 20%) of the HD1 dense bracken/GS1 dry calcareous and neutral grassland/HH2 dry calcareous heath mosaic utilised by small heath will be permanently lost as a result of the proposed project. However, the majority of this habitat mosaic (c. 84%) will be retained. In addition, areas of species-rich grassland (GS1) remain available locally within the study area.

Considering the limited scale of habitat loss, together with the availability of suitable habitat both locally and within the wider area, the overall effect of habitat loss on the local small heath population is assessed as being of negligible to minor magnitude and **not significant** at any geographical scale.

6.6.3.6 Bats

Roosting Bats

Loss of Roosting Habitat

The proposed wind farm layout and associated infrastructure have been designed to avoid confirmed bat roosts and identified PRFs, representing embedded mitigation. No direct loss of the confirmed transitional roost at Feature F.1 (see **Figure 4** of **Appendix 6-4**) is proposed, and

no buildings or structures classified as supporting PRFs of Moderate or High suitability (including F.4 and F.6) will be removed or modified as part of the proposed project.

Baseline surveys (refer to **Section 6.5.2.5** and **Appendix 6-4**) indicate that roosting resources within the proposed wind farm site are primarily associated with buildings and a limited number of trees and treelines supporting PRF-I features, which are used opportunistically by common pipistrelle, soprano pipistrelle and Leisler's bat. No maternity, hibernation or other high-importance roosts were identified within woodland, treeline or hedgerow habitats.

Tree and woodland loss associated with turbine infrastructure will occur at a limited number of turbine locations, primarily affecting areas of woodland and scrub classified as ER2 and WN2 mosaic habitats. These areas support PRF-I suitable for opportunistic use by tree-roosting species, including common pipistrelle, soprano pipistrelle and Leisler's bat, as identified during baseline surveys.

Woodland and tree loss is not uniform across the proposed wind farm site and is concentrated at specific turbine locations (notably T5, T10, T11 and T13). In addition, the affected areas form part of a wider network of retained woodland, treelines and scrub that will continue to provide roosting opportunities within the proposed wind farm site.

A derelict structure (F.7) (see **Figure 4** of **Appendix 6-4**), classified as having Moderate roost suitability, recorded a suspected soprano pipistrelle emergence during an additional survey undertaken in April 2026. While roost use has not been confirmed, no direct loss or modification of this structure is proposed, and it contributes to the wider roosting resource context rather than representing a key roost proposed wind farm site.

Lesser horseshoe bat was recorded at low levels within the wider study area; however, no roosts, core roosting habitats or key woodland complexes for this species were identified within or adjacent to the proposed wind farm site. The limited woodland loss proposed does not represent the loss of roosting habitat of a scale, quality or location likely to affect lesser horseshoe bat populations.

On this basis, and taking account of embedded mitigation, the construction-phase loss of roosting habitat is not predicted to result in an adverse effect on roosting bats and is therefore **not significant** at any geographical scale.

Loss of Foraging and Commuting habitat

Vegetation removal associated with the proposed wind farm site will be limited to that required to facilitate turbine foundations, access tracks, crane hardstands and associated infrastructure. This will result in localised removal of hedgerows, treelines and scrub at a small number of turbine locations, primarily comprising short sections of linear habitat and areas of scrub and woodland mosaic (ER2/WN2), as set out in the habitat loss schedule.

Baseline activity data demonstrate that bat commuting and foraging activity within the proposed wind farm site is strongly associated with an extensive network of linear landscape features, including hedgerows, treelines and stone walls. The majority of these features will be retained, and the proposed removals represent a small proportion of the overall linear habitat resource available within the proposed wind farm site.

Importantly, the proposed removals do not result in the severance of principal commuting corridors identified during baseline surveys. Where breaks in linear features occur, they are generally short and associated with access points or infrastructure interfaces, and do not create

gaps of a scale likely to impede bat movement. No continuous commuting routes used by lesser horseshoe bat were identified within the footprint of proposed vegetation removal, and recorded activity for this species within the proposed wind farm site was low.

The habitats affected by vegetation removal are not identified as core foraging areas or key commuting corridors for bats, but form part of a wider, interconnected network of retained linear features. As such, while there will be a localised reduction in potential foraging and commuting habitat, the functional connectivity of the landscape for bats will be maintained. In the absence of mitigation, construction-phase effects associated with the loss of foraging and commuting habitat would be minor and localised, and are therefore **not significant** at any geographical scale

Disturbance

The construction phase of the proposed project will extend over approximately 24 months. Construction activities will generally take place between 08:00 and 20:00 on weekdays and 08:00 and 13:00 on Saturdays. Construction activities will include turbine foundation excavation, construction of internal access tracks and hardstanding areas, installation of turbine components, operation of a temporary onsite borrow pit, establishment of temporary construction compounds, and associated civil and electrical works. These activities have the potential to result in temporary, localised disturbance to bats during the construction phase, associated with noise and light emissions.

Construction-phase noise will be generated by earthworks, operation of heavy machinery, turbine foundation excavation, track construction and turbine erection activities. In addition, rock breaking will be employed where stone removal is required, and localised blasting may be necessary in limited instances, including at the onsite borrow pit and, where required, at turbine foundation locations (see **Chapter 2**). Blasting activities will be confined to the construction phase and will occur intermittently.

Baseline bat surveys identified two confirmed transitional bat roosts within the wider site. Both roosts are located outside turbine foundation footprints, the borrow pit excavation area and other areas of direct ground disturbance and will not be subject to direct loss as part of the proposed project. In addition, a number of PRFs were identified within the proposed wind farm site, including features located within the wider ZoI of some turbine locations, tracks and associated infrastructure.

Noise generated during construction, including blasting, will result in temporary disturbance to bats occupying nearby roosts and, where PRFs are present, bats using these features. As construction activities will generally occur during daylight hours, disturbance to bats undertaking foraging and commuting activities is expected to be limited. Any disturbance will be localised, confined to periods of active construction, and will not result in the loss of roost structures or permanent loss of roosting habitat. On this basis, construction-phase noise is predicted to result in a temporary and localised disturbance effect on bats that is not significant at the local geographic scale.

Temporary artificial lighting will be installed during the construction phase to facilitate site safety and security. Lighting will be confined to active construction areas, including turbine construction locations, temporary construction compounds and associated working areas. Active construction areas are limited to locations of direct construction activity and do not include retained hedgerows, treelines, woodland edges or other linear features that function as

bat commuting or foraging corridors, except where such features are unavoidably adjacent to construction works. No permanent construction lighting is proposed, and temporary lighting will be removed once construction activities at each location are complete.

All compounds and associated lighting will be located within the proposed wind farm site boundary and linked to defined construction footprints rather than along linear landscape features.

Baseline surveys demonstrated that bat activity within the proposed wind farm site is primarily associated with linear landscape features, including hedgerows, treelines and woodland edges, which provide commuting routes and foraging habitat. Artificial lighting has the potential to disturb bats where it illuminates such features or increases light levels in otherwise dark areas, either by acting as a behavioural barrier for light-averse species or by altering prey availability and foraging behaviour.

Species recorded within the study area that are particularly sensitive to artificial lighting include brown long-eared bat and lesser horseshoe bat, which typically avoid illuminated areas and may be displaced from commuting routes if linear features are lit. *Myotis* species, while generally less light-averse, are clutter-adapted bats that rely on dark, sheltered corridors for navigation and foraging; illumination of linear features may therefore disrupt movement or reduce foraging efficiency for these species.

Temporary construction lighting may therefore result in localised disturbance to bats using commuting and foraging routes where lighting occurs in proximity to linear features or PRFs. Such effects will be temporary, restricted to periods of active construction, and will not result in the loss of bat habitat or roost structures.

On this basis, construction-phase artificial lighting is predicted to result in a temporary and localised disturbance effect on bats of minor magnitude at the local geographic scale, which is considered **not significant** at any geographical scale.

Bat Risk Assessment

An initial (Stage 1) potential risk assessment for the proposed project was undertaken using the risk assessment matrix provided in NatureScot *et al.* (2021). The NatureScot Stage 1 assessment is a precautionary project-level screening exercise used to determine the level of survey effort, assessment and mitigation required. It is not intended to assess collision risk at individual turbines, nor does it provide a detailed appraisal of habitat quality or bat activity levels across the site.

Stage 1 considers the presence of roosting opportunities, the potential for bat use of the site, landscape connectivity and project characteristics. Where one or more specified risk factors are present, a higher screening category may be assigned on a precautionary basis, irrespective of habitat quality or recorded activity levels at individual turbine locations.

For the proposed project, a precautionary 'Moderate' Stage 1 risk category was assigned based on the presence of the following screening criteria:

- Buildings, trees or other structures with moderate to high potential to support roosting bats on or near the proposed project;
- Habitats that could be used extensively by foraging bats; and
- Connectivity to the wider landscape through linear features such as scrub, treelines and drainage ditches.

The Stage 1 assessment applies to the proposed project as a whole and is not undertaken on a turbine-by-turbine basis. Consequently, variations in habitat quality or proximity to commuting and foraging features between individual turbine locations do not alter the overall Stage 1 screening outcome.

6.6.3.7 Aquatic Ecology

There are no significant water bodies (i.e., EPA-designated water bodies) within the proposed wind farm site; therefore, there is no potential for direct impacts. Surface water pathways draining the proposed project flow toward the surrounding catchment, including the Rooaunalaghta and Cloughmoyne tributaries of the Black River (EPA Code: 30B02), while the proposed 110 kV substation area connects hydrologically to the Shancloon Stream (refer to **Section 6.4.5.4**). The proposed project therefore has an indirect hydrological connection to the Black River *via* existing drainage pathways, which may act as conduits for surface water runoff, as well as shallow subsurface and groundwater pathways.

Access tracks associated with the proposed 110 kV substation will utilise existing farm tracks and established crossing points, although some crossings may require localised upgrading or extension.

As described in **Section 6.4.4.6**, water quality within the Black River is generally assessed as Good, and the river supports high-sensitivity aquatic receptors, including salmonids (salmon and brown trout) and lamprey spp. Baseline surveys recorded a good mix of salmonid habitat, including holding and passage areas, mixed juvenile habitat, and areas with some suitability for spawning.

While no evidence of white-clawed crayfish was recorded and no historical records exist for the Black River, the species occurs elsewhere in the wider Lough Corrib catchment and SAC, and hydrological connectivity therefore provides a potential pathway between the proposed project and this IEF of International Importance. The Black River and associated tributaries also support other species of fish that form important ecological linkages for top level predators of conservation interest, namely otter and kingfisher.

Potential impacts during the construction phase on aquatic ecology arise where activities result in changes in surface water runoff, sediment release or accidental pollution (e.g., hydrocarbon spill), or that could affect water quality within the receiving environment.

Specific activities that could result in such impacts are described in **Chapter 2** and **Chapter 9.** These comprise the following:

- Site preparation works, including vegetation clearance and soil stripping, which may alter infiltration characteristics and increase surface runoff rates.
- Excavation and ground disturbance, including soil stripping, which may mobilise fine sediments and result in sediment-laden runoff entering surface water receptors.
- Construction of hardstanding areas and access tracks, involving the handling and placement of aggregate materials, which may contribute to increased sediment runoff if not properly managed.
- Temporary accumulation of groundwater or surface water in excavations, which may become contaminated through contact with excavated materials or aggregates, posing a risk to water quality during dewatering activities.
- Storage and use of potential contaminants, including fuels, oils, wet concrete, and wastewater, which may enter surface water or groundwater *via* accidental spillages, leakage, or improper handling.

- Borrow pit excavation and associated rock breaking, crushing and screening activities, which may increase the potential for sediment mobilisation and sediment-laden runoff if not appropriately managed.
- Excavation, storage and management of spoil and excavated materials, including temporary spoil storage areas and borrow pit reinstatement works, which may result in erosion and sediment transport during periods of rainfall.
- Surface water runoff from construction and operational infrastructure, including access tracks, hardstanding areas, construction compounds and the borrow pit, which may alter runoff characteristics and increase the risk of sediment or contaminant transport to receiving waters if not appropriately controlled.

Changes to Surface Runoff and Sediment Release

Construction activities such as machinery movement and vegetation clearance can alter how rainwater is absorbed across the proposed wind farm site. Repeated use of heavy machinery can compact the soil, reducing its ability to absorb water. Removing vegetation also lowers the amount of rainfall intercepted by plants and decreases natural evapotranspiration. Together, these changes can reduce infiltration and lead to increased surface runoff during rainfall events. This runoff has the potential to mobilise fine sediments and pollutants and transport them *via* local drainage features and overland flow pathways to hydrologically connected downstream surface water receptors, including the Rooaunalaghta Stream, as well as the Black River.

Earthworks and ground disturbance may generate suspended sediments which could be transported off site during rainfall events as surface runoff. The section of the Black River (EPA Code: 30B02) which runs to the east of the proposed wind farm boundary would be considered glide and plain bed with a high transport capacity to carry suspended sediment downstream, where it could become deposited in low-flow areas resulting in localised depositional zones.

High levels of suspended solid concentrations in waterbodies can affect the feeding and health of individual salmonid species through increased turbidity (inhibiting respiration through gills) and increased siltation affecting the composition of riverbed substrate (reducing fry survival) and affecting spawning beds. Suspended solids often hold nutrients such as phosphorus that can result in eutrophication and reduced oxygen levels (with high oxygen levels being important for all life stages of salmonids). Habitat availability and quality are intrinsically linked with the survival rates of juvenile salmonids. Therefore, small amounts of debris entering a section of river important for vulnerable life stages of salmonids can have adverse effects, even in the short-term, on the survival of juveniles.

Lamprey spp. (e.g., brook lamprey), which are known to utilise similar clean, well oxygenated gravel substrates to salmonids, typically spawn at the tails of pools where eggs benefit from shelter and sustained oxygen exchange. Excessive fine sediment deposition can blanket these gravels, reducing oxygen transfer to eggs and inhibiting successful hatching.

Although no crayfish were recorded during the baseline assessment or during the desk study, the decline in species suitability is strongly associated with increased sediment suspension in rivers and subsequent sedimentation on the riverbed, which can smother suitable refuges. For crayfish, siltation not only degrades the quality and availability of suitable refuges but can also clog and damage their gills, leading to compromised respiration.

Considering this, and in the absence of mitigation, there would be an adverse, temporary to short-term effect (i.e., during the period in which suspended solids or pollutants remain within

the receiving waters) of moderate to major magnitude on salmonids, lamprey and white-clawed crayfish, which would be considered **significant** at a county/regional scale.

Accidental Pollution

Given the high level of interaction between groundwater and surface water within the proposed wind farm site and the karstic nature of the underlying geology (including the potential presence of unmapped karstic features), any significant pollution event (such as a concrete spill, fuel leak or accidental release of hydrocarbons) could rapidly migrate through both surface water and groundwater pathways and subsequently reach the Black River. Two karst features (dolines) have been identified within the study area, one located southeast of the T1 hardstand area and a second approximately 200 m west of the proposed offsite 110 kV substation (see **Chapter 8**). Accordingly, the majority of the proposed wind farm site is characterised by extreme groundwater vulnerability or areas where bedrock is at or near the surface (X), reflecting the presence of thin overlying soils and resulting in an increased potential for rapid pollutant migration to groundwater (see **Chapter 9**). The surrounding area of the proposed wind farm site, under the Ground Waterbody WFD status 2016 to 2021, is classified as having Good status, and maintaining this status requires careful management of potential contamination pathways.

The release of hydrocarbons, such as from fuel spills, can negatively affect water quality by reducing oxygen levels, which are critical for salmon and lamprey populations. Hydrocarbons are known to bioaccumulate in salmonids (McCain *et al.*, 1990), with short-term exposure in Atlantic salmon leading to physical degradation and loss of condition. Moreover, salmon are known to avoid areas contaminated with hydrocarbons (Maynard and Weber, 1981), effectively reducing available habitat and obstructing migration routes. Improper fuel storage or handling could severely affect downstream habitats and the species they support.

In the absence of mitigation, accidental pollution events would result in an adverse, short to moderate-term (given the potential for pollutant persistence and bioaccumulation) effect of moderate to major magnitude on salmonids, lamprey and white-clawed crayfish, which would be considered **significant** at a county/regional scale.

6.6.3.8 Grid Connection Route and Turbine Delivery Route

Habitats

Loss of Habitat

The potential for adverse effects on habitats along the TDR, where localised modifications may be required to facilitate the passage of large vehicles and turbine components, was considered. TDR-related works will involve adjustments to existing infrastructure, including temporary setback or relocation of features such as poles and stone walls, removal of street lighting and road signage, vegetation management such as tree or hedgerow trimming and localised road widening where required.

Modelling of the TDR has been undertaken by TOBIN and this has identified one location in Galway city at the junction of the R336 and the L5034 (refer to **Chapter 2**). At this location a footpath needs to be reinforced for the turbine passage. Habitats in the immediate vicinity of these junction are BL3 artificial surfaces such as pavements and GA2 amenity grassland. Otherwise, there is vegetation trimming and demounting of signage/street furniture required at various locations on the route. These areas will be reinstated following completion of turbine

component delivery. Given the limited spatial extent and temporary nature of these works, the effects are expected to be localised and short-term.

No direct habitat loss is anticipated along the GCR. Construction works will take place within the existing road network, including trench excavation and cable laying, in accordance with the CEMP **(Appendix 2-3)**. Habitats along the GCR are predominantly comprised of GA1 improved agricultural grassland, with linear features largely consisting of BL1 stone walls. At the point where the GCR connects to the onsite control building, there will be a limited and temporary loss of GA1 improved agricultural grassland. This habitat is of low ecological value and is not considered an IEF, and therefore the scale of impact is considered minor and temporary in nature. BL1 stone walls impacted during the installation of the GCR will be rebuilt, and therefore the temporary loss of this habitat is **not significant** at any geographical scale.

Spread of Invasive Species

The distribution of invasive species along the GCR and TDR is limited and generally localised (refer to **Figure 9** of **Appendix 6-3**). However, construction works associated with trenching and temporary accommodation works have the potential to result in their spread. In particular, disturbance of soils and vegetation may mobilise plant material, while fragments and seeds may be inadvertently transported via machinery, tools and vehicles.

In the absence of mitigation, the potential spread of invasive plant species during construction activities could result in the localised colonisation of adjacent habitats, including roadside verges, stone walls and field boundaries, leading to displacement of native vegetation and a reduction in habitat quality. This would constitute an adverse, long-term effect of moderate magnitude, which is considered **significant** at a local geographical scale.

Terrestrial Mammals

Mammal activity recorded along the GCR and TDR was limited, comprising three instances of trails likely used by species such as fox and/or badger, a single inactive burrow near Moyne Bridge (Area 17), and one observation of Irish stoat, a highly mobile species. Potential effects associated with the proposed works include minor vegetation removal and temporary disturbance during construction and turbine delivery. However, habitat loss along these routes is negligible, works are confined largely to the existing road network, and disturbance from construction traffic is not considered to significantly exceed existing levels associated with road use.

Taking account of the temporary nature of GCR and TDR works, the reinstatement of affected linear features where required, and the limited evidence of mammal activity recorded, effects on mammal species are minor, short-term and localised, and are **not significant** at any geographical scale.

Otter

Disturbance and Displacement

At locations where the GCR intersects the Black River and the Shancloon Stream, crossing works will be undertaken using horizontal directional drilling (HDD), which will require near-stream works; however, no in-stream works or establishment of temporary dry working areas will be required. Temporary lighting may be required to facilitate construction works at these crossings, but this will be short-term in nature and restricted to active working hours.

Otter may temporarily avoid short sections of the watercourse during periods of construction activity and illumination, anticipated to be up to a day in total; however, this would not constitute a barrier to movement along the river corridor, and normal use of the watercourses would be expected to resume following completion of works.

Taking this into account, and given the short-term and localised nature of works, effects on otter arising from disturbance are adverse, short-term, and of minor to moderate magnitude. While no resting places, holts or natal dens are anticipated to be affected, temporary disturbance of otter using the watercourse corridor cannot be ruled out in the absence of mitigation. The effect is therefore considered **significant** at a local geographical scale.

Water Quality Effects

There is a risk of pollution associated with HDD works, including the potential for drilling fluids (e.g., lubricants and oils) to enter the downstream environment. More critically, indirect effects such as a fish kill following an extreme pollution event could have an adverse effect on otter by reducing fish biomass and overall prey availability. It is, however, highly unlikely that any pollution event of a magnitude sufficient to result in a fish kill within the receiving watercourses would occur. HDD is a less invasive method of watercourse crossing and avoids the need for in-stream works.

Any potential impacts on water quality would be localised and temporary in nature, with recovery expected following the cessation of works. Taking this into account, effects on otter arising from changes in water quality are adverse, short to medium-term and of minor to moderate magnitude and considered **significant** at a local geographical scale.

Bats

Loss of habitat and connectivity

Baseline bat surveys identified bat activity associated primarily with linear landscape features, including hedgerows, treelines and stone walls, which provide commuting and foraging habitat within the wider agricultural landscape across the proposed wind farm site and along sections of the GCR and TDR.

Along the GCR, baseline surveys identified a potential bat roost associated with a roadside structure. No direct loss of this roost is proposed. GCR construction works will be confined to the existing road corridor and will comprise trench excavation and underground cable installation, similar to small-scale road works. Linear features along the GCR are predominantly stone walls, which will be retained. At the point where the GCR connects to the onsite control building, there will be a limited and temporary loss of GA1 improved agricultural grassland, which is of low ecological value and does not function as key bat commuting or foraging habitat.

