6 BIODIVERSITY

6.1 INTRODUCTION

6.1.1 Background

This chapter of the Environmental Impact Assessment Report (EIAR) assesses the effects of the Development on biodiversity. Furthermore, where negative effects are predicted, the chapter identifies appropriate mitigation strategies therein. The assessment considers the potential effects during the following phases of the Proposed Development:

- Construction of the Proposed Development
- Operation of the Proposed Development
- Decommissioning of the Proposed Development (final phase)

The Proposed Development refers to all elements of the application for the construction and operation of the proposed Gortloughra Wind Farm (**Chapter 2: Development Description**). A Construction Environmental Management Plan (CEMP) is appended to the EIAR in **Appendix 2.1**. The CEMP will be further developed post consent/pre-construction once a contractor has been appointed and will cover the construction of the Proposed Development. It will include all of the mitigation recommended within the EIAR (see section 6.7). For the purpose of this application, a summary of the mitigation measures is included in **Appendix 18.1.** In addition, a Habitat Management Plan (Draft HMP) is appended to the EIAR in **Appendix 6.5.**

The potential for the Proposed Development to have adverse effects on the integrity of any designated European Sites has been assessed within a Natura Impact Statement (NIS).
Common acronyms used throughout this EIAR can be found in **Appendix 1.4.**
This chapter of the EIAR is supported by Figures provided in **Volume III** and the following l Appendices documents provided in **Volume IV** of this EIAR:

- **Appendix 6.1**: Statement of Authority
- **Appendix 6.2**: Bat Survey 2020/2021 Report
- **Appendix 6.3**: Target Note Survey Results 2021 – 2025
- **Appendix 6**.4: Fish Population Assessment
- **Appendix 6.5**: Habitat Management Plan

This Chapter includes the following elements:

- **6.1 Introduction**
- **6.2 Overview of the Development**

- **6.3 Assessment Methodology and Significance Criteria**
- **6.4 Baseline Description**
- **6.5 Existing Ecological Baseline**
- **6.6 Assessment of Potential Environmental Effects**
- **6.7 Mitigation Measures**
- **6.8 Monitoring**
- **6.9 Residual Effects of the Development**

6.1.2 Scope

Doherty Environmental Consultants (DEC) Ltd. was commissioned by Jennings O'Donovan (JOD), on behalf of Gortloughra Windfarm Limited to undertake an ecological impact assessment of the Proposed Development to inform the Biodiversity Chapter of an Environmental Impact Assessment Report (EIAR). The scope of this work is set out in further detail in Section 6.3. This Chapter has been prepared by Mr. Pat Doherty, BSC, MSc, MCIEEM of DEC Ltd.

6.1.3 European and International Legislation

6.1.3.1 Council s Directive 92/43/EEC on the conservation of natural habitats and wild fauna and flora ("the Habitats Directive"

The Habitats Directive provides the basis of protection for Natura 2000 sites, namely Special Protection Areas ("SPAs") and Special Areas of Conservation ("SACs"). Article 6 of the EU Habitats Directive requires that any proposal that is likely to have a significant effect on any Natura 2000 site in view of its conservation objectives, individually or in combination with other projects must be subject to an Appropriate Assessment. An Appropriate Assessment is required in order to ascertain the potential impact of a proposal on the reasons for which the site is designated and thereby ascertain the potential for adverse effect on the integrity of the site. An NIS has been prepared. This concludes that the Proposed Development will not, adversely affect the integrity of any European Site (Natura 2000 site).

The Habitats Directive also provides for the protection of species listed under Annex IV of the Directive wherever they occur. These species include otter and all bat species.

6.1.3.2 The Habitats Directive is transposed into Irish law inter alia by Part XAB of the Planning and Development Act 2000 as amended. EU Birds Directive

Directive 2009/147/EC on the conservation of wild birds (codified version) ("the Birds Directive") establishes a system of general protection for all wild birds throughout the European Union. Annex I of the Birds Directive comprises 175 bird species that are rare, vulnerable to habitat changes or in danger of extinction within the European Union. Article 4 establishes clearly that wherever those species occur, they must be the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in the area of distribution. Similar actions must be taken by Member States regarding migratory species, even if they are not listed in Annex I.

6.1.3.3 Bern and Bonn Convention

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982) exists to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries.

6.1.3.4 EU Water Framework Directive 2000/60/EC

The Water Framework Directive (WFD), which was passed by the European Union (EU) in 2000, and came into legal effect in December 2015, is wide-reaching legislation which replaces a number of the other water quality directives (for example, those on Water Abstraction) while implementation of others (for example, The Integrated Pollution Prevention and Control and Habitats Directives) will form part of the 'basic measures' for the Water Framework Directive. The fundamental objective of the Water Framework Directive aims at maintaining "high status" of waters where it exists, preventing any deterioration in the existing status of waters and achieving at least "Good" in relation to all waters by 2027 (WFD).

6.1.3.5 UN Convention on Biological Diversity (CBD)

The CBD entered into force on 29 December 1993. It has 3 main objectives: 1. The conservation of biological diversity. 2. The sustainable use of the components of biological diversity. 3. The fair and equitable sharing of the benefits arising out of the utilization of genetic resources. National Legislation.

Parties to the CBD are required to submit a National Biodiversity Action Plan and report annually on the status of biodiversity and measures to address and reverse loss of

biodiversity. Ireland's National Biodiversity Strategy and Action Plan (2017-2021) was submitted December 2017.

6.1.3.6 The Wildlife Act (1976) as amended and associated Regulations

The Wildlife Act 1976 gives protection to a wide variety of birds, animals and plants in Ireland. It is unlawful to disturb, injure or damage their breeding or resting place wherever these occur without an appropriate licence from National Parks and Wildlife Service (NPWS). The Act (as amended in 2000) protects all birds, their nests and eggs. Wilful destruction of an active nest from the building stage until the chicks have fledged is an offence. The Act also provides a mechanism to give statutory protection to Natural Heritage Areas (NHAs). The amendment in 2000 broadens the scope of the Wildlife Acts to include most species, including the majority of fish and aquatic invertebrate species which were excluded from the 1976 Act.

6.1.3.7 EC (Birds and Natural Habitats) Regulations 2011

The Habitats Directive is transposed into Irish law inter alia through the EC (Birds and Natural Habitats) Regulations 2011.

Annex IV of the Habitats Directive provides protection to a number of named species wherever they occur. These species are protected inter alia under Regulations 27, 29 and 51 of the Habitats Regulations 2011.

6.1.3.8 Planning and Development Act 2000, as amended

For the purposes of an application for planning permission the protection of biodiversity is provided for in the 2000 Act, as amended, and the Planning and Development Regulations 2001, as amended, which transpose provisions of the Habitats and Birds Directives.

6.1.3.9 Flora (Protection) Order (FPO), 2022

The current list of plant species protected by Section 21 of the Wildlife Act, 1976 is set out in the Flora (Protection) Order, 2022, which supersedes orders made in 1980, 1987, 1999 and 2015.

It is illegal to cut, uproot or damage the listed species in any way, or to offer them for sale. This prohibition extends to the taking or sale of seed. In addition, it is illegal to alter, damage or interfere in any way with their habitats. This protection applies wherever the plants are found and is not confined to sites designated for nature conservation.

6.1.3.10 The European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. 272 of 2009) and as amended

The regulations establish legally binding quality objectives for all surface waters and environmental quality standards for pollutants for purposes of implementing provisions of E.U. legislation on protection of surface waters. These regulations clarify the role of public authorities in the protection of surface waters and also concern the protection of designated habitats.

6.1.3.11 European Union Environmental Objectives (Freshwater Pearl Mussel) (Amendment) Regulations 2009 to 2018

The purpose of these Regulations is to support the achievement of favourable conservation status for freshwater pearl mussels. To that end, they:

(a) Set environmental quality objectives for the habitats of the freshwater pearl mussel populations named in the First Schedule to these Regulations that are within the boundaries of a site notified in a candidate list of European sites, or designated as a Special Area of Conservation, under the European Communities (Natural Habitats) Regulations, 1997 (S.I. No. 94/1997).

(b) Require the production of sub-basin management plans with programmes of measures to achieve these objectives.

(c) Set out the duties of public authorities in respect of the sub-basin management plans and programmes of measures.

6.1.4 Policy

6.1.4.1 National Biodiversity Action Plan

Ireland's 4th National Biodiversity Action Plan (NBAP) sets the national biodiversity agenda for the period 2023-2030 and aims to deliver the transformative changes required to the ways in which we value and protect nature.

The 4th NBAP strives for a "whole of government, whole of society" approach to the governance and conservation of biodiversity. The aim is to ensure that every citizen, community, business, local authority, semi-state and state agency has an awareness of biodiversity and its importance, and of the implications of its loss, while also understanding how they can act to address the biodiversity emergency as part of a renewed national effort to "act for nature".

This National Biodiversity Action Plan 2023-2030 builds upon the achievements of the previous Plan. It will continue to implement actions within the framework of five strategic objectives, while addressing new and emerging issues:

- Objective 1 - Adopt a Whole of Government, Whole of Society Approach to Biodiversity
- Objective 2 - Meet Urgent Conservation and Restoration Needs
- Objective 3 - Secure Nature's Contribution to People
- Objective 4 - Enhance the Evidence Base for Action on Biodiversity
- Objective 5 - Strengthen Ireland's Contribution to International Biodiversity Initiatives

Of the above objectives, Objective 3 has particular relevance for planning and development. Outcome 3c sets out a number of actions and targets that aim to facilitate and secure biodiversity's contribution to people. Outcome 3C1 sets out an action for all Public Authorities and private sector bodies to move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure.

6.1.5 Local Policy

The Cork County Development Plan 2022 – 2028 came into effect on the 6th June 2022. Chapter 15: Biodiversity and Environment, of the County Development Plan sets out Policies and Objectives for Biodiversity. The overarching policy set out in the County Development Plan (County Development Plan) is outlined in Objective BE 15-1: Support and comply with national biodiversity protection policies.

Objective BE 15-2 seeks to protect natural heritage sites which are designated or proposed for designation under European/National legislation and International Agreements. This objective also seeks to protect statutorily protected flora as well as areas of local biodiversity value, ecological corridors and habitats that are features of the County's ecological network. This network includes rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands as well as coastal and marine habitats. It particularly includes habitats of special conservation significance in Cork as listed in Volume 2 of the Plan.

Objective BE 15-6 sets out the provision for the protection and enhancement of biodiversity in the development management process.

6.1.6 Guidance

6.1.6.1 Appropriate Assessment of Plans and Projects in Ireland – Guidance for Local Authorities (2010)

The 'Appropriate Assessment of Plans and Projects in Ireland – Guidance for Local Authorities' ("the Appropriate Assessment Guidance")[1] provides methodological and legislative guidance on Appropriate Assessment for any developments that may impact on Natura 2000 sites in Ireland. These guidelines are highly relevant in assessing the potential impact on Natura 2000 sites.

6.1.6.2 CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal

The 'CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine'[2] (the CIEEM Guidelines"), published by the Chartered Institute of Ecology and Environmental Management ("CIEEM"), are the acknowledged reference on ecological impact assessment and reflect the current thinking on good practice in ecological impact assessment across the UK and Ireland. They are consistent with the British Standard on Biodiversity, which provides recommendations on topics such as professional practice, proportionality, pre-application discussions, ecological surveys, adequacy of ecological information, reporting and monitoring. These CIEEM Guidelines have the endorsement of the Institute of Environmental Management and Assessment ("IEMA"), the Chartered Institute of Water and Environmental Management (CIWEM), Northern Ireland Department of the Environment (DoeNI), Scottish Natural Heritage (SNH), The Wildlife Trusts and other leading environmental organisations.

6.1.6.3 Guidelines on the information to be contained in Environmental Impact Assessment Reports

The Environmental Protection Agency (EPA) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports', which were published in 2022, were prepared in accordance with the 1992 Environmental Protection Agency Act (Section 72), which requires the EPA to prepare guidelines on information to be contained in environment impact assessment reports.

[1] Department of Environment, Heritage and Local Government (2010) Appropriate Assessment of Plans and Projects in Ireland – Guidance for Local Authorities – Available at: https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf (Accessed March 2023).

[2] CIEEM (2018 v 1.1) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester. Version 1.1. Updated September 2019 – Available online at: https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-Sept-2019.pdf (Accessed March 2023).

The Guidelines have been drafted with the primary objective of improving the quality of EIARs with a view to facilitating compliance with the EIA Directive (Directive 2014/52/EU). By doing so they contribute to a high level of protection for the environment through better informed decision-making processes. They are written with a focus on the obligations of developers who are preparing EIARs.

The Guidelines are also intended to provide all parties in the EIA process, including competent authorities (CAs), with an authoritative reference to be regarded when considering an EIAR.

6.2 OVERVIEW OF THE DEVELOPMENT

The Proposed Development will comprise of the following main components:

- Erection of eight wind turbines with an overall ground to blade tip height of 175 m consisting of a rotor diameter of 150 m; and a hub height of 100 m.
- Construction of permanent Turbine Hardstands and Turbine Foundations.
- Construction of one temporary Construction Compound with associated temporary site offices, parking areas and security fencing.
- Installation of a meteorological mast with a height of 100m.
- Development of one on-site Borrow pit.
- Construction of new permanent internal site access roads and upgrade of existing internal site access roads to include passing bays and all associated drainage infrastructure.
- Development of a permanent internal site drainage network and sediment control systems.
- All associated underground electrical power and communications cabling connecting the wind turbines to the on-site substation.
- Biodiversity enhancement measures.
- Recreational community improvements including the erection of 4 No. permanent information boards relating to cultural heritage and upgrades to amenity tracks across the site.
- All associated site development works.

A 15-year planning permission and 40-year operational life from the date of commissioning of the entire wind farm is being sought.

6.3 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

Ecology surveys of the Site were undertaken following specific guidelines for habitats and species as outlined in the following sections, and with reference to the legislation and policy outlined in **Section 6.2.**

The importance of the habitats and species present is evaluated using the guidance document Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal, and Marine published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018 v.1.1). This document outlines an accepted approach for the evaluation of potential impacts from such developments.

6.3.1 Desktop Survey

A desktop assessment was carried out to collate available information on the ecological baseline of the proposed land-holding and surrounding area. Consultation was undertaken with current landowners as well as relevant statutory and non-statutory agencies. In addition to the above the following research was also undertaken:

- A review of the National Biodiversity Database Centre (NBDC) to identify the presence or otherwise of protected species occurring within close proximity to the proposed Site;
- A review of the NPWS online database to identify the presence or otherwise of designated conservation areas (i.e. SPAs, SACs, NHAs etc.);
- A review of Site-specific Conservation Objectives (SSCO) mapping, published by the NPWS, for SACs and SPAs;
- A review of EPA water quality data, on-line mapping and catchment information;
- A review of relevant Inland Fisheries Ireland (IFI) reports;
- A review of the online Bat Conservation Ireland Batlas;
- A review of the New Atlas of the British and Irish Flora (Preston et al., 2002);
- Review of aerial photography, satellite imagery and historical mapping for the proposed Site.

6.3.1.1 Existing Ecological Records

The NPWS and NBDC were consulted in order to establish historic records of important and protected species, or the likelihood of their occurrence (through range information).

Important and protected species includes those identified in the Wildlife Act (as amended), listed under the FPO, and in the EU Habitats and Birds Directive.

Records for bird species are not included here, and have been dealt with in **Chapter 7: Ornithology**.

NBDC collects and manages biodiversity data for the island of Ireland and incorporates data from a number of different sources. The NBDC records were reviewed to inform this assessment. An area of search was used to collate all records held for the Site and a surrounding buffer area of 2km. A 2km distance was set as this buffer area will provide adequate coverage for all terrestrial non-volant mammal species, invertebrate species and flora species that may be sensitive to the Proposed Development. For instance, terrestrial mammals species are sensitive to Proposed Development activities to a distance of c. 150m from the source of the activity (NRA, 2007). The area of search is shown on **Figure 6.1**. A wider search area was used to collate records for bat species in the surrounding area. All records for bat species held for the hectad S10 were explored. A Data Information Request was issued to the NPWS for all protected species records occurring within the area of search shown on **Figure 6.1**.

6.3.1.2 Consultations

Scoping letters were issued to the list of stakeholders outlined in **Chapter 1: Introduction**. In relation to this Biodiversity chapter, consultation responses have been received from the National Parks and Wildlife Service (NPWS) / Development Applications Unit (DAU), Inland Fisheries Ireland (IFI), the Irish Peatland Conservancy Council (IPCC) and An Taisce. A summary of the responses received is provided in **Table 6.1**. These responses are provided in full in **Appendix 1.3** of this EIAR.

Table 6.1: Biodiversity Consultation Conducted to Inform the Development

Consultee	Response Details
DAU / NPWS	• Thorough understanding of White-tailed Sea eagle (as well as other bird species vulnerable to collision) activity and densities in the vicinity of the wind farm site • Concerns regarding the potential loss and/or degradation of blanket bog, wet heath, dry heath, Molinia meadows and other peatland habitats arising from the overall wind farm proposal. • Any losses of biodiversity habitat associated with this proposed development (including access roads and cabling etc.) such as woodland, scrub, hedgerows and other habitats should be mitigated for. In addition, Annex I habitats which occur outside the Natura 2000 network are important in terms of biodiversity conservation. The presence of any Annex I habitats outside the network should be given due consideration as part of the consideration of biodiversity matters generally for the proposed development. The loss of Annex I habitats outside SACs should be avoided. It should be noted in this regard that the site contains potential annexed habitat such as the peatland types listed above and in addition assessments of potential effects on Lough Nambrackaderg should also evaluate its potential EU Annex I habitat status. • Wetlands are important areas for biodiversity and ground and surface water quality should be protected during construction and operation of the proposed development. The EIAR should

Consultee	Response Details
	include a detailed assessment of the hydrological impacts on wetlands from the proposed development. • Construction work should not be allowed to impact on water quality and measures should be detailed in the EIAR to prevent sediment and/or fuel runoff from getting into watercourses which could adversely impact on aquatic species.
IFI	**2021 Scoping:** The site of the proposed development appears to encompass the upper Bandon, Owvane and Bealaphadeen Rivers and their tributaries, significant salmonid fisheries. In this context IFI would ask that the following requirements should be taken into consideration. There should be no drainage or other physical interference with the bed or bank of any watercourse without prior consultation with IFI. Suspended solids and or hydrocarbon contaminated site run-off waters must be controlled adequately so that no pollution of surface waters can occur. More specifically IFI feels the following issues should be addressed i. Identifying and zoning the project for environmental impact should a peat slip occur ii. Setting out contingency plan should a peat movement occur. iii. Setting out a plan for the control of silt in such a scenario, including measures to be put in place at the initial stages of construction. In the event of any watercourse crossings being bridged or culverted the following general criteria should apply, (i) The free passage of fish must not be obstructed. (ii)The original slope of the river bed should be maintained with no sudden drops on the downstream side. Design details on any proposed crossing should be incorporated at planning stage (iii) Bridges are preferable to culverts. (v) All instream works should be carried out only in the May-September period. IFI would ask that the scoping study should include an electrofishing survey of an watercourse on which it is proposed to construct a crossing. **2024 Scoping:** Reference to IFI "Guidelines on protection of fisheries during construction works in and adjacent to waters" available at https://www.fisheriesireland.ie/media/guidelines-on-protection-of-fisheries-during-construction-works-in-and-adjacent-to-waters More specifically the following should apply 1. Instream works should be limited to the period July to September inclusive. 2. All necessary measure should be taken to prevent the entry of polluting matter to waters. 3. It is desirable that the works should be undertaken in the dry. 4. The works should be designed and undertaken in a manner so as not to obstruct fish passage. • If you revert when specifics and a method statement are available for any instream works we can discuss in more detail.

Consultee	Response Details
IPCC	Advise that the developer planning construction in, or within close proximity to peatland habitat to be familiar with the Environmental Protection Agency funded project BOGLAND (www.ucd.ie/bogland). This project recommends the best practice guidelines to ensure no damaging development occurs on, or affects peat soils and peatlands of conservation value. Identified a number of designated sites within the proximity of the proposed wind farm which need to be given due attention in ascertaining the impacts to biodiversity from the proposed project. The Irish Peatland Conservation Council have identified a number of designated sites within the proximity of the proposed windfarm which need to be given due attention in ascertaining the impacts to biodiversity from the proposed project. In particular, developments have the potential to disrupt the hydrology of peatland and even small impacts to the water table may have disastrous consequences for specialised peatland species that live within minimal ranges of chemical and hydrological limits, such as the Vertigo whorl snails. Developers need to ensure that their project in no way affects the integrity of the habitats and qualifying interests including species of the designated sites. Peatlands are naturally nutrient poor and the excessive loads can decimate botanical species Peatlands are susceptible to invasive species when they are drained and/or degraded as when the peat dries out it allows species which would not normally survive in the wet acidic conditions to take hold. Wetland Surveys Ireland (***www.wetlandsurveysireland.com***) have identified a number of wetlands which have had or need to have an ecological survey to ascertain the biodiversity and ecological value within them.

6.3.2 Site Investigations Undertaken

6.3.2.1 Habitat Survey

Habitat surveys have been carried out at the Site between July 2021 and March 2025. Habitat surveys were carried out to identify, describe, map and evaluate habitats and to verify information gathered at the desk study stage. The habitat surveys were completed on the 2nd & 3rd July, 2021; 31st July, 2021; 19th July, 2023; 23rd February 2023; 24th February 2024; March 2025.

ArcGIS and ESRI Field Maps were used to collect information on vegetation and habitats during the habitat surveys. A preliminary habitat map was drawn using ArcMap following the completion of the initial habitat survey completed on the 2nd and 3rd July 2021. The preliminary habitat map was then further interrogated during subsequent habitat and vegetation community surveys between 31st July 2021 and 4th March 2025.

6.3.2.2 Vegetation Community Surveys

The Irish Vegetation Classification (IVC) has been developed as a collaboration between the NPWS, BEC Consultants and the NBDC over a series of phases commencing in 2015 when the vegetation community classification for the grassland division was completed

along with the development of the ERICA[3] analysis tool and associated hosting website. Since 2015 community classifications have been completed for woodlands, heaths, bogs, fens, mires, rocky habitat as well as other community divisions.

The IVC now provides a comprehensive and systematic catalogue and description of the plant communities of Ireland. The IVC is a system of classifying natural plant communities in Ireland according to the species they contain and provides a standardised methodology for detailed environmental assessments. The methodology is repeatable and incorporates the use of quadrat and/or target note sampling within which the types and relative abundance of plant species is recorded. From these results, plant community types can be classified.

Detailed target note surveys to identify IVC plant communities and sub-communities were completed in areas of semi-natural habitat occurring within the Site. These include peatland and heathland, dry acid grassland, wet grassland and poor fen and flush habitats.

The Study Area covered by the IVC survey is shown in **Figure 6.2**. A digital camera was used to take representative photographs of the Site and vegetation communities. Vegetation recorded at each quadrat/target note location was analysed using ERICA software.

The target notes that were chosen to represent the range of plant communities found within and surrounding the Site area are mapped in **Figure 6.2**. Due to the complexity of the Site, ground-truthing aerial imagery as well as the initial habitat Surveys were used in combination with the results of the IVC surveys to delineate habitat and community boundaries to enable mapping to be produced to the highest possible degree of accuracy. Plant species were identified and recorded using the keys and nomenclature of Stace (2010) for higher plants and Atherton *et al*. (2010) for bryophytes (mosses and liverworts). IVC communities were recorded by taking detailed target notes of representative samples of vegetation communities. Each location was given a 'TN' number, as indicated in the tables in **Appendix 6.3**. Plant species abundances were made using the DAFOR scale, as defined below.

DAFOR definitions, where applied, are as follows:

- Dominant

[3] ERICA - Engine for Releves to Irish Communities Assignment: https://biodiversityireland.shinyapps.io/vegetation-classification [Accessed: March 2023]

- Abundant
- Frequent
- Occasional
- Rare

6.3.2.3 Aquatic Surveys

Macroinvertebrates & Biological Water Quality

Biological macro-invertebrate surveys were completed at four number locations along three separate watercourses that drain the wind farm site. These streams are the Inchiroe Stream, Shanacrane East Stream and the Shehy Beg Stream. The location of these sampling points are shown on **Figure 6.3**. The biological water quality survey was based on the Biotic Index or Q-value system as outlined by the EPA (McGarrigle, 2002).

6.3.2.4 Fisheries Survey

Fisheries surveys consisting of a fish habitat survey and electrofishing survey were completed for the Gortloughra Wind Farm during September 2022. Full details of the methodologies used for the completion of these surveys are described in **Appendix 6.4**. A total of 10 sites were selected for the habitat and electrofishing surveys. The location of these sites are detailed in **Table 6.2** below and are shown on **Figure 6.4**. These sites were located at representative areas and were located both upstream and downstream of proposed wind farm infrastructure.

Table 6.2: Location of Fisheries Habitat & Electrofishing Survey Sites

Site No.	Catchment	Sub-catchment	Watercourse Name	Watercourse Order	Segment Code	EPA Code
1	Dunmanus-Bantry-Kenmare	Coomhola_SC_010	Inchiroe	3rd	21_2504	21I15
2	Dunmanus-Bantry-Kenmare	Coomhola_SC_010	Inchiroe	1st	21_1040	21I15
3	Bandon-Ilen	Bandon_SC_010	Shehy Beg	3rd	20_908	20S15
4	Bandon-Ilen	Bandon_SC_010	Shehy Beg	2nd	20_396	20S15
5	Bandon-Ilen	Bandon_SC_010	Unnamed	1st	20_392	-
6	Bandon-Ilen	Bandon_SC_010	Shehy Beg	1st	20_399	20S15
7	Bandon-Ilen	Bandon_SC_010	Shanacrane East	3rd	20_2115	20S11

Site No.	Catchment	Sub-catchment	Watercourse Name	Watercourse Order	Segment Code	EPA Code
8	Bandon-Ilen	Bandon_SC_010	Shanacrane East	3rd	20_1022	20S11
9	Bandon-Ilen	Bandon_SC_010	Glanycarney	2nd	20_405	20G19
10	Bandon-Ilen	Bandon_SC_010	Shanacrane East	3rd	20_1170	20S11

The electrical fishing survey was completed under authorisation from the Department of Communication, Energy and Natural Resources under Section 14 of the Fisheries Act (1980). The survey had regard to the CFB (2008) guidance and Matson *et al* (2018). A portable electrical fishing unit (Smith Root-LR 24 backpack) was used during the assessments. Fishing was carried out continuously for 10 minutes at each of the sites. Captured fish were collected into a container of river water using dip nets. On completion of the survey fish were then anaesthetised using a solution of 2-phenoxyethanol, identified, and measured to the nearest mm using a measuring board. Subsequent to this the fish were allowed to recover in a container of river water and were the released alive and spread evenly over the sampling area. No mortalities were recorded.