Taking account of the temporary nature of TDR works, the reinstatement of all affected linear features, and the absence of permanent habitat loss along both the TDR and GCR, effects on bat habitat and connectivity are minor, short-term and localised, and are **not significant** at any geographic scale.

Disturbance

Noise

Construction activities along the TDR and GCR will generate temporary noise disturbance, associated with vehicle movements, localised road works, trench excavation, cable installation and reinstatement works, similar to small-scale road works.

Baseline surveys identified no confirmed bat roosts along the TDR. However, PRFs are present within the wider roadside environment, particularly within old dwellings and mature trees. Along the GCR, a confirmed bat roost has been identified and will be retained in situ. Construction activities in the vicinity of this roost will not result in direct loss but will give rise to temporary construction phase noise disturbance, at similar levels to local agricultural activity.

Construction noise will result in short-term, localised disturbance to bats using commuting, foraging and, where applicable, roosting features in the immediate vicinity of active works. Disturbance will be restricted to periods of construction activity and confined to the construction phase. Construction-phase noise will not result in permanent displacement of bats, loss of roost structures, or long-term changes to bat activity patterns. Therefore, effects from temporary noise emissions are **not significant** at any geographic scale.

Lighting

Temporary artificial lighting will be installed during the construction phase at specific locations along the TDR to facilitate turbine component delivery, including during night-time transport operations, and at locations along the GCR during cable installation works. Lighting will be temporary in nature and restricted to periods of active construction.

Baseline surveys demonstrated that bat activity within the study area is strongly associated with linear landscape features, including hedgerows, treelines and woodland edges. Artificial lighting in proximity to these features results in disturbance to bat commuting and foraging behaviour, particularly for light-sensitive species such as brown long-eared bat and lesser horseshoe bat, which were recorded during baseline surveys.

Temporary construction lighting along the TDR and GCR will therefore result in localised disturbance to bats where lighting occurs in proximity to linear features or PRFs, including the confirmed roost along the GCR. Lighting effects will be short-term, confined to the construction phase, and will not result in the removal of bat habitat or roost structures. Therefore, effects from temporary lighting are **not significant** at any geographic scale.

Aquatic Ecology

Considering that no modifications to watercourse crossings are required along the TDR, no effects on water quality or the receiving freshwater environment are anticipated from this element of the proposed project. Works along the GCR, particularly where the route intersects the Black River and Shancloon Stream, will be undertaken using HDD and may affect the freshwater environment by reducing surface water quality.

Baseline surveys along the GCR recorded variable ecological quality. At WQ05/G1 (Black River), a diverse and sensitive macroinvertebrate community indicated Good status, while WQ06 downstream of the offsite substation reflected fewer sensitive taxa and Moderate status (see **Figure 1** of **Appendix 6-5**). The upstream reach at the substation was heavily vegetated, slow flowing and modified for drainage. Fish habitat at the Black River crossing was generally diverse and supported salmonid fry, whereas the Shancloon Stream downstream of the

substation offered limited habitat and was unsuitable for salmonid or lamprey spp. Additional surveys completed in August 2026 did not materially alter these findings (**see Appendix 6-7**).

While the proximity of works to these watercourses increases the risk of pollution and may affect sensitive ecological receptors further downstream, the proposed GCR works will be largely confined to existing road crossings and culverts and will not require any in-stream works. As a result, any adverse effects on aquatic receptors are expected to be minor in magnitude and restricted to the construction phase. Nonetheless, while significant impacts on water quality are unlikely, a detectable effect may still occur. Therefore, in the absence of mitigation, there would be an adverse, temporary to short-term effect of moderate magnitude on the aquatic receptors of the Black River, and possibly the Shancloon Stream, which would be considered likely **significant** at a local scale.

6.6.4 Likely Significant Effects – Operational

Operational phase effects on biodiversity (either beneficial, adverse or neutral) are considered as those resulting from the operation of the proposed project, including effects arising from the operational turbines and turning blades, maintenance of built infrastructure, and operation of the Rooaunalaghta substation. The operational lifespan of the proposed project is 35 years.

Operational maintenance works of the turbines will be carried out on a regular basis as part of a routine maintenance programme involving a number of checks and changing of consumables, including oil changes. In addition, there is potential for unscheduled maintenance requirements in the event that different components of the proposed wind farm malfunction (e.g., resetting alarms).

The GCR is underground and avoids any notable sensitive habitats, and once installed, it is considered that the underground cable will not require maintenance during its operation. However, if a fault does occur, inspection of the fault will be carried out to determine what works to the ducting/cabling may be required.

Potential effects on biodiversity during the operational phase of the proposed project encompass both direct and indirect effects, which are summarised as:

- Potential sources of direct effects during the operational phase include: collision or barotrauma risk to bats from operational turbines.
- Potential sources of indirect effects during the operational phase include:
    - Disturbance and displacement of fauna due to operational maintenance works;
    - Displacement effects arising from operational lighting at the proposed Rooaunalaghta substation;
    - Dust-related adverse effects arising from operational traffic;
    - Surface water runoff containing suspended sediments arising from hardstanding areas, borrow pit drainage and settlement areas;
    - Surface water runoff containing an accidental pollution spill arising from turbine or substation maintenance activities (e.g., leakage or spillage of hydrocarbons, lubricants or other oils used during routine or unscheduled maintenance); and
    - Surface water runoff containing wastewater emanating from welfare facilities at the substation.

6.6.4.1 Designated Sites

European Designated Sites

As detailed in the NIS prepared for the proposed project and summarised in **Section 6.4.3** of this chapter, there are three internationally designated sites identified having connectivity to the proposed project. These are the Cloughmoyne SAC, Lough Corrib SAC and Shrule Turlough SAC.

The assessment of likely significant effects on these European Sites is presented separately within the AA Screening Report (APEM Group Woodrow, 2026a) and NIS (APEM Group Woodrow, 2026b) prepared for the proposed project. These documents should be referred to for the detailed assessment of European Sites during the operational phase.

In summary, the NIS (APEM Group Woodrow, 2026b) concludes that the proposed project, either alone or in combination with other plans or projects, will not adversely affect the integrity of any European Site, having regard to the conservation objectives of the sites concerned.

Nationally Designated Sites

During the operational phase, no impact pathways are present for the majority of pNHAs identified within the ZoI. Cloughmoyne pNHA occurs within, and is fully encompassed by, the Cloughmoyne SAC. As operational impacts on the SAC have been excluded owing to the absence of any viable pathways, the same conclusion applies to the pNHA and thus any effects can be considered **not significant**.

Four additional pNHAs (i.e., Rostaff Lake pNHA, Lough Corrib pNHA and Lough Hacket pNHA) are hydrologically connected to the proposed project *via* downstream pathways. During operation, the only potential mechanism for effects on these waterbodies relates to surface water runoff from small areas of exposed ground created during felling for bat buffers, or an accidental spill from maintenance vehicles. These events would be short-term and of very low frequency, and the associated risks would be managed through the embedded operational drainage design, which regulates surface water quality and flow before discharge. Owing to the distance downstream, effects on Rostaff Lake pNHA (c. 2.8 rkm downstream), Lough Corrib pNHA (11.1 rkm downstream), or Lough Hacket pNHA (1.0 rkm downstream) would be further reduced to a minor or negligible magnitude, and therefore **not significant**.

Likewise, Shrule Turlough pNHA has been carried forward on a precautionary basis due to the potential for hydrogeological connectivity identified in **Chapter 9**. During operation, no routine emissions to groundwater or significant alterations to groundwater levels are anticipated. Accordingly, effects on Shrule Turlough pNHA are considered **not significant.**

6.6.4.2 Habitats and Flora

As part of operation phase mitigation for bat species, ongoing management of vegetation will be required for maintenance of bat feature buffers around turbines. However, as these habitat changes will need to be implemented before the proposed wind farm site becomes operation they have already been considered during the construction phase in **Section 6.6.3.2**. These habitat management requirements are detailed in **Section 6.7.2.4**.

Chapter 14 sets out that there are no predicted direct impacts to air quality, including dust deposition, during the operational phase of the proposed project. Therefore, no adverse effect on habitats and flora is anticipated and is **not significant** at any geographical scale.

6.6.4.3 Terrestrial mammals

Badger

Disturbance and Displacement

Operational wind farms are generally well tolerated by mesocarnivores (i.e., badger), with studies showing no measurable effects on species where prey resources remain available (Klich *et al.,* 2024). Therefore, effects from operational turbines or routine servicing during operation are not expected. Maintenance visits will be concentrated at turbine and substation infrastructure, will mostly occur during daytime hours, and personnel will largely remain within vehicles or within infrastructure, thereby limiting disturbance. The frequency and scale of these activities will not add materially to existing background levels of human activity. As badger are primarily crepuscular and nocturnal, operational visits will largely avoid periods when they are active, and displacement effects on foraging or commuting individuals are not anticipated.

Any effects on badger as a result of disturbance and displacement during the operational phase will be intermittent and minor, therefore **not significant** at any geographical scale.

Operational lighting at the offsite substation will be localised and focused on operational work areas, not extending beyond the proposed project. Lighting will be motion activated and brief in duration, occurring only when required for safety or emergency purposes. Given the availability of extensive suitable foraging habitat in the wider area and the ability of badger to avoid illuminated zones, operational lighting is not expected to cause displacement from setts or from established foraging routes, including in the vicinity of the main sett located near the offsite substation. Any effects on badger arising from operational lighting will be minor and brief and therefore **not significant** at any geographical scale.

Otter

Disturbance and Displacement

The Black River (EPA Code: 30B02), where otter activity was concentrated, is located c. 280 from the nearest element of the proposed project. Otter are known to be highly selective around breeding and resting sites, avoiding areas with high levels of human accessibility, but they readily use wider river reaches for foraging and commuting where trophic resources are abundant (Tolrà *et al.,* 2024). This reflects their strong dependency on prey availability, meaning that otter presence in more accessible areas is often driven by food resources rather than sensitivity to general human activity. Suitable habitat for otter at the substation and turbine locations is negligible, and operational attendance at turbines will be infrequent and largely confined to daytime hours, with personnel remaining within vehicles or site infrastructure. On this basis, no indirect effects from turbines or routine servicing are expected. Any artificial lighting required for operational or emergency purposes will be brief, localised and well removed from the Black River (minimum of c. 280 m), and will not extend to any watercourse.

Given the distance to suitable otter habitat and the timing and nature of operational activities, disturbance or displacement of foraging or commuting otter during the operational phase is not anticipated. Any disturbance or displacement effects on otter during the operational phase will be minor and therefore **not significant** at any geographical scale.

Water Quality Effects

During the operational phase, the potential for water quality deterioration affecting aquatic prey availability for otter is considered low. Operational surface water will be managed through a robust operational drainage system incorporating attenuation and settlement prior to controlled discharge, and no direct emissions to watercourses are proposed. Any secondary impact would most plausibly arise from an accidental spill associated with maintenance activities, or, less likely, from localised sediment mobilisation associated with drainage infrastructure or borrow pit reinstatement areas.

While such contaminants could, in the absence of embedded drainage controls, migrate via surface water or shallow groundwater pathways, the likelihood of this occurring is considered very low. In the unlikely event of a malfunction or failure of the operational drainage system, any resulting water quality effect would be localised and brief in duration. Taking this into consideration as well as the distance of the nearest element of the proposed project from the Black River where otter forage (minimum of c. 280 m), a reduction in fish or crayfish biomass of a magnitude capable of constraining otter foraging range is unlikely to result as a result of the proposed project. As such, operational activities are not expected to materially affect prey availability or otter behaviour.

Any effects on otter arising from operational water quality pathways affecting prey availability will be minor and therefore **not significant** at any geographical scale.

Other Mammals

Disturbance and Displacement

Operational wind farms are generally well tolerated by terrestrial mammals (Helldin *et al.,* 2012), and no indirect effects are expected from turbines or routine servicing. Maintenance visits will not add materially to existing background levels of human activity, and any artificial lighting required for operational or emergency purposes will be brief, localised and will not extend outside the proposed project. Given the limited extent of suitable habitat for other mammals within the proposed project relative to the wider landscape, and the ability of these species to avoid small, localised areas of activity or illumination, displacement or disturbance effects during operation are not anticipated at any perceptible geographical scale.

Any effects on pine marten, hedgehog, Irish hare, Irish stoat or pygmy shrew as a result of disturbance, displacement or operational lighting will be minor and therefore **not significant** at any geographical scale.

6.6.4.4 Amphibians and Reptiles

Smooth Newt and Common Frog

There is no suitable habitat for smooth newt within the proposed project, and any pond considered suitable lies >600 m from the nearest proposed site infrastructure with no hydrological connection. Therefore, no effects on these features are predicted.

A small number of drainage ditches within the proposed project provide limited suitability for common frog, particularly for frog spawning and early larval development. Surface runoff containing suspended solids, or an accidental pollution event arising from failure of secondary containment or a materials handling incident during the operational phase, has the potential to

temporarily reduce water quality within these drainage features. Any deterioration in water quality could adversely affect frog spawn or tadpoles present in these locations.

The embedded operational drainage design significantly reduces the potential for such events to occur. As such, the likelihood of any impact is considered very low and, in the unlikely event that it does occur, any effect on common frog would be adverse, short-term and of minor magnitude, and therefore **not significant** at any geographical scale.

Common Lizard

Refugia and hibernacula for common lizard, including rock piles and limestone outcrops identified during baseline surveys, will remain intact during operation. Operational activity will be limited to periodic maintenance and inspection visits, most of which will occur during daytime hours and will not involve disturbance to these features. No operational works will remove or degrade suitable refugia or hibernation structures. On this basis, there will be no disturbance or displacement of common lizard during the operational phase.

Any potential effect on common lizard during operation is therefore **not significant** at any geographical scale.

6.6.4.5 Bats

Collision Risk and Barotrauma

During the operational phase, the principal potential effect on bats is collision risk (including barotrauma). Other operational effects, such as habitat change or lighting, are addressed elsewhere in this chapter (refer to **Section 6.6.3.6**).

NatureScot *et al.* (2021) consider common pipistrelle, soprano pipistrelle and Leisler's bat to be at high risk of direct impacts from wind turbines. Evidence for bat collision risk at wind farms is derived primarily from post-construction monitoring studies undertaken at other operational wind farms in the UK and mainland Europe, where consistent patterns of collision mortality have been recorded for species such as common pipistrelle, soprano pipistrelle and Leisler's bat (e.g., Rydell *et al.*, 2010; Arnett *et al.*, 2016; Mathews *et al.*, 2020).

In contrast, *Myotis* species, brown long-eared bat and lesser horseshoe bat are considered to be at lower risk of collision or barotrauma, reflecting their flight behaviour, foraging strategies and typical use of cluttered habitats, which generally reduce interaction with turbine rotor-swept zones.

Collision risk to bats during the operational phase has been assessed following the staged approach set out in NatureScot *et al.* (2021). This combines an initial proposed project-level screening using the Stage 1 risk assessment matrix with site-specific bat activity data from static detectors to derive turbine-specific collision risk.

For project size, the medium-large category was selected, as the proposed project has elements from both the medium (between 10 and 40 turbines) and large (turbines >100 m in height) categories. This returns a site risk level of 3-4. Taking the precautionary approach, a proposed project risk level of 4 will be applied for the next stage of the assessment. **Table 6-26** shows the potential risk level for this proposed project applied across each level of bat activity. This overall risk assessment matrix is used along with site-specific activity data from static surveys to calculate the risk level at each turbine location, the results of which are presented in **Table 6-27**.

The collision risk scores presented in **Table 6-27** are derived by combining the Stage 1 precautionary site risk level with season-specific bat activity levels using the Stage 2 collision risk assessment matrix shown in **Table 6-26** (NatureScot *et al.*, 2021).

For the proposed wind farm site, a Stage 1 site risk level of 4 was applied. For each detector location and season, the corresponding bat activity category was identified based on recorded bat passes per (refer to **Appendix 6-4**) hour, and the intersection of the Stage 1 risk level and activity category within the Stage 2 matrix yields the collision risk score.

For example, a detector location recording High activity combined with a Stage 1 risk level of 4 results in a collision risk score of 18, as shown in **Table 6-26**.

Table 6-26: Stage 2: Collision risk assessment matrix

	Activity Level					
Potential site risk level	0 Nil	1 Low	2 Low-moderate	3 Moderate	4 Moderate-high	5 High
1 Lowest	0	1	2	3	4	5
2 Low	0	2	4	6	8	10
3 Medium	0	3	6	9	12	15
4 High	0	4	8	12	15	18
5 Highest	0	5	10	15	20	25

Table 6-27: Bat potential collision risk scores by species, detector location and season based on the Stage 2 risk assessment matrix

Season	Location	Leisler's bat	Nathusius's pipistrelle	Common pipistrelle	Soprano pipistrelle
Spring	D.01	4	0	4	4
	D.02	4	0	4	4
	D.03	4	0	4	4
	D.04	4	0	4	4
	D.05	4	4	4	4
	D.07	4	0	4	4
	D.08	4	4	4	4
	D.09	4	4	4	4
	D.11	4	4	4	4
	D.10	4	4	4	4

Season	Location	Leisler's bat	Nathusius's pipistrelle	Common pipistrelle	Soprano pipistrelle
	D.12	4	4	4	12
	D.13	4	0	4	18
Summer	D.01	12	4	8	8
	D.02	4	4	8	8
	D.03	4	4	4	8
	D.04	12	4	8	12
	D.05	18	4	4	8
	D.06	18	4	4	4
	D.07	12	4		
	D.08	18	4	8	8
	D.09	12	4	8	8
	D.10	18	4	8	4
	D.11	18	4	12	12
	D.12	12	4	15	15
	D.13	18	4		
Autumn	D.01	18	4	12	8
	D.02	4	4	12	4
	D.03	4	0	8	8
	D.04	12	0		
	D.05	12	0	8	8
	D.06	12	4	8	4
	D.07	12	0		
	D.08	12	0	8	8
	D.09	4	4	8	8
	D.10	4	0	4	4

Season	Location	Leisler's bat	Nathusius's pipistrelle	Common pipistrelle	Soprano pipistrelle
	D.11	4	0	8	8
	D.12	4	0	12	12
	D.13	4	0	8	8

A precautionary risk level of 4 has been applied to the proposed project, reflecting the combination of habitat risk and project size. This proposed project risk level is considered alongside recorded bat activity levels (low, moderate or high) at each detector location to determine the relative collision risk associated with each proposed turbine location for the species recorded. **Table 6-28 and Table 6-29** presents the resulting turbine-specific collision risk values by species, location and season.

The turbine-specific collision risk outputs are subsequently interpreted in the context of species ecology, receptor importance. While all bat species are afforded legal protection susceptibility to turbine collision varies between species according to flight behaviour, foraging strategy, commuting behaviour and use of airspace within the rotor-swept zone. These factors, together with recorded activity levels, inform the assessment of collision risk for each species.

Receptor importance and collision risk are considered separately within the assessment process. Receptor importance reflects the conservation value of the species and is assigned using the criteria outlined in **Table 6-22**. Collision risk is determined based on species ecology, recorded activity levels and the turbine-specific collision risk assessment. The significance of any predicted operational effect is then evaluated by considering the magnitude of the predicted impact in the context of the receptor importance, as described in **Section 6.5.2.5**.

Collision risk effects have been assessed at the local population scale, reflecting the turbine-specific nature of the impact pathway and the information available from the baseline surveys. The significance of effects has subsequently been determined with reference to the conservation importance of the receptor and the magnitude of the predicted collision risk, consistent with NatureScot *et al.* (2021).

Table 6-28: Turbine-detector associations and risk assessment values by species, location and season using mean bat passes per hour.