Juvenile lamprey surveys generally followed the methodology for ammocoete surveys given in the manual 'Monitoring the River, Brook and Sea Lamprey, *Lampetra fluviatilis*, *L. planeri* and *Petromyzon marinus* by Harvey & Cowx (2003). Electrical fishing for juvenile lampreys was carried out at three 1m^2 habitat patches where habitat was available. However, no lamprey habitats were recorded at any of the sites.

6.3.2.5 Survey for Rare or Protected Flora

Whilst undertaking habitat and vegetation surveys particular attention was paid to searching suitable habitat for rare or protected flora species, to determine whether they were present within, or close to, the Proposed Development. Surveys were conducted during the optimum time of year for these species to occur, in order to assist in ascertaining their presence within, or close to the Site. It is noted that no FPO species were identified on the Site during the surveys completed during the 7 no. rounds of habitat and vegetation surveys between 2021 and 2025.

6.3.2.6 Terrestrial Mammal Surveys

A survey for field signs indicating the presence of terrestrial mammals and particularly otters was undertaken during the field surveys. This survey was undertaken during the daytime and particular attention was given to habitat features normally associated with otters and

other protected terrestrial mammals. Any mammal field signs typical of otter activity were recorded during the surveys. These field signs, as described in Neal & Cheeseman (1996) (4) and Bang & Dahlstrom (1990) (5), include:

- mammal breeding and resting places, such as setts, holts, couches, lairs;
- pathways;
- prints;
- spraints and faecal deposits;
- latrines (and dung pits used as territorial markers);
- prey remains and feeding signs (snuffle holes);
- hair; and
- scratch marks

Camera traps (Bushnell Trophy Cam HD E3) were erected at three locations to sample mammal activity at the selected monitoring locations over a 10 night monitoring period. The camera traps were installed along the Inchiroe Stream to the northwest of the proposed wind farm site; Shehy Beg Stream to the east of the wind farm site; and the Shanacrane East Stream to the southwest of the Site. **Figure 6.4** shows the location of camera traps. The camera trap locations were selected to provide coverage of potential otter habitat along the rivers as well as badger activity in the vicinity of the camera trap locations.

Limitations in the effectiveness of trail cameras to record otters have been reported in previous studies (Lerone et al. 2011 & 2015) as body surface temperatures of otters emerging from water do not differ from surrounding ambient temperatures. In order to overcome this limitation each of the three trail cameras, in addition to being set to trigger via heat sensitive motion detection, were set to record still photo images at one-minute intervals through each night of recording.

All photographs logged by each of the cameras were reviewed for the presence of otters and other protected non-volant mammals.

6.3.2.7 Bats

Bat activity surveys were completed at the Site during the 2020 bat activity season. The 2020 surveys were carried out in accordance with SNH (2019) guidelines. Surveys comprised preliminary roost assessments; manual bat activity surveys consisting of walked

(4) Neal, E., & Cheeseman, C., (1996). 'Badgers'. Poyser Natural History, London.
(5) Bang, P., & Dahlstrom, P., 'Animal Tracks and Signs'. Oxford University Press, Oxford.

transects; and static detector surveys. The static detector surveys comprised the installation of 9 static detectors within the Site. Eight of these static detectors are located within or adjacent to the proposed turbine locations, whilst one additional detector was positioned to the east of the Site, approximately 500m to the east of the proposed turbine T06. These are static detector no. D1, D2, D5, D6, D10 and D12. Static detector recordings were analysed using ECOBAT.

The results of the bat surveys, as well as the desktop study completed for bats as described in Section 6.3.1 above, form the basis for the assessments of the potential impacts on bats. Further detail on the methods used and results are presented in **Appendix 6.2**.

6.3.2.8 Kerry Slug

The survey methodology for this species follows the National Roads Authority (NRA) guidelines on the Ecological surveying techniques of protected flora and fauna during the planning of national road schemes (NRA, 2008). Surveys were carried out within 20 meters of the Wind Farm development footprint and associated works. These guidelines recommend that fixed route transects should be walked at 20 m intervals throughout oak woodland or bog habitat, ideally at night using torchlight, and a visual count made of the number of individuals observed within five metres of the transect. A day time survey was completed to identify areas of suitable habitat for Kerry Slug crossed by the proposed wind farm layout. Given the open moorland nature of the Site suitable Kerry Slug habitat is confined to outcrops of sandstone rock crossed by the proposed wind farm layout. These areas were identified during the daytime and transect polylines were prepared in the field using ESRI Field Maps. The location of transects along which suitable Kerry Slug habitat has been identified and night time searches have been completed are shown on **Figure 6.5**.

Night time searches for Kerry Slug were completed along each of the transects shown on **Figure 6.5**. The searches were completed during periods of suitable weather conditions when damp, humid cloudy and overcast conditions prevailed with temperatures in excess of 8C during the surveys.

6.3.2.9 Herpetofauna

Incidental records of herpetofauna were noted during all field surveys undertaken between 2021 and 2025.

6.3.2.10 Other species

Incidental observations of other species such as terrestrial invertebrates were recorded during field surveys.

The prevalence of the marsh fritillary foodplant devil's-bit scabious *Succisa pratensis* is overall rare at the Site, with the only areas of potentially suitable habitat occurring in wet grassland habitat to the west and outside of the proposed wind farm footprint. Given the absence of suitable habitat occurring within the footprint of the proposed wind farm layout no dedicated surveys for marsh fritillary butterfly were completed.

6.3.2.11 Grid Connection Route Surveys

Grid connection route Option A between the Onsite Substation and Control Building and the existing Dunmanway 110 kV substation is approximately 28 km, of which, approximately 3.98 km is within the Site with the remainder located along the L8776 and the R587. The overall length of Option B between the Onsite Substation and Control Building and the existing Carrigdangan 110 kV substation is approximately 22 km, of which, approximately 3.98 km is within the Site with the remainder located along the L8776 and the L4607. The electrical cable will be installed within the formation of the road along its length. A total of 28 watercourses will be crossed by both grid connection route options, with 23 crossed by Option A and 5 crossed by Option B. These watercourses will be crossing using horizontal directional drilling. Each of the watercourse crossings were surveyed.

6.3.2.11.1 Turbine Delivery Route Surveys

The Turbine Delivery Route (TDR) will be restricted to the existing public road corridor between the Port of Cork and the Site. It is proposed to provide road widening for turbine deliveries at 18 no. locations along the TDR between Crookstown and the Site. A habitat survey of each of these 18 no. locations has been completed as part of the habitat surveys. The Level 3 habitat occurring at these locations and the vegetation associated with these habitats was recorded during the surveys.

6.3.2.12 Limitations and Coverage

Limitations can arise during the course of ecological assessments. These limitations may be foreseen, whilst others will not present themselves until the assessment is underway. The limitations can be associated with methods, equipment and health and safety considerations.

Habitat surveys were completed throughout the year, during the optimum growing season as well as outside of the growing season. Habitat surveys were completed during optimum weather conditions, with low winds and dry and bright conditions prevailing.

Limitations noted during bat surveys, analysis and assessment include:

- Difficulties inherent in assigning all bat calls to species level;
- The sensitivity of bat detector equipment to the calls of different bat species, with calls of some species more easily detected (e.g Leisler's bat) that others (e.g. brown long-eared bat)

6.3.3 Impact Assessment Methodology

6.3.3.1 Establishing the Potential Zone of Influence (ZoI) of the Development

The 'zone of influence' for a development is the area over which ecological features may be subject to significant impacts as a result of the Proposed Development and associated activities. The Zone of Influence (ZoI), or distance over which a likely significant effect may occur will differ across the Ecological Receptors identified for the Proposed Development, depending on the potential impact pathway(s). The results of both the desk study and the suite of ecological field surveys undertaken has established the habitats and species present at and surrounding the Site. The ZoI is then informed and defined by the sensitivities of each of the ecological receptors present, in conjunction with the nature and potential impacts associated with the Proposed Development.

The ZoI of the Proposed Development in relation to terrestrial habitats is generally limited to the footprint of the Proposed Development, and the immediate environs. Disturbances to the hydrological regime of wetland/aquatic habitats from impact sources can often result in impacts occurring at distances beyond the immediate adjacent areas of the impact source. With regard to hydrological impacts, the distances over which aqueous pollutants are likely to remain at concentrations that have potential to result in perturbations to water quality and associated freshwater habitats is difficult to quantify. The potential for such effects to occur are also highly site-specific and related to the predicted magnitude of any pollution event. The impact of a pollution event will depend on the volumes of discharged waters, concentrations and types of pollutants (in the case of the proposed development these being comprised of sediment, hydrocarbons, cement-based products and other related construction solutions), volumes of receiving waters, and the sensitivity of the ecology of the receiving waters. With respect to the Proposed Development, this includes all freshwater habitat and ecological receptors downstream of the Proposed Development that have been identified as ecological receptors.

The ZoI for other terrestrial mammals in terms of potential impacts to breeding and resting places is 150 m from the Proposed Development. This distance is in line with the maximum distance for potential disturbance to terrestrial mammals (otters and badgers) as specified by TII guidance documentation (NRA, 2009 a & b).

The ZoI for herpetofauna is considered to be limited to the direct habitat loss arising from the Development.

6.3.3.2 Evaluating Ecological Features within the Zone of Influence

The nature conservation value of habitats and ecological sites occurring within the Site are based upon an established geographic hierarchy of importance as outlined by the National Roads Authority (NRA, 2009). The outline of this geographic hierarchy is provided below and this has been used to determine ecological value in line with the ecological valuation examples provided by the NRA (see NRA, 2009). The geographic evaluation hierarchy is as follows:

- International Sites (Rating A)
- National Importance (Rating B)
- County Importance (Rating C)
- Local Importance (higher value) (Rating D)
- Local Importance (lower value) (Rating E)

Table 6.3: Geographic frame of reference used to determine value of ecological resources[6]

Importance	Criteria

International Importance (Rating A)	• 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.
	• 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 animal 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 (Rating B)	• Site designated or proposed as a Natural Heritage Area (NHA).
	• Statutory Nature Reserve.
	• Refuge for Fauna and Flora protected under the Wildlife Acts.
	• National Park.
	• Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
	• Resident or regularly occurring populations (assessed to be important at the national level) of the following:
	  • Species protected under the Wildlife Acts; and/or,
	  • Species listed on the relevant Red Data list.
	  • Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.

County Importance (Rating C)	• Area of Special Amenity. • Area subject to a Tree Preservation Order.

[6] Adapted from CIEEM 2018 v 1.1 - Available online at: https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-Sept-2019.pdf and NRA 2009 - Available at: http://www.tii.ie/technical-services/environment/planning/Guidelines-for-Assessment-of-Ecological-Impacts-of-National-Road-Schemes.pdf [Accessed March 2023].

Importance	Criteria

	• Area of High Amenity, or equivalent, designated under the County Development Plan.
	• 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; and/or
	  • Species listed on the relevant Red Data list.
	• 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.
	• County important populations of species; or viable areas of semi-natural habitats; or natural heritage features identified in the National or Local BAP; if this has been prepared.
	• 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 Importance (Higher Value) (Rating D)	• 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 Importance (Lower Value) (Rating E)	• Sites containing small areas of semi-natural habitat that are of some local importance for wildlife. • Sites or features containing non-native species that is of some importance in maintaining habitat links.

The Ecological Receptors of the Development are those features which are within the ZoI and are evaluated as being of Local Importance or greater.

6.3.3.3 *Identification and Characterisation of Effects*

When describing the magnitude or scale of ecological impacts reference should be made to the following characteristics:

- Positive or negative
- Extent: the size of the affected area/habitat and/or the proportion of a population affected by the effect
- Duration: the period of time over which the impact will occur. The EPA's guidelines on information to be included in Environmental Impact Assessment Reports (EPA, 2022) sets out the following terms for defining the duration of an impact: Momentary Effects - effects lasting from seconds to minutes; Brief Effects - effects lasting less than a day; Temporary Effects - effects lasting less than a year; Short-term Effects - effects lasting one to seven years; Medium-term Effects - effects lasting seven to fifteen years; Long-term Effects - effects lasting fifteen to sixty years; Permanent Effects - effects lasting over sixty years.
- Frequency & Timing: how often the effect will occur; particularly in the context of relevant life-stages or seasons; and,
- Reversibility: will the effect be permanent or temporary. Will an impact reverse, either spontaneously or as a result of a specific action.

The assessment describes those characteristics relevant to understanding the ecological effect and determining the significance, and as such it does not need to incorporate all stated characteristics (CIEEM, 2018 v.1.1).

6.3.3.4 *Significant Effects on Important Ecological Features*

For the purpose of Ecological Impact Assessment, a 'significant effect', is an effect to an ecological feature from an impact, that either supports or undermines biodiversity conservation objectives for those ecological features which have been identified as important. Conservation objectives may be specific (e.g. for a designated site) or broad (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' should be qualified with reference to the appropriate geographic scale (CIEEM, 2018 v.1.1).

In order to predict likely ecological impacts and effects, the assessor must take account of the relevant aspects of the ecosystem structure and function, which include (CIEEM, 2018 v.1.1):

- The resources available (e.g. territory, prey availability, habitat connectivity etc.);
- Environmental processes (e.g. eutrophication, drought, flooding etc.);
- Ecological processes and relationships (e.g. population / vegetation dynamics, food webs etc.);
- Human influences (e.g. fertilisation, turbary, grazing, burning etc.);
- Historical context (natural range, trends etc.);
- Ecosystem properties (e.g. the carrying capacity, fragility etc.); as well as; and
- Other environmental influences such as air quality, hydrology, water quality, nutrient inputs and salinity etc.

The determination of significance is made in line with the terminology set out in the EPA's guidelines on information to be included in Environmental Impact Assessment Reports. These criteria are as follows:

- No change – no discernible change in the ecology of the affected features.
- Imperceptible effect - An effect capable of measurement but without noticeable consequences.
- Not Significant - An effect which causes noticeable changes in the character of the environment but without significant consequences.
- Slight effect - An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
- Moderate effect - An effect that alters the character of the environment that is consistent
  with existing and emerging trends.
- Significant effect - An effect which, by its character, its magnitude, duration or intensity alters
  a sensitive aspect of the environment.
- Very Significant - An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
- Profound effect - An effect which obliterates sensitive characteristics.

6.3.3.4.1 Integrity

The integrity of an ecological receptor refers to the coherence of the ecological structure and function that enables the ecological receptor to be sustained (NRA, 2009). The term

'integrity' is most often used when determining impact significance in relation to designated areas for nature conservation (e.g. SACs, SPAs or pNHA/NHAs) but can often be the most appropriate method to use for non-designated areas of biodiversity value where the component habitats and/or species exist with a defined ecosystem at a given geographic scale.

An impact on the integrity of an ecological site or ecosystem is considered to be significant if it moves the condition of the ecosystem away from a favourable condition: removing or changing the processes that support the sites' habitats and/or species; affect the nature, extent, structure and functioning of component habitats; and/or, affect the population size and viability of component species.

6.3.3.4.2 Conservation Status

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status.

As per the definitions provided in the EU Habitats Directive, the conservation status of a habitat is favourable when:

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

The conservation status of a species is favourable when:

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

According to the TII/CIEEM methodology, if it is determined that the integrity and/or conservation status of an ecological feature will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (i.e. local, county, national, international). In some cases, an impact may not be significant at the geographic scale at which the ecological feature has been valued but may be significant at a lower geographical level. For example, a particular impact may not be

considered likely to have a negative effect on the overall conservation status of a habitat which is considered to be internationally important. However, an impact may occur at a lower geographic scale on this internationally important habitat. Under such a scenario, such an impact on an internationally important habitat is considered to be significant only at the lower scale e.g. local, county, rather than international scale.

6.3.3.5 Assessment of Residual Effects

After characterising the potential impacts of the Development and assessing the potential effects of these impacts on the 'Important ecological features', mitigation measures are proposed to avoid and / or mitigate the identified ecological effects. Once measures to avoid and mitigate ecological effects have been finalised, assessment of the residual impacts and effects should be undertaken to determine the significance of their effects on the 'Important ecological features'.

6.3.3.6 Assessment of Cumulative Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM, 2018 v.1.1). Different types of actions can cause cumulative impacts and effects. As such, these types of impacts may be characterised as;

- Additive/incremental – in which multiple activities/projects (each with potentially insignificant effects) add together to contribute to a significant effect due to their proximity in time and space (CIEEM, 2018 v.1.1); and,
- Associated/connected – a development activity 'enables' another development activity e.g. phased development as part of separate planning applications. Associated developments may include different aspects of the project which may be authorised under different consent processes. It is important to assess the potential impacts of the 'project' as a whole and not ignore impacts that fall under a separate consent process (CIEEM, 2018 v.1.1).

6.4 BASELINE DESCRIPTION

Baseline conditions represent a summary of the existing environment within the Site before the commencement of the Proposed Development. This section of the report provides information regarding these baseline conditions.

6.4.1 General Site Description

The Site is located 9.7 km north-west of Dunmanway, Co. Cork and 19 km south-east of the county boundary between Cork and Kerry. The Site is located on relatively high ground,

at elevations ranging from 243 m AOD on the northern side of the site at the entrance 326 m, to 510 m AOD towards the middle of the Site and 306 m AOD on the southern side of the Site.
The southern extent of the Site is located within the townland of Shehy Beg. To the south and south-east of the site are the townlands of Shanacrane West and Tooren respectively.

To the north of the Site, there are additional areas of blanket bog, forestry, Douce Mountain, Lough Nambrackderg, pre-existing Shehy More Windfarm and the townlands of Shehy More, Cloghboola, Derryriordane South and Inchiroe. To the east of the site is the townland of Coolmountain and additional areas of forestry.

To the west and south-west of the Site are the townlands of Gortloughra, Coomclogh, Glanycarney, the Cousane Gap and the R585 road. The wider area surrounding the Site is rural in nature with low intensity agriculture in the form of pastoral grassland, peat harvesting and commercial forestry plantations being the predominant land use.

The topography of the Site is mountainous and undulating with slopes locally recorded up to 30° at some probe locations. The turbines are generally located on areas of moderate slope (typically less than 10°, although locally slopes do exceed 10°) and with low peat depths (typically less than 0.5 m). Due to the slope of the ground, little ponding was observed, however most of the peat was saturated during the field surveys.

The Site forms part of the southern fringes of the Shehy Mountains and is therefore generally elevated in nature. The highest peak at the site is Shehy More (546 m OD) which broadly divides the northern and southern sections of the Site. To the north of the Site is Douce Mountain (474 m OD), in between Douce Mountain and Shehy More is a valley through which the L8544 local road traverses and which forms part of the northernmost extent of the Site. The northern portion of the site ranges in elevation from 200 m OD with increasing steeper inclines existing to the south as far as the summit of Shehy More at 546 m OD.

The southern face of Shehy More is also steep with elevations reducing rapidly from 546m OD to 400 m OD across an approximate distance of 300 m. The southernmost extent of the Site ranges in elevation from approximately 250 – 300 m OD. Further south beyond the Redline Boundary the topography is generally flat in the townland of Shanecrane East at an elevation of approximately 120 m. To the west of the Site beyond the EIAR boundary is Carrigmount with an elevation of 342 m OD. To the east and south-east of the Site there

are peaks ranging in elevation from 312 m OD, 332 m OD and 375 m OD and the Cousane Gap through which the R585 regional road traverses.

6.4.1.1 Review of Historical Mapping

The first edition 6-inch map of 1841 and the last edition 6 inch map from 1904 shows the Site to be unenclosed. The watercourses for Shehy Beg, Shanacrane and Gortloughra are shown on the historic maps.

A comparison of the aerial imagery between 1995 and current google satellite imagery shows little change in land cover in areas to the north of the Shehy Beg Mountain ridgeline. The most significant changes in land cover in this 30 year period are apparent to the south of the ridgeline.

The 1995 and 1999 orthophotography shows the presence of tracks to the southwest of Shehy Beg Mountain ridgeline. The 2001 to 2005 imagery shows an extension of the track from the southwest, east towards the location of proposed T04 turbine. A comparison between the 1995 – 1999 and 2001 – 2005 imagery suggests the provision of new drainage channels between these years to the west of the site in the area that is now comprised of improved agricultural grassland. At the time of the 2001 – 2005 imagery this area consists of rough grazing with new drainage channels and the aforementioned track. No improved agricultural grassland is present to the east of the Site (surrounding the proposed On-Site Substation and Control Building location). Conifer plantation is depicted as present for the first time to the east of the proposed wind farm site on the 2001 – 2005 imagery.

The 2013 – 2018 imagery shows the extension of the existing access track from the west to the east with a connection made with the track network to the east that eventually leads south to the public road network. By the time of the capture of this imagery improved agricultural grassland was established to the east of the wind farm site surrounding the proposed T07 location and the west of the Site surrounding the proposed Onsite Substation and Control Building location. Additional forestry was also planted by this time to the east of the Site.

6.4.2 Designated Areas

6.4.2.1 Designated sites within the potential Zone of Influence of the Development

Table 6.4 below outlines the designated sites within the potential Zone of Influence of the Proposed Development (see also **Figure 6.6a to 6.6c**; and the **NIS (DEC Ltd. 2025)**.

Table 6.4: European Sites, NHAs & pNHAs

Site Name	Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Does European Site occur within the Projects Zone of Influence?
SACs			
Bandon River SAC	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] Margaritifera margaritifera (Freshwater Pearl Mussel) [1029] Lampetra planeri (Brook Lamprey) [1096]	7 km to the east of the proposed wind farm site. Crossed by the grid connection route Option A	Yes.
Barley Cove to Ballyrisode Point SAC	Mudflats and sandflats not covered by seawater at low tide [1140] Perennial vegetation of stony banks [1220] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] European dry heaths [4030] Petalophyllum ralfsii (Petalwort) [1395]	41 km to the southwest of the proposed wind farm. 42 km to the southwest of the haul route. 45 km to the southwest of the grid connection routes.	No.
Caha Mountains SAC	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] Natural dystrophic lakes and ponds [3160]	20 km west of the proposed wind farm. 26 km west of the grid connection route.	No.

Site Name	Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Does European Site occur within the Projects Zone of Influence?
	Northern Atlantic wet heaths with Erica tetralix [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230] Blanket bogs (* if active bog) [7130] Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) [8110] Calcareous rocky slopes with chasmophytic vegetation [8210] Siliceous rocky slopes with chasmophytic vegetation [8220] Geomalacus maculosus (Kerry Slug) [1024] Trichomanes speciosum (Killarney Fern) [1421]	21 km west of the TDR.	
Cleanderry Wood SAC	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Trichomanes speciosum (Killarney Fern) [1421]	45 km west of the proposed wind farm. 51 km west of the grid connection route. 46km west of the TDR.	No.
Cloonee and Inchiquin Loughs, Uragh Wood SAC	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] Northern Atlantic wet heaths with Erica tetralix [4010] European dry heaths [4030] Siliceous rocky slopes with chasmophytic vegetation [8220]	26 km west of the proposed wind farm. 31 km west of the grid connection route. 26 km west of the TDR.	No.

Site Name	Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Does European Site occur within the Projects Zone of Influence?
	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Geomalacus maculosus (Kerry Slug) [1024] Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303] Trichomanes speciosum (Killarney Fern) [1421] Najas flexilis (Slender Naiad) [1833]		
Derryclogher (Knockboy) Bog SAC	Blanket bogs (* if active bog) [7130]	9 km west of the proposed wind farm. 14 km west of the grid connection route. 9 km west of the TDR.	No.
Dunbeacon Shingle SAC	Perennial vegetation of stony banks [1220]	28 km southwest of the proposed wind farm. 33 km southwest of the grid connection route. 29 km southwest of the TDR.	No.
Farranamanagh Lough SAC	Coastal lagoons [1150] Perennial vegetation of stony banks [1220]	36 km southwest of the proposed wind farm. 41 km southwest of the grid connection route. 37 km southwest of the TDR.	No.
Glanmore Bog SAC	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]	39 km southwest of the proposed wind farm.	No.

Site Name	Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Does European Site occur within the Projects Zone of Influence?
	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] Northern Atlantic wet heaths with Erica tetralix [4010] Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230] Blanket bogs (* if active bog) [7130] Margaritifera margaritifera (Freshwater Pearl Mussel) [1029] Trichomanes speciosum (Killarney Fern) [1421]	40 km southwest of the Grid Connection Route. 45 km southwest of the TDR.	
Glengarriff Harbour and Woodland SAC	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] Geomalacus maculosus (Kerry Slug) [1024] Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303] Lutra lutra (Otter) [1355] Phoca vitulina (Harbour Seal) [1365]	18 km west of the proposed wind farm. 23 km west of the Grid Connection Route. 23 km west of the TDR.	No.
Kenmare River SAC	Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410]	24 km northwest of the proposed wind farm. 30 km northwest of the Grid Connection Route. 24 km northwest of the TDR.	

Site Name	Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Does European Site occur within the Projects Zone of Influence?
	Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] European dry heaths [4030] Juniperus communis formations on heaths or calcareous grasslands [5130] Calaminarian grasslands of the Violetalia calaminariae [6130] Submerged or partially submerged sea caves [8330] Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303] Phocoena phocoena (Harbour Porpoise) [1351] Lutra lutra (Otter) [1355] Phoca vitulina (Harbour Seal) [1365]		
Maulagowna Bog SAC	Blanket bogs (* if active bog) [7130]	25 km west of the proposed wind farm. 31 km west of the Grid Connection Route. 25 km west of the TDR.	No.
Mucksna Wood SAC	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	24 km northwest of the proposed wind farm. 30 km northwest of the Grid Connection Route. 24 km northwest	No.

Site Name	Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Does European Site occur within the Projects Zone of Influence?
		of the TDR.	
Mullaghanish Bog SAC	Blanket bogs (* if active bog) [7130]	23 km north of the proposed wind farm. 17 km north of the Grid Connection Route. 16 km north of the TDR.	No.
Reen Point Shingle SAC	Perennial vegetation of stony banks [1220]	28 km southwest of the proposed wind farm. 33 km southwest of the Grid Connection Route. 29 km southwest of the TDR.	No.
Sheep's Head SAC	Northern Atlantic wet heaths with Erica tetralix [4010] European dry heaths [4030] Geomalacus maculosus (Kerry Slug) [1024]	27 km southwest of the proposed wind farm. 32 km southwest of the Grid Connection Route. 28 km southwest of the TDR.	No.
St. Gobnet's Wood SAC	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	15 km north of the proposed wind farm. 12 km north of the Grid Connection Route.	No.

Site Name	Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Does European Site occur within the Projects Zone of Influence?
		12 km north of the TDR.	
The Gearagh SAC	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] Rivers with muddy banks with Chenopodion rubri p.p. and Bidention p.p. vegetation [3270] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] Lutra lutra (Otter) [1355]	15 km northeast of the proposed wind farm. 8 km northeast of the Grid Connection Route. 6 km northeast of the TDR.	No.
Three Castle Head to Mizen Head SAC	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030]	50 km southwest of the proposed wind farm. 54 km southwest of the Grid Connection Route. 50 km southwest of the TDR.	No.
SPAs			
Killarney National Park SPA	Merlin (Falco columbarius) [A098] Greenland White-fronted Goose (Anser albifrons flavirostris) [A395]	25 km northwest of the proposed wind farm. 26.5 km northwest of the Grid Connection Route. 25 km northwest of the TDR.	No.

Site Name	Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Does European Site occur within the Projects Zone of Influence?
Clonakilty Bay SPA		30 km southeast of the proposed wind farm. 18.5 km southeast of the Grid Connection Route. 20 km southeast of the TDR.	No.
Eirk Bog SPA Greenland White-fronted Goose (Anser albifrons flavirostris) [A395]	Shelduck (Tadorna tadorna) [A048] Dunlin (Calidris alpina) [A149] Black-tailed Godwit (Limosa limosa) [A156] Curlew (Numenius arquata) [A160] Wetland and Waterbirds [A999]	33 km northwest of the proposed wind farm. 36 km northwest of the Grid Connection Route. 33 km northwest of the TDR.	No.
The Gearagh SPA	Wigeon (Anas penelope) [A050] Teal (Anas crecca) [A052] Mallard (Anas platyrhynchos) [A053] Coot (Fulica atra) [A125] Wetland and Waterbirds [A999]	17 km northeast of the proposed wind farm. 10 km northeast of the Grid Connection Route. 8 km northeast of the TDR.	No.
Beara Peninsula SPA	Fulmar (Fulmarus glacialis) [A009] Chough (Pyrrhocorax pyrrhocorax) [A346]	45 km southwest of the proposed wind farm.	No.

Site Name	Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Does European Site occur within the Projects Zone of Influence?
		50 km southwest of the Grid Connection Route. 45 km southwest of the TDR.	
Sheep's Head to Toe Head SPA	Peregrine (Falco peregrinus) [A103] Chough (Pyrrhocorax pyrrhocorax) [A346]	39 km south of the proposed wind farm. 44 km south of the Grid Connection Route. 40 km south of the TDR.	No.
Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA	Hen Harrier (Circus cyaneus) [A082]	42 km north of the proposed wind farm. 40 km north of the Grid Connection Route. 40 km north of the TDR.	No.
Mullaghanish to Musheramore Mountains SPA	Hen Harrier (Circus cyaneus) [A082]	19 km north of the proposed wind farm. 12.2 km north of the Grid Connection Route. 12 km north of the TDR.	No.
Galley Head to Duneen Point SPA	Chough (Pyrrhocorax pyrrhocorax) [A346]	32 km south of the proposed wind farm. 22 km south of the Grid Connection Route.	No.

Site Name	Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Does European Site occur within the Projects Zone of Influence?
		27.5 km south of the TDR.	
Seven Heads SPA	Chough (Pyrrhocorax pyrrhocorax) [A346]	37 km south of the proposed wind farm. 25.5 km south of the Grid Connection Route. 25.5 km south of the TDR.	No.
Courtmacsherry Bay SPA	Great Northern Diver (Gavia immer) [A003] Shelduck (Tadorna tadorna) [A048] Wigeon (Anas penelope) [A050] Red-breasted Merganser (Mergus serrator) [A069] Golden Plover (Pluvialis apricaria) [A140] Lapwing (Vanellus vanellus) [A142] Dunlin (Calidris alpina) [A149] Black-tailed Godwit (Limosa limosa) [A156] Bar-tailed Godwit (Limosa lapponica) [A157] Curlew (Numenius arquata) [A160] Black-headed Gull (Chroicocephalus ridibundus) [A179] Common Gull (Larus canus) [A182] Wetland and Waterbirds [A999]	33.5 km southeast of the proposed wind farm. 23 km southeast of the Grid Connection Route. 19.5 km southeast of the TDR.	No.
NHAs			
Conigar Bog NHA	Designated for the presence of blanket bog habitat.	6.5 km northwest of the proposed wind farm.	No.

Site Name	Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Does European Site occur within the Projects Zone of Influence?
		7.5 km northwest of the Grid Connection Route. 8.5 km northwest of the TDR.	
Slaheny River Bog NHA	Designated for the presence of blanket bog habitat.	12.5 km northwest of the Grid Connection Route.	No.
Sillahertane Bog NHA	Designated for the presence of blanket bog habitat.	10.5 km north of the proposed wind farm. 11.5 km northwest of the Grid Connection Route. 12.5 km northwest of the TDR.	No.
pNHAs			
Derryclogher (Knockboy) Bog	Listed for blanket bog habitat	10.5 km north of the proposed wind farm. 11.5 km northwest of the Grid Connection Route. 12.5 km northwest of the TDR.	No.
Lough Allua	Listed for freshwater lake habitat	5 km northeast of the proposed wind farm. 1 km north of the Grid Connection Route. 200 m north of the TDR.	No.
Gouganebarra Lake	Listed for freshwater lake habitat	7.5 km north of the proposed wind farm.	No.

Site Name	Qualifying Features of Interest/Special Conservation Interests	Distance (Km)	Does European Site occur within the Projects Zone of Influence?
		8.5 km northwest of the Grid Connection Route. 9.5 km northwest of the TDR.	
Ballagh Bog	Listed for blanket bog habitat	8 km northwest of the TDR. 9.5 km northwest of the Grid Connection Route. 10.5 km northwest of the TDR.	No.
Carriganass Castle, Near Kealkill	List for the presence of bat roost	10.5 km west of the proposed wind farm. 11.5 km west of the Grid Connection Route. 12.5 km west of the TDR.	No.

6.4.3 Desktop study for recorded rare, threatened and/or protected species

The results of the desk study are provided in **Table 6.5** below:

Table 6.5: Rare, threatened or protected Species Recorded within 2 km of the Site (10 km for bat records)[7]

Species	Scientific Name	Habitats Dir. (Annex II / IV)	Birds Dir. (Annex I)	Wildlife Acts (as amended)	Red List Status	Flora Protection Order	Birds of Conservation Concern (2021– 2026)	Likelihood on the Site	Likelihood within 2 km	Most recent record	Record Source
Mammals											
Otter	*Lutra lutra*	Y	-	Y	LC	-	-	3	1	2010	NBDC & NPWS
Badger	*Meles meles*	-	-	Y	LC	-	-	3	1	2018	NBDC & NPWS
Red squirrel	*Sciurus vulgaris*	-	-	Y	LC	-	-	3	2	2015	NBDC
Irish hare	*Martes martes*	-	-	Y	LC	-	-	4	1	2021	NBDC
Irish stoat	*Cervus elaphus*	-	-	Y	LC	-	-	2	1	2015	NBDC
Hedgehog	*Erinaceus europaeus*	-	-	Y	LC	-	-	3	1	2013	NBDC
Pine Martin	*Martes martes*	-	-	Y	LC	-	-	3	1	2012	NBDC
Pygmy Shrew	*Sorex minutus*	-	-	Y	LC	-	-	3	1	2015	NBDC
Bats (within 10 km)											
Soprano pipistrelle	*Pipistrellus pygmaeus*	Y	-	Y	LC	-	-	1	1	2018	NBDC
Daubenton's bat	*Myotis daubentonii*	Y	-	Y	LC	-	-	3	1	2018	NBDC
Leisler's bat	*Nyctalus leisleri*	Y	-	Y	LC	-	-	1	1	2018	NBDC
Brown long-eared bat	*Plecotus auritus*	Y	-	Y	LC	-	-	1	1	2022	NBDC
Brown long-eared bat	*Plecotus auritus*	Y	-	Y	LC	-	-	1	1	2022	NBDC

[7] (Sources: NPWS, NBDC & BCI databases) – Please note the below list is not an exhaustive species list for the area.

Species	Scientific Name	Habitats Dir. (Annex II / IV)	Birds Dir. (Annex I)	Wildlife Acts (as amended)	Red List Status	Flora Protection Order	Birds of Conservation Concern (2021– 2026)	Likelihood on the Site	Likelihood within 2 km	Most recent record	Record Source
Lesser horseshoe bat	*Rhinolophus hipposideros*	Y	-	Y	LC	-	-	1	1	1999	NBDC
Herpetofauna											
Common frog	*Rana temporaria*	-	-	Y	Vulner-able	-	-	2	1	2018	NBDC
Common lizard	*Zootoca vivipara*	-	-	Y	Vulner-able	-	-	2	1	2020	NBDC
Invertebrates											
Kerry Slug	*Geomalacus maculosus*	Y	-	Y	-	-	-	1	1	2021	NBDC
Marsh fritillary	*Euphydryas aurinia*	Y	-	Y	-	-	-	4	1	2015	NBDC
Wall	Lasiommata megera)	-	-	-	Endangered	-	-	4	1	2023	NBDC
Gatekeeper	Pyronia tithonus)	-	-	-	Near threatened	-	-	4	1	2023	NBDC
Grayling	*Hipparchia semele)*	-	-	-	Near threatened	-	-	4	1	2021	NBDC
Small Heath	*Coenonympha pamphilus)*	-	-	-	Near threatened	-	-	2	1	2018	NBDC
Dark Green Fritillary	*Argynnis aglaja)*	-	-	-	Vulnerable	-	-	4	1	2018	NBDC
Large Red Tailed Bumble Bee	*Bombus (Melanobombus) lapidarius)*	-	-	-	Near threatened	-	-	2	1	2022	NBDC
Megachile (Megachile) centuncularis	*Megachile (Megachile) centuncularis*	-	-	-	Near threatened	-	-	4	1	2022	NBDC
Moss Carder-bee	*Bombus (Thoracombus) muscorum)*	-	-	-	Near threatened	-	-	3	1	2023	NBDC
Plants											

Species	Scientific Name	Habitats Dir. (Annex II / IV)	Birds Dir. (Annex I)	Wildlife Acts (as amended)	Red List Status	Flora Protection Order	Birds of Conservation Concern (2021– 2026)	Likelihood on the Site	Likelihood within 2 km	Most recent record	Record Source
Green Hoar-moss	*Hedwigia integrifolia*	-	-	-	Vulner-able	Y	-	3	1	2014	NBDC
Awl-leaved Swan-neck Moss	*Campylopus subulatus*	-	-	-	Vulner-able	-	-	2	1	2009	NBDC
Broadleaf Grimmia	*Schistidium platyphyllum*	-	-	-	Vulner-able	-	-	2	1	2009	NBDC
String Grimmia	*(rimmia funalis*	-	-	-	Near threaten-ed	-	-	2	1	2009	NBDC
Invasive Species											
Butterfly bush	*Buddleja davidii*	-	-	-	-	-	-	2	1	2018	NBDC
Rhododendron	*Rhododendron ponticum*	-	-	-	-	-	-	1	1	2003	NBDC
Cherry laural	*Prunus laurocerasus*	-	-	-	-	-	-	1	1	2004	NBDC
Field penny-cress	*Thlaspi arvense*	-	-	-	-	-	-	3	1	2004	NBDC
Giant rhubarb	*Gunnera tinctoria*	-	-	-	-	-	-	3	1	2009	NBDC
Japanese Knotweed	*Fallopia japonica*	-	-	-	-	-	-	1	1	2006	NBDC
Sycamore	*Acer pseudoplatanus*	-	-	-	-	-	-	1	1	2018	NBDC
Three-cornered garlic	*Allium triquetrum*	-	-	-	-	-	-	1	1	2004	NBDC
Virginia-creeper	*Parthenocissus quinqufolia*	-	-	-	-	-	-	3	1	2004	NBDC
Jenkin's spire snail	*Potamopyrgus antipodarum*	-	-	-	-	-	-	3	1	2012	NBDC
American mink	*Mustela vison*	-	-	-	-	-	-	2	1	2012	NBDC

Species	Scientific Name	Habitats Dir. (Annex II / IV)	Birds Dir. (Annex I)	Wildlife Acts (as amended)	Red List Status	Flora Protection Order	Birds of Conservation Concern (2021– 2026)	Likelihood on the Site	Likelihood within 2 km	Most recent record	Record Source
Bank vole	*Myodes glareolus*	-	-	-	-	-	-	2	1	2012	NBDC
Brown rat	*Rattus norvegicus*	-	-	-	-	-	-	2	1	2011	NBDC
Rabbit	*Oryctolagus cuniculus*	-	-	-	-	-	-	1	1	2015	NBDC
Fallow deer	*Dama dama*	-	-	-	-	-	-	1	1	2015	NBDC
Feral ferret	*Mustela furo*	-	-	-	-	-	-	2	1	2006	NBDC

Key to likelihood of species presence: 1 = Confirmed; 2 = Likely; 3 = Possible; 4 = Unlikely

6.4.3.1 Flora Protection Order Species

Records are held for one FPO species in the wider area surrounding the proposed development. This relates to two no. records of *Hedwigia integrifolia*, recorded in the vicinity of Derrylahen Holy Well, Mount Gunnery, approximately 1.5km to the west of the proposed grid connection route and approximately 2.5km to the north of Dunmanway. This location is remote from the proposed development. This species has not been recorded within the proposed development site.

6.4.3.2 Marsh fritillary

There are no marsh fritillary records held by the NBDC for marsh fritillary within the area of search as shown on **Figure 6.1**. There are records for the presence of marsh fritillary within the hectad W15 within which the Site is located. The nearest record for marsh fritillary in the wider surrounding area is from the 100 m square W169 595 in the townland of Torreen, located approximately 2.5 km to the southeast of the Proposed Development.

6.4.4 Article 17 Habitats

Under Article 17 of the EU Habitats Directive Ireland is required to report to the European Commission every six years on the status of habitats and species listed in the Annexes of the Directive. The latest Article 17 Report prepared for Ireland were published by the NPWS

in 2019. Article 17 Reports provide estimates for the area of Annex 1 habitats occurring in Ireland. This area calculation is based upon the overall area of these habitats occurring within the country, as mapped by the NPWS. As part of the Article 17 publication, the digital mapping dataset for the location of Annex 1 habitats has also been made publicly available. This dataset was reviewed to identify the presence of any area of Annex 1 habitat occurring within or adjacent to the Development that forms part of the current national area of these habitats. **Figure 6.7** shows the location of Annex 1 habitats that form part of the national area of these habitats within/or surrounding the Site.

The Article 17 mapping for Annex 1 habitats has been used by the NPWS to establish the favourable conservation range (FCR) of these habitats nationally.

Examples of Annex 1 Alpine and Sub-Alpine heath (4060) are mapped as occurring within and adjacent to the proposed Site. **Figure 6.7** shows the extent of the mapped are of Article 17 Alpine and Sub-Alpine heath with respect to the Site. The area of mapped Annex 1 Alpine and Sub-Alpine heath occurring at and surrounding the Site is referenced by the NPWS as being sourced from the backing documents for the 2007 Article 17 reporting (see NPWS, 2007). The area of Alpine and Sub-Alpine heath occurring at Shehy Mountain within and surrounding to the Site is representative of an indicative area of this habitat. The criteria for mapping the indicative natural range and potential distribution of this Annex 1 habitat was based on the following three factors:

- elevation above 350m
- uplands areas above 350n with a slope of >40˚
- areas of ridges and summits which were identified using a curvature index of >65˚

The NPWS have used a "certainty rating" to rate the accuracy of data with respect to the distribution mapping of Alpine and Sub-Alpine heath. The Certainty rating ranges from 1 to 3 with 1 being 'least certain' and 3 being 'certain'. The NPWS have assigned a Certainty rating of 1 – least certain – to the 2007 mapping data used to map the example of this habitat at and surrounding the proposed development site.

The NPWS recognised in the 2013 Article 17 reporting that the 2007 indicative natural range and potential distribution, at best overestimated the extent of this habitat occurring in Ireland and as such used only 5% of these areas for the purposes of mapping the national range and extent of this habitat in Ireland.

The extent of the area of Article 17 Alpine and Sub-Alpine heath shown on **Figure 6.7** amounts to c. 384 Ha, with 5% of this area amounting to c. 19 Ha. This 5% area is also similar in area to the extent of the Fossitt Level 3 habitat Montane Heath Alpine which corresponds to the Annex 1 habitat Sub-Alpine heath mapped as occurring at Shehy Mountain in the vicinity of the Site. The extent of this habitat occurring in the vicinity of the Site, as identified during habitat surveys is shown on **Figure 6.8**. As can be seen on **Figure 6.8** the extent of the area of Alpine and Sub-Alpine heath occurring at the Shehy Mountains, as mapped following primary habitat and vegetation surveys, lie outside the proposed wind farm layout.

6.5 EXISTING ECOLOGICAL BASELINE

6.5.1 Designated Sites with Potential Ecological / Hydrological Connections with the Development

Designated Sites are referred to above in **Table 6.4** in Section 6.4.2.

A NIS has been prepared for the Development (DEC, 2025) which assesses if the integrity of European Sites will be adversely affected. As such, this EIAR Chapter focusses on the potential for impacts upon National and Local Sites of Ecological Importance and does not reassess impacts upon European Sites. The findings of the NIS report are nonetheless referred to within this Chapter.

The European Sites occurring in the wider area surrounding the Site are shown on **Figure 6.6a**.and **6.6b.** Those European Sites that are hydrologically connected to the Site include the Bandon River SAC. There is a tenuous connection between the Proposed Development and The Gearagh SAC, owing to the location of the TDR widening locations and the proposed grid connection route Option B being located within the Lee catchment. It is noted that a section of the Site falls into the Lee catchment, however no watercourses occur in the vicinity of this section of the Site and there are no hydrological pathways connecting the site to watercourses of this catchment. The TDR widening locations and the proposed grid connection route option B are located at a remote distance upstream of the The Gearagh SAC, approximately 12 km, and is separated from this SAC by Lough Allua. Lough Allua, which is located downstream of the TDR widening locations and the proposed grid connection route Option B is listed as a pNHA, Lough Allua pNHA (Site Code: 001065).

6.5.2 Habitats occurring at the proposed wind farm site

6.5.2.1 Level 3 Fossitt Habitats

A description of the Level 3 Habitats, as per the Guide to Habitats in Ireland, occurring within the Site is provided below. The extent and distribution of these habitats within the Site are

shown on **Figure 6.8**. A total of 14 habitats have been identified as occurring within the Site. These habitats are described in **Table 6.6** below.

Table 6.6: Primary Fossitt 2000 Habitat Communities recorded at the proposed wind farm site during surveys

Fossitt 2000 Code (s)	Name of Fossitt 2000 Habitat Communities	Brief Description* *The brief descriptions below, are based on the Site Habitat Surveys – refer to the Guide for Habitats in Ireland (Fossitt, 2000) for further information regarding these Habitat Classifications.
FW1	Eroding Watercourse	A description of the eroding watercourses occurring within and adjacent to the proposed wind farm site is provided under Secton 6.5.5 and 6.5.6.4 below.
FW4	Drainage ditches	Drainage ditches are predominantly located towards the west of the proposed wind farm site in areas of improved habitat underlain by peat substrate and with wet heath and blanket bog habitat. These drains are dominated by stands of species poor *Juncus effusus* and *Sphagnum cuspidatum*.
GA1	Improved agricultural grassland	Improved agricultural grassland dominates the land cover to the west of the proposed wind farm site boundary at and surrounding the proposed turbine T07 and to the east at and surrounding the proposed On-Site Substation and Control Buidling. This habitat is nutrient enriched and intensively managed for cattle grazing and silage. Species indicative of high nutrient conditions in the habitat were noted throughout the land holding. These species include an abundance of *Lolium perenne, Holcus lanatus, Alopecurus pratensis, Ranunculus repens, R. acris, Trifolium repens, Trifolium pratense, Cirsium arvense, Cirsium vulgare* and *Urtica dioica*. Overall, the improved agricultural grassland is species-poor and widespread on a local to national scale. This habitat plays a limited function in supporting wildlife although it does provide foraging and dispersal habitat for badgers and can support a limited range of invertebrates.
GS3	Dry Acidic grassland	Acid grassland occurs predominantly towards the south of the Site, south of Shehy Mountain. The extent of acid grassland in this area is likely to have increased as a result of past land management where grazing pressure has converted areas of heath to grassland habitat. The area is now grazed by livestock in the form of both sheep and cattle. The sward is dominated by acidic grasses that comprise *Deschampsia flexuosa, Agrostis stolonifera, Agrostis capillaris, Nardus stricta, Anthoxanthum odoratum, Festuca ovina, Cynosaurus cristatus,* and *Molinia caerulea*. Other species occurring in this acid include *Juncus squarrosus, Juncus effusus, Carex echinata, Veronica officinalis, Polygala serpyllifolia, Potentilla erecta, Euphrasia nemorosa, Luzula sylvatica, Pedicularis sylvatica, Galium saxatile, Luzula multiflora* and *Ranunculus flammula*. Some low browsed *Calluna vulgaris* and *Erica tetralix* also occur in this habitat. Prominent bryophytes occurring include *Rhytidiadelphus loreus, Rhytidiadelphus squarrosus, Hylocomium splendens* and *Pleurozium schreberi*.
GS4	Wet grassland	Wet grassland occurring within and surrounding the proposed development site is characterised by species-poor stands of Juncus effusus. This habitat occurs along the verges of existing access tracks and in flushed areas along drainage ditches and stream corridors.
GS4/GS3	Wet grassland/ Dry Acid Grassland Mosaic	The wet and acid grassland mosaic principally occurs to the east of the proposed wind farm site in the vicinity of T06. It is situated on more gently south sloping ground and is subject to grazing by livestock. The sward consists of a patchy cover of *Juncus effusus* inter-mixed with acid grasses such as Anthoxanthum odoratum, Deschampsia flexuosa, Festuca ovina and Agrostis capillaris. Frequently occurring herbs include Galium saxatile, Potentilla erecta, Cirsium vulgare and Polygala serpyllifolia. Pleurocarpous mosses in the form of

Fossitt 2000 Code (s)	Name of Fossitt 2000 Habitat Communities	Brief Description* *The brief descriptions below, are based on the Site Habitat Surveys – refer to the Guide for Habitats in Ireland (Fossitt, 2000) for further information regarding these Habitat Classifications.
		Hylocomium splendens, Pleurozium schreberi, Rhytidiadelphus loreus, Rhytidiadelphus squarrosus, Kindbergia praelonga and Pseudoscleropodium purum dominate the bryophyte layer.
	Dry Acid Grassland/ Dense Bracken Mosaic	A small area of this mosaic habitat occurs at the base of the south facing slope to the northwest of the proposed turbine T07. It forms a patches mosaic of dense bracken with dry acid grassland.
GS3/ER3	Dry Grassland/ Siliceous Rock	This habitat is characterised by areas of dry acid grassland with outcrops of siliceous rock. It is located within and adjacent to the proposed development site, occurring to the southeast of the proposed turbine T04.
PB2	Blanket Bog	The principal area of blanket bog occurring within the site is located in an area of level ground between the proposed turbines T07, T08 and T03. Deeper peat occurs at this location and a basin mire has established in the level ground. *Trichophorum germanicum* dominates the sward with *Calluna vulgaris* and *Erica tetralix* occurring abundantly. *Eriophorum vaginatum, Eriophorum angustifolium* and *Schoenus nigrans* occur throughout. *Agrostis ovina, Deschampsia flexuosa, Carex echinata, Carex panicea, Rhynchospora alba, Narthecium ossifragum, Potentilla erecta* and *Drosera rotundifolia* occur constantly. The bryophyte layer is dominated by *Sphagnum* species with *Sphagnum capillifolium, Sphagnum papillosum, Sphagnum palustre, Sphagnum denticulatum, Sphagnum subnitens* and *Sphagnum tenellum* occurring. Other frequently occurring bryophytes include *Pleurozia purpurea, Pleurozium schreberi, Racomitrium lanuginosum, Aulacomium palustre, Hypnum jutlandicum*, *Rhytidiadelphus loreus* and *Odontoschisma sphagni*. A second smaller area of blanket bog habitat occurs in a deposit of peat located on relatively flat to gently sloping ground at the base of the south facing slope of Shehy More. This more discrete area of bog is located at and surrounding the turbine T06. The bog here is most representative of a spur bog as described by Lindsay (1995), with a steep slope to north and under natural conditions the southern boundary of the spur bog being delimited by the south facing slope of Shehy Beg. This example of spur bog is fragmented moving from east to west through the habitat by the Shehy Beg Stream and from north to south by the existing access track. It is confined to the north by the slopes of Shehy More, to the west by a rise in topography, west of the Shehy Beg Stream, to the east by a rise in topography, approximately 70m east of the T06 hardstand, and to the south by a combination of the existing access track (west of the Shehy Beg Stream and a rise in topography (East of the Shehy Beg Stream). The spur bog extends south of the existing access track. The extent of this habitat occurring to the west of the Shehy Beg Stream is characterised by a low water table, with firm ground underfoot and dehumidified peat at the surface. Sphagnum cover is low with dry shallow hummocks colonised by *Racomitrium lanuginosum* occurring throughout. The sward is patchy with bare peat frequent amongst pioneering Eriophorum vaginatum, Eriophorum angustifolium and Molinia caerulea (see Target note No. 98). Similar conditions, albeit with a slight increase in Sphagnum cover persist to the east of the Shehy Beg Stream (see Target note No. 99). Moving further east through this habitat, the ground rises slightly approaching T06, with wet conditions and more humidified peat and abundant Sphagnum occurring at the eastern extent of the T06 hardstand and for approximately 60m to the east. This example of bog habitat to the north of the existing access track is predominantly desiccated and dehumidified with a discrete area representative of more active conditions occurring near the eastern extent of T06 and stretch east for approximately 60m.
PB2	Molinia caerulea	Two areas of Molinia caerulea blanket bog occur to the west of the proposed development site in associated with flushed areas along stream corridors underlain by deep peat. The