Season	Location	Associated turbine	Leisler's bat	Nathusius' pipistrelle	Common pipistrelle	Soprano pipistrelle	*Myotis sp.*	Brown Long-eared	Lesser Horseshoe
Spring	D.01	c. 74 m from T1	0.96	0.00	0.33	0.44	0.04	0.03	0.00
	D.02	c. 43 m from T2	0.03	0.00	0.05	0.06	0.01	0.00	0.00
	D.03	c. 90 m from T3	0.24	0.00	0.25	0.45	0.02	0.00	0.00
	D.04	c. 65 m from T4	0.58	0.00	0.22	0.31	0.02	0.01	0.00
	D.05	c. 73 m from T5	0.77	0.02	0.35	0.87	0.04	0.01	0.01
	D.06	c. 340 m from T6	1.15	0.00	0.20	0.41	0.04	0.05	0.00
	D.07	c. 100 m from T7	0.89	0.00	0.24	0.35	0.02	0.01	0.00
	D.08	c. 355 m from T8	0.02	0.00	0.05	0.07	0.00	0.00	0.00
	D.09	c. 370 m from T9	0.49	0.02	0.56	0.88	0.02	0.04	0.04
	D.10	c. 3 m from T10	0.65	0.00	0.26	0.42	0.03	0.01	0.00
	D.11	c. 33 m from T11	0.61	0.02	0.40	0.87	0.04	0.04	0.00
	D.12	c. 93 m from T12	0.57	0.00	0.72	2.09	0.07	0.00	0.07
	D.13	c. 193 m from T13	0.88	0.00	1.41	6.84	0.05	0.04	0.00
Summer	D.01	c. 74 m from T1	3.06	0.00	0.82	1.25	0.24	0.18	0.00
	D.02	c. 43 m from T2	1.77	0.02	0.24	0.10	0.01	0.01	0.00
	D.03	c. 90 m from T3	1.70	0.01	0.28	0.31	0.01	0.01	0.00

Season	Location	Associated turbine	Leisler's bat	Nathusius' pipistrelle	Common pipistrelle	Soprano pipistrelle	*Myotis sp.*	Brown Long-eared	Lesser Horseshoe
	D.04	c. 65 m from T4	2.47	0.01	0.18	0.20	0.01	0.01	0.01
	D.05	c. 73 m from T5	6.36	0.03	4.63	4.33	0.10	0.07	0.03
	D.06	c. 340 m from T6	5.39	0.06	0.68	0.06	0.04	0.02	0.00
	D.07	c. 100 m from T7	4.72	0.09	1.97	0.38	0.08	0.05	0.00
	D.08	c. 355 m from T8	5.26	0.13	3.70	1.74	0.03	0.08	0.01
	D.09	c. 370 m from T9	3.57	0.09	5.60	5.16	0.06	0.03	0.06
	D.10	c. 3 m from T10	7.20	0.05	2.63	1.24	0.20	0.16	0.00
	D.11	c. 33 m from T11	7.58	0.01	1.61	0.99	0.27	0.13	0.05
	D.12	c. 93 m from T12	2.95	0.02	1.75	1.82	0.38	0.07	0.09
	D.13	c. 193 m from T13	33.74	0.16	4.51	2.24	0.14	0.53	0.01
Autumn	D.01	c. 74 m from T1	7.31	0.02	0.64	1.49	0.21	0.33	0.00
	D.02	c. 43 m from T2	1.96	0.01	0.71	2.12	0.36	0.34	0.00
	D.03	c. 90 m from T3	1.55	0.00	0.72	1.89	0.17	0.28	0.01
	D.04	c. 65 m from T4	3.72	0.00	1.04	1.46	0.09	0.11	0.00
	D.05	c. 73 m from T5	7.37	0.00	1.33	1.54	0.15	0.09	0.03
	D.06	c. 340 m from T6	7.49	0.06	0.79	0.82	0.44	0.66	0.00
	D.07	c. 100 m from T7	2.25	0.00	0.71	0.85	0.16	0.27	0.00

Season	Location	Associated turbine	Leisler's bat	Nathusius' pipistrelle	Common pipistrelle	Soprano pipistrelle	*Myotis sp.*	Brown Long-eared	Lesser Horseshoe
	D.08	c. 355 m from T8	4.36	0.00	20.34	10.18	0.23	0.11	0.10
	D.09	c. 370 m from T9	1.71	0.01	2.08	2.26	0.07	0.11	0.05
	D.10	c. 3 m from T10	1.60	0.00	0.74	1.00	0.20	0.36	0.01
	D.11	c. 33 m from T11	1.22	0.00	1.11	1.32	0.19	0.39	0.05
	D.12	c. 93 m from T12	0.82	0.00	23.70	14.07	0.03	0.14	0.13
	D.13	c. 193 m from T13	1.41	0.00	2.49	5.31	0.05	0.04	0.00

Table 6-29: Summary of collision risk impact assessment for the proposed project

Species	Vulnerability to collision impacts at wind farms	Overall activity levels recorded in study area	Site-wide collision risk context	Population Importance (local scale)
Leisler's bat	High vulnerability due to fast-flying behaviour and regular use of open airspace at rotor height. Species widely recognised as susceptible to collision mortality at wind farms.	Moderate to high activity recorded across several detectors and seasons, with particularly elevated activity during summer.	Moderate–High	County/Regional Importance
Common pipistrelle	Moderate vulnerability; species can forage within open airspace but typically at lower flight heights.	Moderate activity recorded across the Proposed project, with occasional higher values at some detectors	Low–Moderate	Local (Higher) Importance
Soprano pipistrelle	Moderate vulnerability; typically associated with linear features and riparian habitats but capable of open-space flight.	Moderate activity recorded across several detectors, with higher activity at some locations.	Low–Moderate	Local (Higher) Importance
Nathusius' pipistrelle	Moderate vulnerability due to high-altitude commuting and migratory behaviour; however recorded activity levels were very low.	Low activity recorded across all seasons.	Low	Local (Higher) Importance

Species	Vulnerability to collision impacts at wind farms	Overall activity levels recorded in study area	Site-wide collision risk context	Population Importance (local scale)
Myotis spp.	Low vulnerability; typically clutter-adapted species flying below rotor height.	Low activity recorded across all seasons.	Low	Local (Higher) Importance
Brown long-eared bat	Very low vulnerability due to slow flight and strong association with cluttered habitats below rotor height.	Low activity recorded across all seasons.	Low	Local (Higher) Importance
Lesser horseshoe bat	Very low collision vulnerability due to low-altitude, clutter-adapted flight behaviour.	Very low activity recorded across all seasons.	Negligible	Local (Higher) Importance

Species-level assessment and significance

Different bat species exhibit varying foraging behaviours and ecological requirements; as such, infrastructure such as wind turbines may affect species in different ways. Each bat species recorded within the proposed wind farm site is therefore considered individually, with reference to its ecology, recorded activity levels and associated collision risk, drawing on the assessment summarised in **Table 6-29** and site-specific activity data.

Leisler's bat is a fast-flying, open-air forager that regularly uses airspace at rotor-swept height. They are less reliant on linear features for commuting and is therefore considered highly vulnerable to collision risk at wind farms. Moderate to high levels of activity were recorded across multiple detector locations and seasons, with particularly elevated activity during the summer period. Leisler's bats showed moderate activity at D.01, D.04, D.07, D.09 and D.12, and high activity at D.05, D.06, D.0,8, D.10, D.11 and D.13 during summer. Leisler's bats showed moderate activity at D.04, D.05, D.06, D.07, and D.08 and high activity at D.01 in autumn. These detector locations are representative of turbines T1, T4, T5, T6, T7, T8, T9, T10, T11, T12 and T13. Leisler's are active throughout the proposed wind farm site. Leisler's bats activity peaks in late summer and early autumn, which is evident on this wind farm site with activity levels higher in summer and autumn compared to low activity at all detector locations in spring. Given the species' susceptibility to collision risk and the moderate to high levels of activity recorded across the proposed wind farm site, there is potential for collision fatalities to occur during operation, which could adversely affect the local Leisler's bat population. In the absence of mitigation, operational collision risk for Leisler's bat would constitute a direct, moderate adverse effect that is likely **significant** at a local geographical scale.

Common pipistrelle typically forages along linear features but is capable of utilising open airspace. Moderate activity levels were recorded across the proposed wind farm site, with localised higher activity at some detector locations. Common pipistrelles showed moderate activity at D.05, D.08, D.10 and D.13 and high activity at D.09 during summer. They showed moderate activity at D.09 and high activity at D.08 and D.12 during autumn. In the absence of mitigation, collision risk for common pipistrelle would result in an adverse effect of low to moderate magnitude at the local population scale, which is considered **not significant** at any geographical scale**.**

Soprano pipistrelle is strongly associated with linear and riparian features but is capable of open-space flight. Moderate activity levels were recorded across several detector locations, with higher localised activity at some locations. Soprano pipistrelles showed moderate activity at D.12 and high activity at D.13 in spring. They showed moderate activity at D.05 and D.13, and high activity at D.09 in summer. They showed moderate activity at D.02 and D.09, and high activity at D.08, D.12 and D.13 in autumn. In the absence of mitigation, collision risk for soprano pipistrelle would result in an adverse effect of low to moderate magnitude at the local population scale, which is considered **not significant** any geographical scale.

Nathusius' pipistrelle is a migratory species capable of high-altitude flight; however, only very low levels of activity were recorded across the proposed wind farm site. In the absence of mitigation, collision risk for this species would result in an adverse effect of low magnitude at the local population scale, which is considered **not significant** at any geographical scale.

Myotis species are clutter-adapted bats that typically forage at low heights within vegetation. Recorded activity levels across the proposed wind farm site were low. In the absence of

mitigation, collision risk for *Myotis* species would result in an adverse effect of low magnitude at the local population scale, which is considered **not significant** at any geographical scale.

Brown long-eared bat is a slow-flying, clutter-adapted species that forages close to vegetation and below rotor height. Activity levels recorded across the proposed wind farm site were low. In the absence of mitigation, collision risk for brown long-eared bat would result in an adverse effect of low magnitude at the local population scale, which is considered **not significant** at any geographical scale.

Lesser horseshoe bat typically flies at very low heights within sheltered, cluttered habitats. Very low levels of activity were recorded across the proposed wind farm site. In the absence of mitigation, collision risk for lesser horseshoe bat would result in an effect of negligible magnitude at the local population scale, which is **not significant** at any geographical scale.

Taking account of species-specific vulnerability, recorded activity levels and turbine-specific collision risk outputs, Leisler's bat represents the most sensitive receptor in collision-risk terms within the proposed wind farm site. In the absence of mitigation, operational collision risk would give rise to a direct, moderate adverse effect on Leisler's bat at the county population scale that is likely **significant**, while effects on all other bat species would be of low or negligible magnitude and therefore **not significant** at any geographical scale.

6.6.4.6 Aquatic Ecology

There is no potential for direct impacts during the operational phase due to the absence of significant watercourses within the proposed project. The Black River, which occurs c. 280 m from the nearest proposed site infrastructure, represents the primary aquatic receptor within the receiving environment, and is known to support salmon and brown trout. While no lamprey records were identified for the Black River within the datasets reviewed, records are available from the nearby Cullagh River (EPA Segment Code: 30_2796), a tributary of the Black River, the confluence of which is located approximately 1.2 rkm from the proposed wind farm site. As such, the Black River is considered likely to support the species.

The operational phase drainage design incorporates embedded measures to control surface water quality and regulate flow prior to discharge. In accordance with **Chapter 9**, operational activities will not result in any routine emissions or effluent discharges and will not give rise to any significant alteration to natural flow regimes. Surface water generated within the proposed wind farm site will be managed through attenuation, settlement and controlled discharge via the site drainage system.

Potential indirect effects during operation are limited to infrequent and small-scale accidental spills associated with maintenance activities. In the absence of drainage controls, there would be a theoretical pathway for contaminants to enter the receiving environment; however, the embedded drainage design substantially reduces this likelihood, and the potential for contaminants to reach the Black River is considered very low.

In the unlikely event of a failure of the drainage system, any effects would be adverse, localised and temporary to short-term in duration. Given the small volumes involved, the magnitude of impact would be minor and therefore **not significant**.

6.6.5 Likely Significant Effects – Decommissioning

Decommissioning phase effects are anticipated to be broadly similar to those occurring during construction (see **Section 6.6.3**), including localised ground disturbance, reinstatement activities and the presence of machinery onsite. Although certain construction phase activities will occur at reduced levels, such as the removal of above ground turbine components while foundations, ducting and access tracks remain in situ, there remains potential for surface water quality impacts arising from ground disturbance, refuelling, or the storage and handling of hazardous materials.

The GCR is not proposed to be decommissioned, as it will form part of the permanent electricity network. In line with the approach described in **Chapter 2**, the cable infrastructure will remain in situ and will continue to be managed by EirGrid/ESB at the end of the wind farm's operational life.

Decommissioning phase impacts that are expected to result in potentially significant effects on terrestrial ecology and IEF's, as listed in **Table 6-23**, include the following:

- Water quality effects arising from surface water runoff of sediments, and/or accidental pollution, including the potential for contaminants to enter shallow groundwater pathways and reach aquatic receptors in the Black River;
- Disturbance and displacement of fauna; and
- Temporary lighting effects.

In the absence of mitigation, the effects would result in a short-term, adverse impact of minor to moderate magnitude, considered likely **significant** at a local scale.

6.7 MITIGATION MEASURES

This section describes the mitigation measures proposed to avoid or reduce the potential for adverse effects upon the IEFs identified in **Section 6.6** as receptors of direct or indirect impacts considered to result in likely significant adverse effects.

6.7.1 MITIGATION MEASURES – CONSTRUCTION PHASE

All mitigation measures in the following sections have been incorporated into the Construction Environmental Management Plan (CEMP) (refer to **Appendix 2-3**).

Prior to the commencement of the construction phase, a suitably qualified Ecological Clerk of Works (ECoW) will be appointed to oversee and report on the implementation of mitigation measures outlined in this section, the HMP (refer to **Appendix 6-6**) and CEMP during the construction phase of the proposed project. The ECoW will have demonstrated professional experience in managing large-scale construction works affecting ecological receptors identified within the EIAR.

The appointed ECoW will also deliver ToolBox Talks to all contractors, including sub-contractors, on ecologically sensitive features within or in close proximity to the proposed site infrastructure and associated mitigation measures to be implemented during construction; these will be completed prior to the commencement of construction works. The main Contractor will be required to maintain a record of these sessions and ensure all construction staff complete this training before being authorised to work onsite.

During construction, the duties of the ECoW will be to monitor the efficacy of mitigation measures implemented by the contractors and to report on the application and success of these measures. This includes monitoring measures to protect water quality and undertaking regular upstream and downstream water quality checks.

The ECoW will also provide general ecological oversight, including checks of open excavations and areas of vegetation clearance for the presence of wildlife, and reporting any protected species encountered during the works. If protected wildlife is observed, or if any activity poses a risk to ecological receptors, the ECoW may instruct that works be paused until derogation licences are obtained and complied with (where required), and/or appropriate safeguards are implemented. In the event of a pollution event occurring, or where the ECoW identifies their potential to occur, the ECoW will have a 'Stop Works' authority to ensure measures to stop a pollution event are implemented immediately.

6.7.1.1 Designated Sites

Mitigation Measures to Protect Watercourses and Designated Sites

The contractor will be required to implement standard practice construction methods and mitigation measures to protect watercourses and habitats in European and nationally designated sites, including those linked *via* surface and sub-surface pathways. These measures are based on the following best practice guidelines:

- Construction Industry Research and Information Association (CIRIA), (2001). *Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532).*
- CIRIA (2006). *Control of Water Pollution from Linear Construction Projects (C648).*

- CIRIA, (2015). *The SuDS Manual (C753).*
- CIRIA, (2016). *Groundwater Control: Design and Practice (C750).*
- CIRIA (2023). *Environmental Good Practice on Site Guide (fifth edition) (C811).*
- NetRegs & SEPA (2018). *Guidance for Pollution Prevention (GPP) 2: Above Ground Oil Storage.*
- IFI, (2016). *Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters.*
- NRA (2005b). *Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes* (TII Publication no. CC-ENV-01101).
- EPA (2013). *Storage and Transfer of Materials for Scheduled Activities.*

The following measures are to be read and implemented in conjunction with **Chapter 9**, the CEMP (**Appendix 2-3**) and Surface Water Management Plan (SWMP) (**Appendix 2-6**):

- Where temporary works are required in the vicinity of drainage features or watercourse crossings, these shall be undertaken in accordance with the approved construction methodology and relevant IFI guidance (2016) and within the permitted instream working period.
- Temporary drainage diversions, fluming arrangements and associated sediment control measures will be implemented where necessary to isolate works from flowing water, maintain downstream flow and minimise sediment mobilisation. Any temporary drainage modifications will be fully reinstated following completion of works.
- Horizontal Directional Drilling (HDD) will be employed at major watercourse crossings, including the Black River crossing associated with the GCR, where practicable, to avoid direct disturbance to channel beds and banks and minimise impacts on aquatic habitats and species.
- A site surface water management system, as set out in the SWMP, will be implemented across all construction areas, including access tracks, turbine foundations, borrow pits, hardstands, storage areas and construction compounds. Runoff will be treated through attenuation and settlement prior to controlled discharge.
- Clean surface water runoff will be separated from construction runoff wherever practicable. Components of the site drainage network, including swales, settlement ponds and other attenuation features, will be installed in advance of, or alongside, construction works to attenuate runoff, promote settlement of suspended solids and regulate discharge rates in accordance with the SWMP and CEMP.
- Interceptor drains will be installed upslope of works to divert clean surface runoff away from construction areas and reduce interaction with exposed soils.
- Swales, check dams and level spreaders will be used, where required, to slow flows, promote sediment settlement and prevent erosion.
- Temporary settlement ponds will be established in areas of active construction (e.g., borrow pits, turbine bases and compounds) to capture and treat silt-laden runoff prior to discharge.
- Where construction activities occur adjacent to Cloughmoyne SAC, surface water runoff will be intercepted and managed within the site drainage network to prevent uncontrolled discharge towards the SAC. Clean runoff will be diverted away from active works areas, while runoff from construction areas will be directed to appropriate treatment measures prior to discharge.
- Silt control measures, including silt fences, silt traps, silt bags and, where required, mobile filtration units, will be used to remove suspended solids and reduce sediment transport, particularly within 50 m of drainage features or where pathways to watercourses exist.
- Drainage crossing works will be staged so that only a limited number are open at any time and will be undertaken during low flow conditions where practicable.

- Where excavation occurs near drainage features, working areas will be isolated from active flows using temporary measures (e.g., bunds or sandbagging), with regular inspection and maintenance.
- A minimum setback will be maintained during construction, including at least 10 m from surface water features and settlement ponds, and 50 m from wells and boreholes.
- All excavated material will be removed to designated stockpile areas, which will be located in stable, well-drained locations and set back from drainage features.
- Temporary spoil and material storage areas will be enclosed (e.g., with silt fencing) and, where required, bunded to prevent runoff and erosion. Bunding will extend above the level of stored material.
- Runoff from stockpiles will be monitored and controlled and prevented from discharging directly to the drainage network or adjacent watercourses.
- Exposure of stripped ground will be minimised, with progressive stabilisation and reinstatement (e.g., reseeding, use of geotextiles or mulches) undertaken as soon as practicable.
- Dewatering will be undertaken in accordance with best practice, with pumped water treated prior to diffuse discharge over vegetated ground.
- Concrete works will be carried out in designated impermeable washout areas, with no discharge to ground or drainage systems.
- Refuelling and storage of fuels, oils and chemicals will be undertaken in designated bunded areas. Servicing will be carried out on level, hardstanding areas and will not occur within 50 m of surface water features.
- All machinery will be regularly maintained and inspected to prevent leaks.
- An adequate supply of spill kits and hydrocarbon absorbent materials will be available at all times, with all vehicles carrying spill kits. Personnel will be trained in their use and all waste materials will be disposed of off-site appropriately.
- A 24-hour Emergency Response Protocol will be implemented for the containment and management of accidental spillages or sediment releases to surface or groundwater.
- Construction activities will comply with the Karst Management Procedure set out within the CEMP. No excavated materials, spoil, fuels, concrete washout, construction wastes or drainage discharges will be placed within karst features, fissures, grykes, enclosed depressions or other potential groundwater recharge features. Any previously unidentified karst feature encountered during construction will be subject to the Karst Encounter Protocol and reviewed by the project Hydrogeologist prior to works recommencing.
- Weather conditions will be monitored and earthworks restricted during periods of heavy rainfall to reduce the risk of sediment mobilisation and runoff.
- All onsite welfare facilities will be installed and managed to prevent nutrient or contaminant discharge to any drainage pathways.
- All equipment and machinery will be cleaned prior to arriving on site as a biosecurity measure to prevent the introduction or spread of invasive species.

Mitigation Measures to Protect Cloughmoyne SAC During Construction

Given the immediate proximity of Cloughmoyne SAC to the proposed project boundary, the SAC boundary will be clearly demarcated on site prior to commencement of construction works. Particular attention will be given to locations where construction activities occur in close proximity to the SAC boundary, including along the access track between T2, T3 and T4.

In accordance with the CEMP (see **Appendix 2-3**), construction vehicles, plant and machinery will remain within the defined project footprint and will not encroach into adjacent habitats. The boundaries of the approved works area will be clearly marked prior to the commencement of works and maintained throughout the construction phase. The ECoW will monitor compliance

with these requirements and undertake toolbox talks, as required, to ensure that all site personnel are aware of the ecological sensitivities associated with the adjoining SAC.

No construction activities, stockpiling, material storage, vehicle movements or site compounds will be permitted outside the defined project footprint. Temporary drainage controls and water quality protection measures will be maintained adjacent to the SAC to ensure that surface water runoff from active construction areas is intercepted and managed within the site drainage network.

Compliance with these measures will be monitored by the ECoW throughout the construction phase.

Mitigation Measures to Prevent Dust Deposition on Adjacent Designated Sites

Mitigation measures to control dust generation and deposition will be implemented in full during construction. **6.7.1.2**The appointed contractor will adhere to best practice construction procedures outlined in **Chapter 14** to minimise dust generation and dispersal. Implementation of appropriate mitigation measures will ensure that any short-term adverse effects of dust deposition on vegetation during the construction phase are minimised and largely imperceptible. **Section 14.5** of **Chapter 14** details the mitigation measures for Air Quality and these include:

Construction Works Area Management

- Construction compounds are laid out so that machinery and dust causing activities such as stockpiles are located away from sensitive receptors, as far as is practicable;
- Stockpiles will be covered to prevent wind whipping;
- A site hoarding of 2.4_m height at a minimum will be used at construction compounds, which will assist in minimising the potential for dust impacts off-site. Construction works area fencing, barriers and scaffolding will be kept clean using wet methods;
- Earthworks and exposed areas/soil stockpiles will be re-vegetated to stabilise surfaces as soon as practicable;
- Any chutes and conveyors will be enclosed and skips will be covered;
- Drop heights from any conveyors, loading shovels, hoppers and other loading or handling equipment will be minimised. Fine water sprays will be used on such equipment where visible dust plumes are generated;
- Cutting, grinding or sawing equipment will be fitted with or used in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g., suitable local exhaust ventilation systems;
- A temporary vehicle wheel wash facility will be installed in proximity to the site entrances; and
- A water bowser will be used to spray work areas (hardstands and access tracks and grid connection route) and haul roads, especially during periods of excavations works coinciding with dry periods of weather.

Earthworks Activities

- Materials with the potential to produce dust, such as excavated material, will be removed from the construction works area as soon as possible, unless being re-used within the construction works area. Management of extracted material is detailed in the Construction and Demolition Resource and Waste Management Plan;
- Areas exposed by earthworks will be re-vegetated to stabilise surfaces as soon as practicable. Hessian, mulches or trackifiers will be used where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. Cover will only be removed in small areas during work and not all at once; and

- During dry and windy periods and when there is a likelihood of dust nuisance, water-based dust suppression (e.g. bowser) will operate to ensure soil moisture content is high enough to increase the stability of the soil and thus suppress dust.

Construction Activities

- Sand and other aggregates will be stored in bunded areas and will not be allowed to dry out, unless this is required for a particular process;
- Smaller supplies of fine power materials bags will be sealed after use and stored appropriately to prevent dust escaping;
- Vehicles transporting loose materials (e.g. spoil or sand) entering and leaving the proposed project works areas and construction compounds will be covered with tarpaulin to prevent escape of materials during transport. Before entrance onto public roads, trucks will be checked to ensure the tarpaulins are properly in place;
- Where construction work area or construction compound conditions result in large amounts of mud building up on truck wheels, wheel washing will be carried out for trucks before they use the public road network;
- A speed restriction of 25 kph will be applied as an effective control measure for dust for onsite vehicles;
- Water suppression shall be applied to dust-generating activities during dry weather conditions; and
- Water-assisted dust sweeper(s) will be used at the access points to a construction compound and the immediate adjoining local road, to remove, as necessary, any material tracked out of the compound.

These measures as set out fully in **Chapter 14**, will ensure that any short-term dust related effects on designated sites are avoided or reduced to non-significant levels.

6.7.1.2 Habitats and Flora

Habitat Loss

The proposed wind farm layout was designed to utilise existing tracks for approximately 1.2 km, and the infrastructural footprint largely targets lower value habitats, including improved grassland. Furthermore, the number of locations where access tracks are required to punch through hedgerows/treelines has been limited and the areas to be removed will be kept to a minimum.

However, as detailed in **Section 6.6.3.2,** some IEF habitat areas/lengths will be lost during construction of the proposed wind farm site:

- BL1 Stone walls and other stonework (0.68 km lost to construction);
- ER2 Exposed calcareous rock/ WN2 Oak-ash-hazel woodland mosaic (none lost to construction but 0.89 ha of 'wooded' limestone pavement converted to 'exposed' limestone pavement (ER2 Exposed calcareous rock) as bat mitigation but no loss of Annex I habitat [8240] Limestone pavements*. Works to be conducted in accordance with guidance/established best practice such as that undertaken as part of the East Burren Complex SAC (DHLGH, 2023);
- FW4 Drainage ditches (0.34 km lost to construction);
- GS2 Dry meadows and grassy verges (0.11 ha lost to construction);
- HD1 Dense bracken/ GS1 Dry calcareous and neutral grassland/ HH2 Dry calcareous heath mosaic habitat (0.28 ha lost to construction);
- HD1 Dense bracken/ WS1 Scrub (none lost to construction but 0.51 ha converted to permanent grassland as bat mitigation);
- WL1 Hedgerows (0.20 km lost to construction and 0.12 km as bat mitigation);

- WL2 Treelines (0.16 km lost to construction); and
- WN2 Oak-ash-hazel woodland (0.02 ha lost to construction).

To ensure no net loss of Annex I habitat, mitigation and offsetting measures will be implemented within appropriate areas of the proposed wind farm site. As detailed in **Appendix 6-6, Section 2.1** and **Section 2.2** these measures will focus on

- Scrub clearance on Annex I habitats: scrub cover will be reduced within the 'exposed' limestone pavement, calcareous grassland and dry calcareous heath habitats where these areas intersect with bat buffer zones to maintain a favourable habitat condition in accordance with Wilson & Fernandez (2013). Tree and scrub clearance will be broadly split into two classes as follows:
    - Dense tree and scrub clearance where areas of wooded limestone pavement will be cleared of trees and shrubs to create bat buffers (to reduce the risk of collision with the turbine and barotrauma). The habitat will be locally converted from wooded limestone pavement to exposed limestone pavement where dense wooded limestone pavement occurs near T11 and T13 covering 0.89ha (refer to **Appendix 6-6**, **Table 7** for individual clearance areas ranging in size from 0.01 ha up to 0.19 ha); and
    - Open and scattered scrub clearance where Annex I habitats will be managed to maintain scrub cover levels relatively low to benefit the habitat condition of the Annex I type and also will allow for bat buffers at T1, T2, T3, T4, T5, T10, T11 and T13 where open and relatively scattered scrub occurs covering 9.19ha in total (refer to **Appendix 6-6**, **Table 8**).
- Non-Annex I habitats, such as improved agricultural grassland (GS1), and dry meadows and grassy verges (GS2) that will be temporarily lost due construction activities will be reinstated (see **Appendix 6-6**, **Section 2.5**).
- Where reinstatement is not feasible, management strategies will be deployed to enhance the condition of the remaining, retained habitat areas.

Habitat Degradation

Where works are occurring in close proximity to trees or shrubs to be retained:

- Temporary and permanent access tracks will not be sited within 3 m from the edge of the woody vegetation, unless existing access tracks in such locations are being utilised.
- Existing agricultural tracks will be used by machinery traffic associated with construction works.
- No other construction works or activities will be located within 3 m of retained hedgerow or treeline vegetation.
- A pre-construction assessment of trees and shrubs adjacent to the works corridor, targeting sections that will be retained post-construction, will be undertaken by an appropriately qualified arboriculturist; and
- Root Protection Areas (RPA), will be implemented in line with BSI (2012) at locations where construction activities, including excavation, access and storage of materials will be undertaken. These works will be limited, to avoid adverse effects on the health of trees/shrubs adjacent to the area of construction works.

Dust Deposition

The appointed contractor will adhere to best practice construction procedures outlined in **Chapter 14** to minimise dust generation and dispersal. Implementation of appropriate mitigation measures will ensure that any short-term adverse effects of dust deposition on

vegetation during the construction phase are minimised and largely imperceptible. This includes mitigation of dust emissions generated during the construction of turbine foundations, hardstands, material storage areas and the excavation of borrow pits as detailed in **Section 14.5** of **Chapter 14**.

- Water will be used as a dust suppressant where required, e.g., a water bowser to spray access tracks and crane hardstanding areas during any extended dry periods when fugitive dust emissions could potentially arise;
- Public roads will be inspected regularly for cleanliness and cleaned as necessary;
- All loads entering and leaving the proposed project will be covered during dry periods, to protect from dust;
- Vehicle speeds will be controlled when passing over access tracks and crane hardstanding areas within the proposed project;
- Wheel wash facilities will be implemented at the site entrance from the public road to facilitate removal of any material collected by vehicles entering or leaving the proposed project and preventing its deposition on public roads;
- Site stockpiling of materials will be designed and laid out to minimise exposure to wind; and
- Daily site inspections will take place to examine dust measures and their effectiveness.

With the application of the mitigation measures **Chapter 14** has determined that the potential effect would be short-term and negligible in magnitude and therefore not significant from an ecological perspective.

Non-native Invasive Plant Species

The following invasive plant species were recorded within the proposed project: rock cotoneaster, winter heliotrope and cherry laurel (see **Figure 6-6**). These species were primarily recorded along the GCR, with butterfly bush and winter heliotrope also noted in one location along the TDR.

Cherry laurel occurs within private lands, and butterfly bush was also recorded growing from a derelict building within private lands along the TDR; accordingly, no specific intervention measures are proposed. Winter heliotrope and rock cotoneaster are low impact species and is not listed on the Third Schedule. Measures are included in the HMP to avoid the spread of invasive species and to treat invasive species within the proposed wind farm site.

Best practice guidelines will be employed during construction to ensure that invasive plant species are not spread. This will include the establishment of demarcation zones, auditing of stone sources where material is imported, and where feasible, treatment of invasive species. The following subsections provide a summary of the measures as set out in the HMP (refer to **Appendix 6-6**).

Treatment of Winter Heliotrope

According to NRA (2020), the physical treatment of low impact species like winter heliotrope is often challenging due to the risk of reinfestation and further spread, and only practical where infestations are limited in extent. Where this is the case, entire stands of winter heliotrope will be excavated and buried (to a depth of 2 m), incinerated or disposed of at an appropriately licensed waste facility. As this is a Council road follow-up treatment will not be undertaken.

Treatment of Rock Cotoneaster

Cotoneaster control can only be achieved through long-term management programmes. An initial 2-3 year treatment programme is needed. In Year 1, the treatment should aim treat at least 90-95% of the Cotoneaster in the given area. There may be repeated treatments in the first year to targets any plants which were missed. In Year 2, any further plants which were missed or which have regenerated can be targeted. Any seedlings can also be treated. Year 3 is a repeat of Year 2 with the aim of ensuring that all plants have been killed. Seedlings may continue to be an issue for several years after the initial 2-3 year programme and may require periodic control. A site should be monitored until 2 years have passed with no signs of regrowth and seedlings.

Hand-pulling or excavation of individual plants using hand tools is suitable for smaller plants, although care is needed to avoid destabilising soil particularly on steeper ground and fragments being left behind as these will re-grow in following years. Hand-pulling of plants in the limestone grasslands and excavation of individual small using hand tools does not work unless plants are very small. Cotoneaster roots penetrate the near surface bedrock, making them impossible to pull. Waste should be disposed of at an appropriately licensed waste facility. Where larger stands occur an application of glyphosate-based herbicide will be applied using a weed wipe applicator or spot treatment.

Preventative Measures

Appropriate measures will be incorporated into the Contractor's CEMP, including, but not limited to, those set out in this section. Management measures relating to invasive species will be guided by relevant best practice documents, including:

- TII (2020b). *The Management of Invasive Alien Plant Species on National Roads – Technical Guidance* (TII Publication no. GE-ENV-01105);
- IFI (2010). *Biosecurity Protocol for Field Survey Work*; and
- Brew, T. and Gilligan, N. (2019). Environmental Guidance: Drainage Maintenance and Construction. OPW, Ireland.

To avoid invasive plant species being introduced to the proposed project during the construction phase, material that cannot be retrieved from onsite borrow pits will require to be sourced from local, licenced quarries. Materials imported onto the proposed wind farm site will need to be audited for invasive species to avoid or reduce the potential of their accidental introduction.

All footwear/waders and any equipment that will enter the hydrological environment will be treated to prevent foreign flora/fauna entering the water and after use to prevent spread to other catchments.

Biodiversity Enhancement

In addition to the mitigation measures outlined in previous sections, habitat enhancement measures will be implemented to maximise biodiversity value within the proposed wind farm site. While measures will be commenced during the construction phase, many of these measures will continue to be implemented and maintained during the operational phase and are therefore described in **Section 6.7.2.2**.

6.7.1.3 Terrestrial Mammals

Badger

Baseline surveys recorded two badger setts within the proposed project: a single-entrance outlier sett located in the area of T7 and the adjacent borrow pit, and a main sett near the proposed 110 kV substation. As badger sett distribution and activity may change over time, pre-construction surveys will be undertaken by a suitably experienced ecologist within 50 m of all proposed site infrastructure and working areas, as well as locations where setts were previously recorded, including the vicinity of T7 and the borrow pit, as well as the proposed substation. Where blasting is required, this survey area will be extended to 150 m in accordance with NRA (2005a). These surveys will be undertaken no more than 10-12 months in advance of construction.

Following completion of the pre-construction checks, avoidance measures will be applied. A minimum 30 m buffer will be maintained around any active sett, or 50 m in the case of a breeding sett. Where blasting is proposed and the full 150 m buffer cannot be achieved, additional measures will be implemented, including scheduling blasting outside the badger breeding season (July to December), restricting blasting to daylight hours, and monitoring sett activity before and during blasting where badger presence is confirmed. Any new setts identified within 50 m of proposed site infrastructure or working areas, or within 150 m of any area requiring blasting will be monitored using trail cameras (under NPWS licence).

Where sett closure is required, works will be undertaken under licence and in line with NRA (2005a). This will involve:

- Monitor the sett for a minimum of five days prior to closure using trail cameras, light sticks or sand pads to determine activity.
- Undertake sett closure only outside the badger breeding season (July to December).
- Install a chain link or sheep net fence around sett entrances at a distance of 5 m, with the fence dug into the ground by a minimum of 30 cm and standing at least 1 m high.
- Install one way badger gates obtained from an appropriate wildlife management supplier.
- Leave gates in place for a minimum of 21 days, including a period with gates tied open, to confirm that all badger have vacated the sett.
- Once exclusion is confirmed, proceed with sett destruction in accordance with licence requirements, leaving the fence and gate in place until the area is fully stripped.

To minimise disturbance to foraging badger, construction activities will be largely restricted to daylight hours as set out in **Chapter 2**. During periods when night works are required for turbine erection, lighting will be positioned and angled to avoid illuminating key habitats for badger such as woodland edges and hedgerows. Spotlighting will be used where possible in preference to broad beam lighting, and warm lighting with a colour temperature of ≤2700 Kelvin will be adopted where feasible to reduce disturbance.

To prevent accidental entrapment, all open excavations including trenches and turbine foundation pits will be fitted with mammal ramps allowing animals to exit safely. These ramps may take the form of sloped spoil runs or securely placed timber planks, and excavations will remain open only for the minimum duration necessary.

Otter

Disturbance and Displacement

Pre-construction surveys will be carried out at all watercourse crossings, in accordance with NRA (2006) *Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes*, to confirm the absence of newly established holts or couches and to implement avoidance measures, where required. These surveys will be undertaken no more than 10-12 months in advance of construction.

Construction works will be largely restricted to daylight hours, in line with **Chapter 2**, thereby avoiding peak periods of otter activity. Where limited night-time works are necessary, lighting will be kept to the minimum required for safety, directed away from riparian habitats and watercourses, and positioned to prevent light spill beyond the working area. Spotlighting will be preferred over broad area lighting, and warm spectrum light will be used with a colour temperature of ≤2700 Kelvin to minimise disturbance to commuting and foraging otter. The ECoW will advise on placement, orientation and operation of lighting to avoid illuminating potential otter routes or foraging areas.

Water Quality Impacts

Standard practice construction methods and mitigation measures set out in **Section 6.7.1.1** to protect downstream water quality during the construction phase, will also safeguard otter and their prey resource by preventing water quality deterioration that could reduce prey availability.

Other Mammals

Other mammals (e.g., Irish hare, hedgehog, etc.) may occasionally enter open excavations, including trenches and turbine foundation pits, during the construction phase. To prevent injury or accidental entrapment, all open excavations will be fitted with mammal escape ramps to allow any animal that enters to exit safely. These ramps may consist of gently sloped spoil runs or securely positioned timber planks. The duration that excavations remain open will be kept to the minimum necessary, and excavated areas will be checked regularly by site personnel and the ECoW to ensure no mammals are trapped.

6.7.1.4 Amphibians and Reptiles

Common Frog

Standard practice construction methods and mitigation measures set out in **Section 6.7.1.1** to protect water quality during the construction phase, will also safeguard common frog by preventing water quality impacts that could indirectly reduce habitat availability.

Common Lizard

Common lizard were not recorded, but suitable habitat is present in localised areas of the proposed project, primarily associated with rock piles and limestone outcrops that provide potential refugia and hibernacula. Pre-construction checks of these features will be carried out by a suitably qualified ecologist/ECoW in line with recognised reptile survey guidance to confirm any use of these areas prior to works.

Where practicable, construction works will maintain an avoidance buffer of 10 m around identified refugia or hibernacula to prevent disturbance. Rock piles and hibernation features

will not be removed. If works are required in close proximity, activity will be undertaken carefully to avoid vibration or accidental disturbance to animals occupying smaller refuges nearby.

Vegetation clearance, ground preparation and stone movement will be timed to minimise the risk of accidental mortality. Works will avoid the main hibernation period (October to March) where possible, as reptiles are less able to escape disturbance when overwintering (Edgar *et al.*, 2010). During the active season (March to October), the ECoW will check suitable microhabitats immediately in advance of clearance. If any reptiles are encountered, they will be allowed to disperse naturally into adjacent suitable habitat.

Open ground will be left exposed for the minimum duration necessary and suitable refuge features at the margins of the works will be retained throughout construction to allow animals to move away from disturbed areas.

6.7.1.5 Bats

Commuting and Foraging Bats

Bat activity recorded during baseline surveys was primarily associated with linear landscape features, including hedgerows, treelines and woodland edges, which provide commuting routes and foraging habitat within the agricultural landscape. No significant loss of bat foraging or commuting habitat is anticipated as part of the proposed wind farm site. Nevertheless, measures will be implemented to retain and protect these linear features and to maintain ecological connectivity across the proposed wind farm site.

Landscape Feature Enhancement

Precautionary operational-phase mitigation measure is proposed in the vicinity of T5. Where existing vegetation has been removed to achieve the required bat buffer distances, opportunities will be taken to enhance existing hedgerows and linear vegetation features to the north and east of T5, creating a more continuous and attractive commuting edge away from the turbine and away from the species-rich grassland located to the south-east. Enhancement measures will include gapping-up of existing hedgerows, strengthening of structural diversity through native shrub planting and management to increase linear continuity. This approach is intended to encourage bat commuting and foraging activity along retained and enhanced linear features, thereby reducing the likelihood of bats traversing open ground within the rotor-swept area. These measures are intended to avoid unnecessary fragmentation of retained boundary features and to support landscape connectivity while maintaining the required separation between turbines and features used by commuting or foraging bats.

Retention and Protection of Existing Vegetation

Existing hedgerows, treelines and woodland edges will be retained and protected throughout the construction phase, except where removal or management is required to accommodate the proposed project or establish the prescribed bat buffers, as described in **Section 6.7.1.2** and **Section 6.7.2.4**. Construction activities will be managed to avoid damage to retained vegetation and to maintain its function as commuting and foraging habitat for bats. Measures to address the loss of vegetation and associated habitat connectivity are set out in the compensatory planting and habitat enhancement measures below and in the Habitat Management Plan (**Appendix 6-6**).

Compensatory Planting and Habitat Enhancement (Connectivity Targets)

Baseline bat surveys demonstrated that bat commuting and foraging activity within the proposed wind farm site is strongly associated with linear landscape features, including hedgerows, treelines and woodland edges. Although the assessment of effects identified no significant loss of bat habitat, localised removal or interruption of linear features has the potential to result in a reduction in functional connectivity if not appropriately addressed. The measures set out below are therefore intended to maintain and, where possible, enhance connectivity for commuting and foraging bats during the operational phase.

Where removal of hedgerow or other linear vegetation is unavoidable to facilitate the installation of infrastructure, compensatory planting and habitat enhancement will be undertaken to maintain bat commuting connectivity and support insect prey availability (see **Appendix 6-6**). These areas are referred to as connectivity targets, defined as locations where planting or enhancement is specifically designed to reinforce or restore linear movement corridors for bats.

Compensatory planting and habitat enhancement will be delivered in accordance with the HMP (**Appendix 6-6**), which sets out the location, extent, specification and management objectives for habitat creation and enhancement across the proposed wind farm site. Measures will include:

- Like-for-like replacement of hedgerow length (and in some cases greater as specified in the HMP), planted to form continuous linear features suitable for bat commuting;
- Gapping-up of retained hedgerows where discontinuities occur, to strengthen connectivity between woodland blocks and retained linear features; and
- Establishment and long-term management provisions (e.g., watering, protection from grazing, re-planting of failures) to ensure successful establishment.

These measures will minimise habitat fragmentation and maintain bat commuting and foraging connectivity during operation.

Roosting Bats

Overview and Precautionary Approach

Precautionary mitigation measures, as detailed in the following sections, will be implemented to protect roosting bats during construction and operation of the proposed project. These measures are designed to avoid disturbance to roosting bats, maintain the functionality of associated habitats and commuting features, and ensure compliance with the Wildlife Acts 1976–2021 and relevant best practice guidance. Measures will be secured and implemented through the CEMP (**Chapter 2, Appendix 2-3**).

Protection of Confirmed Roost and Associated Habitat

The confirmed transitional roost at F.1 (refer to **Table 6-19**) and its associated surrounding habitat will be retained in situ. No direct works are proposed to the roost structure or its immediate setting, and the roost lies outside the footprint of all proposed construction activities. Consequently, no direct or indirect disturbance to the roost is anticipated. An appropriate exclusion buffer of 50 m will be established around the roost feature prior to construction and incorporated into the CEMP to prevent accidental disturbance or damage.

In addition to the protection measures described above for the confirmed roost at F.1, a site-specific buffer assessment was undertaken to define construction exclusion buffers around sensitive bat features with reference to the proposed turbine model (Vestas V136) (refer to

Table 6-31). The assessment accounts for dimensions, including rotor diameter and minimum blade tip clearance, as well as the potential height of nearby vegetation features. These buffers will be implemented prior to the commencement of construction works and maintained throughout construction activities to prevent encroachment and reduce the risk of disturbance to bats.

Construction Controls: Lighting, Timing and Ecological Supervision

Construction and operational lighting will be designed, installed and operated to avoid illumination of the roost structure and adjacent linear features that may function as bat commuting routes. Lighting design will follow recognised best-practice guidance for bats and artificial lighting, including the Institute of Lighting Professionals (ILP) and BCT *'Bats and Artificial Lighting at Night – Guidance Note'* (2023).

Measures will include:

- Use of directional, low-spill luminaires;
- Avoidance of upward lighting and minimisation of light spill, glare and skyglow;
- Restriction of lighting levels to those strictly required for site safety; and
- Use of timers, motion sensors or curfews where practicable.

Lighting units will be positioned and angled away from the roost structure and associated linear features.