Fossitt 2000 Code (s)	Name of Fossitt 2000 Habitat Communities	Brief Description* *The brief descriptions below, are based on the Site Habitat Surveys – refer to the Guide for Habitats in Ireland (Fossitt, 2000) for further information regarding these Habitat Classifications.
	dominated blanket bog	most significant area occurs approximately 200 m to the west of the redline boundary on gently sloping ground on peat typically deeper than 1 m.
HH1/ER3	Dry heath/ Siliceous Rock	Expanses of dry heath with Siliceous rock outcrops occurs to the west of the proposed development site. Exposed bedrock at the surface occurs throughout this habitat. The dry heath vegetation is dominated by tall and sometimes leggy swards of *Calluna vulgaris*. Erica cinerea is constant throughout this habitat. Erica tetralix and Molinia caerulea are also frequent. Acid grass species occur in area of less dense heather cover and include *Agrostis stolonifera, Agrostis capillaris, Deschampsia flexuosa, Festuca ovina* and *Nardus stricta. Juncus squarrosus, Potentilla erecta, Rhytidiadelphus squarrosus, Rhytidiadelphus loreus, Hylocomium splendens* and *Racomitrium lanuginosum* all occur frequent within this habitat.
HH3	Wet heath	Wet heath dominates the land cover to the north of Shehy Mountain. This habitat occurs on thin peat, generally at less than 0.5 m in depth. This habitat is dominated by stands of *Calluna vulgaris* and *Erica tetralix* with *Molinia caerulea, Eriophorum vaginatum, Eriophorum angustifolium, Schoenus nigrans* also occurring abundantly throughout this habitat. Other species that are frequent in this habitat include *Narthecium ossifragum, Cladonia species, Nardus stricta, Anthoxanthum odoratum, Hypnum jutlandicum, Pleurozium schreberi, Pleurozia purpurea, Vaccinium myrtillus, Sphagnum capillifolium, Sphagnum subnitens, Sphagnum papillosum* and *Sphagnum palustre*.
HH3/ER3	Wet heath/ exposed siliceous rock	This mosaic habitat dominates the land cover on undulating to level ground on thin peat cover, less than 0.5m in depth between the proposed turbines T03, T04 and T09. The vegetation occurring in this habitat is similar to that of the wet heath described above. The principal difference distinguishing this area from other areas of wet heath is the prevalence of exposed bedrock at the surface. In this habitat *Calluna vulgaris, Vaccinium myrtillus* and *Trichophorum germanicum* along with a range of other grasses are abundant. *Sphagnum capillifolium* is prevalent throughout along with *Cladonia portentosa*.
HH3/GS3	Wet heath/Acid grassland	This habitat mosaic occurs on outcrops of bedrock that are more grassy in nature occurring in association with typical wet heath species such as *Calluna vulgaris, Erica tetralix, Vaccinium myrtillus* and *Juncus squarrosus*. Other species occurring include *Deschampsia flexuosa, Agrostis capillaris, Festuca ovina, Nardus stricta, Potentilla erecta* and *Carex binervis*
HH3/GS3 /ER3	Wet heath/Acid grassland/ Exposed siliceous rock Mosaic	This habitat mosaic occurs on outcrops of bedrock that are more grassy in nature occurring in association with typical wet heath species such as *Calluna vulgaris, Erica tetralix, Vaccinium myrtillus* and *Juncus squarrosus*. Other species occurring include *Deschampsia flexuosa, Agrostis capillaris, Festuca ovina, Nardus stricta, Potentilla erecta* and *Carex binervis.* This mosaic habitat dominates the western side of the Site in areas of elevated and sloping ground on thin peat cover, less than 0.5m in depth. The vegetation occurring in this habitat is similar to that of the wet heath described above. The principal difference distinguishing this area from other areas of wet heath is the prevalence of exposed bedrock at the surface. In this habitat *Calluna vulgaris, Vaccinium myrtillus* and *Trichophorum germanicum* along with a range of other grasses are abundant. *Sphagnum capillifolium* is prevalent throughout along with *Cladonia portentosa*.
HH4	Montane Heath	Examples of montane heath occur at high elevation along the ridge line of Shehy More and the north facing slopes of the mountain. The north side comprises a sward of extensive *Calluna vulgaris* undisturbed by grazing pressure. *Calluna vulgaris* is the dominant species

Fossitt 2000 Code (s)	Name of Fossitt 2000 Habitat Communities	Brief Description* *The brief descriptions below, are based on the Site Habitat Surveys – refer to the Guide for Habitats in Ireland (Fossitt, 2000) for further information regarding these Habitat Classifications.
		with other species typical of montane heath such as *Empetrum nigricans, Galium saxatile, Rumex acetosella, Huperzia selago* and Racomitrium lanuginosum also prevalent.
ER1	Exposed siliceous rock	Examples of exposed siliceous rock occur adjacent to the proposed development site to the north of T03 and T04 where ridge lines of exposed sandstone rock occur on the south facing slopes of Shehy More. This habitat supports a range of typical species such as *Saxifraga spathularis; Galium saxatile; Potentilla erecta; Oxalis acetosella; Blechnum spicant; Agrostis capillaris; Festuca ovina; Polytrichum alpinum; Mnium hornum; Isothecium myosuroides; Rhytidiadelphus loreus; and Diplophylum albicans.* The example of this habitat occurring on the south facing rock face of Shehy More has links to the Annex 1 habitat Siliceous Rocky Slopes (8220).
ED2	Spoil and bare ground	A small are of spoil and bare ground that is comprised of denuded surface with spoil deposition occurs at the terminus of an existing access track to the south of T09.
ED3	Recolonising bare ground	Minor areas of recolonising bare ground occur within the Development site in areas of previously disturbed agricultural lands.

6.5.2.2 Annex I Habitats

The Annex 1 habitats identified as occurring within the Site are listed in **Table 6.8** below.

Table 6.7: Primary Associated EU Annex I Habitat Types

Annex I Code	Annex I Short Name in this report	Corresponding Level 3 Fossitt Habitat	Annex I Full Title Interpretations of these Annex I habitats in a European context are available from European Commission 2013 (EUR28).
			EU Annex I habitats marked by an asterisk (*) are deemed to be priority habitats that are in danger of disappearing within the EU territory.
4030	Dry heath	Dry heath HH1	European dry heath
Annex 1 habitat Adjacent to the proposed development site			
4010	Wet heath	Wet heath HH3	North Atlantic Wet heath with Erica Tetralix
4060	Alpine and Sub-Alpine heath	Montane heath HH4	Alpine and Boreal heaths
8220	Siliceous Rocky Slopes	Siliceous rocky slopes with chasmophytic vegetation	Exposed siliceous rock

6.5.3 Habitats occurring at the TDR Widening Locations

A description of the Level 3 Habitats, as per the Guide to Habitats in Ireland, occurring within the Site is provided in **Table 6.8** below. The extent and distribution of these habitats at TDR widening locations are shown on **Figure 6.9 to Figure 6.23**. The TDR widening locations habitat map figures are prepared moving from east to west along the TDR from the Port of Cork to the Site A total of 8 habitats have been identified as occurring within the Site. These habitats are described in **Table 6.8** below.

Table 6.8: Primary Fossitt 2000 Habitat Communities recorded at the Site during surveys

Fossitt 2000 Code (s)	Name of Fossitt 2000 Habitat Communities	Brief Description* *The brief descriptions below, are based on the Site Habitat Surveys – refer to the Guide for Habitats in Ireland (Fossitt, 2000) for further information regarding these Habitat Classifications.
FW1	Eroding Watercourse	Eroding watercourses occur at the widening locations: • 12C (the Gortnalour Stream, EPA Code: 19G20); • 17A (the Lagneeve, EPA Code: 19GL08 • 18B (the Gortnarea Stream, EPA Code: 19G22); and • 21 (un-named and un-coded stream). The watercourse crossed at each of these locations are located within the Lee[Cork]_SC_010 sub-catchment. Bridge widening will be required at the widening location 12C, at the existing crossing of the Gortnalour Stream, approximately 2.5 km upstream of this stream's confluence with the River Lee.
GA1	Improved agricultural grassland	Improved agricultural grassland dominates the land cover at the TDR widening locations 7; 22; 29; 28. These species include an abundance of *Lolium perenne, Holcus lanatus, Alopecurus pratensis, Ranunculus repens, R. acris, Trifolium repens, Trifolium pratense, Cirsium arvense, Cirsium vulgare* and *Urtica dioica*.
GS2	Dry meadows and grassy verges	This habitat consists of road side verges with a range of commonly occurring grasses and forbs occurring. This habitat is present at the TDR widening locations 18B; 19; 20A; 21; 21A; 22
GS4	Wet grassland	Wet grassland occurring within and surrounding the proposed development site is characterised by species-poor stands of *Juncus effusus*. This habitat is present at TDR 14.
WL1	Hedgerows	The hedgerows occurring at the TDR locations are dominated by Crataegus mongyna and Salix species. Hedgerows occur at the TDR locations 7; 12C; 14; 17a; 29.
WS1	Scrub	The scrub habitat occurring at the TDR locations is dominated by Crataegus mongyna, Salix species, Rubus fruticosus agg. with Ilex aquifolium and Pteridium aquilinum also prevalent. Scrub occurs at the TDR locations 12C; 14; 17C; 17D; 20; 20A
HH3	Wet heath	Wet heath vegetation occurs along the roadside verge at TDR 20B. The vegetation at this location consists of Calluna vulgaris, Erica tetralix and Molinia caerulea. Ulex europeaus is also occurring.
HD1	Dense bracken	Dense bracken occurs at TDR 14; 19A and 20. The dense bracken habitat is dominated by dense mono-specific stands of Pteridium aquilinum.

Fossitt 2000 Code (s)	Name of Fossitt 2000 Habitat Communities	Brief Description* *The brief descriptions below, are based on the Site Habitat Surveys – refer to the Guide for Habitats in Ireland (Fossitt, 2000) for further information regarding these Habitat Classifications.
BL3	Buildings and artificial surfaces	The land cover within the TDR widening locations 12C; 14; 17a; 20; 21; 21A and 22 is dominated by buildings and artificial surfaces.

6.5.4 Habitats occurring along the Grid Connection Route

The entire stretch of the grid connection route Option A and Option B from the Site to the existing ESB substations at Dunmanway and Carrigdangan will be located within the footprint of existing public road corridors.

Horizontal directional drilling will be used to cross watercourses along the route. At the crossing locations, the electrical cable ducts will be drilled underground below the watercourses. The launch and receptor pits required for the horizontal directional drilling will be positioned within the existing road corridor.

The habitat occurring along the cable route is entirely comprised of road surface which is representative of buildings and artificial surfaces (BL3).

6.5.5 Results of the Aquatic Habitat Survey

The Site and the grid connection route is located within the Lee, Cork Harbour and Youghal Bay Catchment Area, the Bandon-Illen Catchment Area and the Dunmanus-Bantry-Kenmare Catchment Area in Hydrometric Areas 19, 20 and 21 respectively. The Proposed Development and Grid Connection Route Options are located within three WFD sub-catchments. These include the Lee [Cork]_SC_010 sub-catchment, the Bandon_SC_010 sub-catchment and the Coomhola_SC_010 sub catchment. These three sub-catchments occur within catchment that are listed as a *Margaritifera* Sensitive Areas.

The Site is intersected by four EPA mapped rivers or small streams, with sixteen rivers or small streams being located either within or in relative proximity to the Redline Boundary. Many of these streams merge to form larger channels. These small channels have been numbered 1 – 16 for the purpose of ease of identification and are shown on **Figure 9.3** and **Figure 9.4** in **Volume III**. The Site also contains multiple unmapped small natural and artificial drainage channels. Eight EPA mapped channels located north of the summit of Shehy More (Streams 1 - 8), are tributaries of the Gortloughra River which in turn is a

tributary of the Owvane River, which is also referred to as the "*Ouvane River*". The Gortloughra River has the EPA name designation of "*Inchiroe*" and has a stream order of 3. The Gortloughra River flows for approximately 2 km west of the Site until it merges with the Owvane River. The Owvane River has the EPA name designation of "*Owvane (Cork)*" and has a stream order of 4. The Owvane River flows in a south-westerly direction to the north of Kealkill before ultimately draining into Bantry Bay at Ballylickey.

Eight small channels are located south of the summit of Shey More (Channels 9 – 16, inclusive), all of which are tributaries of the River Bandon. Six of these small channels have a stream order of 1 and are unnamed streams. Two of these channels have a stream order of 2 and have the EPA names of "*Shehy_Beg*" and "*Shanacrane_East*". Six channels located in the south-eastern area of the Site all merge into the "*Shehy_Beg*" River to the south-east of the Site in the townland of Tooreen. The Shehy Beg River ultimately merges with the Bandon River, approximately 4km to the south-east of the Redline Boundary. Two channels drain the south-west portion of the Site, namely the "*Shanacrane_East*" and a small unnamed stream. Both of these streams ultimately merge and continue as the EPA named "*Shanacrane_East*" which merges with the Bandon River approximately 3.8 km southwest of the Redline Boundary.

Figure 6.3 illustrates the locations of rivers and streams within the Site and its environs. This figure also indicates the locations used for Aquatic Monitoring Points (WQ 1 – 4). The results of aquatic surveys are summarised in **Table 6.9** below. Locations surveyed differed between small order streams to larger order rivers surrounding the Site.

Table 6.9: Summary Results of the Aquatic Surveys that were undertaken at the Site (WQ1-WQ4) on 19th July 2023

Water Quality Site	WQ1	WQ2	WQ3	WQ4	WQ5
River/Stream Name	Gortloughra Stream	Shanacrane East Stream	Shanacrane East Stream	Shehy Beg Stream	Shehy Beg Stream
River Sub-basin	Coomhola sub-catchment	Bandon SC 010 sub-catchment	Bandon SC 010 sub-catchment	Bandon SC 010 sub-catchment	Bandon SC 010 sub-catchment
River/Stream Order	1st Order	2nd Order	2nd Order	2nd Order	2nd Order
***Margaritifera* sensitive area**	Yes	Yes	Yes	Yes	Yes
EPA code	21I15	20S11	20S11	20S15	20S15
EPA Q-Value	Not assigned	Not assigned	Not assigned	Not assigned	Not assigned
Q-Value	Q4 – 5	Q4 – 5	Q4 – 5	Q4 – 5	Q4 – 5
WFD Class	A	A	A	A	A
WFD Status	Good	Good	Good	Good	Good
Salmonid Suitability	Marginal salmonid spawning and nursery habitat.	Important salmonid spawning and nursery channel.	Important salmonid spawning and nursery channel	Important salmonid spawning and nursery channel	Important salmonid spawning and nursery channel

6.5.6 Fauna

6.5.6.1 Bats

6.5.6.1.1 Existing Desktop Information

The review of existing BCI records of bat species in the area of the Site indicates that at least six of the nine known Irish species of bat have been recorded within a 10 km radius of the Site. These bats include *Pipistrellus* sp. soprano pipistrelle, Leisler's, brown long-eared, Daubenton's, Myotis species (unidentified to species) and lesser horseshoe bat. Of these species, *Pipistrellus* sp., soprano pipistrelle, brown long-eared bat, Daubenton's bat and lesser horseshoe bat have been recorded roosting within a 10 km radius of the Site. Review of NBDC (10 km grid squares W15 and W16) indicates that soprano pipistrelle, unidentified *Pipistrellus* sp., Leisler's bat, Daubenton's bat, whiskered bat, and lesser horseshoe bat have previously been recorded within 10 km of the Site.

Review of the NPWS Lesser Horseshoe bat database indicates that there are no records of roosts within a 2.5 km buffer (Core Sustenance Zone (CSZ)) of the Site boundary (NPWS 2018).

The Cave Database for the Republic of Ireland does not hold any records of caves within a 4 km radius of the Redline Boundary.

Survey work undertaken for Carrigarierk Wind Farm, located c.5.5 km to the east of the proposed Gortloughra Wind Farm at its closest point, recorded common pipistrelle, soprano pipistrelle, Leisler's, whiskered/Brandt's, brown long-eared and lesser horseshoe bat.

6.5.6.1.2 Roost Survey Results

No dwellings or other buildings are present within the Site at Gortloughra and its environs. Structures present within the Site are limited to five culverts over the small watercourses draining the Site. Three of the culverts did not support any features of potential use by roosting bats. Two of the culverts supported some crevices that would be of potential use by bats but neither culvert had any associated habitat features such as scrub or riparian woodland that would be favoured by roosting bats. No evidence of bats was observed at any culvert within the proposed site.

The cover of broadleaved trees at the proposed site at Gortloughra is low; no large mature trees were recorded during the site surveys. No trees with suitability as roosting or resting places for bats were recorded at this site.

6.5.6.1.3 Bat Transect Survey Results

Three species of bats were recorded during the bat transect surveys. These comprised Common pipistrelle, followed by Leisler's bat and Soprano pipistrelle. The most commonly recorded species was Common pipistrelle. Activity during transect surveys was low with the highest number of bat passes recorded during any night of transect survey amount to 9. No bat activity was recorded during any of the three no. transects completed at the site during the 2021 bat survey season.

6.5.6.1.4 Static Survey Results

A total of nine species of bats were recorded during the static detector monitoring. **Table 6.8** below provides a summary of the bat species recorded during the static detector monitoring sessions.

Table 6.10: Bat species recorded during static detector monitoring surveys

Detector	Survey Year	**Monitoring Round**	**Species detected**
GL1	2020	Round 1	Daubenton's bat Whiskered bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
		Round 2	Leisler's bat Common pipistrelle
		Round 3	N/A
	2021	Round 1	Daubenton's bat Natterer's bat Leisler's bat

Detector	Survey Year	Monitoring Round	Species detected
			Common pipistrelle Soprano pipistrelle Brown long-eared bat
		Round 2	Daubenton's bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
		Round 3	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
GL2	2020	Round 1	Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
		Round 2	Daubenton's bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared

Detector	Survey Year	Monitoring Round	Species detected
			bat
		Round 3	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
	2021	Round 1	Daubenton's bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
		Round 2	No data
		Round 3	Daubenton's bat Whiskered bat Natterer's bat Myotis bat Leisler's bat Common pipistrelle Soprano pipistrelle
GL3	2020	Round 1	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat Lesser horseshoe bat

Detector	Survey Year	Monitoring Round	Species detected
		Round 2	Daubenton's bat Leisler's bat Pipistrelle sp. Common pipistrelle Soprano pipistrelle Brown long-eared bat
		Round 3	N/A
	2021	Round 1	Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
		Round 2	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
		Round 3	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat

Detector	Survey Year	**Monitoring Round**	**Species detected**
GL4	2020	Round 1	Leisler's bat Nathusius' pipistrelle Brown long-eared bat Lesser horseshoe bat
		Round 2	Leisler's bat Common pipistrelle Soprano pipistrelle
		Round 3	Daubenton's bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
	2021	Round 1	Daubenton's bat Whiskered bat Leisler's bat Brown long-eared bat
		Round 2	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
		Round 3	Daubenton's bat Natterer's bat Whiskered bat

Detector	Survey Year	Monitoring Round	Species detected
			Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
GL5	2020	Round 1	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat Lesser horseshoe bat
		Round 2	Daubenton's bat Leisler's bat Pipistrelle sp. Common pipistrelle Brown long-eared bat
		Round 3	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat Lesser horseshoe bat
	2021	Round 1	Daubenton's bat Natterer's bat Leisler's bat

Detector	Survey Year	Monitoring Round	Species detected
			Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
		Round 2	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
		Round 3	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
GL6	2020	Round 1	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
		Round 2	Daubenton's bat Whiskered bat

Detector	Survey Year	Monitoring Round	Species detected
			Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
		Round 3	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
	2021	Round 1	Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
		Round 2	Daubenton's bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
		Round 3	Daubenton's bat Natterer's bat Whiskered bat

Detector	Survey Year	**Monitoring Round**	**Species detected**
			Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
GL7	2020	Round 1	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
		Round 2	Nathusius' pipistrelle
		Round 3	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat Lesser horseshoe bat
	2021	Round 1	Daubenton's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat

Detector	Survey Year	Monitoring Round	Species detected
		Round 2	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
		Round 3	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
GL8	2020	Round 1	Daubenton's bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
		Round 2	Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
		Round 3	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat

Detector	Survey Year	Monitoring Round	Species detected
			Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
	2021	Round 1	Leisler's bat Brown long-eared bat
		Round 2	Daubenton's bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
		Round 3	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
GL9	2020	Round 1	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Common pipistrelle Brown long-eared bat
		Round 2	Leisler's bat Common pipistrelle Soprano pipistrelle
		Round 3	Daubenton's bat

Detector	Survey Year	**Monitoring Round**	**Species detected**
			Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
	2021	Round 1	Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
		Round 2	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
		Round 3	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat

6.5.6.2 Terrestrial Mammals – Badger and Otter

The lower sections of the Shanacrane East, Gortloughra and Shehy Beg Streams downstream of the Site provide suitable foraging habitat for otters. The upper sections of these streams, near their sources adjacent to and within the Site provide limited foraging habitat for otters owing to the spate conditions and variable flow rates in these upper sections, with limited fisheries resource.

No evidence indicating the presence of otters, their holts or couches were observed along the stretch of the Shanacrane East, Gortloughra and Shehy Beg Streams downstream of the Site.

No badgers or their setts were observed during field surveys within the Site. The upland grassland and heath habitat on thin layers of soil and peat with rock at or close to the surface limits the suitability of the site to support badgers and their setts.

No evidence of other mammal species such as fox, pine marten, Irish stoat, red squirrel, hedgehog and pygmy shrew were recorded during surveys. However, these species are likely to occur in the surrounding area.

6.5.6.3 Herpetofauna

Common frog (Rana temporaria) was frequently recorded within the Site. This species was recorded breeding in pooling water in depressions and in flushed habitat. Common lizard or smooth newt were not recorded during field surveys. However, the upland habitat with exposed rock within the Site provides suitable habitat for both these species and they are likely to occur within, and surrounding the Site.

6.5.6.4 Kerry Slug

Kerry Slug occur within the landholding having been recorded on exposed siliceous rock habitat during torch light searches of suitable habitat along transect no. 1, 2 and 4 at the Site (see Figure 6.5). Kerry slug are known to occur in this area having previously been recorded in the neighbouring townland of Torreen to the southeast and during baseline ecological surveys for the Shehy More Wind Farm.

6.5.6.5 Protected Terrestrial Invertebrates

The food plant of the marsh fritillary larvae Succisa pratensis occurs rarely on Site and as such the Site does not offer suitable habitat for supporting this species.

Marsh fritillary has been recorded in the wider surrounding area with records for this species held of the townland of Torreen, approximately 1 km to the southeast of the Site.

6.5.6.6 Aquatic Fauna

6.5.6.6.1 Fisheries

The three principal watercourses draining the Site are of a similar character and are representative of the Eroding Upland River (FL2) habitats. Each of the watercourses are representative of upland spate rivers characterised by fast water flow and incised banks. Each of the streams are subject to variable flow rates that are dependent on precipitation rates, with spate conditions occurring during periods of higher rainfall and ebb flows resulting during periods of low rainfall or dry conditions. During ebb flows much of the stream bed along these streams can be subject to drying out. The morphology of the Shanacrane East and Shehy Beg Stream at the Site is representative of high-gradient upland A/B-type zone (Rosgen, 1996) which are characterised by first order streams over high gradients, with steps and pools boulder strewn beds with cobbles and gravels and a straight profile. The Gortloughra Stream is located in an area of more gently sloping ground and is more representative of C-type zone (Rosgen, 1996). Shading occurs along the Shanacrane East and Shehy Beg Streams downstream of the proposed wind farm site caused by adjacent broad-leaved woodland.

The overall evaluation of these three watercourses for their potential to support salmonids and lamprey species is set out in **Table 6.11** below.

Table 6.11: Summary of Salmonid & Lamprey Habitat downstream of the proposed wind farm site

Watercourse	Salmonid Habitat	Lamprey Habitat
Gortloughra Stream	Supports important salmonid spawning and nursery habitat downstream of Site. Marginal salmonid spawning and nursery channel upstream adjacent to Site	No lamprey species present in stream.
Shanacrane Stream	Upstream sections of stream within and near proposed wind farm site not used by salmonids. Supports important	Lamprey species absent but suitable habitat occurs along this stream downstream of the Site.

Watercourse	Salmonid Habitat	Lamprey Habitat
	salmonid spawning and nursery habitat downstream of Site.	
Shehy Beg Stream	Upstream sections of stream within and near proposed wind farm site not used by salmonids. Supports important salmonid spawning and nursery habitat downstream of Site.	Lamprey species absent but suitable habitat occurs along this stream downstream of the Site.

As outlined in **Table 6.11** above, the three primary streams draining the Site support conditions at the Site that are overall not representative of optimal spawning or nursery habitat for salmonids. These findings are supported by McGinnity et al. (2003) and Hendry et al. (2003) who note that salmonid watercourses are generally restricted to 2nd order and higher watercourses, whilst 1st order streams are unsuitable for spawning and the early life stage of salmonids. The 1st order nature of these streams within the Site, along with their propensity for variable flow rates and the drying out of sections of riverbed during periods of drier weather conditions are identified as the principal factors reducing the potential to support salmonids.

All three streams draining the Site, downstream of the Site, are representative of salmonid watercourses and provides suitable spawning and nursery habitat for salmonids.