Where practicable, timing controls will be applied to construction activities in proximity to roosting features to minimise disturbance during sensitive periods of the bat lifecycle. Where required, ecological supervision by a suitably qualified bat ecologist will be provided during works undertaken near roosting features to ensure mitigation measures are correctly implemented and adhered to.

In addition, where works have the potential to affect features with bat roosts, timing restrictions will be applied to avoid sensitive periods in the bat lifecycle. The optimal timing for such works, based on roost type, is set out in Table 6-30. These measures will be implemented as part of the CEMP and will be refined, where necessary, following any pre-construction surveys, in accordance with relevant guidance (e.g., BCT, 2023; NatureScot *et al.*, 2021).

Table 6-30: Optimal season for works at different roost types

Bat usage of site	Optimum period for carrying out works*
Maternity	01 October to 01 May
Summer (not a proven maternity site)	01 September to 01 May
Hibernation	01 May to 01 October
Mating/swarming	01 November to 01 August
*Note: There is some variation between species	

6.7.1.6 Aquatic Ecology

Water Quality

Standard practice construction methods and mitigation measures set out in **Section 6.7.1.1** to protect downstream water quality during the construction phase, will also safeguard aquatic IEFs from potential water quality effects.

Spread of Crayfish Plague

Confirmed outbreaks of crayfish plague have been recorded in the Corrib catchment in recent years, with cases reported downstream of the proposed project, as recent as 2020. Where works are undertaken within or in close proximity to watercourses, and where plant, equipment or personnel may come into contact with water or wet sediments , the following biosecurity measures will be followed. These measures have been taken from Office of Public Works (OPW) guidelines for High Biosecurity where a known presence of crayfish plague or a particular waterborne invasive risk has been identified (Brew and Gilligan, 2019):

- Check, clean, dry equipment/vehicles when leaving a contaminated area zone, or, when leaving the works area.
- Visually inspect all equipment/vehicles, disinfect and remove any attached material.
- Clean excavator with power washer to remove all organic material, clean underside of tracks and park on clean surface.
- Spray all surfaces liberally with Virkon Aquatic 1 sachet per 5 L. Spray twice to ensure no surfaces missed.
- Ensure no reservoirs of water retained within tracks, channels or crevices.
- Leave within the contaminated zone for 48 hrs to dry.
- Do not move machinery within the works area unless there is a requirement to do so, particularly where invasive species are present. This will conserve resources, limit disruption and minimise potential spread of invasives. Any water retained within buckets, tracks or machinery should be removed prior to movement between locations.

Personal Biosecurity:

- Disinfect all boots and footwear when leaving a contaminated area zone.
- Scrub footwear with a brush to remove any organic material.
- Use a boot bath and sprayer to disinfect boots and footwear. Add 1 virkon sachet per 5 L for boot bath container or sprayer.
- Ensure adequate contact time within boot bath or spray liberally.
- Dispose of solution weekly by spreading over soil, unless it is very soiled.
- Visually inspect all PPE and remove attached material. Wipe down affected PPE with a cloth soaked in disinfectant solution.
- Place disposable gloves bag in clean bag and dispose of correctly, if used.

6.7.1.7 Biodiversity Mitigation, Compensation and Enhancement

Likely significant effects have been identified as a result of the construction phase of the proposed project on ecologically important features (refer to **Section 6.6**). In addition to the mitigation measures outlined above, habitat enhancement measures will be implemented to maximise biodiversity value within the proposed wind farm site through targeted habitat management and creation.

The HMP (presented in **Appendix 6-6**) will set out management areas, measures, methods and actions to achieve biodiversity enhancement, as summarised in the following sections. Such measures include management of four key areas within the proposed project site:

- Area 1: Management of bracken-dominated habitats (HD1/GS1/HH2) associated with the loss of c. 0.28 ha to facilitate the onsite control building;
- Area 2: Management and enhancement of GS1 dry calcareous grassland near T5;
- Area 3: Management and enhancement of GS1 dry calcareous grassland at the northern end of the proposed wind farm site.;
- Area 4: Field boundary creation and enhancement of stone walls, hedgerows and treelines near T5, T6 and T7.
- Area 5: Dense tree and shrub clearance on sensitive areas to reduce risk of bat collision and barotrauma at turbine locations (T11 and T13) and to restore areas of 'wooded' limestone pavement back to 'exposed' limestone pavement.
- Habitat reinstatement following temporary construction activities.
- Widespread habitat management across all turbine locations to reduce the risk of bat collision and barotrauma.

The locations of the proposed enhancement measures, together with details of the associated methods and management actions, are of these enhancement measures are illustrated in **Figures 6-11** and **6-12**, with further detail on methods and management actions provided in **Appendix 6-6**.

Area 1: Bracken Management and Habitat Restoration

An area of approximately 0.28 ha of HD1/GS1/HH2 habitat mosaic (dense bracken/dry calcareous and neutral grassland/dry calcareous heath) will be permanently lost to facilitate the proposed project's onsite control building. The heathland component of the vegetation corresponds with the Annex I habitat [4030] European dry heaths and the grassland potentially aligns to the semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) [6210]. Significant expanses of bracken intrude into the habitat mosaic, but these areas were not mapped separately as dense bracken because overall cover does not exceed 50%.

Habitat enhancement within retained HD1/GS1/HH3 mosaic habitat in the surrounding areas of the proposed project, covering *c.* 1.03 ha*,* will include targeted management of bracken. Repeated cutting of bracken is a management technique that has been used to return bracken-dominated sites back to acid grassland/heathland mosaics (Cox *et al.*, 2008). Management will involve a phased approach, including periodic cutting or rolling of bracken to reduce dominance, allowing increased light penetration and encouraging the establishment of characteristic ground flora.

Control measures will be implemented over successive growing seasons to progressively weaken bracken stands, while avoiding abrupt disturbance of soils. This will promote structural diversity and support the recovery and long-term enhancement of species-rich grassland and heath habitats within the proposed project.

Area 2: Management of Dry Calcareous Grassland (GS1)

Areas of GS1 dry calcareous grassland within the proposed wind farm site near T5 covering approximately 3.63 ha (including areas within the buffer zone for bats) will be subject to active management to maintain and enhance their ecological value.

Management measures will include control of encroaching scrub and bracken, coupled with continuation of existing livestock grazing regimes to maintain favourable sward structure and species composition.

These measures will support the retention and enhancement of calcareous grassland habitats of ecological importance.

Area 3: Management of Dry Calcareous Grassland (GS1)

An area of approximately 2.27 ha of GS1 dry calcareous grassland in the northern part of the proposed wind farm site will be subject to active management to maintain and enhance their ecological value.

Management measures will include control of encroaching scrub, coupled with continuation of existing livestock grazing regimes to maintain favourable sward structure and species composition.

These measures will support the retention and enhancement of calcareous grassland habitats of ecological importance.

Area 4: Field Boundary Creation and Enhancement

New lengths of stone wall will be created using stone from walls being lost to construction to create 0.44 km of new stone walls. In addition, approximately 0.75 km of new hedgerows will be planted, typically next to existing stone walls, to enhance the landscape connectivity for bats.

Enhancement of retained hedgerows will include infilling gaps with native species and, where appropriate, creating structurally diverse, double hedgerows. Management will focus on promoting a varied age structure and maintaining connectivity across the landscape.

Field boundary creation and enhancement works will be undertaken near T5, T6 and T7.

The proposed measures will result in a net gain of hedgerow habitat and will contribute positively to biodiversity within the proposed project by increasing habitat availability, structural diversity and ecological connectivity.

Additional field boundary creation works will be undertaken at the offsite substation where new drainage ditch lengths will be created replacing those lost to construction.

Area 5: Dense Tree and Shrub Clearance

To improve habitat conditions for bats with the aim of reducing collision and barotrauma risks areas of dense trees and shrubs on limestone pavement will be carefully cleared to reduce the vegetation height and reinstated 'expose' limestone pavement habitat conditions.

Habitat Reinstatement Following Temporary Loss

Habitat areas that are to be temporarily lost to construction will be reinstated to a habitat equivalent to that lost. The largest area to be reinstated will be returned to GA1 improved agricultural grassland. However, areas of higher ecological value habitats will also be restored including 0.06 ha of GS1 dry calcareous and neutral grassland (as part of HD1 Dense bracken/GS1 Dry calcareous and neutral grassland/HH2 Dry calcareous heath mosaic), 0.11 ha of GS2 dry meadows and grassy verges, and 0.02 ha of WN2 oak-ash-hazel woodland.

Widespread Bat Mitigation Works

Additional measures will be undertaken across the proposed wind farm site to reduce the risk of bat collision and barotrauma associated with turbine operation. Habitat management works will include maintaining a short sward 10 cm high or less surrounding each turbine and removing scattered scrub from these areas as well.

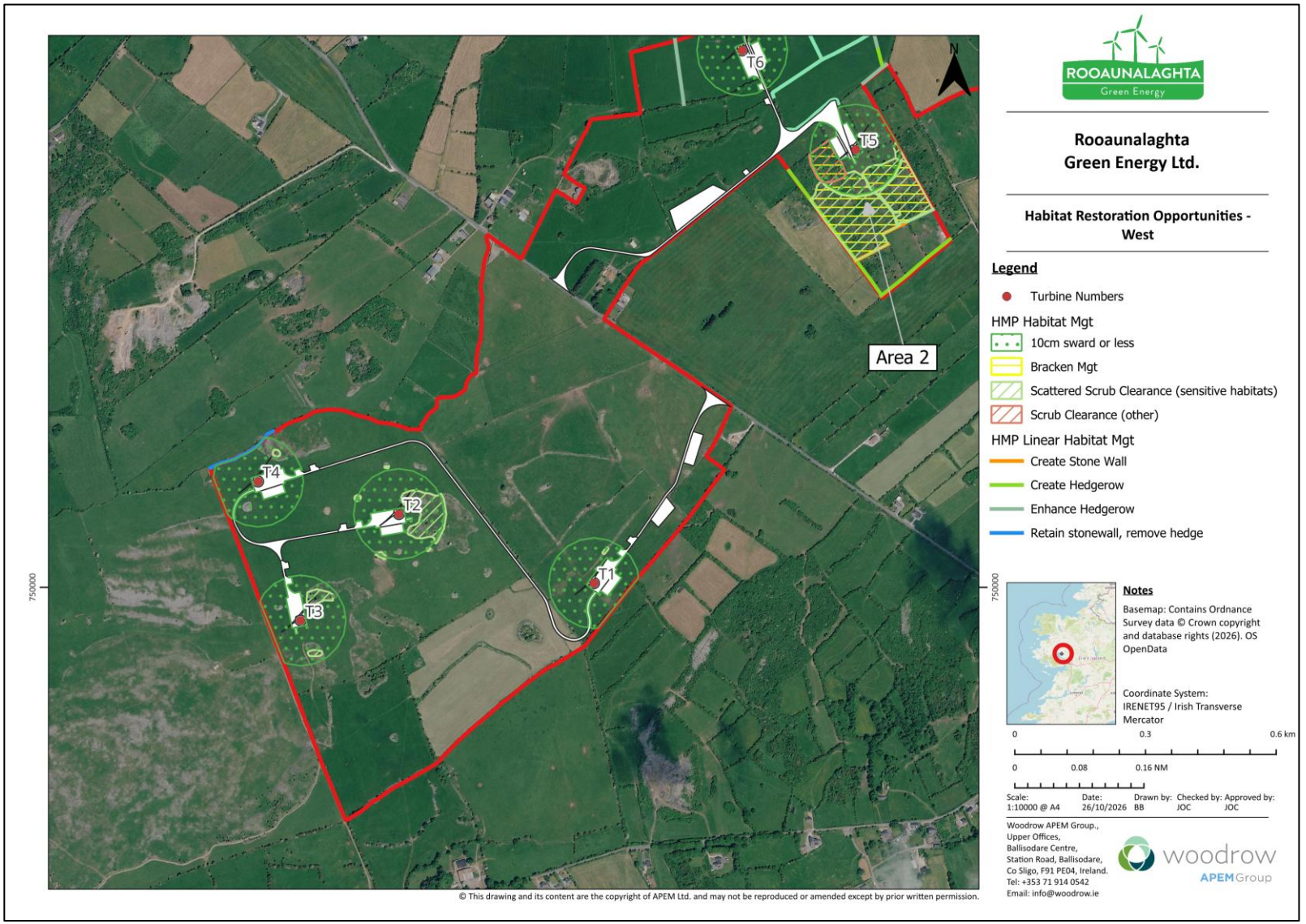


Figure 6-11: Habitat restoration opportunities on western side of proposed wind farm development

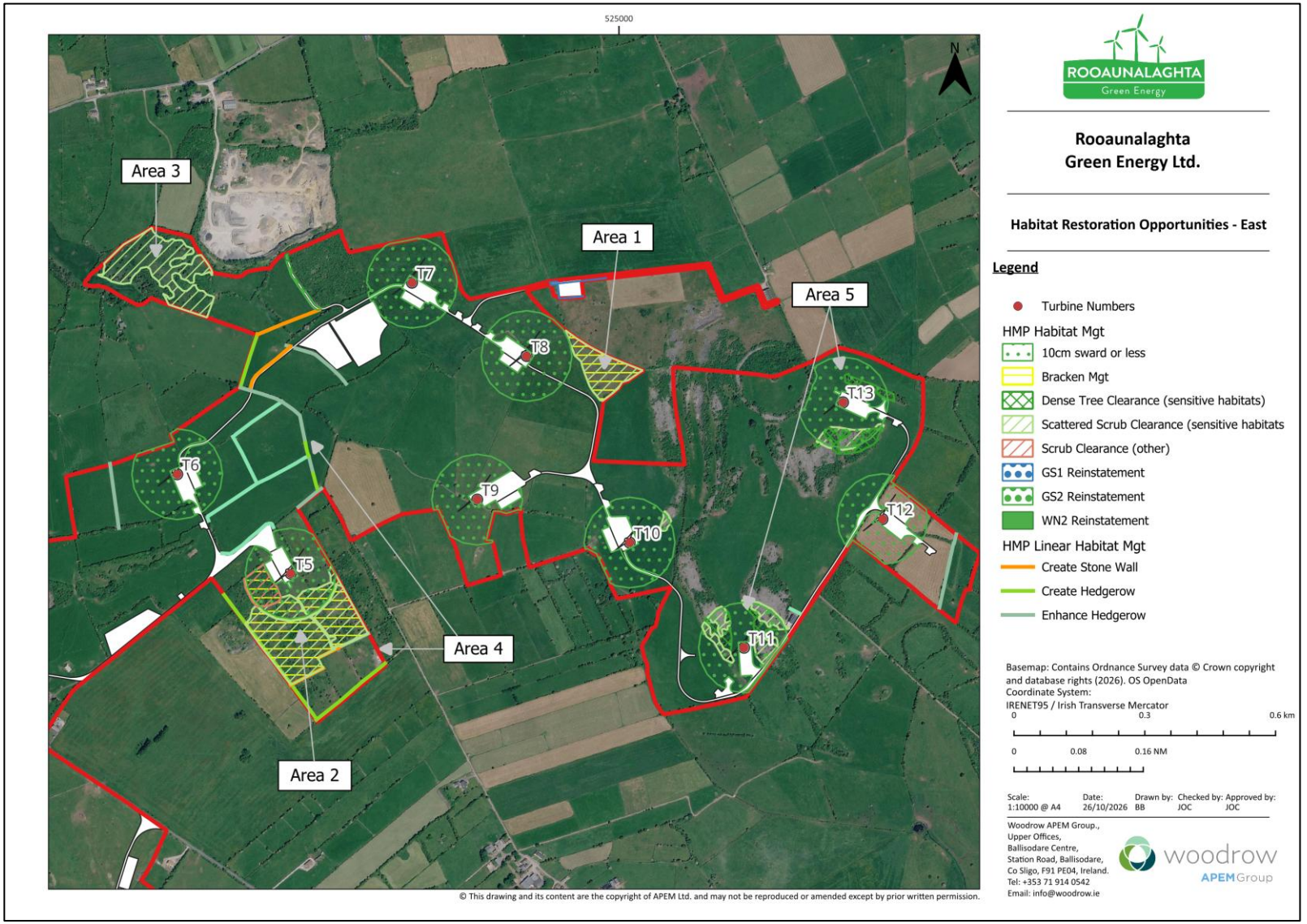


Figure 6-12: Habitat restoration opportunities on eastern side of proposed wind farm development

6.7.2 Mitigation Measures – Operational Phase

6.7.2.1 Designated Sites

In addition to the embedded drainage design described above, standard operational procedures will be implemented to manage day-to-day activities and minimise the potential for effects on connected designated sites. These include appropriate handling and storage of fuels and chemicals, use of double-bunded refuelling equipment, management of foul water *via* contained systems, and disposal of wastes at licensed facilities.

6.7.2.2 Habitats and Flora

Ongoing habitat management (maintenance or enhancement works) to reduce the risk of bat collisions and barotrauma will be undertaken, as described in **Section 6.7.2.4**. However, as these are maintenance or enhancement works following construction phase works there were no likely significant effects identified, **Chapter 14** has determined that there are no predicted direct impacts to air quality during the operational phase of the proposed project.

6.7.2.3 Terrestrial Mammals

There were no likely significant effects identified for badger, otter, or other mammals during the operational phase of the proposed project, so no specific mitigation is proposed. For continued protection, routine operations will include ecological awareness for maintenance personnel, daytime scheduling of standard visits where practicable, and lighting directed and shielded to avoid spill onto hedgerows, woodland edges and riparian habitats.

For any planned maintenance near viable water features, a brief pre-works ecological check will confirm the absence of otter holts or couches within relevant buffers (150 m).

6.7.2.4 Bats

Collisions and Barotrauma

Collision and barotrauma represent the principal potential operational impacts of wind energy developments on bats. These impacts are typically associated with species that utilise open airspace at rotor height, particularly fast-flying species such as Leisler's bat.

To reduce collision risk, turbine placement has implemented recommended separation distances between turbines and linear landscape features used by commuting and foraging bats. NatureScot *et al.* (2021) recommends a minimum 50 m separation between turbine blade tips and features such as treelines, woodland edges and hedgerows.

A site-specific buffer assessment was undertaken to define the minimum exclusion buffers required around sensitive bat features in relation to the proposed turbine model (Vestas V136). The assessment accounts for turbine dimensions, including rotor diameter and minimum blade tip clearance, as well as the potential height of nearby vegetation features. These buffers will be implemented during construction and retained for the operational and maintenance phases to prevent encroachment and reduce the risk of disturbance to bats. The calculated buffer distances are presented in **Table 6-31**.

Where vegetation features occur, turbine placement maintains appropriate separation distances where feasible, reducing the likelihood of bats commuting or foraging close to the rotor swept area.

In addition, operational lighting will be designed to minimise illumination of nearby hedgerows, treelines and woodland edges where feasible, reducing the potential for attracting insects and foraging bats into areas close to turbine structures.

Table 6-31: Bat buffer calculations using the turbine model in relation to feature height and the buffers recommended by NatureScot (2021)

Turbine model	Feature height (m)	Turbine buffer distance (m)
Vestas V136	0	104
	3	107
	5	109
	10	114
	15	119

Curtailment

Baseline surveys identified spatial variation in bat activity across the proposed wind farm site, with elevated activity by collision-risk species concentrated at a limited number of turbine locations. The collision risk assessment presented in **Table 6-28** and **Table 6-29** identified those turbines associated with the highest predicted collision risk after consideration of recorded activity levels, species-specific collision vulnerability and turbine-specific risk scores. These results informed the development of a targeted operational curtailment strategy.

To reduce the risk of collision and barotrauma, a targeted smart curtailment strategy shall be implemented at turbines T1, T5, T8, T12 and T13 from commencement of operation.

Unlike blanket curtailment, which restricts turbine operation during fixed periods irrespective of bat activity levels, smart curtailment uses environmental conditions associated with elevated bat activity to target periods of greatest collision risk. This approach allows turbine operation during lower-risk conditions whilst reducing collision and barotrauma risk during periods when bats are most likely to be active.

The curtailment strategy shall be applied during the bat activity season (May to October inclusive) and shall operate between sunset and sunrise when all of the following conditions occur:

- Air temperature exceeds 10°C; and
- Wind speed is below 5 m/s.

The proposed curtailment thresholds have been selected to target periods when elevated bat activity is most likely to occur whilst minimising unnecessary restrictions on turbine operation. The approach is consistent with recognised guidance and published evidence indicating that collision risk is greatest during periods characterised by relatively low wind speeds and suitable foraging temperatures.

The proposed curtailment strategy forms part of an integrated mitigation package that also includes bat exclusion buffers, habitat management, blade feathering and post-construction monitoring. Together, these measures are intended to reduce collision and barotrauma risk throughout the operational lifetime of the proposed wind farm.

The curtailment regime shall be implemented in full from commencement of operation and maintained for a minimum period of three consecutive operational years.

Post-construction bat activity and mortality monitoring shall be undertaken throughout this initial three-year period in accordance with the monitoring programme described in **Section 6.8.** The purpose of the monitoring programme shall be to verify the effectiveness of the mitigation measures and to determine whether collision and barotrauma risks have been reduced to the levels predicted by the assessment.

The results of the monitoring programme shall be reviewed at regular intervals throughout the initial three-year monitoring period. Where monitoring identifies higher than anticipated levels of bat activity, collision risk or mortality, additional mitigation measures shall be implemented through an adaptive management approach. Such measures may include, but shall not be limited to:

- Increasing wind-speed thresholds at which curtailment is applied;
- Extending seasonal curtailment periods;
- Extending nightly curtailment periods;
- Applying curtailment to additional turbines; and/or
- Implementing other measures demonstrated to reduce collision and barotrauma risk.

No reduction in the curtailment regime shall be considered during the initial three-year monitoring period.

Following completion of the three-year monitoring programme, the effectiveness of the mitigation strategy shall be reviewed using the monitoring data collected. Only where the monitoring results demonstrate that collision and barotrauma risks have been reduced to acceptable levels, and that the conservation status of bat populations would not be adversely affected, shall refinement or reduction of the curtailment regime be considered.

Any modification to the curtailment strategy shall be evidence-led, based on the results of post-construction monitoring and agreed with the relevant planning authority. Where monitoring indicates that predicted levels of mitigation effectiveness have not been achieved, the curtailment regime shall be retained or strengthened as necessary.

Evidence for the Effectiveness of Smart Curtailment

A substantial body of published research has demonstrated that operational curtailment is one of the most effective currently available measures for reducing bat mortality at onshore wind farms. NatureScot *et al.* (2021) identify operational curtailment, together with appropriate turbine siting, habitat management and blade feathering, as a key mitigation measure for reducing collision and barotrauma risk for bats.

Curtailment effectiveness has been demonstrated across a range of wind farm developments and operational settings. A recent meta-analysis by Whitby *et al.* (2024), which reviewed a decade of curtailment studies undertaken at multiple wind energy facilities, concluded that bat fatalities decreased by approximately 33% for every 1 m/s increase in turbine cut-in speed.

Across the sites reviewed, a 5 m/s cut-in speed reduced bat fatalities by an average of approximately 62%, with reductions ranging from 33% to 79% at individual sites.

More recent studies evaluating smart curtailment approaches have similarly demonstrated substantial reductions in bat mortality relative to unmitigated turbine operation whilst maintaining greater operational flexibility than traditional blanket curtailment regimes. Collectively, these studies indicate that operational curtailment is an effective means of reducing collision and barotrauma risk and that mitigation effectiveness increases where curtailment is combined with other measures such as habitat management, turbine feathering and adaptive management.

The proposed mitigation strategy combines bat exclusion buffers, habitat management, blade feathering, smart curtailment and a three-year post-construction monitoring programme with adaptive management. In combination, these measures are considered to represent a robust and proportionate mitigation strategy for reducing collision and barotrauma risk associated with the proposed project.

6.7.2.5 Aquatic Ecology

In addition to the embedded operational drainage design, standard good practice measures, as outlined in **Section 6.7.2.1**, will be applied during the operational phase to minimise any potential for effects on aquatic receptors.

6.7.3 Mitigation Measures – Decommissioning Phase

Mitigation measures described for the construction phase (see **Section 6.7.1**), including those relating to surface water management, sediment control and pollution prevention, will, where relevant to decommissioning works, be updated to reflect best practice at the time of the commencement of the decommissioning phase and implemented accordingly. A detailed decommissioning plan will be prepared prior to the commencement of works, taking account of the findings of this EIAR and the regulatory requirements in place at that time, and will be developed in consultation with the relevant authorities.

Decommissioning will be undertaken in a manner that minimises disturbance and environmental effects. The works areas will be kept to the minimum extent required, vegetation clearance will be limited, and appropriate measures will be implemented to protect water quality and any protected fauna. A pre-decommissioning walkover survey will be undertaken to identify any species or habitats of conservation importance, and works will be timed to avoid sensitive periods where necessary.

Access tracks will remain in situ for ongoing land management purposes, while turbine foundations and hardstanding areas will also remain in situ and be covered with soil to allow for natural re-vegetation. This approach minimises disturbance associated with removal works and facilitates recovery of habitats. The site drainage system, including SuDS features, will remain in place to continue to manage surface water runoff and maintain existing drainage patterns during and following decommissioning.

Measures to control erosion and sediment will be implemented, including the reinstatement of silt protection measures similar to those applied during construction. Spoil and reinstated areas will be monitored, and where a risk of erosion is identified, additional stabilisation measures will be implemented.

6.8 MONITORING

Monitoring is an essential element of any major works program, during construction, habitat enhancement, and operation, as it is important to determine whether applied measures are successfully contributing to the achievement of objectives. Full details and a schedule table of proposed monitoring have been provided within the HMP (refer to **Appendix 6-6**), with key elements summarised in the following sections.

6.8.1 WATER QUALITY

Water-quality mitigation measures described in **Chapter 9** and the CEMP (**Appendix 2-3**) will be implemented for the protection of designated sites, downstream watercourses and aquatic ecology. It is essential that these measures are monitored to ensure they remain effective and that any reduction in performance triggers timely corrective action through an established feedback system. Monitoring locations will be agreed with the relevant Planning Authority prior to the commencement of site works, and a monitoring programme, including monitoring parameters, frequency and reporting requirements, will be established prior to construction. Appropriate corrective actions will also be implemented where monitoring identifies exceedances or a deterioration in water quality. The following water quality monitoring measures will be implemented during the construction and operational phases of the proposed project. Monitoring required during the decommissioning phase will be agreed as part of the decommissioning plan.

6.8.1.1 Construction Phase

During the Construction Phase, the following monitoring measures will be implemented:

- Regular inspections will be undertaken by the main contractor or appointed delegate during excavations and groundworks to ensure that all water-quality protection measures specified in this EIAR and the CEMP are correctly implemented and functioning.
- A suitably qualified ECoW will be appointed for the duration of the works. The ECoW will be present during works in proximity to watercourses, drains and crossing locations, undertaking routine upstream and downstream water quality checks to detect any deterioration and instigate corrective actions where required, in liaison with the Environmental Manager and other project specialists, including the Project Hydrogeologist where relevant.
- Silt control features, including silt fences and settlement ponds, will be monitored throughout construction to ensure they remain effective. Inspections will include checks for blinding, overtopping, bypassing and damage, with maintenance or replacement undertaken as required to maintain performance.
- Turbidity (NTU) monitoring will be undertaken upstream and downstream of active works areas during key construction activities (e.g., turbine base construction) and, where required, at the outlets from settlement ponds, supported by visual inspection.
- Where elevated turbidity is identified, immediate investigation and corrective actions will be implemented. Monitoring equipment will be regularly calibrated to ensure accuracy
- The main contractor, in consultation with the ECoW, will prepare and implement a water quality monitoring schedule. Monitoring frequency and parameters will follow best practice and relevant guidance and will be agreed with MCC prior to commencement. Inspection records and ECoW summary reports will be made available to MCC on request. Any deviation from proposed mitigation or any exceedance of agreed trigger

levels will be reported immediately to MCC, and appropriate corrective measures will be agreed. Water-quality monitoring will include:

- Baseline sampling undertaken at least twice, during both low-flow and high-flow conditions (high-flow sampling following sustained rainfall; low-flow sampling following a dry period). Sampling to include, as a minimum, pH, electrical conductivity (µs/cm), dissolved oxygen, turbidity (NTU), suspended solids, ammonia, nitrate, nitrite, orthophosphate, total phosphorus and other relevant parameters required to establish baseline conditions.
- Regular (monthly) laboratory analysis of selected parameters identified through baseline monitoring, including Environmental Quality Standards (EQSs) from each watercourse/land drain draining from the construction site.
- Daily field monitoring, in addition to turbidity monitoring, will include checks of pH, electrical conductivity (µs/cm) and visual assessment (colour, clarity) upstream and downstream of active works areas, and where required, at settlement pond outlets. Where settlement-pond discharge fails to meet required standards, water will be recirculated to the pond inlet to allow further settlement. A penstock or similar valve will be installed to control pond discharge. Works will cease until the cause of any deviation is identified and rectified.

- Surface water outfalls and drainage controls will be routinely inspected, including checks on erosion protection, outlet structures and energy dissipation devices.
- Routine inspections will be undertaken during refuelling, concrete works and other activities with elevated pollution risk, ensuring full compliance with avoidance, mitigation and remedial measures set out in the EIAR and CEMP.
- Groundwater monitoring will be undertaken during construction in accordance with **Chapter 9**, including monitoring of groundwater levels and any active dewatering operations where required

6.8.1.2 Operational Phase

Ongoing regular operational monitoring and maintenance of the surface water drainage system will be undertaken throughout the lifetime of the proposed project in accordance with **Chapter 9** and any requirements agreed with MCC and GCC. Monitoring and inspection will be undertaken to verify the continued effectiveness of drainage controls and to ensure that any issues requiring corrective action are identified and addressed in a timely manner.

6.8.2 Habitats and Flora

6.8.2.1 Habitat Recovery/Restoration

Re-vegetation of areas temporarily affected by construction activities within the proposed wind farm site will be monitored within the construction phase and in Years 1, 2 and 3 post-construction.

Monitoring will be in the form of general assessment of area cover of vegetation, with an aim of maximising vegetated cover to restore the areas for associated wildlife including bats and badgers to utilise for foraging, and to reduce likelihood of water quality impacts on any downstream receptors. Fixed point photography will be used to document change and success.

Remedial actions identified during monitoring, such as the need for re-seeding, will be identified and implemented as required. Refer to **Appendix 6-6** for methods and actions of the management area.

6.8.2.2 Habitat Enhancement

Monitoring of habitat enhancement of areas, as outlined in **Section 6.7.1.7,** will occur during the Construction year and post-construction Year 1, 3, and 5. These works will include the management to improve habitat condition of GS1 dry calcareous and neutral grassland and HD1/ GS1/ HH2 dense bracken/ dry calcareous and neutral grassland/ dry calcareous heath mosaic habitat by controlling scrub and bracken. Other works are to enhance the condition and connectivity of the WL1 hedgerows and WL2 treelines for bats.

Refer to **Appendix 6-6** for methods and actions of the management area.

6.8.2.3 Indirect Habitat Degradation

As Cloughmoyne SAC is immediately adjacent to the proposed wind farm development, monitoring of habitats equivalent to the qualifying interests will be undertaken to provide scientific data to validate the assessment on indirect impacts. Baseline data will be collected from within the proposed wind farm development by an appropriately skilled ecologist at locations. Surveys will collect detail botanical data for analysis within the IVC (Perrin, 2024), allowing species level analysis opportunities and the classification of vegetation to community level. Habitat condition monitoring for the Annex I habitat [8240] Limestone pavements* will also be undertaken (Wilson & Fernández, 2013).

Baseline surveying will be completed prior to construction works to establish a baseline data set for qualifying interest habitats within 50 m of the proposed wind farm development. As the impacts would be indirect it would be anticipated that a delay in observable changes would occur. Therefore, unless the ECoW has immediate concerns, then repeat sampling would be undertaken in Year 3 and again in Year 5, and the results compared and analysed over a five-year period.

6.8.3 Bats

6.8.3.1 Bat exclusion buffers

Bat feature buffers around turbines are intended to create areas that are as unattractive to bats as practicable by avoiding features such as pollinator-rich habitats, hedgerows, and other linear features that may facilitate bat foraging or commuting. This reduces the risk of bats flying near operating turbines. These measures have been incorporated into the HMP (**Appendix 6-6**) for the proposed project.

Monitoring of bat exclusion buffers and associated habitat management measures shall be undertaken during operational Years 1, 2 and 3. Monitoring shall comprise annual inspections during spring (April) and late summer (August) and shall verify that:

- Bat exclusion buffers are maintained in the intended condition;
- Structurally complex habitats are not developing within exclusion areas;
- Retained habitat features are being managed in accordance with **Appendix 6-6**; and
- Habitat management objectives continue to be achieved.

Following completion of the initial three-year monitoring period, habitat compliance inspections shall continue at intervals of no greater than five years for the remainder of the operational life of the proposed wind farm, unless otherwise agreed with the relevant planning authority.

6.8.3.2 Bat Activity Monitoring

Post-construction bat activity monitoring shall be undertaken during operational Years 1, 2 and 3 to assess whether bat activity patterns remain consistent with those predicted by the assessment and to support review of the operational mitigation strategy.

Monitoring shall comprise:

- A minimum of six static bat detectors located at turbines T1, T5, T8, T12 and T13 together with one detector at the proposed substation location;
- Monitoring during spring, summer and autumn;
- Monitoring for a minimum of 15 consecutive nights per season, subject to suitable weather conditions;
- Assessment of species activity levels, seasonal patterns and turbine-specific activity trends; and
- Comparison with baseline datasets and the results of previous monitoring years.

Particular emphasis shall be placed on turbines T1, T5, T8, T12 and T13, where smart curtailment will be implemented.

Monitoring shall also be undertaken at selected turbine locations where stone walls have been retained as part of the final mitigation design. The purpose of this monitoring shall be to confirm that retained stone walls are not resulting in higher than anticipated levels of bat activity within turbine risk zones and that the assumptions underlying the collision risk assessment remain valid.

Monitoring results shall be used to assess:

- The effectiveness of bat exclusion buffers;
- The effectiveness of smart curtailment;
- Turbine-specific activity patterns;
- Changes in bat activity over time; and
- Whether adaptive management measures are required.

6.8.3.3 Bat Mortality Monitoring

The objective of the mortality monitoring programme is to verify the effectiveness of the bat mitigation strategy and determine whether collision and barotrauma mortality remains within the levels predicted by the assessment.

A structured bat mortality monitoring programme shall be undertaken during operational Years 1, 2 and 3 and repeated during Years 5, 10, 15 and 25.

Monitoring shall focus primarily on turbines T1, T5, T8, T12 and T13, where smart curtailment will be implemented and where the collision risk assessment identified the greatest potential for bat mortality. Monitoring shall also encompass a representative sample of the wider turbine array such that a minimum of 50% of operational turbines are included within the mortality monitoring programme.

Monitoring shall also include turbines where stone walls have been retained as part of the final mitigation design in order to confirm that mortality rates remain consistent with those predicted by the assessment.

Monitoring shall be undertaken in accordance with recognised best-practice guidance available at the time of survey, including NatureScot *et al.* (2021), Bat Conservation Ireland guidance, and any subsequent guidance which supersedes these documents.

The mortality monitoring programme shall include:

- Systematic carcass searches beneath selected turbines;
- Search areas designed to encompass the anticipated carcass fall zone;
- Search frequencies appropriate to periods of highest bat activity and collision risk;
- Carcass persistence trials to quantify scavenger removal rates;
- Searcher-efficiency trials to determine carcass detection rates;
- Estimation of corrected fatality rates using accepted correction factors;
- Identification of species where possible; and
- Review of weather conditions and operational turbine data.
- Monitoring results shall be reviewed following each monitoring year.

Where monitoring identifies:

- Higher-than-predicted mortality rates;
- Repeated fatalities of sensitive species;
- Elevated levels of bat activity within turbine risk zones;
- Evidence that retained stone walls are associated with higher than anticipated activity or mortality; or
- Evidence that the curtailment regime is not functioning as intended,

Additional mitigation measures shall be implemented through the adaptive management framework outlined in **Section 6.7.2.4**.

- Potential adaptive management responses may include:
- Increasing curtailment wind-speed thresholds;
- Extending seasonal curtailment periods;
- Extending nightly curtailment periods;
- Applying curtailment to additional turbines;
- Modifying retained stone wall sections or associated habitat features where necessary; and/or
- Modifying habitat management prescriptions.

No reduction in the curtailment regime shall be considered during the initial three-year monitoring period.

Monitoring data collected during the operational phase will be reviewed annually as part of the adaptive management process and used to evaluate the effectiveness of the mitigation measures implemented for the proposed project. Where appropriate, the findings of the monitoring programme will be used to inform future wind farm assessments and contribute to the development of industry best practice in relation to bat collision risk, operational curtailment and habitat management.

6.9 RESIDUAL EFFECTS

Residual effects are those likely to occur following the implementation of mitigation measures. **Table 6-32** summarises residual effects occurring within the proposed project on IEFs assessed in this chapter.

6.9.1 CONSTRUCTION PHASE

While the implementation of mitigation measures will reduce and alleviate likely significant effects, some temporary residual effects may occur during the construction phase that cannot be fully avoided. These include temporary habitat loss of hedgerows and areas of dry calcareous and neutral grassland to accommodate proposed site infrastructure (e.g., turbine foundations, hardstands and the control building). This also includes temporary habitat loss for mammals until temporary construction compounds are decommissioned. Such effects will be temporary in nature and limited to the construction period, with affected habitats reinstated and/or appropriately managed following completion of works.

6.9.1.1 Designated Sites

Mitigation measures set out in **Section 6.7.1.1** of this chapter, together with those detailed in **Chapter 9,** the SWMP **(Appendix 2-6)** and the CEMP (**Appendix 2-3**), will protect designated sites that are hydrologically connected to the proposed project. These include Lough Corrib SAC, designated for a range of aquatic QIs, as well as Rostaff Lake pNHA, Lough Corrib pNHA and Lough Hacket pNHA, which are designated for aquatic and wetland features and connected to the proposed project *via* surface water and groundwater pathways. Shrule Turlough SAC and Shrule Turlough pNHA have also been assessed in accordance with the conclusions of **Chapter 9**, which identified a potential hydrogeological linkage.

For these sites, mitigation focuses on controlling surface runoff, protecting surface and groundwater quality and preventing pollution during construction, thereby avoiding adverse effects on their QIs and designated features.

Cloughmoyne SAC and the overlapping Cloughmoyne pNHA occur directly adjacent to the proposed project boundary and are designated for limestone pavement and associated calcareous habitats. **Section 14.3.3** in **Chapter 14** sets out that, as these designated sites are within 20 m of the site, they are high sensitivity receptors. Potential construction phase effects in this context relate primarily to alterations to working areas and dust deposition affecting sensitive habitats. Dust mitigation measures will ensure protection of the QI and the designated features of these sites.

The NIS prepared for the proposed project (APEM Group Woodrow, 2026b) concluded that, in view of best scientific knowledge, applying the precautionary principle, and having regard to the conservation objectives of Cloughmoyne SAC, Lough Corrib SAC, Lough Corrib SPA and Shrule Turlough SAC, the proposed project, either alone or in-combination with other plans or projects, will not adversely affect the integrity of any European Site. This conclusion has been reached beyond reasonable scientific doubt following implementation of the mitigation measures set out in the NIS.

6.9.1.2 Habitats and Flora

Mitigation measures set out in **Section 6.7.1.1** of this chapter, together with targeted habitat management plans detailed in **Appendix 6-6**, will contribute towards protecting some of the habitats and flora present. However, where residual effects remain during the construction phase, these are detailed in the following sections.

BL1 Stone walls and other stonework

Construction activities will result in a loss of 0.68 km of this type of habitat. Stone from these walls will be used to restore 0.44 km of new stone wall lengths near T5 and T6 i.e. replacement in-situ will be reused elsewhere in the landscaping of the wind farm site. The site design utilised existing gaps in so far as possible and where removal of walls is unavoidable to facilitate access of abnormal loads, recommendations for reinstatement as set out in Appendix 6-8 will be followed i.e., relocation to similar environmental conditions and all stones removed will be placed with the bryophytes on the upper surface and not buried or otherwise inhibited. The remaining 0.24 km of stone not replaced in-situ. Stone from the removed walls not used in the construction of new walls will be reused in the landscaping of the wind farm site. Residual effects on stonewalls during the construction phase are predicted to be permanent, adverse and **significant** at a local geographical scale on this habitat.

ER2 Exposed calcareous rock/WN2 oak-ash-hazel woodland mosaic

This habitat will not be impacted by any of the wind farm infrastructure however to achieve appropriate buffer distances to minimise the risk of bats suffering collision or barotrauma from the turbines scrub clearance will need to be undertaken. This will result in a change in the habitat from a wooded limestone pavement (ER2/WN2) to an exposed limestone pavement habitat (ER2), and it will still represent examples of limestone pavement* Annex I habitat (outside of designated sites of international importance). Working methods will follow those set out in the Screening for AA Adoption of necessary conservation measures within East Burren Complex SAC (DHLGH, 2025) where tree and shrub clearance work was proposed in an Annex I habitat. This would result in an effect of negligible magnitude at the local geographical scale, which is **not significant**.

FW4 Drainage ditches

Construction activities at the proposed offsite 110 kV substation will result in a loss of 0.34 km of this type of habitat. The ditches are to be re-routed however there will a lag phase while the new ditches develop established vegetation similar to the existing features therefore even if an equivalent length is created there will be a residual effect. Residual effects on drainage ditches during the construction phase are predicted to be short-term and likely **significant** at a local scale.

GS2 Dry meadows and grassy verges

Approximately 0.11 ha of this habitat will be lost to create direct access between the proposed wind farm development and Lydon Quarry to the north. This will reduce the volume of vehicle movement on public road transporting stone to locations required for construction activity. On removal of the temporary access route the effected habitat area will be re-instated to GS2 as set out in **Appendix 6-6**. However, successful restoration will take approximately 5-years to achieve, during which time there will be temporary, adverse and likely **significant** effect at a county/regional geographical scale.

HD1 Dense bracken/GS1 dry calcareous and neutral grassland/HH2 dry calcareous heath mosaic

Approximately 0.28 ha of this habitat will be lost to accommodate the onsite control building and access towards T7 and T8. **Section 3.3.5.10.4** within **Chapter 3** sets out the rationale for locating this infrastructure within an area corresponding to Annex I habitat. Location criteria included a requirement for a location on the eastern boundary of the site, near existing or proposed internal access tracks, and be at least 150 m from a turbine location. These criteria limited the available land options.

The area of predicted loss includes buffer areas to reflect the expected wider works footprint during construction activity. This buffer covers 0.06 ha and will be re-instated to GS1 dry calcareous and neutral grasslands as set out in **Appendix 6-6** reducing the habitat loss down to 0.22 ha. Habitat restoration of additional retained areas of this habitat totalling 1.03 ha is set out in **Appendix 6-6** to improve the condition of the retained habitat and offset the loss of this area.