In addition to the fisheries surveys completed for the Project, Inland Fisheries Ireland (IFI) (Gordon et al., 2021) completed a catchment-wide survey of the Bandon River between August and September 2021. A total of 35 no. sites were surveyed as part of the catchment-wide survey. Of these survey sites 4, 5 and 6 occur in the vicinity of the Project. Survey sites 5 and 6 are located along the Shanacrane East Stream approximately 3.5 km and 5.5 km downstream of the Site. Survey site 4 is located along the Caha River at Coolmountain Bridge, which is crossed by the proposed Grid Connection Route Option A. Other survey sites occurring in the local catchment area upstream of the Project include survey site 2, 3, 9 and 10. The location of these 2021 IFI survey sites are shown on **Figure 6.24**. **Table 6.12** lists the fish species recorded during surveys at these 7 no. survey sites in terms of minimum density (no. fish/m^2).

Results for the 2021 survey are compared with results from a previous round of IFI survey completed during 2019.

Table 6.12: Results of IFI 2021 Fisheries Surveys at Sites Local to the Gortloughra Wind Farm

Site No.	4		5		6		2		3		9		10	
Species	**2019**	**2021**	**2019**	**2021**	**2019**	**2021**	**2019**	**2021**	**2019**	**2021**	**2019**	**2021**	**2019**	**2021**
Brown Trout	0.257	0.201	0.086	0.248	0.175	0.228	0.352	0.098	0.228	0.144	0.083	0.032	0.237	0.273
0+ brown trout	0.227	0.139	0.023	0.053	0.123	0.176	0.253	0.098	0.114	0.096	0.083	0.019	0.113	0.196
1+ & older brown trout	0.031	0.061	0.063	0.195	0.052	0.053	0.1		0.114	0.048		0.013	0.124	0.077
Salmon	0.082	0.017	0.161	0.318	0.362	0.217	0.253	0.106	0.053		0.609	0.263		
0+ salmon	0.082		0.103	0.239	0.349	0.205	0.253	0.098	0.053		0.595	0.236		
1+ & older salmon		0.017	0.057	0.08	0.013	0.012		0.008			0.014			
European Eel			0.04					0.041	0.011	0.018				
Minnow			0.092	0.027										
Three-spinned Stickleback								0.008	0.061	0.222				

Colour Code: Blue = High Fish Ecological Status; Green = Good Fish Ecological Status; Yellow = Moderate Fish Ecological Status

As per **Table 6.12** above the IFI have recorded a decline in fish ecological status at Site No. 4 and 3, no improvement from moderate status at Site No. 9 and 10; no change in Good status at Site No. 6; and an improvement in status at Site No. 5.

In terms of the wider all catchment-area survey Site No. 2, 3 and 4 as set out in Table **6.12** were the only sites where a deterioration in fish ecological status was recorded. Of the 35 survey sites, 13 sites improved whilst 16 site remained unchanged in the wider catchment area survey.

The IFI offered likely causes for the deterioration at Site No. 2, 3 and 4 as being related to pressures caused by nutrient enrichment, habitat modification and fish passage issues.

6.5.6.6.2 Freshwater Pearl Mussel

The Proposed Development and Grid Connection Route Options are located within three WFD sub-catchments. These include the Lee [Cork]_SC_010 sub-catchment, the Bandon_SC_010 sub-catchment and the Coomhola_SC_010 sub catchment. These three sub-catchments occur within catchment that are listed as a *Margaritifera* Sensitive Areas. Freshwater pearl mussel are known to occur downstream of the proposed wind farm site along higher order watercourses of the catchment.

A Sub-Basin Management Plan (SBMP) has been prepared for the freshwater pearl mussel population of the Bandon Catchment. The population occurring within the Bandon catchment, downstream of the proposed wind farm site, is a qualifying features of interest of the Bandon River SAC.

Pearl mussels require specific habitat conditions for the survival of viable populations. The principal habitat requirements are oligotrophic, well oxygenated waters of highwater quality with low levels of sedimentation and a firm substrate of gravels and sand. Such conditions occur throughout the Bandon catchment and the distribution of pearl mussels in this catchment is known to be widespread with records from as high as Cullenagh Lake to as low as Bandon Town. Significant survey effort to establish the extent of the population within the Bandon River at Dunmanway was undertaken between the mid 1990's and 2005. Attempts to survey the population along the river in 2009 were repeatedly thwarted by spate conditions. Thus, it is noted in the SBMP that the current status of the population is based on survey work completed up to 2005.

While the surveys undertaken to date found the population to be abundant in places, with up to 75 individuals per square metres recorded (Ross, 2005), the population consisted mainly of adult mussels: the surveys recorded no mussels with shell lengths lower than 65mm. The results of surveys also suggested that juvenile habitat is seriously impaired. High levels of silt in the Caha River have been recorded and are likely to be affecting juvenile survival. Examination of salmonids during electro-fishing surveys in 2009 found none to be encysted with glochidia, suggesting that although good numbers of salmonids are present within the Bandon River the mussel population may be too stressed to brood glochidia to maturity. Other unfavourable conditions have been recorded within the catchment such as macrophyte cover over 5% at pearl mussel habitats (legislation requires cover to be <5%). The SBMP does note that the population of the Bandon River is likely to support in excess of 50,000 individuals. Notwithstanding these numbers the conservation status of the Bandon River catchment mussel populations is considered to be unfavourable due to low levels of recruitment and impaired juvenile habitat.

The nearest location of known pearl mussel beds to the proposed development is along the stretch of the Caha River crossed by the proposed grid connection route Option A (at the townland of Neaskin and Ardcahan). Extensive mussel beds occur along the Caha River at this crossing location as well as upstream and downstream of the crossing location. Extensive mussel beds also occur downstream along the main channel of the Bandon River also at that location.

6.5.6.7 Invasive Alien Species (IAS)

No non-native invasive species were identified within the proposed development site. *Rhododendron ponticum* and *Prunus laurocerasus* occurring in the surrounding area and downstream of the Site.

6.6 ASSESSMENT OF POTENTIAL ENVIRONMENTAL EFFECTS

6.6.1 Identification & Evaluation of Ecological Receptors

Table 6.13 below lists and evaluates the ecological features identified as occurring within the ZoI of the Proposed Development and identifies those which are considered to be ecological receptors following the methodology previously described within Section 6.2.

Table 6.13: Evaluation of Ecological Features Identified at and surrounding the Proposed Development

Ecological Feature	Evaluation	Ecological Receptor?
National and Local Designated Sites*		
Bandon River SAC & Bandon River pNHA	This is an internationally important site of conservation. It supports freshwater and woodland Annex 1 habitats and also supports internationally important populations of freshwater pearl mussel and brook lamprey.	Yes – International Importance (Rating A). Assessment of this ecological feature is provided in the NIS for the Development.
Habitats		
Montane Heath	The montane heath habitat occurring within the Site comprises vegetation communities that are representative of the Annex 1 habitat Alpine and Sub-Alpine heath (4060). The condition of this habitat on the steepest north-facing slopes of Shehy More are good with a typical structure of Calluna vulgaris sward that is not subject to grazing pressure. Grazing pressure on this habitat increases to the south of the fenceline running along the ridge of Shehy More and the quality of this habitat to the south of the fenceline is considered to be reduced when compared to the north. Overall the example of this habitat occurring at Shehy ranges from County Value (Rating C) to the south of the fenceline and National Value (Rating B) to the north of the fenceline.	Yes – County to National Importance (Rating C to B)
Wet heath	The wet heath habitat occurring occurring within the Site comprises vegetation communities that are representative of the Annex 1 habitat Northern Atlantic Wet heath with Erica tetralix (4010). The condition of wet heath habitat on site is variable with examples of this habitat at lower elevations to the north and south of Shehy More being subject to high levels of grazing pressure with desiccation and erosion evident at the surface.	Yes – local importance (higher value) (Rating D) to County Importance (Rating C)
Blanket bog	A discrete area of bog classified as blanket bog occurs within the site between T07 and T03. This area of blanket bog is representative of active peat bog and supports a typical suite of peat forming species. It is small in extent being confined to area that is likely to represent a bedrock depression. This example of blanket bog is of county importance. A second discrete area of bog, likely to have formed in a bed rock depression occurs in the vicinity of T06. This section of blanket bog is predominantly characterised by firm and dehumified, desiccated peat at the surface. The vegetation predominantly consist of low Sphagnum cover with cover becoming dominant in wetter condition in a	Yes – local importance (higher value) (Rating D) to County Importance (Rating C)

Ecological Feature	Evaluation	Ecological Receptor?
	very localised area at and to the east of the turbine. At the turbine and to the west as land levels decrease the surface is characterised by patchy cover with bare peat at the surface. This discrete example of blanket bog is of local importance (higher value).	
Molinia caerulea blanket bog	The example of this habitat occurring to the west of the proposed development site is species poor being dominated by Molinia caerulea.	Yes – County Importance (Rating C)
Dry acid grassland	This habitat has been overgrazed by livestock. It represents a preferred location for sheep and cattle to graze within the Site. It is of limited nature conservation value.	Yes - (local importance (higher value) (Rating D)
Wet grassland	The wet grassland habitat occurring within the proposed wind farm site are generally species poor being dominated by stands of Molinia caerulea and Juncus effusus. However they provide cover and habitat for fauna species and are therefore considered to be of local value.	Yes - Local importance (higher value) (Rating D)
Improved agricultural grassland	This is an intensively management habitat that supports low flora diversity and is of low value for fauna.	No - Local importance (lower value) (Rating E)
Exposed siliceous rock	The exposed siliceous rock habitat occurs as ridges of exposed rock face on the south facing side of Shehy More. Suitable habitat for Kerry Slug and support a typical suite of epilythic and endolithic lithophytes. This habitat corresponds to the Annex 1 habitat Siliceous Rocky slopes with Chasmophytic Vegetation (8220).	Yes – National Importance (Rating B)
Acid grassland/dense bracken mosaic	This mosaic habitat occurs to the west of the proposed development site at the base of Shehy More. It is a species poor habitat.	No – Local importance (lower value) (Rating E)
Wet heath/Exposed siliceous rock	This mosaic habitat occurs to the south of Shehy More, supporting Calluna vulgaris dominated vegetation on shallow peat with frequent to abundant siliceous bedrock outcropping.	Yes – County Importance (Rating C)
Wet heath/exposed siliceous rock/acid grassland mosaic	This habitat occurs at lower elevations on more level to undulating ground to the south of Shehy. It is well grazed by livestock and of local importance (higher value).	Yes – local importance (higher value) (Rating D)
Wet heath/acid grassland	This habitat comprises areas of grazed heath with lower cover of Calluna vulgaris and higher abundance of acid grasses at lower elevations to the west and south of Shehy More.	Yes – local importance (higher value) (Rating D)

Ecological Feature	Evaluation	Ecological Receptor?
Dry/Montane Heath/Exposed siliceous rock	This habitat occurs along the ridgeline of Shehy More to the west of the Site.	Yes – County Importance (Rating C)
Dry grassland/exposed siliceous rock	Examples of this habitat occurring to the south of the existing access track in the vicinity of T04 are well grazed by livestock with acid grassland occurring with exposed sandstone bedrock.	Yes – local importance (higher value) (Rating D)
Wet grassland/dry acid grassland	Occurring to the east of the site on the south facing slopes of Shehy More this habitat is well grazed by livestock with frequent poaching noted throughout this habitat.	Yes – local importance (higher value) (Rating D)
Spoil and bare ground	The examples of this habitat occurring within the Site is characterised by spoil deposited in the area surrounding T09.	No - Local importance (lower value) (Rating E)
Recolonising bare ground	Minor areas of recolonising bare ground occur within the Development site in areas of previously disturbed agricultural lands.	No - Local importance (lower value) (Rating E)
Species		
Otters	While no otter resting places or signs of foraging otters were observed during field surveys along the first order streams draining the proposed wind farm site, and the Shanacrane East and Shehy Beg Streams support suitable habitat for otters. The Gortloughra Stream further downstream also provides suitable habitat for otters.	Yes - International Importance (Rating C)
Bats	All bat species in Ireland are protected under national and European legislation. Up to seven species of bats were recorded at the proposed wind farm site during bat monitoring surveys.	Yes - local importance (higher value) (Rating D)
Badgers	No evidence of badgers was recorded at the Site. The thin substrates over bedrock and abundance of bedrock outcropping are not considered to offer suitable habitat for badgers and this species is not identified as a potential ecological receptor.	Yes - local importance (higher value) (Rating D)
Irish hare	Whilst not recorded during field surveys, the habitats within the proposed wind farm site provide suitable habitat for this species and, following a precautionary approach, this species is included as an ecological receptor.	Yes - local importance (higher value) (Rating D)
Irish stoat	Whilst not recorded during field surveys, the habitats within the proposed wind farm site provide suitable habitat for this species and, following a precautionary approach, this species is included as an ecological receptor.	Yes - local importance (higher value) (Rating D)

Ecological Feature	Evaluation	Ecological Receptor?
Hedgehog	Whilst not recorded during field surveys, the habitats within the proposed wind farm site provide suitable habitat for this species and, following a precautionary approach, this species is included as an ecological receptor.	Yes - local importance (higher value) (Rating D)
Pygmy Shrew	Whilst not recorded during field surveys, the habitats within the proposed wind farm site provide suitable habitat for this species and, following a precautionary approach, this species is included as an ecological receptor.	Yes - local importance (higher value) (Rating D)
Herpetofauna	Common frog were encountered within the wind farm site. The Site also provides suitable habitat for common lizard and smooth newt.	Yes - local importance (higher value) (Rating D)
Kerry Slug	The habitat occurring within and adjacent to the proposed development site, particularly the examples of exposed siliceous rock on the south facing slopes of Shehy More, is representative of high value Kerry Slug habitat.	Yes – County Importance (Rating C)
Marsh fritillary	The nearest record for this species is approximately 2.5km to the southeast of the project site. Stands of Succisa pratensis are limited within the wind farm site and as such there is limited potential for the habitats occurring within the wind farm site to support colonies of marsh fritillary.	N/A - no suitable habitat present in the proposed development footprint.
Invertebrates	Other species of local importance are likely to be supported by the Site.	Yes - local importance (higher value) (Rating D)
Fisheries	The Shanacrane East and Shehy Beg Streams are important salmonid spawning and nursery river and is also known to support populations of brook lamprey. Brook lamprey is listed as Annex 2 qualifying species of the Bandon River SAC. As such the fisheries supported by this watercourse are of international value.	Yes - International Importance (Rating A)
Freshwater pearl mussel	Freshwater pearl mussel does not occur in the high energy, higher order spate streams draining the wind farm site. This species is known to occur within the Bandon and Owvane catchments downstream of the wind farm site. It also occurs in the Lee catchment downstream of the TDR and proposed Grid Connection Route Option A. The Bandon River population is especially important, with this mussel population forming the key qualifying features of interest for the Bandon River SAC.	Yes – International Importance (Rating A)
Non-native invasive species	*Prunus laurocerasus,*and *Fallopia japonica* is the only identified Schedule IAS that has	N/A – potential for spread of this non-native invasive species

Ecological Feature	Evaluation	Ecological Receptor?
	been identified as occurring within the Site and that requires assessment.	

**Assessment of impacts upon European Sites is provided within the Natura Impact Statement; SPAs are not considered here. SPAs and overlapping pNHAs are considered in Chapter 7 Ornithology*

6.6.2 The 'Do-Nothing' Impact

Land use activities at the Site comprise livestock grazing in the form of sheep and cattle grazing. On more level ground away from steeper slopes grazing pressure appears to have undermine the favourable status of heath habitat.

These lands will continue to be used for agricultural purposes in line with current agricultural policies for the rearing of livestock. The continued implementation of current grazing regimes on site will maintain grazing pressure on heath land habitats occurring within the Site.

6.6.3 Potential Effects of the Construction Phase

The construction phase will involve disturbance to existing vegetation during the construction activities. This will be largely in the form of excavation and removal of habitats to facilitate the construction of the wind farm site infrastructure comprising the site access tracks, Turbine Hardstand areas and Turbine Foundations and Onsite Substation and Control Building. A section of electrical cable will be undergrounded within the proposed access track. Vegetation clearance and minor excavations will also be required for temporary infrastructure required for the construction phase of the Proposed Development. The temporary construction phase infrastructure comprises the Temporary Construction Compound, blade set-down areas and Turbine Hardstands.

The provision of the electrical cable will result in excavations along the public road corridor between the proposed wind farm site and the 110kV substation at either Dunmanway or Carrigdangan.

The TDR from the Port of Cork to the Site will require temporary widening at 18 no. locations to allow a load bearing surface.

6.6.3.1 Direct Effects

Potential sources of direct impacts during the construction phase include:

- Clearance of vegetation, soil and peat substrate and rock for the construction of the Site infrastructure as listed above;
- Creation of temporary infrastructure within the Site as listed above;
- Deposition of spoil material arising from infrastructure works; and
- Access by construction equipment, including access away from the proposed infrastructure location (compaction and other damage).

Estimates of habitat loss are provided within **Tables 6.14** below.

6.6.3.1.1 Potential Direct Effects on Designated Areas During the Construction and Decommissioning Phase

No elements of the Site permanent or temporary infrastructure are located within the boundary of any European Sites, NHAs or pNHAs. There will be no direct effects, in terms of direct habitat loss, damage or disturbance on any designated conservation area as a result of the construction phase of the Proposed Development; the provision of the grid connection cable along the public road between the Site and the 110kV substation at either Dunmanway or Carrigdangan; or the provision of the temporary widening areas along the TDR.

6.6.3.1.2 Potential Direct Effects to Article 17 Annex 1 habitats

Turbines T01; T02; T03; T04; T06 and T08, associated hardstand and approximately 4 km of the proposed access track are located within the NPWS generated Article 17 mapping polygon for Alpine and Sub-Alpine heath. As noted in Section 6.4.4 above this polygon has been mapped using desk-based criteria and has not been informed by primary site survey information. The extent of montane heath and corresponding Alpine and Sub-Alpine Annex 1 heath habitat has been mapped as part of the baseline habitat and vegetation surveys. On the basis of these surveys no example of Alpine and Sub-Alpine heath habitat occurs under the footprint of the project with the nearest example of this habitat to the wind farm footprint occurring adjacent to but outside of the footprint of the proposed T02 hardstand and access track.

As such there will be no loss of Article 17 Alpine and Sub-Alpine heath as a result of the project.

6.6.3.1.3 Potential Direct Effects on Habitats During the Construction and Decommissioning Phase

Direct Effects Arising from the Proposed Wind Farm Site

Loss and disturbance of habitats will be the principal adverse ecological effect of this Proposed Development. The installation of the wind turbines and associated infrastructure will result in direct and permanent habitat loss under the footprint of the Proposed Development.

The temporary construction infrastructure elements listed above will result in direct and temporary habitat loss under the footprint of the Proposed Development.

Direct habitat loss during the construction stage of the Proposed Development will occur under the footprint of each of the wind farm infrastructure elements listed in the bullet points above.

Table 6.14 which follows, provides an assessment of the significance of habitat loss to habitats occurring within the footprint of the Proposed Development. The total loss of habitat, in square meters, is provided in **Table 6.14** and a summary list of the elements of the Proposed Development infrastructure that will result in this loss is also provided.

Table 6.14: Assessment of Estimated Habitat Loss at the Site

Habitat	wind farm infrastructure	Area under footprint HA (m^2)	% of Habitat under footprint of the proposed wind farm	Annex 1 Habitat	Significance of habitat loss
Blanket bog	Access track to T06 Turbine T06	0.99 (9,933)	2.7	Not representative of Annex 1 habitat	The blanket bog habitat occurring at T06 is representative of a localised area of peat accumulation supporting vegetation typical of blanket bog habitat. It has formed in a bedrock depression on a shelf of level ground between south facing slopes of Shehy More. It does not form a blanket of peatland in this area and as such is not considered to be representative of the Annex 1 habitat blanket bog habitat. Notwithstanding this this habitat has been classified as being of local importance (higher value) owing to its semi-natural character and the typical suite of blanket bog vegetation supported by it. The loss of this example of habitat and c. 3% of this habitat type occurring within the overall landholding will represent an irreversible and permanent, significant negative effect at the local scale. No loss of the larger area of blanket bog habitat occurring within the Site between T07, T03 and T08 will arise as a result of the proposed wind farm.
Wet heath	Access track to T01; T02; T03; T04 & T08 Turbine 01; 2 & 3 and associated hardstands	5.73 (57,254)	4.9	Examples of wet heath habitat occurring within the proposed wind farm layout are generally not representative of Annex 1 quality wet heath habitat owing to grazing pressure. The exception to this is the section of wet heath occurring under the access track between Turbine 01 and Turbine 03. This area of wet heath amounts to c. 0.3 HA (3000m^2).	The majority of the wet heath occurring under the footprint of the Proposed Development has been subject to grazing pressure and the quality of this habitat has been undermined by past land use activities. The wet heath that will be lost to the access track to T01, T02, T04 and T08 as well as Turbines 1, 2 and 3 is of local importance (higher value). This will result in the loss of c. 4.6% of the extent of this habitat occurring within the overall landholding. This will represent an irreversible and permanent moderate negative effect at the local scale. The access track connecting Turbine 01 to Turbine 03 will result in the loss of wet heath of high quality that has not be subjected to excessive grazing and is representative of the Annex 1 wet heath and is of County Importance. The loss of this area of wet heath will represent a permanent, negative effect to this area of wet heath habitat at the County scale.
Wet heath/exposed siliceous rock Mosaic	Turbine T04	0.39 (3,948)	1.3		This mosaic habitat occurring under the footprint of the Proposed Development has been subject to grazing pressure and the quality of this habitat has been undermined by past land use activities. Turbine 04 and associated hardstand will result in the loss of c. 1.3% of the extent of this habitat occurring within the overall landholding. This will represent an irreversible and permanent moderate negative effect at the local scale.

Habitat	wind farm infrastructure	Area under footprint HA (m^2)	% of Habitat under footprint of the proposed wind farm	Annex 1 Habitat	Significance of habitat loss
Wet heath/exposed siliceous rock/acid grassland mosaic	Access track to Turbine 03; 4; 8 Turbine 01 Turbine 07	2.03 (20,347)	2		This mosaic habitat occurring under the footprint of the proposed development has been subject to grazing pressure and the quality of this habitat has been undermined by past land use activities. The wind farm infrastructure will result in the loss of c. 2% of the extent of this habitat occurring within the overall landholding. This will represent an irreversible and permanent moderate negative effect at the local scale.
Wet heath/acid grassland mosaic	Access track to Turbine 03; 7 Borrow pit Turbine 07	2.46 (24,598)	16		Past grazing pressure has led to the established of denuded heath cover and an subsequent increase in grassland cover in this mosaic habitat. The wind farm infrastructure will result in the loss of c. 16% of the extent of this habitat occurring within the overall landholding. This will represent an irreversible and permanent moderate negative effect at the local scale.
Dry acid grassland	Access track to Turbine 04; 7 Turbine 01 Turbine 04 Turbine 07	0.69 (6,940)	0.69	-	The acid grassland to be loss to the footprint of the wind farm is evaluated at local importance (higher value). The status of the acid grassland occurring under the footprint of the Proposed Development and within the overall boundary is considered to be undermined by inappropriate land management such as grazing pressure and bracken encroachment. The wind farm infrastructure will result in the loss of c. 16% of the extent of this habitat occurring within the overall landholding. This will represent an irreversible and permanent slight negative effect.at the local scale.
Wet grassland	Access track to Turbine 02; 3; 4; 6; 7 and Substation Turbine 01 Turbine 02	1.08 (10,789)	1.08	-	The Proposed Development will result in the loss of wet grassland which is evaluated at local importance (higher value). The stands of wet grassland occurring under the footprint of the proposed wind farm layout comprise species-poor *Juncus effusus* dominated wet grassland. The proposed development will result in a small loss of this habitat occurring within the overall Site boundary and given that this habitat is widespread in the wider surrounding area, the loss of wet grassland will represent a slight negative effect at the local scale.
Wet/Acid grassland mosaic	Access track to Turbine 03; 5; Turbine 04 Turbine 05	0.99 (9,888)	2		The Proposed Development will result in the loss of wet grassland which is evaluated at local importance (higher value). The stands of wet/acid grassland occurring under the footprint of the proposed wind farm layout comprise species-poor *Juncus effusus* dominated wet grassland interspersed with stands of well grazed acid grassland. The Proposed Development will result in a small loss of this habitat occurring within the overall Site boundary and given that this habitat is widespread in the wider surrounding area, the loss of wet/acid grassland will represent a slight negative effect at the local scale.

Direct Effects Arising from the Proposed TDR

The habitats and their extent that will be lost to temporary widening at the proposed widening locations along the TDR are set out in **Table 6.15** below.

Table 6.15: Habitats within the Footprint of the proposed widening locations along the TDR

Habitat	Habitat in Footprint	
	m^2	HA
Wet Heath	90.63	0.009
Wet Grassland	41.76	0.004
Dense Bracken	497.02	0.050
Dry Meadows and Grassy Verges	907.73	0.091
Buildings and Artificial Surfaces	988.06	0.099
Scrub	680.90	0.068
Improved Agricultural Grassland	25091.41	2.509
Linear Habitat	**m**	
Stonewall	36.46	
drainage ditch	19.54	
Hedgerow	200.20	

The habitats occurring within the TDR widening locations are either of Local importance (lower value) (Rating E) and are not representative of key ecological receptors or are representative of discrete areas of local importance (higher value). Of the habitats listed in **Table 6.15** wet heath habitat and hedgerows are the only habitats identified to be of local importance (higher value). The example of wet heath to be lost to the footprint of the TDR will be at the widening location no. 20B. This area of wet heath occurs along the local road verge, between the road corridor and conifer plantation. It is species poor and dominated by Molinia caerulea with patchy cover of Calluna vulgaris. the temporary loss of this area of wet heath will represent an impact of slight, negative, long-term significance.

The hedgerow sections to lost along the TDR will occur at the TDR widening locations 12C; 14 and 29. These hedgerows are dominated by Salix species and Crataegus mongyna. The loss of these hedgerow will represent an impact of slight, negative, short-term significance. The remaining habitats to be temporarily lost to the footprint of the TDR are of low nature conservation value (Rating E) and have not been identified as ecological receptors. The temporary loss of these features will not result in significant negative biodiversity impacts.