Appendix 6-6 details the enhancement of 5.9 ha of GS1 dry calcareous grassland, split between Area 2 (3.63 ha) and Area 3 (2.27 ha). As no infrastructure is proposed within these areas, the management measures focus exclusively on habitat enhancement.

Accordingly, while the removal of habitat to facilitate the control building will result in a short-term adverse effect until habitat restoration and management measures become established, the implementation of the proposed offsetting and habitat management measures is expected to result in an overall permanent beneficial effect through improvements in the condition and extent of the remaining habitat mosaic. As such, the effect is considered to be beneficial and likely **significant** at a county/regional geographical scale.

HD1 Dense bracken/WS1 scrub

An area of 0.51 ha of dense bracken and scrub mosaic habitat will be removed to measures to reduce the risk of bat collision and barotrauma from turbine. This would represent a permanent, adverse and likely **significant** effect at a local geographical scale on this habitat. However, the habitat management objectives as detailed in **Appendix 6-6** should result in the development of permanent grassland in this area. As GS1 is of higher ecological value, if calcareous grassland develops approaching Annex I quality, then the habitat management outcome would result in a permanent, beneficial and likely **significant** effect at a local geographical scale.

WL1 Hedgerows

Approximately 0.20 km of hedgerow will be lost to the construction of the wind farm site and a further 0.12 km being removed (alongside a stone wall being retained) near T4 as measures to reduce the risk of bat collision and barotrauma from the turbines. Planting of a new hedge approximately 0.75 km in length near T5 and T6 adjacent to existing stone walls, as detailed in **Appendix 6-6**, will compensate for the lengths lost. In addition, a further 0.86 km of existing hedgerow will be enhanced though actions such as gapping up, as detailed in **Appendix 6-6**. As such, there will be a temporary, adverse but minor effect on hedgerows, which is **not significant** at a local geographical scale.

WL2 Treelines

Approximately 0.16 km of treelines will be removed for the creation of the proposed infrastructure. As treelines includes overgrown WL1 hedgerows, the habitat creation and

enhancement of hedgerows will compensate for the loss of WL2 treelines. There will be a temporary, adverse but minor effects on treelines, which is **not significant** at a local geographical scale.

WN2 Oak-ash-hazel woodland

A small area of woodland will be lost from the edge of a woodland area to create access to the quarry to the north. Approximately 0.02 ha will be lost during construction but replanted following removal of the temporary access track. However, successful restoration will take at least 20-years to achieve, during which time there will be a temporary, adverse but minor effect, which is **not significant** at a local geographical scale.

6.9.1.3 Terrestrial Mammals

Potential impacts on terrestrial mammals associated with the construction phase include disturbance from machinery, including blasting, piling and crushing, human activity, vegetation clearance, and temporary artificial lighting, which have the potential to result in short-term displacement of individuals. These effects will be avoided or reduced through adherence to best practice construction protocols (see **Appendix 2-3**), implementation of species-specific mitigation measures (including pre-construction mammal surveys, exclusion buffers and lighting controls), and appropriate timing of works where required.

For otter, the implementation of watercourse protection and surface runoff control measures will maintain water quality and prey availability, such that no indirect effects on foraging habitat will occur.

Given the availability of suitable and connected habitats within the wider landscape, any displaced individuals are expected to relocate temporarily and resume normal activity following construction. There will be no loss of breeding or resting sites such as badger setts, and no barriers to mammal movement are anticipated, as site access and haul routes will, where feasible, utilise existing tracks and areas of previous disturbance.

In summary, residual effects on terrestrial mammals during the construction phase are expected to be minor, short-term, reversible, and **not significant** at any geographical scale.

6.9.1.4 Amphibians and Reptiles

No suitable amphibian breeding ponds or habitats will be directly affected by the proposed project, and no works are proposed within or adjacent to suitable breeding habitat for smooth newt. Potential effects on amphibians are therefore limited to indirect pathways only. Water quality protection measures, as set out in **Section 6.7.1.1** and the CEMP **(Appendix 2-3)**, will maintain surface-water quality during construction, thereby preventing indirect effects on amphibians such as common frog that may utilise nearby drainage features or waterbodies.

For reptiles, including common lizard, mitigation measures comprising pre-construction habitat checks and appropriate timing of construction activities will avoid disturbance during sensitive periods and reduce the risk of injury or displacement. Construction activities will not result in the loss or long-term degradation of reptile habitat.

With the implementation of these measures, the proposed project will not result in any discernible changes to the availability or quality of amphibian or reptile habitat. Accordingly, residual effects on amphibians and reptiles during the construction phase are predicted to be **not significant** at any geographical scale.

6.9.1.5 Bats

Construction activities may result in localised and short-term disturbance to bats associated with increased noise, artificial lighting and human activity within parts of the proposed project area.

The confirmed transitional bat roost located approximately 240 m from T3 will not be directly affected by construction works. Given this separation distance and the small number of bats recorded, the potential for disturbance is considered low. Nevertheless, precautionary measures will be implemented, including the avoidance of lighting spill onto the roost and adjacent commuting features, and the application of sensitive working practices where works are undertaken in the vicinity.

The retention and protection of key commuting and foraging features, including hedgerows, treelines and woodland edges, together with the implementation of a sensitive lighting strategy and ecological supervision where required, will further reduce the potential for disturbance.

Taking account of the temporary nature of construction activities, the limited spatial extent of disturbance, and the mitigation measures, no adverse effect on bats is anticipated during the construction phase and is therefore **not significant** at any geographical scale.

6.9.1.6 Aquatic Ecology

Construction-phase effects on aquatic ecology are limited to indirect effects associated with surface runoff, groundwater pathways and the potential for short-term changes in water quality. Mitigation measures set out in **Section 6.7.1.6** and in the CEMP (**Appendix 2-3**) will substantially reduce the likelihood and extent of sedimentation, accidental pollution and nutrient inputs to receiving surface waters and groundwater during construction. Particular consideration has been given to the site's karst characteristics and groundwater vulnerability. Any effects on aquatic habitats and species would therefore be localised, short-term and reversible, with no lasting alteration to habitat quality or ecological function.

As a result, residual effects on aquatic ecology during the construction phase are predicted to be minor, short-term and **not significant** at any geographical scale.

6.9.2 OPERATIONAL PHASE

During the operational phase, residual effects across ecological receptors are limited following the implementation of embedded design measures and operational mitigation. In relation to bats, potential effects associated with collision and barotrauma have been addressed through turbine siting, buffer distances and the implementation of a precautionary curtailment strategy, such that no significant residual effects are predicted.

For the proposed project overall, residual effects are limited to the unlikely occurrence of an accidental release of fuels, oils or chemicals associated with routine maintenance activities. The principal potential pathways for such effects are via surface runoff and groundwater infiltration, with embedded design measures (i.e., the operational drainage system) and additional operational mitigation (see **Section 6.7.2.1**) in place to reduce the likelihood of such events.

6.9.2.1 Designated Sites

Embedded operational measures, including the site drainage system and standard good practice in the handling and storage of fuels and chemicals, ensure that there is no pathway for contaminants to reach downstream designated sites. Accordingly, there are no residual effects on designated sites during the operational phase.

6.9.2.2 Amphibians and Reptiles

Embedded operational measures, including the site drainage system and standard good practice, ensure that there are no residual operational effects on amphibians.

6.9.2.3 Bats

Collision and Barotrauma

During the operational phase, bats may be subject to collision and barotrauma effects associated with turbine operation. These effects are most relevant to fast-flying, open-air species such as Leisler's bat. As set out in **Section 6.7.1.5** and **Appendix 6-4**, baseline surveys identified spatial and seasonal variation in bat activity across the proposed wind farm site, with higher levels of activity by collision-risk species concentrated at a limited number of turbine locations. However, embedded mitigation measures have been incorporated into the project design to address these identified risk pathways. These include turbine micro-siting to maintain separation from key commuting features, implementation of defined buffers around sensitive bat receptors, and a targeted, turbine-specific curtailment strategy focused on locations where elevated activity was recorded. Curtailment will be applied during periods of higher bat activity and lower wind speeds, informed by the evidence presented in **Appendix 6-4**.

Taking account of the distribution of bat activity, the absence of high-importance roosts within the proposed wind farm site, and the application of these mitigation measures, potential collision and barotrauma effects are predicted to be localised and of low magnitude. On this basis, no adverse residual effect on bats is anticipated during operation and is therefore **not significant** at any geographical scale.

Lighting

Artificial lighting associated with turbine operation has the potential to influence bat behaviour by illuminating commuting routes or altering local insect abundance. As demonstrated by baseline surveys (**Section 6.7.1.5** and **Appendix 6-4**), bat activity within the proposed wind farm site is primarily associated with linear landscape features, including hedgerows, treelines and woodland edges, which function as key commuting and foraging corridors.

Operational lighting has therefore been specifically designed to minimise illumination of these features. Lighting will be directional, low-spill and restricted to that required for aviation safety and essential maintenance purposes. Luminaires will be positioned and angled away from hedgerows, treelines and woodland edges, and lighting levels will be kept to the minimum necessary for site safety.

Lighting design and operation will follow recognised best-practice guidance for bats and artificial lighting (BCT and ILP, 2023). With these measures in place and given the limited extent and controlled nature of operational lighting, the potential for lighting to adversely affect bat

commuting or foraging behaviour is considered low. Therefore, no adverse residual effect on bats is anticipated and is **not significant** at any geographical scale.

6.9.2.4 Aquatic Ecology

Embedded operational measures, including the site drainage system, ensure that there are no residual operational effects on aquatic ecology.

6.9.3 Decommissioning Phase

Decommissioning phase works are set out in **Section 2.11** of **Chapter 2** Description of Proposed Project. With the implementation of mitigation measures, no significant adverse residual effects on biodiversity are predicted during the decommissioning phase. Accordingly, adverse residual effects on all IEFs during decommissioning are assessed as **not significant**.

Decommissioning will involve the removal of wind farm infrastructure and reinstatement of temporarily disturbed areas, allowing habitats to recover to their current (pre-construction) baseline condition. In addition, permanent habitat management measures included within the HMP (refer to **Appendix 6-6**), including the management of species-rich grassland and the enhancement of hedgerows, are expected to result in localised beneficial effects for biodiversity beyond the decommissioning phase when compared with the current baseline. This will result in a likely **significant** beneficial effect on all IEFs.

6.9.4 Summary of Potential Effects

Table 6-32 summarises the identified IEF, the potential effects statement of significance for each IEF during the construction phase, operational phase and decommissioning phase. It includes a summary of the proposed mitigation measures to be applied and a summary of the residual effects.

Table 6-32: Summary of potential effects, mitigation measures, and residual effects

IEFs	Project Phase	Potential Effect	Significance of Effect	Proposed mitigation	Significance of Residual Effect
Designated Sites					
Designated Sites *(Lough Corrib SAC; Shrule Turlough SAC; Rostaff Lake pNHA; Shrule Turlough pNHA; Lough Hacket pNHA; Lough Corrib pNHA)*	Construction	Indirect effects *via* surface runoff, groundwater contamination and sediment mobilisation.	Adverse, minor to moderate magnitude, significant.	Water quality protection, pollution prevention, dust control and working-area management.	No likely significant residual effect.
	Operation	Indirect effects *via* surface runoff and/or groundwater infiltration in the unlikely event of accidental spillage or welfare facility failure.	No significant effect.	N/A	No likely significant residual effect.
	Decommissioning	Indirect effects *via* surface runoff or groundwater contamination, reduced in magnitude due to limited disturbance.	Adverse, short-term, minor to moderate magnitude, significant.	Decommissioning water quality controls.	No likely significant residual effect.
Designated Sites (*Cloughmoyne SAC; Cloughmoyne pNHA)*	Construction	Indirect effects on limestone habitats including accidental contamination of surface water or groundwater pathways and dust deposition affecting exposed limestone surfaces and fissures; localised changes to soils and near-surface hydrology.	Adverse, medium-term, minor to moderate magnitude, significant.	Water quality protection, pollution prevention and working-area management. Dust mitigation measures as set out in **Section 14.5.1** of **Chapter 14**. Potentially sources of higher levels of dust, such as the deposition areas, located over 250 m from site boundary.	No likely significant residual effect.
	Operation	Indirect effects *via* surface runoff or groundwater pathways during operation.	No significant effect.	N/A	No likely significant residual effect.

IEFs	Project Phase	Potential Effect	Significance of Effect	Proposed mitigation	Significance of Residual Effect
	Decommissioning	Indirect effects on limestone pavement *via* surface runoff, sediment mobilisation and dust deposition, of lower magnitude than during construction due to minimal ground disturbance, no excavation works, and limited material use.	Adverse, short-term, minor to moderate magnitude, significant.	Decommissioning water quality controls. Dust mitigation measures as set out in **Section 14.5.3** of **Chapter 14**. Potentially sources of higher levels of dust, such as the borrow pit, located over 200 m from closest area of Annex I habitat.	No likely significant residual effect.
Habitats					
ER2, ER2/GS1, FL6, GS1, WN2/WS1	Construction	Permanent and temporary habitat loss under the proposed project footprint and working area.	No permanent or temporary habitat loss therefore no significant effect.	N/A	No likely significant residual effect.
ER2/WN2			Reduction in extent of ER2/WN2 but habitat restored to ER2. No significant effect.	Tree and shrub clearance to be undertaken following best practice methods of tree and scrub management on limestone pavement and in species-rich grasslands following best practice applied elsewhere such as on the East Burren Complex SAC (DHLGH, 2023).	No likely significant residual effect.
WN2			Permanent, adverse but minor effect that is not significant at any geographical scale.	Appointment of an appropriately qualified ECoW. Implementation of HMP (**Appendix 6-6**) including replanting and enhancement of habitats including hedgerows, tree and scrub management on limestone pavement and in species-rich grasslands following best	Temporary, adverse but minor effect, which is not significant at a local geographical scale

IEFs	Project Phase	Potential Effect	Significance of Effect	Proposed mitigation	Significance of Residual Effect
GS2, FW4, WL1, WL2			Adverse, permanent, likely significant effect at a local geographical scale or greater.	practice applied elsewhere such as on the East Burren Complex SAC (DHLGH, 2023), etc. • 5 m buffer to shrubs and trees being retained to act as root protection zones.	Short-term significant residual effect at local or regional/county geographic scale. Long-term biodiversity gain from enhancement planting and management.
BL1, HD1/WS1			Adverse, permanent significant effect at a local geographical scale.		Adverse, permanent significant effect at a local geographical scale.
HD1/GS1/HH2			Adverse, permanent likely significant effect at a county/regional scale or greater.		Long-term beneficial effect, likely significant at a county/regional scale.
All habitats	Construction	Dust deposition resulting in nutrient enrichment of low productivity habitats and/ or degradation of habitats by suppressing plant growth.	Adverse short-term moderate effect significant at a local geographical scale.	Dust mitigation measures as set out in **Section 14.5.1** of **Chapter 14**. Potentially sources of higher levels of dust, such as the borrow pit, located approximately 35 m from closest area of Annex I habitat (lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510], and over 200 m from all other Annex I habitats.	No likely significant residual effect.

IEFs	Project Phase	Potential Effect	Significance of Effect	Proposed mitigation	Significance of Residual Effect
FL6	Construction	Water quality deterioration from sediment runoff and accidental spills of fuels/oils/hydrocarbons into depositing lowland river and drainage ditches.	Negligible to Not Significant.	Water quality mitigation measures as set out in **Section 9.6.1** of **Chapter 9**. Regular monitoring of groundwater (levels and quality) using the monitoring boreholes installed onsite and any available well data immediately downgradient of turbines during the construction phase.	No likely significant residual effect.
Non-native Invasive Species	Construction	Spread of invasive plant species.	Adverse, long-term, likely significant effect at a local geographical scale.	Prevention of spread and treatment of invasive plant species. Supply sites will be audited to ensure that they do not act as a source for invasive species. Monitoring throughout operational phase to ensure no development of non-native invasive species.	No likely significant residual effect.
All habitats	Operation	Dust deposition resulting in nutrient enrichment of low productivity habitats and/or degradation of habitats by suppressing plant growth.	No significant effect	N/A	No likely significant residual effect.
All habitats	Decommissioning	As described for construction phase, however, of a lower magnitude as less vegetation clearance, no excavation works required and reduced risk of pollution, as limited use of materials in particular cement.	Adverse, short-term moderate effect significant at a local geographical scale.	As per construction phase.	No likely significant residual effect.
Terrestrial Mammals					
Badger	Construction	Direct effects as a result of loss of foraging habitat.	No significant effect.	N/A	No likely significant residual effect

IEFs	Project Phase	Potential Effect	Significance of Effect	Proposed mitigation	Significance of Residual Effect
		Disturbance and displacement associated with construction works (e.g., piling) and the presence of machinery, human activity, vegetation clearance, and temporary artificial lighting.	Short-term, adverse, minor in magnitude, significant.	• Pre-construction badger surveys undertaken by suitably qualified ecologist no more than 10-12 months in advance of construction. • Implementation of avoidance buffer areas. • Scheduling of blasting activities informed by pre-construction surveys. • Monitoring of sett activity before and during blasting. • Construction largely restricted to daylight hours. Lighting control measures where nighttime works are required. • Adherence to best practice construction measures to prevent wildlife entrapment or injury (e.g., mammal escape ramps and good housekeeping).	No likely significant residual effect
	Operation	Disturbance and displacement associated with turbines, routine servicing, and operational lighting.	No significant effect	N/A	No likely significant residual effect.
	Decommissioning	Disturbance and displacement, similar to construction phase.	As per construction phase.	As per construction phase.	No likely significant residual effect
Otter	Construction	Disturbance and displacement associated with construction works and the presence of machinery, human activity, vegetation clearance, and temporary artificial lighting.	Adverse, short-term, minor in magnitude, significant.	• Pre-construction otter surveys undertaken by suitably qualified ecologist no more than 10-12 months in advance of construction. • Implementation of avoidance measures, where required. • Construction largely restricted to daylight hours. Lighting control measures where nighttime works are required.	No likely significant residual effect

IEFs	Project Phase	Potential Effect	Significance of Effect	Proposed mitigation	Significance of Residual Effect
				• Adherence to best practice construction measures to prevent wildlife entrapment or injury.	
		Loss of suitable foraging habitat and pray availability due to water quality deterioration.	Adverse, short to medium-term, minor to moderate magnitude, significant.	• Implementation of watercourse protection and surface runoff control measures. • Adherence to best practice construction measures for water quality protection and pollution prevention.	No likely significant residual effect
	Operation	Disturbance and displacement associated with turbines, routine servicing, and operational lighting.	No significant effect.	N/A	No likely significant residual effect
		Loss of suitable foraging habitat and pray availability due to water quality deterioration.	No significant effect.	N/A	No likely significant residual effect
	Decommissioning	Disturbance and displacement, and water quality effects, similar to construction phase.	As per construction phase.	As per construction phase.	No likely significant residual effect
Pine marten	Construction	Disturbance and displacement associated with construction works and temporary artificial lighting.	No significant effect.	N/A	No likely significant residual effect
	Operation	Disturbance and displacement associated with turbines, routine servicing, and operational lighting.	No significant effect.	N/A	No likely significant residual effect
	Decommissioning	Disturbance and displacement, similar to construction phase.	No significant effect.	N/A	No likely significant residual effect

IEFs	Project Phase	Potential Effect	Significance of Effect	Proposed mitigation	Significance of Residual Effect
Other mammals	Construction	Risk of entrapment, injury, or mortality during construction works (e.g., due to open excavations).	Adverse, short-term, minor in magnitude, significant.	Adherence to best practice construction measures to prevent wildlife entrapment or injury.	No likely significant residual effect
		Loss of foraging and refuge habitat as a result of vegetation removal.	No significant effect	N/A	No likely significant residual effect
		Disturbance and displacement associated with construction works and the presence of machinery and human activity.	No significant effect	N/A	No likely significant residual effect
	Operation	Disturbance and displacement associated with turbines, routine servicing, and operational lighting.	No significant effect	N/A	No likely significant residual effect
	Decommissioning	Disturbance and displacement, similar to construction phase.	No significant effect	N/A	No likely significant residual effect
Amphibians and Reptiles					
Smooth Newt & Common Frog	Construction	Loss of suitable habitat due to water quality deterioration in the event of a pollution incident.	Adverse, short-term, minor to moderate magnitude, significant.	Adherence to best practice construction measures for water quality protection and pollution prevention.	No likely significant residual effect
	Operation	Loss of suitable habitat due to water quality deterioration in the unlikely event of a pollution incident or from surface runoff containing suspended solids.	No significant effect	N/A	No likely significant residual effect
	Decommissioning	Loss of suitable habitat due to water quality effects, similar to construction phase.	As per construction phase.	As per construction phase.	No likely significant residual effect

IEFs	Project Phase	Potential Effect	Significance of Effect	Proposed mitigation	Significance of Residual Effect
Common Lizard	Construction	Disturbance and displacement associated with construction works and the presence of machinery and human activity.	Adverse, short-term, minor to moderate magnitude, significant.	• Pre-construction checks undertaken by a suitably qualified ecologist/ECoW. • Implementation of avoidance buffer areas. • Retention of suitable refuge features in proximity to the works. • Scheduling of certain works outside of hibernation period (October to March). • Duration of open ground left exposed to be minimised. • Adherence to best practice construction measures to prevent wildlife entrapment or injury.	No likely significant residual effect
		Risk of entrapment, injury, or mortality during site vegetation clearance.	Adverse, short-term, moderate magnitude, significant at a local geographical scale.		
	Operation	No disturbance or displacement anticipated to occur.	No significant effect.	N/A	No likely significant residual effect.
	Decommissioning	Disturbance and displacement, similar to construction phase.	As per construction phase.	As per construction phase.	No likely significant residual effect.
Invertebrates					
Lepidoptera (butterflies)	Construction	Loss of a small area of suitable habitat associated with construction works.	No significant effect	N/A	No likely significant residual effect
	Operation	No disturbance anticipated to occur.	No significant effect.	N/A	No likely significant residual effect.
	Decommissioning	No disturbance anticipated to occur	No significant effect	N/A	No likely significant residual effect.