Direct Effects Arising from the Proposed Grid Connection Route Options

The proposed Grid Connection Route Options will be restricted to the existing public road corridor, which does not support any ecological receptors identified for the Proposed

Development. The installation of the Grid Connection cable ducting will not require any instream works as the cable cross watercourses using horizontal directional drilling. The launch pits and receptor pits required for the horizontal directional drilling will be positioned within the road corridor and as such will not result in the loss of any semi-natural habitats.

6.6.3.1.4 Potential Direct Effects on Watercourses, Fisheries, Freshwater Pearl Mussel and Associated Aquatic Fauna during the Construction and Decommissioning Phase

The Development will comprise one bridge crossing of a first order headwater stream (EPA Code: 20_392) of the Shehy Beg Stream. An existing crossing is present at this location and it is proposed to upgrade this crossing to facilitate increased site access track widths to allow heavier vehicles to traverse the crossing. In addition to this another two crossing will be provided, one over a minor first order headwater (EPA Code: 20_397) to the southeast of the Site in the vicinity of turbine T04, and another of a first order stream (EPA Code: 21_655) to the south of the turbine T01. The crossings have been designed in accordance with detail shown in shown in **Figure 2.6 (a), (b) & (c)**, which are in line with standard Inland Fisheries Ireland requirements for new watercourse crossings. These crossing comprise a clear span bridge and box culverts (see Drawing 6460-JOD-GLWF-XX-DR-C-0304) and will not result in any modifications to the watercourse channel at the crossing location. In addition, no instream works will be required during the construction of this watercourse crossings. As such there will be no direct physical impacts to watercourses as a result of the proposed wind farm. Notwithstanding the absence of direct physical impacts, the provision of the new crossing at the Site will pose a risk of the loss of contaminants, such as suspended solids, hydrocarbons or cementitious materials, to this watercourse. The loss of such contaminants to this watercourse are representative of an indirect impact and are considered further in **Section 6.6.3.2.2**.

Whilst the Development is located within freshwater pearl mussel sensitive catchments it will not result in any works within watercourses or the riparian zone of watercourses that support populations of freshwater pearl mussel. As such there will be no potential for the project to result in direct effects on freshwater pearl mussel. The potential for the construction phase of the project to result in indirect effects to freshwater pearl mussel through the release of contaminated waters downstream to receiving watercourses that support freshwater pearl mussel is set out in **Section 6.6.3.2.2** below.

In addition to new watercourse crossings at the Site, diversions of 6 no. artificial drainage channels within the site. In the absence of appropriate methods and safeguards the diversion of these drainage channels will pose a risk of the loss of contaminants, such as

suspended solids, hydrocarbons or cementitious materials, to receiving watercourses downstream i.e. the Gortloughra, Shanacrane East and Shehy Beg Streams. The loss of such contaminants to these watercourses are representative of an indirect impact and are considered further in **Section 6.6.3.2.2**.

No new watercourse crossings are required as part of the Grid Connection Route Options or the TDR. The potential for works associated with these elements of the Proposed Development, in the vicinity of watercourses and drains to result in perturbations to water quality, is considered further in **Section 6.6.3.2.2**.

6.6.3.1.5 Potential Direct Effects on Bats During the Construction and Decommissioning Phase

Typical potential direct effects on bats during the construction and Decommissioning Phase relate to the direct loss of or disturbance to roost sites supports by buildings and other structures or trees. Given that no roost sites within the Proposed Development site there will be no potential for the construction and Decommissioning Phase to result in direct effects to bats.

6.6.3.1.6 Potential Direct Effects on Otter During the Construction and Decommissioning Phase

Typical potential direct impacts on Otters from construction works are associated with the loss of or damage to holts and couches or the abandonment of these breeding/resting sites as a result of ongoing disturbance. As detailed in **Section 6.5.6.2**, no holts, couches or field signs indicating the presence of an otter breeding/resting site were recorded within the Site during field surveys. Given the absence of such features there will be no potential for the construction phase of the Proposed Development to result in significant negative effects to otters.

6.6.3.1.7 Potential Direct Effects on Badgers & other Non-volant mammals during the Construction and Decommissioning Phase

Typical potential direct impacts on badgers and other non-volant mammals from construction works are associated with the loss of or damage to setts and breeding/resting places of other non-volant mammals, the abandonment of these breeding/resting sites as a result of ongoing disturbance and the potential for the loss of foraging habitat for these species. As detailed in **Section 6.5.6.2**, no setts, breeding or resting places of badger or other protected non-volant mammals were recorded within the Site during field surveys. Given the absence of such features there will be no potential for the construction phase of

the Proposed Development to result in significant negative effects to badgers and other non-volant mammals by way of loss of or disturbance to their breeding/resting places.

6.6.3.1.8 Potential Direct Effects on Kerry Slug During the Construction and Decommissioning Phase

Kerry slug have been recorded during surves along transect 1, 2 and 4 during baseline Kerry slug surveys. Suitable exposed siliceous rock along these transects are located outside the wind farm footprint. Suitable exposed siliceous rock for Kerry Slug occurs within the construction footprint and the construction of wind farm infrastructure will have the potential to result in the loss of suitable habitat for Kerry Slug. This will occur in mosaic habitats where exposed siliceous rock forms part of the habitat mosaic with wet heath and acid grassland. Based on the likely extent of habitat loss (see **Table 6.14** above) throughout the Site, this impact is likely to be slight and localised as only a small proportion of suitable Kerry Slug habitat within the Site will be impacted, whilst the most extensive areas of exposed siliceous rock occurring within the wider landholding will remain outside of the wind farm footprint and as such unaffected by the Proposed Development. It is noted that the species is known to populate extensive areas of this type of habitat throughout the wider landscape and has a favourable conservation status across its range (NPWS 2019). It is further noted that, in the absence of adequate safeguards the construction phase works could result in the death of individual Kerry Slugs due to machinery movements in areas of suitable habitat.

6.6.3.1.9 Potential Direct Effects on Herpetofauna During the Construction and Decommissioning Phase

Potential direct impacts to common frog, smooth newt and common lizard during the construction works will be limited to direct mortality during vegetation clearance, excavations and spoil deposition works particularly in wet grassland and heath habitats. As detailed in **Section 6.5.6.3**, common frogs were recorded during surveys within the Site. The population at the Site is considered to be of Local (Higher) Importance (Rating D). The nature of the Site means that they have the potential to occur immediately adjacent to the existing infrastructure.

Potential impacts to herpetofauna can vary depending on the time of year, with destruction of hibernacula (locations being used for winter hibernation) being a particular concern. Hibernacula need to be frost-free, humid and safe from predators and flooding (Baker et al., 2011). Such areas can include bunds and rocky areas, notably when these occur within slightly drier habitats such as dry heath. In light of the above it is considered that, in the absence of mitigation measures, there is potential for significant temporary impacts to

herpetofauna at the local level. Mitigation proposals in this respect are provided in **Section 6.7** below.

6.6.3.1.10 Potential Direct Effects on Terrestrial Invertebrates During the Construction and Decommissioning Phase

The loss of habitats to the footprint of the Proposed Development will result in the loss of terrestrial invertebrate habitat and therefore reduce the abundance and potentially the diversity of this group. The impact of the Proposed Development to terrestrial invertebrates will be at the local scale and restricted to local populations occurring at the Site.

Impacts on terrestrial invertebrates are considered temporary moderate negative where infrastructure is reinstated post construction e.g. proposed Temporary Construction Compound, temporary construction areas. Impacts on terrestrial invertebrate habitat are assessed as permanent moderate negative where infrastructure remains post construction.

6.6.3.1.11 Potential Direct Effects on Notable Flora During the Construction and Decommissioning Phase

No notable flora species were identified as occurring within the footprint of the Proposed Development and as such there will be no potential for the direct loss of such species.

6.6.3.1.12 Potential Direct Effects arising from the spread of Invasive Alien Species (IAS) During the Construction phase

Fraga, *et al.* (2008) have identified a link between wind farms and the spread of IAS in upland habitats. The scheduled invasive alien species *Rhododendron ponticum* occurs along the public road network that will be used as part of the TDR and Grid Connection Route Options for the Proposed Development. In addition, stands of *Prunus laurocerasus* also occur along the route of both the TDR and the proposed Grid Connection Route Options. As such, where these species occur at works locations the potential exists for direct effects associated with the spread of a scheduled invasive alien species during the construction phase. The spread of these species within the Site or in the surrounding area is considered to represent a significant effect at the local level and will require mitigation to prevent the spread of this species.

6.6.3.2 Indirect Effects

6.6.3.2.1 Potential Indirect Effects on Designated Areas During the Construction and Decommissioning Phase

The designated conservation areas that have been identified as occurring within the zone of influence of the Proposed Development and representative of key biodiversity features are:

- Bandon River SAC & pNHA;
- Lough Allua pNHA

The potential for indirect impacts to these designated conservation areas have been examined within the Screening Report for Appropriate Assessment and the NIS prepared for the Proposed Development.

The Screening Report for Appropriate Assessment for the Proposed Development concluded that it cannot be excluded, on the basis of objective information, that the Proposed Development, individually or in combination with other plans or projects, will not have a significant effect on the Bandon River SAC and pNHA.

As such, an Appropriate Assessment is required for the Proposed Development and an NIS has been prepared to assist the competent authority during the completion of its Appropriate Assessment.

The NIS for the Project has concluded that in light of the best scientific knowledge in the field, the Project, alone or in-combination with other plans or projects will not result in adverse impacts to the integrity of relevant European Sites and associated/overlapping pNHAs provided all mitigation measures set out in the NIS are implemented in full. These mitigation measures have been evaluated for their effectiveness to remove the potential for adverse effects to European Sites. These measures have been found to represent effective safeguards. These findings have been reached in the absence of reasonable scientific doubt and it is concluded that the Project will not adversely affect the integrity of the relevant European Sites examined.

In the absence of the implementation of appropriate safeguards works at the TDR widening locations 12C; 17A; 18B; and 21 will have the potential to result in the release of deleterious runoff to streams being crossed at these locations. These streams drain into Lough Allua pNHA and as there will be potential for localised water quality impacts to the freshwater habitat of the pNHA in the event that such discharges occur during works.

Similarly, the provision of launch and receptor pits for horizontal directional drilling crossings of watercourse along the proposed Grid Connection Route Option B could, in the absence of appropriate measures have the potential to result in the loss of contaminated runoff to streams draining to this pNHA.

The implication of such discharges to the freshwater habitat and fauna of the pNHA are further detailed in **Section 6.6.3.2.2** below.

6.6.3.2.2 Potential Indirect Effects on Watercourses, Fisheries, Freshwater Pearl Mussel & Aquatic Fauna during the Construction and Decommissioning Phase

The Site

The potential impacts that may arise as a result of the Proposed Development relate to the discharge of contaminated surface water from the Site during the construction phase. The freshwater habitat receptors that are at risk from such discharges comprise the Gortloughra, Shanacrane East and Shehy Beg Streams and the higher order rivers, namely the Bandon River and Owvane River, downstream of these streams into which they drain.

Earthworks associated with the construction phase of the Proposed Development will necessitate the denuding of surfaces. In the absence of appropriate mitigation measures such activities will have the potential to generate silt-laden runoff from the works area and for this runoff to be discharged via existing preferential surface water flow pathways and drainage channels to the above listed streams and.

Whilst the risk of a peat slide event arising from the Proposed Development has been found to be negligible to low (see **EIAR Section 8.3.10**), the potential for ground instability/slope failure has been identified. In the event of slope failure, the potential will exist for the conveyance of significant quantities of sediment to the Gortloughra, Shanacrane East and Shehy Beg Streams and on downstream to the Bandon River and Owvane River. Whilst the possibility of a slope failure at the Site has been assessed to be representative of a negligible to low risk, poorly managed construction activities (including spoil stockpiling and traffic movement) can increase the risk. Given the hydrological pathway to European Sites and the important status of the Bandon River and Owvane River sub-catchments downstream for sensitive aquatic fauna such as freshwater pearl mussel, Atlantic salmon, lamprey species and otters, any slope failure will have the potential to result in significant long-term damage to freshwater habitats.

The contribution of silt-laden runoff to the Gortloughra, Shanacrane East and Shehy Beg Streams and further downstream to the main channels of the Owvane and Bandon Rivers will have the potential to result in significant negative impacts to invertebrates, plant life and on all life stages of salmonid fish. The negative impacts of silt-laden runoff to fish species such as Atlantic salmon and brown trout include:

- The settlement of silt on spawning redds resulting in the infilling of intra-gravel voids and the smothering of eggs and newly hatched fish.
- Increase in turbidity and water colour resulting in a reduction in light penetration and perturbation to instream salmonid habitats.
- The settlement of silt on river beds can smother and displace macroinvertebrates, reducing the prey resource for fish species.
- Suspended solids can settle in pool and riffle habitats resulting in a reduction in the availability and quality of rearing habitat for fish.
- Silt-laden runoff can result in a reduction in transparency, impairing the ability of fish and otters to find food.
- Suspended solids can abrade or clog salmonid fish gills. Whilst high concentrations of suspended solids are required to clog fish gills, small concentrations can result in abrasion to gills a create the potential for infection.

The clearance of surface vegetation and the exposure of underlying substrate can result in the mobilisation of nutrients stored within soil substrates and the generation of nutrient-laden surface water runoff (Tuukkanen, 2017; Monteverde, 2022). Potential nutrient mobilisation is not just associated with substrates. Inputs of suspended solids can also contribute to nutrient enrichment in receiving waters as a result of the release of nutrient bound to sediments following mobilisation (Sharpley et al., 1992; Ballantine et al. 2006). The degree to which sediment loss contributes to nutrient enrichment is dependent on the type of soil. Soils / subsoils will contribute varying degrees of loading of various compounds and nutrients, including Nitrogen (N) and Phosphorous (P) compounds, which are attributed to nutrient enrichment, or excessive loading of N and P in waters. The release of such sediment in silt-laden surface water runoff from works at the Site will have the potential to contribute to nutrient inputs to receiving waters within the Bandon and Owvane sub-catchment and their conveyance downstream to the Bandon and Owvane Rivers.

The discharge of nutrient laden surface water to the Gortloughra, Shanacrane East and Shehy Beg Streams and downstream to the Bandon and Owvane Rivers will have the potential to result in/contribute to reductions in water quality, increasing primary productivity

leading to eutrophication and decreasing oxygen saturation. High oxygen levels in freshwaters are critical for all life stages of sensitive aquatic fauna such as Atlantic salmon. Such changes in watercourse trophic status will have the potential to contribute towards the degradation of habitat conditions with the Owvane and Bandon sub-catchments downstream and their potential to support Atlantic salmon, otter and lamprey species.

Pearl mussels require specific habitat conditions for the survival of viable populations. The principal habitat requirements are oligotrophic, well-oxygenated waters of high-water quality with low levels of sedimentation and a firm substrate of gravels and sand. Pearl mussels also require a healthy stock of juvenile salmonids to host glochidia during the larval stage of their life cycle. Pearl mussels are very sensitive to any changes or perturbations to these habitat requirements. Mussels use their gills for feeding and respiration and high levels of suspended solids within watercourses can significantly affect mussel respiration and feeding by clogging gills. Persistent exposure to high levels of suspended solids can result in starvation or respiratory stress resulting in asphyxiation.

Silt accumulation on riverbeds also significantly affects recruitment and the viability of a population. During the juvenile stage mussels will spend several years buried beneath the course riverbed. A constant flow of oxygen through the riverbed to the juvenile mussels is required for survival. In the event that the construction phase of the Project contributes excessive silt-laden runoff to the Bandon and Owvane sub-catchments downstream, the deposition of silt material over mussel beds will clog the interstice and reduce or prevent the penetration of oxygen to juveniles resulting in death.

Plant equipment and vehicles associated with excavation, material transport, and construction activities introduce the risk of hydrocarbon (fuel and oil) spillages and leaks, particularly in relation to regular refuelling which in turn implies the requirement of a fuelling station or will be supplied by fuel tanker scheduled to refuel the plant machinery directly. Similar to suspended solids arising from excavation activities, hydrocarbons accidentally introduced to the environment will likely be intercepted by drainage and surface water networks that drain the Site.

Hydrocarbons are a pollutant risk due to their toxicity to all flora and fauna organisms. Hydrocarbons chemically repel water and sparingly dissolve in water. The majority of hydrocarbons are light non-aqueous phase liquids (L-NAPL's) which means that they are less dense than water and therefore float on the water's surface. Hydrocarbons adsorb ('stick') onto the majority of natural solid objects they encounter, such as vegetation,

animals, and earth materials such as soil. They burn most living organic tissue, such as vegetation, due to their volatile chemistry. They are also a nutrient supply for adapted micro-organisms, which can deplete dissolved oxygen at a rapid rate and thus kill off water-based vertebrate such as Atlantic salmon and invertebrate life. Hydrocarbons can bioaccumulate in salmonids (e.g. McCain *et al.* 1990), with Atlantic salmon known to be physically affected by short term exposure leading to loss of condition and are also known to avoid areas containing hydrocarbons (e.g. Maynard and Weber 1981) leading to the effective loss of habitat or migration routes for the species.

The Development has the potential to result in the accidental spillage or deposition of construction materials such as cementitious materials into soils and in turn impact on surface water runoff, or accidental spillages directly intercepted by drainage or surface water networks associated with the proposed wind farm site.

Depending on the material in question, the introduction of such materials can lead to a local change in hydrochemistry and impact on the aquatic ecology of the receiving waterbody. For example, the introduction of cementitious material (concrete / cement / lean mix etc.) can lead to changes in soil and water pH, and increased concentrations of sulphates and other constituents of concrete. Fresh or wet concrete is a much more significant hazard when compared to old or set concrete which is considered inert in comparison, however it should also be noted that any construction materials or non-natural materials deposited, even if inert, are considered contaminants.

Proposed TDR Widening Locations

The proposed widening works at the TDR widening location 12C; 17A; 18B; and 21 will involve works for the widening of the existing road corridor at existing watercourse crossings. Bridge widening will be required at the widening location 12C, at the existing crossing of the Gortnalour Stream (EPA Code: 19G20), approximately 2.5 km upstream of this streams confluence with the River Lee. As such the construction works associated with the TDR widening areas are predicted to have the potential to result in significant negative impacts, such as those described above, to aquatic habitats and the fauna supported by them.

Proposed Grid Connection Route Options

Along the proposed Grid Connection Route Options, which will be confined to existing public road corridors, the approach to the installation of the Grid Connection Route Options crossing of rivers and streams will be via horizontal directional drilling. No above ground

works will be undertaken at or immediately adjacent to watercourses crossed by the route. The launch pits and receptors pits for the horizontal directional drilling crossing of watercourses will be set back from them by a minimum distance of 20m. This set back distance is to allow for the drilling of the cable route at the appropriate depth within bedrock under the watercourse. As part of the horizontal directional drilling works existing road and paved surfaces will require to be excavated at the pit locations for the crossings. These excavations will create the potential for the generation of silt-laden surface runoff to adjacent watercourses. In the event that such runoff is entrained in surface water runoff and conveyed to receiving watercourses it will present a risk of sedimentation and perturbations to water quality, with consequent effects such as those described above.

In addition to the potential generation of surface water runoff from launch pits and receptor pits, fluids will be used during the horizontal directional drilling works, with such fluid being pumped down the drill bore under pressure. The drilling fluid to be used during horizontal directional drilling for the Project will be Clearbore. Clearbore is a polymer-based product that is designed to instantly break down and become chemically destroyed in the presence of small quantities of calcium hypochlorite. The product is not toxic to aquatic organisms and is biodegradable. The drilling fluid will become mixed with material drilled in the borehole to form a drilling mud. As the drilling is completed under pressure any blockages in the pilot-hole during the pilot drill or reaming can result in the inadvertent breakout of drilling mud within the pilot-hole. Such breakouts can occur where an alternative path of less resistance through the overburden is present during a blockage. The breakout of drilling mud can result in contamination in the vicinity of the breakout. The locations where a breakout would present the greatest risk to key ecological receptors is at the crossing of the Caha River within the Bandon River SAC. This section of the Caha River is known to support existing pearl mussel beds. Populations of Atlantic salmon brook lamprey and otter are known to occur in this and other watercourses along the proposed Grid Connection Route Options. The breakout of drilling muds to these rivers crossed by the proposed electrical cable route will have the potential to undermine the status of instream habitats with resultant adverse effects to populations of these species.

6.6.3.2.3 Potential Indirect Effects on Terrestrial Habitats During the Construction Phase

Indirect effects to terrestrial habitats during the construction phase of the wind farm relate to the potential for works to undermine key processes that underpin the status of these habitats. For terrestrial habitats this relates to the potential for works to undermine key hydrological or hydrogeological processes that underpin the status of terrestrial wetland

habitats. In the context of the wind farm site such processes are related to blanket bog habitat occurring on deeper peat deposits. Two discrete areas of blanket bog occurring on deeper peat deposits occur at the Site, one at T06 and the other to the north of the existing access track to T07.

Given that the existing access track on site will be used to access T07 the Proposed Development will not result in any further indirect effects to this example of blanket bog. Blanket bog habitat will be lost to the footprint of turbine T06. Examples of blanket bog occur to the west and south of the wind farm layout at T06. The extent of indirect impacts to blanket bog at this location adjacent to the layout footprint is likely to be restricted to a discrete area immediately to the east and west of the T06 Turbine Hardstand. The example of spur bog at this location is fragmented by the exist access track south of T6 and by the Shehy Beg Stream to the west. These existing fragmenting features will limit the extent of indirect effects from water table drawdown within the peat deposit at the T06 location. The bog habitat to the west is already dehumidified and representative of inactive peat. The extent peat surface with peat forming vegetation on humidified peat terminates approximately 60m to the east T06, where the topography rise and conditions change from peat substrate to mineral and thin peat on a slope.

In view of this it is considered that the indirect to blanket bog habitat as a result in indirect effects relating to peat water table drawn down will be representative of an impact of slight, negative significance.

6.6.3.2.4 Potential Indirect Effects on Otter During the Construction Phase

The main pressure affecting this species in Ireland is pollution, particularly from organic pollution resulting in fish kills and accidental deaths as a result of road traffic and fishing gear (NPWS, 2019b). The NPWS also list diffuse and point source pollution of freshwaters as a likely indirect impact to otters through changes in prey abundance. However, the NPWS conclude that these threats are considered to produce local impacts only and are not of significance for the national otter population. Nevertheless, such impacts have the potential to be of local significance in the context of a population supported by the Bandon and Owvane River catchments downstream. As such in the event of pollution, arising from construction activities to suitable otter foraging habitat downstream of the project, the potential will exist for indirect impacts to the conservation status of otters within the these sub-catchments, by way of reductions in the abundance of prey species.

Similarly the input of deleterious runoff to watercourses at the 4 no. widening locations along the TDR spanning watercourses will have the potential to negatively affect the foraging resource for otters at a local scale along these watercourses within the upper Lee[Cork]_SC_010 sub-catchment.

Horizontal directional drilling will generate noise and vibration during drilling operations. The primary noise sources would consist of the elevated diesel-powered hydraulic drill drive, a diesel driven electricity generator, and electrically driven spoil treatment plant for mechanical separation of solids from working fluid.

Table D.6 in BS5228: Part 2: 2009 +A1:2014 suggests that vibration from such activities falls to below 1 mm/s within a distance of approximately 10 to 15 metres. No otter breeding sites are located in the vicinity of the proposed Grid Connection Route Options crossings and given the low levels of noise and vibration predicted to be generated during the drilling of the 110 mm boreholes along with the set-back distances of 50 m from the watercourse for the launch pits where the hydraulic driver and generator will be positioned, there will be no potential for significant disturbance to otters during this element of the Proposed Development.

Other potential indirect effects on otter during the construction phase are generally considered to be those associated with disturbance and water quality impacts on watercourses, resulting in potential impacts on prey availability. The effects of water quality perturbations to otter habitat have been described in **Section 6.6.3.2.2** above and it is considered that, without mitigation, potential indirect impacts on Otter as a result of perturbations to water quality will arise.

6.6.3.2.5 Potential Indirect Effects on Badgers & other Non-volant mammals during the Construction and Decommissioning Phase

Given that no breeding/resting sites for badgers or other non-volant mammals were recorded within or in the vicinity of the Site there will be no potential for significant indirect disturbance to badgers and other non-volant mammals during the construction phase.

Other potential negative impacts to badgers during the construction phase of the Project include:

- The exposure of badgers to polluting substances such as chemicals, fuels and cement-based products; and
- The entrapment of badgers within excavation areas.

Without the implementation of appropriate construction practices these impacts will have the potential to negatively affect badgers occupying the sett adjacent to the Site. **Section 6.7** below provides measures to ensure that disturbance associated with the sustained presence of humans is avoided.

6.6.3.2.6 Potential Indirect Effects on Bats During the Construction and Decommissioning Phase

Potential indirect effects on bats relate to the loss of habitat that may be used bats for roosting, foraging or commuting.

Given the absence of roost sites for bats occurring at or surrounding the Site there will be no potential for the Construction and Decommissioning Phase to result in the loss of roosting habitat for bat species.

The construction phase will have the potential to result in the loss of or damage to commuting and foraging habitat.

6.6.3.2.7 Potential Indirect Effects on Kerry Slug During the Construction and Decommissioning Phase

Potential impacts to Kerry Slug as a result of the Proposed Development relate to the loss of habitat and the potential for fatalities during construction works. Such impacts are representative of direct effects to Kerry Slug and have been set out in **Section 6.6.3.1.8** above.

6.6.3.2.8 Potential Indirect Effects on Herpetofauna During the Construction and Decommissioning Phase

Potential indirect effects on common frog, smooth newt and common lizard during the Construction and Decommissioning Phase are generally considered to be those associated with disturbance. However, although these species are easily disturbed when approached, the impact of disturbance is not considered likely to carry over a significant distance. As noted in **Section 6.6.3.1.9** above these species are considered to be sensitive to impacts associated with the direct loss of habitat to the footprint of the Site. The proposed works will be undertaken from the temporary infrastructure provided for the construction phase and from the existing wind farm infrastructure during the Decommissioning phase. Suitable habitat for these species will extend into the wider area, ensuring that there is sufficient habitat remaining to support these species in an undisturbed state. Given the limited likely effective disturbance distance for these species and the extensive area of suitable habitat

for them in the wider area the potential indirect effects on these species during the construction phase are not considered to be significant.