IEFs	Project Phase	Potential Effect	Significance of Effect	Proposed mitigation	Significance of Residual Effect
Bats					
Bats (all)	Construction	Loss of roosting, foraging and commuting habitat.	No significant effect.	• Retention and protection of commuting and foraging features. • In-situ protection of confirmed roost and associated habitat. • Construction-phase exclusion buffers around sensitive bat features. • Construction management measures secured through the CEMP.	No likely significant residual effect.
		Disturbance due to noise and artificial lighting.	No significant effect	• Construction controls for lighting and sensitive construction lighting design. • Construction timing restrictions, where relevant. • ECoW supervision for works undertaken near roosting features. • Construction management measures secured through the CEMP.	No likely significant residual effect.
Leisler's bat	Operation	Collision and barotrauma risk associated with turbine operation, primarily affecting Leisler's bat.	Potentially significant adverse effect at a local scale.	• Targeted, turbine-specific operational curtailment informed by baseline activity data. • Sensitive operational lighting design. • Implementation of HMP. Maintenance of bat commuting and foraging connectivity through retained and enhanced linear features.	Not significant at a local scale.
Common pipistrelle, Soprano pipistrelle, Nathusius' pipistrelle, *Myotis* species, Brown long-eared bat, Lesser horseshoe.			No significant effects.	N/A	No likely significant residual effect.

IEFs	Project Phase	Potential Effect	Significance of Effect	Proposed mitigation	Significance of Residual Effect
Bats (all)	Decommissioning	Temporary disturbance during turbine and infrastructure removal, followed by removal of collision risk and habitat reinstatement	Temporary adverse effect of minor magnitude at a local scale, followed by a beneficial effect	• Timing of works to avoid sensitive periods where practicable. • Sensitive lighting design. • Ecological supervision, where required. • Reinstatement of affected areas in accordance with the agreed restoration strategy	Beneficial effect (long-term)
Aquatic Ecology					
Aquatic receptors, including salmonids (salmon and brown trout), lamprey spp., white-clawed crayfish	Construction	Effects associated with changes to surface runoff and sediment release as a result of construction works (e.g., earthworks), machinery movement, and vegetation clearance. may temporarily reduce the availability and quality of aquatic habitat and interfere with key biological processes, including respiration, feeding and spawning in aquatic species.	Adverse, temporary to short-term, moderate to major magnitude, significant.	Adherence to best practice construction measures for water quality protection and pollution prevention.	No likely significant residual effect
		Effects associated with accidental hydrocarbon release could temporarily reduce oxygen availability, interfere with respiration and movement, and reduce the availability of suitable habitat for aquatic species.	Adverse, short to moderate-term, moderate to major magnitude, significant.		
	Operation	Indirect effects *via* surface runoff and/or groundwater infiltration in the unlikely event of accidental spillage or welfare facility failure.	No significant effect.	N/A	No likely significant residual effect

IEFs	Project Phase	Potential Effect	Significance of Effect	Proposed mitigation	Significance of Residual Effect
	Decommissioning	Effects on feeding patterns and health, and loss of suitable habitat due to water quality effects, similar to construction phase.	As per construction phase.	As per construction phase.	No likely significant residual effect.

6.10 CUMULATIVE EFFECTS

The effects on IEFs arising from the proposed project in combination with other plans or projects at various stages of planning, construction or operation were assessed to determine the potential for cumulative effects, in accordance with the methodology set out in **Chapter 1** and summarised in **Section 6.3.5.5**.

The assessment considered existing developments, consented developments, projects under construction and proposals awaiting determination at the time of writing, where these had the potential to contribute to the identified impact pathways. Particular attention was paid to developments located within the same hydrological sub catchment as the proposed project, namely the Black (Shrule) (SC_010), which could contribute cumulatively to water quality effects affecting hydrologically connected designated sites and aquatic IEFs associated with the Black River and upper Lough Corrib. Consideration was also given to plans or projects located within the foraging or commuting ranges of bat species recorded within the study area, where cumulative effects could arise through direct (e.g., mortality) or indirect pathways.

Potential pathways affecting surface water quality and ecological status have been identified as the primary plausible cumulative impact associated with the proposed project. Permanent habitat loss during the construction phase is not considered to have a cumulative effect with other plans or projects unless they fall within 300 m.

It is generally anticipated that disturbance and displacement effects on fauna, will not extend beyond a 300 m radius of construction activities. This is because noise from typical construction work is expected to decrease to levels similar to the ambient environment at approximately this distance (Cutts *et al.*, 2009).

6.10.1 OTHER WIND FARMS

As outlined in **Table 6-33**, **Chapter 1** and **Section 6.3.5.5** (which sets out the rationale for the 20 km search radius), there are eight wind farms within 20 km of the proposed wind farm site, either in operation, currently under construction, pending commencement of construction, or pending planning decision. None of these wind farms are in close proximity to the proposed wind farm site; the closest is Shancloon Wind Farm, located approximately 6.4 km northeast from the proposed wind farm site.

Table 6-33: Wind Farms within 20 km of the proposed wind farm site

Wind Farm Name (Planning reference)	No. of Turbines	Distance	Location (approx. distance from proposed wind farm site*)	Status
Shancloon Wind Farm (ACP Ref. 323699)	11	6.5 km northeast	In the townlands of Beagh, Beagh More, Cloonbar, Cloonweelaun, Cloonnaglasha, Cloonteen, Corillaun, Derrymore, Ironpool, Shancloon, Toberroe and Tonacooleen, Co. Galway	Planning permission refused on 21 September 2026
Laurclavagh Wind Farm	8	11.6 km southeast	Laurclavagh and adjacent townlands, Co. Galway	Pending planning decision

Wind Farm Name (Planning reference)	No. of Turbines	Distance	Location (approx. distance from proposed wind farm site*)	Status
(ACP Ref. 319307)				
Ardderro Wind Farm (ACP Ref. 303086)	25**	16.1 km southwest	Townlands of Ardderroo, Letter and Finnaun, Co. Galway	Operational
Knockranny Wind Farm (ACP Ref. 243094 and 318723)	11	16.3 km southwest	Knockranny, Ardderroo, Letter, Moycullen, Co. Galway	Currently under construction
Uggool Wind Farm (GCC Ref. 111735)	16	16.9 km southwest	Uggool, Co. Galway	Operational
Seecon Wind Farm (GCC Ref. 11429 and ACP Ref. 307117***)	7**	18.2 km southwest	Seecon, Finnaun, Co. Galway	Pending construction
	16**	18.3 km southwest	Seecon, Lettercraffro, Derradda,, Finnaun and Shannapheasteen, Co. Galway	Operational
Lettercraffroe Wind Farm (GCC Ref. 101454)	8	18.6 km southwes)	Lettercraffroe, Co. Galway	Operational
Cloonascragh Turbine (GCC Ref. 221175)	1	19.5 km east	Cloonascragh, Tuam, Co. Galway	Pending construction

*Measured from the boundary of the proposed wind farm site to the closest wind turbine of the wind farm considered for cumulative impacts.

**Some of which are >20 km from the proposed wind farm site.

***This application concerns nine turbines across two wind farms. The two turbines within the Cloosh Wind Farm (GCC Ref. 20198) are located >20 km from the proposed wind farm site and therefore not considered in the cumulative impacts assessment.

Potential cumulative impacts from the proposed project and other existing, planned, or proposed wind farms include:

- Downstream water quality effects within the Black (Shrule) sub catchment that, while imperceptible or not significant for the proposed project, result in a significant effect when viewed on a wider geographical basis;
- Habitat loss;
- Disturbance and displacement of fauna; and
- Collision risk to bat species.

6.10.1.1 Water Quality

The likelihood of cumulative effects arising during the construction phase of the proposed project is limited to potential changes in water quality within the Black River and associated watercourses that drain the proposed project and its surrounding environs, namely the Shancloon, Rooaunalaghta and Cloughmoyne streams. These watercourses form part of a hydrologically connected network within the Black (Shrule) sub catchment. As outlined previously, the Black River forms part of the Lough Corrib SAC, which is located 147 m from the proposed project at its nearest point and is intersected by the proposed GCR. In addition, the proposed project is hydrologically connected to a number of pNHAs and to Cloughmoyne SAC and the overlapping Cloughmoyne pNHA, which occur immediately adjacent to the proposed project boundary and are connected *via* surface water (overland flow) and groundwater pathways.

Shancloon Wind Farm (ACP Ref. PAX07.323699) is located c. 6.5 km northeast of the proposed project, also lies within the Black (Shrule) sub catchment. Planning permission for the development was refused in September 2026. However, as the decision remains subject to the statutory challenge period and potential judicial review proceedings, the project has been retained within the cumulative assessment as a reasonably foreseeable development. The development comprises the construction of 11 no. wind turbines, together with associated infrastructure including access tracks, a meteorological mast, substation, GCRs and TDR, as well as associated drainage and sediment control measures such as interceptor drains, cross drains, settlement ponds and swales.

The EIAR and NIS accompanying Shancloon Wind Farm identify the potential for construction activities, including turbine hardstand and access track construction, to give rise to runoff or infiltration of sediments, hydrocarbons and cementitious materials to drains and watercourses draining the site. In the absence of mitigation, such effects could result in adverse effects on aquatic habitats, fisheries and hydrologically connected designated sites. However, having regard to the implementation of appropriate buffer distances from principal watercourses (i.e., 50 m) and comprehensive water quality protection measures, and a responsive water quality monitoring programme with corrective actions implemented where required, cumulative effects on aquatic receptors and hydrologically connected designated sites arising from the proposed project in combination with Shancloon Wind Farm are assessed as **not significant** at any geographical scale.

6.10.1.2 Habitat Loss

Potential direct construction-phase adverse effects include land take associated with the construction of wind farm infrastructure, including turbine hardstands, access tracks, temporary construction compounds, the proposed 110 kV substation, cable trenches, deposition areas and any borrow pit works, together with the removal of sections of hedgerows to facilitate construction and the establishment of bat buffer zones. The dominant habitat type affected within the proposed project area is improved agricultural grassland (GA1), which is of limited ecological value, and therefore the permanent loss of this habitat is not expected to be ecologically significant in isolation. There will be a limited amount of Annex I habitat loss comprised of a habitat mosaic with [4030] European dry heaths and [6210] Semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (approximately

0.28 ha before any habitat reinstatement) and [6510] Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) (approximately 0.11 ha before habitat reinstatement).

While some loss and fragmentation of hedgerows and treelines will occur, these features are relatively localised in extent within the wider agricultural landscape. Cumulative effects could arise where similar land-take pressures occur in combination with other existing or proposed developments in the area; however, given the low ecological value of the primary habitats affected and the limited spatial extent of hedgerow removal, cumulative effects associated with land take and habitat loss are assessed as minor and **not significant** at any geographical scale.

6.10.1.3 Habitat Degradation

Dust deposition has the potential to impact the IEF habitats present. **Chapter 14**, **Section 14.7** sets out that the cumulative construction dust impacts may occur if large-scale developments within 500 m of the proposed wind farm site are under construction simultaneously.

A review of the planned and permitted projects (conducted in **Chapter 14**) within the vicinity of the proposed wind farm site was undertaken to identify developments with the potential for cumulative construction phase impacts. Similarly, cumulative dust impacts may occur where developments within 500 m of the proposed wind farm site are under construction or decommissioning (i.e. dust generating phases) simultaneously with the decommissioning phases of the proposed project. There were no developments that were identified of sufficient scale to potentially generate cumulative dust impacts with the proposed.

The dust mitigation measures outlined in **Section 14.5.1** will be applied during the construction phase which will avoid significant cumulative effects on air quality. Similar dust mitigation measures are required for other permitted developments as per their respective impact assessments and planning conditions.

With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction and decommissioning phases of the proposed project is ***short-term, direct, adverse*** and ***not significant***.

No significant cumulative effects on air quality are predicted for the construction or operational phases.

6.10.1.4 Bats

The potential for cumulative effects on bats has been considered in relation to other wind energy developments As identified in **Table 6-33**, Shancloon Wind Farm is the nearest wind energy development to the proposed project. All other wind farms considered in the cumulative assessment are located beyond the species-specific Core Sustenance Zones (CSZs) of the bat species recorded within the proposed project. Furthermore, the separation distance between the proposed project and Shancloon Wind Farm (approximately 6.5 km) exceeds the CSZs identified for all bat species recorded during the baseline surveys (see **Table 6-11**). Consequently, there is no likely overlap between the core foraging ranges or CSZs of bat populations associated with the proposed project and those associated with any other wind farm included within the cumulative assessment.

In addition, no regionally or nationally significant bat roosts or population centres have been identified within or near the proposed project that would give rise to shared CSZs extending across both developments. As such, the potential for cumulative effects on roosting or foraging

bats is considered low. Regarding migratory species such as Nathusius's pipistrelle, the proposed wind farm site is not located within a recognised migration corridor, and recorded activity levels for this species were low. Furthermore, the implementation of operational mitigation measures, including curtailment during periods of peak bat activity, will reduce the potential for collision risk at both a site-specific and cumulative level.

On this basis, having regard to the separation distances presented in **Table 6-33**, the absence of overlap between the species-specific CSZs of the bat species recorded at the proposed project and any other wind energy developments considered in the cumulative assessment, and the implementation of operational mitigation measures, cumulative effects on bats arising from the proposed project in combination with other wind energy developments in the wider area are assessed as **not significant**.

6.10.2 OTHER DEVELOPMENTS

Table 6-34 presents other notable projects within 20 km of the proposed project (see **Section 6.3.5.5** for rationale) that were considered in the cumulative effects assessment. Particular attention was given to developments located within the Black (Shrule) sub catchment, where there is potential for overlapping effects on water quality within the Black River, associated watercourses, and upper Lough Corrib.

Smaller-scale developments located within 2 km of the proposed project were screened out of the cumulative assessment on the basis of their limited scale, separation distance, and the absence of plausible overlapping effects. Following this initial screening, the majority of the remaining developments assessed were residential in nature. These developments are generally located within existing urban and semi-urban environments and are situated >400 m from any nearby watercourses. Even where construction activities associated with these developments were to occur concurrently with the proposed project, the potential for cumulative effects would not be significant at any geographical scale.

Immediately adjacent to the northern edge of the proposed wind farm site is an active commercial quarry. Planning permission allows for the extraction of rock to an elevation of 25 m OD over an area of 2.6 ha and further permission to extract rock by blasting methods to an elevation of 25m OD over an area of 0.87 ha within the existing quarry boundary. The operation of the quarry has the potential to increase the cumulative impact on sensitive receptors.

The quarry currently undertakes blasting on an infrequent basis, typically up to four times per year. Blasting and working on rock in the quarry will result in elevated dust levels, which in combination with those generated as a result of the proposed development, may impact sensitive receptors within the proposed wind farm site. In areas close to the quarry these would include both [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) and [6510] lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*). Cumulative impact on water quality consideration for [3180] turloughs* also has to be evaluated. Operational mitigation measures described in **Section 9.6** of **Chapter 9** and **Section 14.5** of **Chapter 14** will reduce the cumulative impact. On this basis, cumulative effects on habitats arising from the proposed project in combination with quarry activities in the wider area are assessed in the absence of mitigation due to the relatively high sensitivity of the Annex I habitats, dust effects are predicted to be direct, short-term, **moderately adverse**. However, once construction is completed and the temporary access road to the quarry to the north of the proposed wind farm has been removed the separation of

activities between project will exceed the 50 m assessment criteria (as set out in **Chapter 14**) for sensitive habitats, Therefore, during the operational phase there would not be a cumulative effect between projects on any single area.

Construction of the proposed project will also require occasional blasting associated with rock extraction at the borrow pit and, where necessary, at turbine foundation locations. As a result, there is potential for temporary cumulative disturbance to noise- and vibration-sensitive fauna, including badger. However, blasting at the adjacent quarry is infrequent, typically occurring up to four times per year, and blasting associated with the proposed project will, insofar as practicable, be coordinated with the quarry operator to coincide with scheduled quarry blasting events. This will avoid extending the overall frequency of disturbance events within the wider area. This, together with mitigation measures set out for badger, including timing restrictions on blasting to avoid the breeding season, will reduce any cumulative disturbance effects.

An approved waste recovery facility is located 14 m north of the proposed wind farm site. This facility provides for the acceptance and processing of up to 5,000 tonnes per annum of construction and demolition waste, including concrete, brick, tile, soil and stone, for the production of recycled aggregates. The facility is located within the footprint of an adjoining operational quarry and forms part of the existing baseline land use. It is therefore not expected to introduce additional cumulative effects beyond those already associated with the established quarry operations.

Other identified developments include works associated with the Castlebar – Dalton 110 kV overhead line, involving the replacement or upgrade of existing masts. These works are located at a minimum distance of c. 620 m from the proposed project and are not of a scale or proximity that would give rise to overlapping effects.

The Therapeutic Village development at Lislaughera, Cong, Co. Mayo (ACP Ref. PL16.321245), located adjacent to the Lough Corrib, was also considered. Potential effects relating to water quality, including runoff, sediment mobilisation and accidental pollution pathways, are addressed through the mitigation measures set out in accompanying Ecological Impact Assessment (EcIA) and NIS, such that significant cumulative effects are not anticipated.

Overall, having regard to the nature, scale and spatial distribution of the other developments identified above, and the limited potential for overlapping effects, these projects are not expected to result in significant cumulative effects in combination with the proposed project.

Table 6-34: Projects with the potential for in-combination effects with the proposed project

Planning Ref. no.	Description of development	Location [approx. distance from proposed project]*	Status	Grant Date	Reason for inclusion
MCC 22970	Retention permission for the extraction of rock over an area of 2.6ha and further permission to extract rock by blasting methods over an area of 0.87ha within the existing quarry boundary.	[Immediately adjacent north]	Approved. Operational.	01/10/2024	Proximity to proposed project and potential impact on water and air quality.
MCC 24510	Waste recovery facility for the acceptance, recovery and processing of up to 5,000 tonnes per annum of construction and demolition (C&D) waste, including concrete, brick, tile and soil and stone to produce recycled aggregates for export and use in the construction industry.	Carrowoughteragh, Shrule, Co. Mayo [14 m north]	Approved. Status of construction unknown.	06/02/2025	Proximity to proposed project.
MCC 2560928	For works to uprate the existing Castlebar-Dalton 110 kV overhead line (OHL) (27.8 km in length, with a total of 144 no. supporting structures). The proposed development will comprise, amongst other works, the replacement ("restringing") of the existing OHL circuit conductor wires with a new higher capacity conductor between substations; the replacement of some structures; the strengthening of some tower foundations; painting of some towers; associated temporary site development works to gain access to the existing structures; etc.	Existing Castlebar - Dalton 110 kV overhead power line, See Particulars for multiple townlands, Co. Mayo [1.4 km northwest]	Approved. Status of construction unknown.	12/02/2026	Proximity to river within the same sub-catchment
GCC 2461601	Construction of 65 no. residential dwellings, one 2-storey duplex building, and a single storey creche building with associated play area, bin store, parking and set down areas. The development also includes, amongst other proposed elements and ancillary works, the provision of public and private open spaces, bicycle and car parking, landscaping and boundary treatments, public lighting, connection to services, surface water drainage works residential carparking, road works, ESB substation, etc.	Headford, Cong Road, Co. Galway [3.2 km south]	Approved. Status of construction unknown.	18/07/2025	Proximity and potential hydrological connectivity

Planning Ref. no.	Description of development	Location [approx. distance from proposed project]*	Status	Grant Date	Reason for inclusion
GCC 201353 ACP 310697	Construction of 54 no. dwelling units, car-parking and all associated services.	Headford, Co. Galway [3.6 km southeast]	Under construction, partly operational	17/12/2021	Unlikely connectivity, but within same catchment and <500 m from river.
GCC 2460556 ACP 320253	Revisions to a housing development previously permitted under GCC 212388. The development will consist of the construction of seven additional houses; variation of conditions; provision for bin storage collection points; connection to services, and all associated site works.	Eallagh, Headford, Co. Galway [3.9 km southeast]	Approved. Status of construction unknown.	01/05/2025	Unlikely connectivity, but within same catchment and <500 m from river.
GCC 25125	Extension of duration for permission to construct 21 no. residential units, including connection to services, the provision of a temporary construction site access route, site compound, and all ancillary site services.	Headford, Co. Galway [4.2 km southeast]	Under construction.	12/06/2025	Unlikely connectivity, but within same catchment and <500 m from river.
MCC 2560545	Construction of 12 no. residential units, including the provision of landscaped public open space, play areas, public lighting, connection to services, and all associated site works.	Ballymacgibbon North, Cross, Co. Galway [5.8 km northwest]	Pending decision.	N/A	Given proximity to river, with potential to effect northern half of lake in particular.
MCC 2460297 ACP 321245	Amendment to P17/585 (subject to an extension of duration granted under P17/5850) for the development of a therapeutic village to provide respite facilities and all associated site works.	Lislaughera, Cong, Co. Mayo. [7.5 km northwest]	Under construction.	03/07/2025	Potential impact on water quality in upper Lough Corrib.
*Measured from the closest element of the proposed project, including the GCR.					

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