6.6.3.2.9 Potential Indirect Effects on Terrestrial Invertebrates During the Construction Phase

Potential indirect effects on terrestrial invertebrates during the construction and Decommissioning Phase will relate to effects associated with disturbance. Whilst terrestrial invertebrates are easily disturbed when approached, the impact of disturbance is not considered likely to carry over a significant distance. As noted in **Section 6.6.3.1.10** above these species are considered to be sensitive to impacts associated with the direct loss of habitat to the footprint of the Site. The proposed works will be undertaken from the temporary infrastructure provided for the construction phase and from the existing wind farm infrastructure during the Decommissioning phase. Suitable habitat for terrestrial invertebrates will extend into the wider area, ensuring that there is sufficient habitat remaining to support these species in an undisturbed state. Given the limited likely effective disturbance distance for these species and the extensive area of suitable habitat for them in the wider area the potential indirect effects on terrestrial invertebrates during the construction phase are not considered to be significant.

6.6.3.2.10 Cumulative effects of the Construction and Decommissioning Phase

Past land use practices have resulted in negative impacts to heathland habitats within and adjacent to the Site. Heath habitats have been subjected to historical overgrazing which has led to damage and erosion to heath and grassland habitats to the west of the Site. The presence of extensive forestry to the west, east and north of the Site has also resulted in the conversion of heathland habitats and the loss of areas of heath habitat.

In the absence of future habitat management measures the Proposed Development will have the potential to combine with these historical land use activities to result in further loss of heath habitats within the Site. In addition, the risks to receiving waterbodies posed by the Proposed Development will also have the potential to combine with existing land use activities such as forestry plantation and intensive agricultural activity to result in cumulative pollution loss to Bandon, Owvane and Lee River sub-catchments downstream with associated pressures to water quality and the freshwater ecology supported by this catchment.

In terms of other projects there are no recent significant projects permitted in the vicinity of the Site. Those that do occur within the area surrounding the Proposed Development relate

to small scale projects associated with amendments to residential dwellings and the construction of residential dwellings (see Planning Reference: 24552; 2374). A screening for Appropriate Assessment and EIA for these projects were completed by the Planning Authority and it was determined that they, alone or in-combination with other plans or projects, would not have the potential to result in likely significant effects to European Sites or the environment. Given this determination the Proposed Development will not combine with these two other recent projects to result in cumulative negative effects to the environment and biodiversity receptors.

6.6.4 Potential Effects during the Operational Phase

6.6.4.1 Potential Direct Effects on designated areas during the Operational Phase

The potential effects of the operational phase of the Proposed Development to designated sites is set out in the accompanying NIS. The NIS has concluded that given the absence of any element of the Proposed Development within the boundary of any European Sites, NHAs or pNHAs it will not have the potential to result in direct effects to designated areas that could in turn result in adverse impacts to the integrity of these sites.

6.6.4.2 Potential Direct Effects on Habitats during the Operation phase

The operation phase of the Proposed Development will not cause significant or adverse direct impacts to the quality or functionality of the habitats occurring within the Proposed Development area.

6.6.4.3 Potential Direct Effects on Watercourses, Fisheries, Freshwater Pearl Mussel and Associated Fauna during the Operational Phase

There is limited potential for direct effects on receiving watercourses within or bounding the Proposed Development during the operational phase as no instream works or loss of natural watercourse features are planned as part of the operational phase. However, in the event that a maintenance need arises for the watercourse crossing within the Site during the operational phase, instream works may be required and such works could result in direct effects to these watercourses. Such a direct effect upon watercourses and downstream ecology during the operational phase are considered to have the potential to be significant at the local scale.

6.6.4.4 Potential Direct Effects on Bats during the Operational Phase

Impacts that may arise during the operation phase relate to collision mortality, barotrauma and other injuries to bats.

Analysis of baseline surveys at the Site has found that Turbines T02, T03, T07, and T09 present a potential moderate risk for Leisler's bats, a potential low to moderate impact risk for common and soprano pipistrelle and a low impact risk for Nathusius' pipistrelle. Turbine T01, T04 and T06 a potential moderate impact risk for common pipistrelle, and a potential low to moderate impact risk for Leisler's bat, soprano pipistrelle and Nathusius pipistrelle.

6.6.4.5 Potential Direct Effects on Otter during the Operation phase

The operation phase of the Proposed Development will not have the potential to result in direct effects to otters. No otter holts or couches were identified within the Site and there will be no potential for operational phase maintenance activities to result in disturbance to otters.

6.6.4.6 Potential Direct Effects on Badgers & other Protected Non-volant mammals during the Operation phase

No effects to badgers or other protected non-volant mammals are predicted during the operational phase of the Proposed Development. As no field signs indicating the presence of such species were noted within the Site during field surveys and due to the limited human presence for maintenance works during daylight hours, outside the period of peak badger and other protected non-volant mammals' activity, no significant effects are predicted to affect such species during the operation of the Proposed Development.

6.6.5 Potential indirect effects during the Operational Phase

The potential for indirect effects to arise during the operational phase and impact receptors that include designated areas, the aquatic environment and associated aquatic fauna and habitats are considered in the following subsections. The operation phase will not have the potential to result in significant indirect impacts to otter.

6.6.5.1 Potential indirect effects on designated areas during the Operational Phase

The designated conservation areas that have been identified as occurring within the zone of influence of the Proposed Development and representative of key biodiversity features are:

- Bandon River SAC & pNHA

The potential for indirect impacts to these designated conservation areas during the operational phase have been examined within the Screening Report for Appropriate Assessment and the NIS prepared for the Proposed Development.

The Screening Report for Appropriate Assessment for the Proposed Development concluded that it cannot be excluded, on the basis of objective information, that the Proposed Development, individually or in combination with other plans or projects, will have a significant effect on the following European Sites:

- Bandon River SAC & pNHA;

As such, an Appropriate Assessment is required for the Proposed Development and an NIS has been prepared to assist the competent authority during the completion of its Appropriate Assessment.

The NIS for the Proposed Development has concluded that in light of the best scientific knowledge in the field, the Proposed Development, alone or in-combination with other plans or projects will not result in adverse impacts to the integrity of European Sites, and all other relevant European Sites, provided all mitigation measures set out in the NIS are implemented in full. These mitigation measures have been evaluated for their effectiveness to remove the potential for adverse effects to European Sites. These measures have been found to represent effective safeguards. These findings have been reached in the absence of reasonable scientific doubt and it is concluded that the Proposed Development will not adversely affect the integrity of the relevant European Sites examined.

6.6.5.2 Potential indirect effects on watercourses, Fisheries, Freshwater Pearl Mussel and associated Fauna during the Operational Phase

There is potential for indirect effects on watercourses during the operational phase of the Proposed Development due to the operation of permanent site drainage. As with the construction activities sediments and hydrocarbons represent the source of risk to water quality during operation phase maintenance works. These effects are already described for the Construction and Decommissioning Phase and are also a risk in the operational phase of the Proposed Development.

Taking this into account, unmitigated, the potential for indirect effects on watercourses resulting from the operational phase is considered to be significant at the local scale. This is due to the potential for wider surface water runoff given the larger areas of hardstanding required to accommodate the proposed wind farm infrastructure.

6.6.5.3 Potential indirect effects on Habitats during the Operational Phase

During the operation of the wind farm, the increased area of hard standing within the Site and surrounding the proposed wind turbine locations will have the potential to lead to

changes in the volume and nature of site runoff. The worst-case scenario net increase of surface water runoff associated with the Proposed Development is calculated to be approximately 7,431 m^3/month (or 3.25% relative to the area of the Site) during the wettest month of the year.

The use of construction materials with a different mineralogical composition to that of the surrounding substrate can lead to changes in the hydrochemistry of the substrate into which these materials are placed. Heathland, such as wet heath are sensitive to changes in hydrochemistry and pH levels given the low pH of these habitats. Where materials with different mineralogical composition are used, waters percolating through these materials will acquire a different hydrochemical signature to waters associated with the native substrate of the Site. The impact of this percolating water to the surrounding substrate will depend on the difference between the mineralogy of the imported material and native substrate. Imported material that is highly alkaline in nature, such as cement-based products, can leach highly alkaline waters into the native substrate adjacent to these areas. This can result in the alteration of the hydrochemistry of sub-soil waters by elevating pH levels, which in turn can lead to a change in vegetation community. As such in the absence of the use of appropriate materials, such an effect could result in significant effects to the status of wet heath occurring in the immediate vicinity of the Site infrastructure.

Aside from the potential changes to surface water runoff rates and mineralogy the operation of the Proposed Development will not result in any additional land take or loss of revegetated habitats and as such there is no potential for any significant effects in this regard. In addition, the operational phase has the potential to result in enhancement of the surrounding areas within the Site and within the Habitat Management Plan area through habitat rehabilitation management (as described in the Biodiversity Management Plan) that will be implemented during the construction phase of the Proposed Development and maintained during the operational phase.

6.6.6 Cumulative Effects during the Operational Phase

It is anticipated that, in the absence of mitigation, the key cumulative impacts upon biodiversity during the operation of the Proposed Development are largely as a result of existing drainage on the Site which could exacerbate erosion within the vicinity of the proposed infrastructure. As such, the potential for cumulative impacts as a result of the operation of the Proposed Development is considered to be significant at the local level, taking into consideration the potential for cumulative effects of other land use operations, such as drainage from neighbouring conifer plantations and public road corridors, in the

vicinity of the Site. This is because, cumulatively and before mitigation is introduced at the Site, the installation of wider surface areas of hardstanding and potentially operational drainage as required, in-combination with other land uses such as forestry could result in greater surface water runoff in the region as a whole. This could potentially result in increased washout to receiving watercourses during operation. In the absence of appropriate mitigation, increased surface water runoff can lead to an exacerbation of erosion and/or sediments entering local watercourses, particularly during the first few years of operation. Mitigation proposals in this respect are provided in **Section 6.7**.

6.7 MITIGATION MEASURES

Section 6.6 identified the need for mitigation of the following potentially significant effects:

Table 6.16: Summary of Significant Effects before Mitigation

Potential significant effects during the construction phase on:	Potential significant effects during the operational phase on:
• Designated sites (indirect effects)	• Designated sites (indirect effects)
• Annex 1 habitats: wet heath (direct and indirect effects)	• Watercourses and lake habitats (indirect effects)
• Watercourses (indirect effects)	• Annex 2 species: Freshwater pearl mussel, Otters, Atlantic salmon, Lamprey species (indirect effects)
• Terrestrial habitats: Acid grassland; wet grassland & hedgerow	• Other Aquatic species: fish species (indirect effects)
• Annex 2 species: freshwater pearl mussel; Brook Lamprey; Otters, Atlantic salmon (indirect effects) • Annex 2 species: Kerry Slug (direct effects)	• Herpetofauna (indirect effects)
• Badgers & Other protected non-volant mammals (indirect effects)	• Watercourses (indirect effects)
• Other Aquatic species: fish species (indirect effects)	
• Herpetofauna (indirect effects)	

Core areas of mitigation required relates to aspects such as minimising the extent of working areas and control of sediment and other pollution, in addition to timing and specific methods to avoid impact on particular species. The incorporation of these requirements into appropriate compliance documents and overseeing of mitigation measures by an Ecological Clerk of Works is also fundamental.

This section sets out the required mitigation and draws on other sections and reports as necessary. Notably, the mitigation from Chapter 9: Hydrology and Hydrogeology and Chapter 8 Soils and Geology are highly pertinent as these chapters set out the required mitigation to avoid impact on watercourses and water-based erosion and avoid/minimise

the risk of a slope failure event during the construction phase of the Proposed Development. These mitigation requirements are not repeated in this section but need to be implemented in full to avoid impacts on ecological features and are referred to as appropriate.

6.7.1 Construction Phase Mitigation

6.7.1.1 Mitigation by Avoidance

6.7.1.1.1 Protection of Watercourses, Fisheries & Freshwater Pearl Mussel

The Proposed Development has been designed to ensure that an adequate buffer zone is provided for between this infrastructure and watercourses. In addition, the design has sought to minimise the requirement for new watercourse crossings. This has been achieved by restricting the need for watercourse crossing to a total of one bridge crossing of a headwater of the Shehy Beg Stream within the Site, and two new culvert crossings of headwaters of the Gortloughra and Shehy Beg Streams. The buffer zone implemented between all large-scale infrastructure associated with the Site, such as turbines, Turbine Hardstands, and access tracks are located at distances of over 50 m from any watercourses, except for where the access track crosses watercourses the minor stream headwaters. In addition, the best practice construction measures that are described above are designed to avoid impacts on areas that are outside the site including watercourses.

A Surface Water Management Plan (SWMP) has been prepared for the Proposed Development and this plan ensures the implementation of a suite of measures that will avoid negative impacts to water quality and the hydrological regime of the Gortloughra, Shanacrane East and Shehy Beg Streams and the higher order Bandon River and Owvane River downstream.

The mitigation measures set out in the SWMP, in Section 6.7 of this Biodiversity Chapter and at Section 9.5 of the Hydrology and Hydrogeology Chapter have been designed to manage flow regimes, sediment loss and other pollutant loss to the aquatic environment during the construction phase. These mitigation measures are informed by and consistent with the mitigation measures for freshwater pearl mussel set out by Atkinson et al. (2023).

6.7.1.1.2 Protection of Watercourse during Watercourse Crossings

Wind Farm Site

At the Site, three no. new watercourse crossing will be constructed. The required crossing will be a crossing of the small stream headwater of an Un-named Stream, one crossing of the second order Shehy Beg Stream and one crossing of a first order tributary of the Shehy Beg. The following measures provide for the planning and consideration of this watercourse

as part of the overall approach to watercourse crossing to ensure potential impacts are adequately mitigated.

The proposed crossing location will be situated relatively near the headwaters of the Shehy Beg Stream and two no. minor first order tributaries. As a result, bridge/culvert specification and construction are envisaged to be of relatively low significance in terms of expected flow and culvert diameter. The following design measures have been implemented for the watercourse crossing to ensure any potential impacts of the proposed watercourse crossing are minimised:

- The design of the proposed crossing and a method statement for the proposed construction will be agreed in advance with Inland Fisheries Ireland (IFI)
- Crossings have been designed to minimise, in so far as practical, the disturbance or alteration of water flow, erosion and sedimentation patterns and rates
- Vehicles and plant used in the construction of the proposed crossing will only be refuelled at the Site's bunded and designated refuelling area, no refuelling will be permitted within 50 m of any watercourse at the Site
- To mitigate against the potential risk of accidental leaks or spillages from plant and equipment the following measures will be implemented: Multiple spill kits will be maintained on the Site at all times within the cabs of vehicles and placed strategically at environmentally sensitive locations across the Site. Spill kits will be routinely inspected to ensure that they are fully stocked with oil absorbent booms and pads at all times. Oil absorbent booms will be installed downstream of channel crossing work areas within 25 m of the works location prior to the commencement of works.

Grid Connection Route

The proposed grid connection route Option A and Option B include the crossing of 22 no. and 18 no. watercourse respectively. The crossings will be via horizontal directional drilling. The mitigation measures to be implemented during horizontal directional drilling are set out in **Section 6.7.1.1.1.2** below.

6.7.1.1.2.1 Protection of Watercourses during Horizontal directional drilling

The following mitigation measures to reduce potential impacts associated with horizontal directional drilling (HDD) will be implemented:

- Clearbore, which is not toxic to aquatic organisms and is biodegradable will be the drilling fluid used.
- Mud mixing will be monitored to suit the ground conditions encountered.

- The drilling fluids will be constantly monitored, any changes required to the mix will be performed on site by a specialised HDD Contractor upon consultation with the drilling fluid supplier and Environmental Clerk of Works.
- Mud testing equipment will be available at all times during drilling operations to monitor key mud parameters.
- All equipment will be carefully checked on a daily basis by the Site Supervisor prior to use to ensure plant and machinery is in good working order with no leaks or potential for spillages.
- Spill kits, including an appropriate hydrocarbon boom will be available on the site in the event of any unforeseen hydrocarbon spillages and all staff shall be trained in their use.
- All plant, materials and wastes will be removed from site following the HDD works.
- The launch pit will be reinstated to the original land surface condition and the normal duct trench will continue from this point.
- Should any dewatering be required, it will be carried out in accordance with the CEMP provided in Appendix 1.
- Test pits and boreholes will not be located directly on, or extend through, the proposed alignment, as these weak points may serve as conduits where inadvertent fluid returns or frac outs could occur. At least a 3m offset will be provided between the boreholes and pipe alignment.

The following measures will be implemented at launch and receptor pits to ensure that the excavation, preparation and works undertaken at these pits do not pose a risk to the water quality of the Caha River and other watercourses to be crossed via horizontal directional drilling:

- All launch pits and reception pits for horizontal directional drilling under watercourses will be buffered back from watercourses at a minimum distance of 20 m.

The launch pit for the proposed electrical cable route crossing under the section of the Caha River within the Bandon River SAC, will be located to the west of the existing local road and Bridge crossing in the townland of Neaskin. The reception pit will be positioned along the road to the east of the river in the townland of Ardcahan. The launch pit will be buffered from the Caha River by a minimum distance of 20 m. The reception pit will be buffered from the river bank by a minimum distance of 20 m. The location of the launch and receptor pits on level ground a minimum distance of 20 m from the Caha River will provide sufficient buffering between the reception pit and the river to ensure that there is no potential for the

discharge of silt-laden or otherwise contaminated materials from the reception pit to the river.

All spoil arisings from all launch pits and reception pits at the proposed Grid Connection Route Option A watercourse crossings will be stored in bunded areas to prevent the runoff of silt-laden runoff from the spoil to watercourses. All spoil material will be reused to reinstate the launch pits and reception pits.

Pumps will be available at the launch and receptor pits. The pumps will be powered by diesel fuel and will be stored in a secure bunded area. The pumps will be used to pump any standing water from the pits during works. A lay flat hose will be positioned within the pit and pooling surface water will be pumped from the pit via the lay flat over adjacent vegetated surfaces. Under no circumstances will the lay flat outfall be directed to an existing drainage ditch or the watercourse being crossed via horizontal directional drilling. The discharge of the surface water to vegetated ground will allow for discharge to ground and will retard overland flows in the direction of the watercourse being crossed.

Continuous monitoring of drilling fluid/mud pressure will be undertaken by the drill technician during all drilling. The drill technician in turn will be supervised by the drill supervisor and all horizontal directional drilling will be monitored by the project Ecological Clerk of Works (ECoW). The continuous monitoring will ensure that in the event of a change in pressure due to a blockage, the technician will be immediately alerted to this change and will cease drilling operations. This will prevent drill fluid/mud from breaking out through an alternative path of least resistance and will prevent such materials from breaking out to the river. The avoidance of a breakout depends primarily on the experience of the drilling personnel and reliable, accurate drilling records interpreted in relation to the geotechnical information available. The drilling personnel will be suitably qualified and experienced to complete the works. Boreholes will be completed at all HDD locations as part of the Site Investigations works to be completed during the detailed design phase. Trends during the pilot drilling will be monitored and tracked so as to maximise the chances of accurately establishing a point where the formation is causing drilling fluid losses. The volume of drilling mud entering and returning from the bore will be constantly monitored by the drill operating staff. Staff will be especially vigilant for any loss of volume of drill mud returns, which would indicate the escape of drilling mud from the bore.

At the location a number of measures can be implemented as follows:

- Pump drilling fluid with a higher density into the formation.

- Circulate and pump organic lost circulation materials (LCM) into the loss zone to physically seal the fracture. Lost circulation occurs when drilling fluid, flows into one or more geological formations instead of returning to the launch area.
- Grout the loss zone; and/or
- Launch a packer before the loss zone. A packer is a mechanical device sent down the hole to the area of concern. It is designed for blocking the system for sealing grout to set.

All of the above options will be prepared and made available for application during the HDD works.

All equipment will be carefully checked on a daily basis by the Site Supervisor prior to use to ensure plant and machinery is in good working order with no leaks or potential for spillages. In order to minimise any risk of pollution in the first instance. Spill kits, including an appropriate hydrocarbon boom will be available on the site in the event of any unforeseen hydrocarbon spillages and all staff shall be trained in their use. It is noted that, given the separation distances between the launch pit and reception pit for the crossing under the Caha River that the potential for the release of hydrocarbons to the Caha River will be extremely unlikely.

In addition to the supervision of drilling the project ECoW will be required to supervise the set-up and reinstatement of all launch pits and reception pits at all watercourse crossings to ensure that all measures required to protect water quality and instream habitats are properly implemented.

In addition to the horizontal directional drilling method provided under separate cover, a detailed method statement for the crossing of watercourses will be prepared in advance of all crossings and will be submitted to the NPWS and IFI for agreement prior to the commencement of works.

All drilling fluids and spent drill mud will be prepared and returned within a closed drilling train. All spent mud will be discharged from the closed drilling train to an impermeable bunded container and will be removed from site for disposal at an appropriately licenced facility.

All fuels, lubricants and hydraulic fluids for equipment used during horizontal directional drilling will be stored in securely bunded containers and will not be carried to within 10 m of any watercourse.

All measures detailed in the SWMP and CEMP prepared for the project to protect water quality will be implemented during horizontal directional drilling works.
An Emergency Response Plan has been prepared as part of the project's CEMP and all measures detailed therein will be implemented in the event of an emergency.

6.7.1.1.3 Protection of Designated Areas

The Proposed Development is not located within any designated areas and as such the potential for direct impacts to these areas will be avoided. As set out in the accompanying Natura Impact Statement the principal risk posed by the Proposed Development to designated areas in the surrounding area relate to indirect impacts arising from negative impacts to water quality and associated adverse effects to freshwater dependent habitats and species. Mitigation measures are set out in **Section 6.7.1.2.1** and **Section 6.7.1.3.2** below that aim to protect water quality in receiving watercourses and thereby avoid the potential for adverse effects to the freshwater dependent qualifying habitats and qualifying species of surrounding designated areas.

6.7.1.1.4 Protection of Important Habitats

The Proposed Development will result in the loss of c. 0.3 Ha of Annex I quality wet heath habitat as well as other areas of overgrazed wet heath, heath mosaic and a discrete area of fragmented spur blanket bog. Areas of habitat loss amounts for the latter are set out in **Table 6.14** above. It is essential that the direct loss of wet heath and other heath mosaic and spur blanket bog habitat is fully minimised and so mitigation by avoidance is essential to limit such losses within the footprint of the Proposed Development, and its zone of influence. Mitigation in this respect is:

- The full extent of the infrastructure footprint will be marked out prior to the commencement of works, with an appropriately robust and visible fencing / marker system. Where this meets Annex I habitats, this will also be the full extent of the works corridor, with no machinery access (access will only be allowed on foot and only for the purposes of silt / pollution control if required), storage or other works allowed outside this area.
- The efficacy and coherence of the marker system (and required remediation) will form an essential part of the Site operations.

- A pre-construction Invasive Species Survey will be conducted during the optimal growing season (May to August immediately prior to works occurring at this site for the Proposed Development) and shall include data on all locations, extents and potential construction impacts in relation to scheduled and non-scheduled Alien Invasive Species (IAS). This survey will be completed along with reporting on the best course of action to be implemented to avoid the spread of such IAS on the Site or further afield. The management of IAS identified as occurring within the Site will be undertaken in accordance with best practice management guidelines as set out in the TII guidelines "The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads" (2010).

6.7.1.1.5 Protection of Important Mammal Species

The Ecological Clerk of Works for the construction phase will complete a pre-construction survey of the construction footprint to confirm the continued absence of mammal breeding and resting places within the construction footprint and within 50 m of the construction footprint or identify the presence of newly established breeding/resting places. Based upon the results of these surveys, the ECoW will establish whether or not there is a need at that stage for the implementation of further mitigation measures and the requirement for protected species licences. An example of where such a need could arise is where a badger sett becomes established along or in the immediate vicinity of a hedgerow that will be intersected by the proposed access track.

6.7.1.1.6 Protection of Bats

The existing bridge crossing of the headwater of the Shehy Beg Stream to the southwest of T06 will be upgraded with a new bridge crossing. This existing bridge structure was surveyed for its potential to support roosting bats and found to have limited potential with no evidence indicating its use as a roost site by bats. Notwithstanding the result of the baseline surveys, this bridge structure will be surveyed in advance of works to confirm the findings of the baseline surveys and the continued limited potential for this structure to function as a roost site for bats.

6.7.1.1.7 Protection of Kerry Slug

In order to avoid the potential for mortality to Kerry Slug the ECoW will complete checks for the presence of Kerry Slug in areas of suitable habitat occurring within the construction footprint of the wind farm. In the event that slugs found to be present, they will be transferred to suitable habitat in landholding away from the construction footprint. Such on-going

monitoring of suitable habitat within the construction footprint will continue throughout the construction phase. Such monitoring will be undertaken during periods of wet weather when slugs are most active and feeding on the surface and therefore at greater risk of impacts by movement of machinery.

The transfer of Kerry Slugs will be subject to a derogation licence from the NPWS.

6.7.1.1.8 Protection of Herpetofauna

The Ecological Clerk of Works for the construction phase will complete a survey of the construction footprint during spring (late February / March / early April) ahead of the proposed works in order to identify any key amphibian breeding areas. This will allow wildlife barriers to be installed where necessary to minimise impacts upon such features where these are likely to be indirectly affected by the works.

6.7.1.2 Mitigation by Design & Best Construction Practice

6.7.1.2.1 Protection of Watercourses, Fisheries & Freshwater Pearl Mussel

An Ecological Clerk of Works ("ECoW") will be employed from the commencement to completion of construction works, including access tracks, On-site Substation and Control Building, Temporary Construction Compound, Turbine Hardstands and Turbine Foundations and Wind Farm Internal Cabling works at a minimum. Primary roles for the ECoW will include the setting out and monitoring of the working corridor and review of pollution control measures and working practices during the active construction period as well as ad hoc input into site remediation.

For the construction of culverts, all activities must adhere to IFI, (2016) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters. Section 9 Planning, Design and Construction Issues details on Best Practice guidance for the installation of culverts on watercourses.

All measures outlined in the accompanying SWMP will be fully implemented by the contractor and will be agreed to with the planning authority in advance of construction activities. The objective of the SWMP is to prevent pollution to watercourses and adverse impacts to sensitive fauna. The SWMP has provided sufficient detail so that all activities that could potentially lead to negative impacts on water quality have been identified. The SWMP is based upon a detailed understanding of the hydrology, hydrogeology and geology within and surrounding the Proposed Development.

All watercourses draining the Site will be examined on a repeated scheduled timeframe (i.e. daily/weekly/fortnightly etc.) as deemed appropriate by the Contractor, Planning Authority, NPWS and Inland Fisheries Ireland. A log will be kept of these examinations and a water sampling protocol to monitor key water quality parameters will be established in agreement with the NPWS and Inland Fisheries Ireland. The monitoring protocol will be devised so that sediment release (should it occur) from the Site is detected at an early stage. Sediment release to the above watercourses from the site will be restricted to <25mg/l as per the Salmonid Water Regulations.

Method statements outlining the approach to all surface watercourse crossing will be approved in advance with Inland Fisheries Ireland.
Disturbance to natural drainage features will be avoided during the construction phase of the Proposed Development. The design of the Proposed Development has allowed for the establishment of a 50 m wide watercourse buffer zone during the construction phase.
Uncontaminated surface runoff will be diverted away from construction areas through the installation of interceptor drains up-gradient of construction areas.
Drainage waters originating in construction areas will be collected in a closed system and treated prior to controlled, diffuse release. Drainage waters from construction areas will be managed through a series of treatment stages that include swales, check dams and settlement/attenuation ponds along with other pollution control measures such as silt fences and silt mats.

A three-stage treatment train will be employed to capture, retain and treat discharges during the construction phase. This treatment train is also proposed for discharges from hard surfaces that will be installed as a result of the Proposed Development.

Settlement/attenuation ponds will be used to attenuate and treat runoff. A detailed pre-construction peat stability assessment has considered the appropriate location of settlement/attenuation ponds so that these facilities will not increase the risk of slope failure. These will have permanent open water to minimise the risk of sediment washout. Settlement/attenuation pond side slopes will be constructed at shallow grades such as 1 in 3 side slope. Settlement/attenuation ponds will be designed so that outflows are spread diffusely over a wider area so that increases in run-off can be mitigated. Erosion control and detention ponds will be regularly maintained during the construction phase.
Standing water from excavations will not be pumped directly into watercourses. Where dewatering of excavations is required, water will be pumped to the head of a treatment train in order to receive full treatment prior to discharge.

Roadside drains will be shallow with moderate gradients to prevent scouring. In steep areas check dams (possibly in conjunction with settlement ponds and / or cross drains) may be necessary to reduce flow rate.

Oil fuel will be stored within containment areas and emergency response measures for oil spillage on site will be prepared.

Refuelling of plant during construction will be carried out at a designated area, a minimum of 50 m from watercourses. Drip trays and spill kits will be available on site. Maintenance of all plant and machinery will be undertaken off-site. Only emergency break-down maintenance will be carried out on site.

Cement will be mixed within containment areas and if Readymix vehicles are used these will be washed in the same area and the water cycled.

All vehicles transporting materials to and from the Site will store materials in a contained load so that the potential for emissions or spillage is reduced during journeys and bridge crossing over watercourses. The measures outlined in the UK's Planning Policy Guidance No. 26: Dealing with Spillages on Highways (a Good Practice Guidance notes proposed of the UK EA/SEPA/EHS) will be adhered to in the event of a spillage or accident during the transportation of materials.

All construction personnel will be trained in pollution incident control response. An emergency response plan has been prepared as part of the CEMP for the Proposed Development and information outlining response procedures and contingency plans to contain pollution, as set out in the CEMP, will be made available on site.

Access tracks and turning areas will be confined to areas of shallow peat where possible and will be constructed on a geotextile layer. These areas will also be kept as level as possible to avoid fast run-off. This can be achieved by following contours where possible.

At the proposed temporary storage area, impermeable berms will be put in place surrounding the spoil storage receptor area. The berms will be established in advance of the deposition of spoil material. The berms will be designed to account for a bulking factor of 10% of the spoil material to be disposed in these areas.

6.7.1.2.2 Prevention of Spread of Invasive Alien Species

The presence of the non-native invasive species *Rhododendron ponticum* and *Prunus laurocerasus* along the TDR and proposed Grid Connection Route Options provides the potential for the spread of this species by the proposed works. These species are invasive and out-compete native flora to form mono-specific stands. Their presence along watercourses is particularly significant, as contaminated soil or vegetative material washed from an infected area can result in the spread of this species downstream. Appropriate mitigation measures including management and control measures are required at all sites within the proposed works area where this species is encountered for the prevention of spread of these species. The mitigation measures for the control of invasive species will follow the TII guideline document *The Management of Invasive Alien Plan Species on National Roads – Technical Guidance* (TII, 2020). A summary of the physical and chemical control measures for *Fallopia japonica* are as follows:

- Where feasible, preference should be given to treating Japanese knotweed in its original location to limit the risk of further spread of the plant.
- Physical methods of IAPS control include cutting, digging or excavating, hoeing and pulling by hand.
- Where cut, pulled or mown IAPS material arises, its disposal shall not lead to a risk of further spread
- Particular care shall be taken near watercourses as water is an effective conduit for the dispersal of plant fragments and seeds.
- particular care is required in relation to the disposal of Japanese and other knotweed species. Where burial is being used to dispose of these species, a non-persistent herbicide shall be applied to the infestation prior to excavation. The material shall then be excavated and subsequently buried to a minimum depth of 5 m. The waste shall be covered with a proprietary root barrier membrane layer and infilled with a minimum 5 m depth of uncontaminated soil.
- Any geotextile membranes used for burial must be undamaged, sealed securely, have a manufacturer's guarantee that it will remain intact for at least 50 years, and be UV resistant. Where burial to a depth of 5m is not possible, the infestation shall be treated with a non-persistent herbicide prior to excavation, excavated and then completely encapsulated in a proprietary root barrier membrane cell. The upper surface of the cell shall be buried to a depth of at least 2 m with uncontaminated soil.
- Treat with glyphosate. Glyphosate is a broad-spectrum herbicide and, as such, is potentially damaging to non-target plants.
- Great care is, therefore, necessary when applying this herbicide

- effective control of Japanese knotweed may be achieved by biannual (summer and autumn) foliar glyphosate applications or by annual application of glyphosate in autumn (after the flowering period but prior to senescence) using stem injection (at high concentrations) or foliar spray (Jones, et al., 2018).
- The use of herbicides containing the active ingredients aminopyralid and fluroxypyr are not to be used for stands of Fallopia japonica occurring in close proximity to watercourses and wetland habitats.
- The application of herbicides and pesticides shall not be undertaken in the following conditions:
  - Windy weather where there is a risk of spray drift occurring
  - During or preceding rainfall which can result in the chemical being washed off
  - During periods of particularly cold weather which can reduce the plant's ability to uptake the chemical

A summary of the physical and chemical control measures for *Prunus laurocerasus* are as follows:

- Cutting – anytime of the year. This approach can be very labour intensive and does not kill the plant. Regular follow up is required to deal with re-growth.
- Uprooting - anytime of the year. Small plants can be pulled by hand while large stems can be cut and the roots grubbed out by winch or machine.
- Mulch matting - anytime of the year. This approach can be labour intensive and regular follow up is required to deal with re-growth.
- Bud-rubbing – spring to autumn. This approach can be labour intensive and regular follow up is required to deal with re-growth.
- Glyphosate – during the active growth in late spring or summer. Spot treatment of stands of *Prunus laurocerasus* on site.
- Triclopyr - during the active growth in late spring or summer. Spot treatment of stands of *Prunus laurocerasus* on site.

Due to the legislative requirements to control the spread of noxious weeds and non-native invasive plant species, it is important that any activities associated with the planning, construction and operation of wind farm developments comply with the requirements of the Wildlife Acts, 1976-2012. Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) include legislative measures to deal with the dispersal and introduction of Invasive Alien Species (IAS), which are listed in the Third Schedule of the regulations. Regulation 49 deals with the Prohibition on introduction

and dispersal of certain species while Regulation 50 relates to Prohibition on dealing in and keeping certain species.

The introduction and/or spread of invasive species such as Himalayan Balsam, Giant Rhubarb or Rhododendron for example, could result in the establishment of invasive alien species and this may have negative effects on the surrounding environs. Appropriate spread prevention measures have been incorporated into the design of the project. The following measures address potential effects associated with the construction phase of the project:

- Good construction site hygiene will be employed to prevent the introduction and spread of problematic invasive alien plant species (e.g. Himalayan Balsam, Japanese Knotweed etc.) by thoroughly washing vehicles prior to leaving any site.
- All plant and equipment employed on the construction site (e.g. excavator, footwear, etc.) will be thoroughly cleaned down using a power washer unit prior to arrival on site to prevent the spread of invasive plant species
- All washing will be undertaken in areas with no potential to result in the spread of invasive species. This process will be detailed in the contractor's method statement.
- Any soil and topsoil required on the site will be sourced from a stock that has been screened for the presence of any invasive species and where it is confirmed that none are present.
- All planting and landscaping associated with the Development shall avoid the use on invasive shrubs such as Rhododendron.

6.7.1.3 Mitigation by Reduction

6.7.1.3.1 Protection of important habitats

A site-specific CEMP will be implemented to ensure that potential adverse impacts to upland watercourses flowing through the site are avoided. Minimum buffer zones will be implemented between areas associated with the construction of Turbine Foundations and streams/eroding gullies, except where stream crossings are required.

Within the wind farm site operatives, plant and machinery will be restricted to the footprint of the Proposed Development construction boundary and will not be permitted to encroach upon adjacent lands. This will reduce the potential for damage and disturbance to heath, acid grassland and mosaic habitats.

6.7.1.3.2 Protection of Watercourses

All elements of the SWMP and the mitigation measures outlined in Chapter 9 to reduce the amount of silt-laden water generated within the construction footprint will be implemented. These measures will include the provision of clean water catch drains upslope of construction areas and the minimisation of excavation footprints and the time excavations and surfaces are left exposed and denuded.

6.7.1.4 Offsetting

6.7.1.4.1 Habitat restoration

Areas of existing degraded wet heath occurring to the east of the T02 within the wind farm landholding will be subject to habitat enhancement measures. A Habitat Management Plan is provided as **Appendix 6.5** and all measures set out in this plan will be implemented as part of the Proposed Development. The restoration and enhancement of areas of wet heath and the implementation of measures such as the control of grazing will aim to achieve the restoration and enhancement of an area that will compensate for the loss of wet heath habitat in good condition and representative of Annex 1 habitat occurring along the proposed access track to between T01 and T03.

6.7.2 Operational Phase mitigation

6.7.2.1 Mitigation by Design

6.7.2.1.1 Protection of Watercourses

The following measures are required in order to ensure the ongoing protection of watercourses:

- Re-seeding / re-vegetation of all areas of bare ground or the placement of Geo-jute (or similar) matting will take place as practically possible at the start of the operational phase to prevent run-off.
- Silt traps erected during the construction phase within roadside and artificial drainage will be replaced with stone check dams for the lifetime of the project. These stone check dams will only be placed within artificial drainage systems such as roadside drains and not natural streams or ditches.
- A full review of construction stage temporary drainage will be undertaken by the Developer (in conjunction with the Project Hydrologist/ Site Engineer and the Project Ecologist) following the completion of construction, and drainage removed or appropriately blocked where this will not interfere with infrastructure.
- The Temporary Construction Compound / office must house all chemicals within a secure bunded COSSH store for the operational phase of the project.

6.7.2.1.2 Protection of Bats

Turbines will operate in a manner which restricts the rotation of the blades as far as is practicably possible below the manufacturer's specified cut-in speed (SNH 2021). This is usually achieved by feathering the blades during low wind speeds; the angle of the blades is rotated to present the slimmest profile possible towards the wind, ensuring they do not rotate or 'idle' when not generating power.

Turbine blades spinning in low wind can kill bats, however bats cannot be killed by feathered blades which are not spinning (Horn et al., 2008). The feathering of turbine blades combined with increased cut-in speeds have been shown to reduce bat fatalities by up to 50% (SNH 2021). As such, the feathering of blades to prevent 'idling' during low wind speeds is proposed for all turbines.

6.7.2.2 Mitigation by Reduction

6.7.2.2.1 Protection of Bats

Cut-In Speeds/Curtailment

Increasing the cut-in speed above that set by the manufacturer can reduce the potential for bat/turbine collisions. A study by Arnett et al. (2011) showed a 50% decrease in bat fatality can be achieved by increasing the cut-in speed by 1.5 m/s.

Species with elevated risk of collision (Leisler's bat, soprano and common pipistrelle) in particular would benefit from increasing the cut-in speed of turbines, as dictated on a case-by case basis depending on the activity levels recorded at each turbine.

Cut-in speeds should be increased during the bat activity season (April-October) or where temperatures are optimal for bat activity to 5.5 m/s from 30 minutes prior to sunset and to 30 minutes after sunrise at turbines where surveillance shows high bat activity levels for High and Medium-Risk species and/or if bat carcasses are recorded.

The duration required depends on the level of mitigation required for each individual turbine i.e. a full bat activity season or only spring and autumn (duration will be determined by the first year of surveillance).

Cut-in speeds restrictions will be operated according to specific weather conditions:

- When the air temperature is greater than 7°C (as bat activity does not usually occur below this temperature).
- Generally, bat activity peaks at low wind speeds (<5.5m/s). As such, it has been shown that curtailing the operations of wind turbines at low wind speeds can reduce bat mortality dramatically, particularly during late summer and the early autumn months.

Due to the considerable unnecessary down time resulting from the proposed "blanket curtailment" (above) and the advances in smart curtailment a focused curtailment regime is further proposed from the year two of operation.

This will focus on times and dates, corresponding with periods when the highest level of bat activity occur within the Site. This includes the use of the SCADA (Supervisory Control and Data Acquisitions) operating system (or equivalent) to only pause/feather the blades below a specified wind speed and above a specified temperature within specified time periods.

Post-constructions surveys will be undertaken for the first three years of operation to confirm if blanket curtailment restrictions can be amended in line with post-construction activity levels. The post construction surveys will be used to update the current curtailment regime (blanket curtailment) designed around the values for the key weather parameters and other factors that are known to influence collision risk. This will include all of the following:

- Wind speed in m/s (measured at nacelle height)
- Time after sunset
- Month of the year
- Temperature (ºC)
- Precipitation (mm/hr)

6.7.2.3 Offsetting

6.7.2.3.1 Restoration of Important Habitats

Restoration of habitats will require ongoing positive management input as well as monitoring of success and necessary remedial measures. This is set out in the Habitat Management Plan in **Appendix 6.4**.

6.7.3 Decommissioning Phase Mitigation

No new impacts on the surface water and groundwater receiving environment are anticipated during the Decommissioning phase of the Project. The Decommissioning phase of the Project will result in the removal of Site infrastructure such as wind turbines and the Met Mast etc. No new additional mitigation measures to those proposed for the construction which will also be implemented during Decommissioning are required for the Decommissioning phase of the Proposed Development. The Decommissioning phase and associated removal of major infrastructure components is anticipated to result in similar potential risks to surface water and groundwater as those that will be encountered during the construction phase of the Proposed Development.

The excavation of greenfield land is not expected to be required during the Decommissioning phase. In addition, the movement of plant, vehicles and equipment is not expected to be required during the Decommissioning phase since all of the project's hardstand areas will be pre-existing by the time the Decommissioning phase is being carried out. As a result, the risk of elevated suspended solids being discharged in surface water run-off to the downstream receiving environmental is expected to be low. However, the potential risk remains for spills of fuels hazardous chemicals which is a common risk to all developments. The mitigation measures outlined in this chapter will be implemented during the decommissioning phase to reduce the potential for such impacts.

6.8 MONITORING

An ECoW will be appointed prior to the commencement of construction. The ECoW will be an ecologist with experience of baseline ecological surveys, pre-construction surveys and construction phase supervision. The ECoW will be responsible for completing pre-construction surveys and supervising construction works and advising on the implementation of biodiversity enhancement measures that will be commenced during the construction phase.

Pre-construction confirmatory surveys required in advance of the construction phase will include as a minimum:

- Otter surveys along the Gortloughra, Shanacrane and Shehy Beg Streams. Surveys to be completed will pay particular attention to identifying the presence/absence of otter holts/couches within 150 m of the proposed wind farm infrastructure. In the event that otter holts or couches identified within 150 m of the Proposed Development the status of the breeding/resting place will be confirmed. Where the holt/couch is identified as a breeding site, then, in the absence of a derogation licence, no works will be permitted to proceed within a 150 m radius of the breeding place, whilst it is still actively used as a breeding site. In the event that a non-breeding active holt or couch is identified within 50 m of the Proposed Development, then, in the absence of a derogation licence, no works will be permitted to proceed within a 50 m radius of the non-breeding but active holt or couch.
- Non-native invasive plant species surveys: An up-to-date confirmatory non-native invasive plant species survey of the Site and adjacent areas will be completed during the growing season immediately prior to the commencement of construction works.
- The ECoW will ensure that best practice construction methods and mitigation measures detailed in this EIAR and accompanying planning documentation including the CEMP and NIS are implemented in full.

- The ECoW will be responsible for ensuring that the construction phase contractor is aware of key biodiversity receptors. The ECoW will inspect the construction works throughout the construction phase and will pay particular attention to the implementation of all biodiversity related mitigation measures.
- The ECoW will provide monitoring inspection reports during the construction phase and will also provide a close-out report following the completion of the contract construction works.
- Where necessary the ECoW will liaise with relevant authorities such as Cork County Council, the IFI and the NPWS with respect to construction phase activities that relate to biodiversity.
- As part of the ECoW terms of appointment, the ECoW will be vested with the authority to stop works where activities have been identified on site that are not in accordance with the mitigation measures outlined in this EIAR, the NIS and/or the CEMP prepared for the planning application for the proposed development.

6.8.1 Post-construction phase monitoring

6.8.1.1 Habitats

Post construction phase monitoring will be completed as per the specification for monitoring set out in the Habitat Management Plan in **Appendix 6.4**.

6.8.1.2 Bats

Post construction phase monitoring for bats will be completed as per the specification for monitoring set out in **Appendix 6.2**.

6.9 RESIDUAL EFFECTS

The direct and indirect effects of the proposed development to biodiversity have been set out in Section 6.6 above. There will be an overall loss of approximately 14.4 Ha of habitat to the footprint of the proposed wind farm. This will include a loss of approximately 0.3 Ha of wet heath habitat that is representative of Annex 1 habitat. An additional area of approximately 5.4 Ha of wet heath that has been subject to past grazing pressure will be lost to the footprint. In addition, the extent of mosaic habitat including heath occurring in a mosaic of grassland and exposed siliceous rock as well as the discrete area of blanket bog occurring at the T06 area will amount to approximately 6 Ha. A Habitat Management Plan will be implemented to mitigate for the loss of these habitats to the footprint of the proposed wind farm. This plan comprises measures for the maintenance and restoration of an area of approximately 20 Ha of heath habitat.

Table 6.17: Assessment of Residual Effects

Biodiversity Receptor	Impact	Significance	Probability	Mitigation	Residual Impact
European Sites	Potential for the discharge of pollutants such as sediment or hydrocarbons downstream to the Bandon River SAC and pNHA which could affect qualifying habitat and species.	The significance of impact will depend upon the magnitude of the pollution event (i.e. the levels of pollution released). Any pollution event with the potential to result in short to long-term perturbations to conservation objective targets of qualifying feature of interest will represent a significant effect.	Likely	Minimise ground disturbance. Timing of works and implementation of surface water management and control measures. Implementation of all mitigation measures set out in Section 6.7, Chapter 8 & 9 and within the Natura Impact Statement (DEC, 2025). The implementation of mitigation measures will negate the potential for this impact to arise.	No residual adverse effects
NHAs	No impact. No NHAs within the zone of influence of the Development.	N/A	None	None Required	No residual impact
pNHAs	Potential for the discharge of pollutants such as sediment or hydrocarbons downstream to the Bandon River pNHA and Lough Allua pNHA which could	The significance of impact will depend upon the magnitude of the pollution event (i.e. the levels of pollution released). Any pollution event with the potential to result in short to long-term perturbations to	Likely	Minimise ground disturbance. Timing of works and implementation of surface water management and control measures. Implementation of all mitigation measures set out in Section 6.7, Chapter 8 & 9 and	No residual adverse effects

Biodiversity Receptor	Impact	Significance	Probability	Mitigation	Residual Impact
	affect qualifying habitat and species.	feature of interest will represent a significant effect.		within the Natura Impact Statement (DEC, 2025). The implementation of mitigation measures will negate the potential for this impact to arise.	
Heath, Heath Mosaic & Blanket bog Habitat	Loss of habitat to the footprint of the Proposed Development.	Permanent loss of EU Annex 1 wet heath habitat (see **Table 6.13**) and loss of discrete areas of heath mosaic and blanket bog habitat.	Certain	Mitigation measures for habitats are set out under Section 6.7.1. A Habitat Management Plan has been prepared. This includes for the maintenance and restoration of approximately 20 Ha of wet and montane heath within the Site. The extent of wet heath associated with this area will be greater than the c. 0.3 Ha of Annex 1 quality wet heath habitat and c. 11.3 Ha of other degraded areas of wet heath, heath mosaic and peat habitat that will be lost to the footprint of the Proposed Development.	Permanent loss of habitat to the footprint of the Proposed Development (see **Table 6.13**). This will result in a significant, temporary impact on features of local to international importance. The long-term residual impact will be dependent upon achieving the targets set out in the Habitat Management Plan. The successful achievement of the targets set out in this Plan will have the potential to offset the loss of habitat to the footprint of the proposed wind farm through the provision of a

Biodiversity Receptor	Impact	Significance	Probability	Mitigation	Residual Impact
					net increase the area of wet and montane habitats at favourable conservation condition. The successful delivery of the HMP will provide for the maintenance and restoration of 20Ha of wet and montane heath.
Wet grassland	Potential for loss of c. 0.58 Ha of species-poor wet grassland	Slight at the local scale	Certain	Mitigation measures for habitats are set out under Section 6.7.1.	Permanent loss of habitat to the footprint of the Proposed Development (see **Table 6.13**). Slight negative residual impact
Acid grassland	Loss of habitat to the footprint of the Proposed Development.	Permanent loss of acid grassland habitat to the footprint of the Site (see **Table 6.13**).	Certain	Mitigation measures for habitats are set out under Section 6.7.1.	Permanent loss of habitat to the footprint of the Proposed Development (see **Table 6.13**). Slight negative residual impact
Aquatic Habitats	Potential for the discharge of pollutants such as sediment or hydrocarbons	The significance of impact will depend upon the magnitude of the pollution	Likely	Minimise ground disturbance. Timing of works and implementation of surface	Imperceptible

Biodiversity Receptor	Impact	Significance	Probability	Mitigation	Residual Impact
	downstream to aquatic habitats.	event (i.e. the levels of pollution released). Any pollution event with the potential to result in short to long-term perturbations to the status of receiving aquatic habitats.		water management and control measures. Implementation of all mitigation measures set out in Section 6.7, Chapter 8 & 9 and within the Natura Impact Statement (DEC, 2025). The implementation of mitigation measures will negate the potential for this impact to arise.	
Fisheries and Aquatic Fauna	Potential for the discharge of pollutants such as sediment or hydrocarbons downstream to aquatic habitats that support fisheries and aquatic fauna.	The significance of impact will depend upon the magnitude of the pollution event (i.e. the levels of pollution released). Any pollution event with the potential to result in short to long-term perturbations to the status of receiving aquatic habitats to support fisheries and aquatic fauna.	Likely	Minimise ground disturbance. Timing of works and implementation of surface water management and control measures. Implementation of all mitigation measures set out in Section 6.7, Chapter 8 & 9 and within the Natura Impact Statement (DEC, 2025). The implementation of mitigation measures will negate the potential for this impact to arise.	Imperceptible
Otters	Potential for indirect impacts to otters as result of perturbations to aquatic habitats downstream that	The significance of impact will depend upon the magnitude of the pollution event (i.e. the levels of	Likely	Minimise ground disturbance. Timing of works and implementation of surface water management and	Imperceptible

Biodiversity Receptor	Impact	Significance	Probability	Mitigation	Residual Impact
	are relied upon by otter or provide suitable habitat for otters.	pollution released). Any pollution event with the potential to result in short to long-term perturbations to the status of receiving aquatic habitats to support otters.		control measures. Implementation of all mitigation measures set out in Section 6.7, Chapter 8 & 9 and within the Natura Impact Statement (DEC, 2025). The implementation of mitigation measures will negate the potential for this impact to arise.	
Bats	Potential impacts during the operation phase associated with the risk of fatalities posed by operating wind turbines to high risk species that comprise pipistrelle species and Leisler's bat.	Potential for impacts to the local population of Soprano pipistrelle and Common pipistrelle populations.	Possible	Implementation of mitigation measures set out in Section 6.7.3.1.2 and 6.7.3.2.1 and set out in further detail in **Appendix 6.2**.	The adjudged worst-case scenario is that, during operation, the turbines may possibly cause injury or death to a few individual specimens of Leisler's bat as it is a high-flying species (10 m to 70 m+). However, the amount of time spent hunting at the upper height limit cannot be assessed accurately due to the maximum distance (60 m to 80 m) of detection of this species by ultrasound detectors but most activity and time can be expected to occur in the mid-region of the

Biodiversity Receptor	Impact	Significance	Probability	Mitigation	Residual Impact
					species hunting altitude i.e. 40 m. The resulting effect of the development on local bat populations, with implemented mitigation measures, is considered to be a Slight to Imperceptible Residual Negative Reversible Effect and in the Local Context with the favourable conservation status (FCS) of bat species being unaffected and all species confirmed or expected on or near the study areas are predicted to persist.
Herpetofauna	Mortality resulting from construction works. Loss of foraging habitat.	Potential for impacts to the local common frog populations.	Likely	Minimise ground disturbance. Timing of works. Habitat management measures as part of the Habitat Management Plan. Implementation of mitigation measures set out in Section 6.7.2.1.6.	Imperceptible

Biodiversity Receptor	Impact	Significance	Probability	Mitigation	Residual Impact
Terrestrial Invertebrates	Loss of habitat.	Potential for impacts to the local terrestrial fauna populations.	Likely	Minimise ground disturbance. Timing of works. Habitat management measures as part of the Habitat Management Plan.	Imperceptible