

## 6. BIODIVERSITY

### 6.1 Introduction

This chapter assesses the likely significant effects (both alone and cumulatively with other plans and projects) that the Proposed Project may have on Biodiversity. Mitigation by design was applied to the finalised Proposed Project layout wherever possible to avoid impacts on Biodiversity. This chapter sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified. The residual impacts on biodiversity are then assessed. Particular attention has been paid to species and habitats of ecological importance. These include species and habitats with national and international protection under the Wildlife Acts 1976 (as amended) and/or EU Habitats Directive 92/43/EEC. Impacts on avian receptors are considered in Chapter 7 (Birds) of this EIAR. The full description of the Proposed Project is provided in Chapter 4 of this EIAR.

As detailed in Section 1.1.1 in Chapter 1 (Introduction) and for the purpose of this EIAR, the various project components are described and assessed using the following references:

- Where the 'Proposed Project' is referred to this encompasses the entirety of the project for the purposes of this EIA in accordance with the EIA Directive. The Proposed Project is described in detail in Chapter 4 of this EIAR.
- Where the 'Proposed Wind Farm' is referred to, this refers to turbines and associated foundations and hardstanding areas, including entrances and access roads, underground cabling, permanent meteorological mast, temporary construction compounds, turbine delivery accommodation works, spoil repository areas, borrow pits, tree felling, site drainage, operational stage signage, battery energy storage system and all ancillary works and apparatus. The Proposed Wind Farm is described in detail in Chapter 4 of this EIAR.
- Where the 'Proposed Grid Connection Route' is referred to, this refers to the 110kV onsite substation, all ancillary works and underground 110kV grid connection cabling connecting to the existing Killonan 110kV substation Co. Limerick, and all ancillary works and apparatus. The Grid Connection Route is described in detail in Chapter 4 of this EIAR.
- Where the 'Site' is referred to, this relates to the primary study area for the EIAR, as delineated by the EIAR Site Boundary in green as shown on Figure 1-1 of the EIAR and encompasses an area of approximately 1,564 hectares. Where the 'Wind Farm site' is referred to, this relates the EIAR Site Boundary without the corridor that encompasses the underground grid connection cabling route.

This chapter is structured as follows:

- The Introduction provides a description of the legislation, guidance, and policy context applicable to Biodiversity, Flora and Fauna.
- This is followed by a comprehensive description of the ecological survey and impact assessment methodologies that were followed to inform the robust assessment of likely significant effects on ecological receptors.
- A description of the Baseline Ecological Conditions and Receptor Evaluation is then provided.
- This is followed by an Assessment of Effects which are described with regard to each phase of the Proposed Project: construction phase, operational phase and decommissioning phase. Potential Cumulative effects in combination with other plans and projects are also fully assessed.
- Proposed mitigation and best practice measures to avoid or reduce the identified effects are described and discussed. This is followed by an assessment of residual

effects taking into consideration the effect of the proposed mitigation and best practice measures.

- The conclusion provides a summary statement on the overall significance of predicted effects on Biodiversity, Flora and Fauna.

In addition:

- ‘Key Ecological Receptor’ (KER) is defined as a species or habitat occurring within the zone of influence of the Proposed Project upon which likely significant effects are anticipated.
- ‘Zones of Influence’ (ZOI) for individual ecological receptors refers to the zone within which potential effects are anticipated. ZOIs differ depending on the sensitivities of particular habitats and species and were assigned in accordance with best available guidance and through adoption of a precautionary approach.

## 6.1.1 Requirements for Ecological Impact Assessment

### National Legislation

The Wildlife Act, (as amended), is the principal piece of legislation governing protection of wildlife in Ireland. The Wildlife Act provides strict protection for species of conservation value. The Wildlife Act conserves wildlife (including game) and protects certain wild creatures and flora.

Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) are heritage sites that are designated for the protection of flora, fauna, habitats, and geological sites. Only NHAs are designated under the Wildlife (Amendment) Act 2017. These sites do not form part of the Natura 2000 network of European sites and the AA process, or screening for same, does not apply to NHAs or pNHAs. Proposed Natural Heritage Areas (pNHAs) were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated<sup>1</sup> However, these sites are considered to be of significance for wildlife and habitats as they may form statutory designated sites in the future (NPWS, 2020).

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

### National Policy

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

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

- **Objective 1: Adopt a Whole-of Government, Whole of Society Approach to Biodiversity.** Proposed actions include capacity and resource reviews across Government; determining responsibilities for the expanding biodiversity agenda providing support for communities, citizen scientists and business; and mechanisms for the governance and review of this National Biodiversity Action Plan.
- **Objective 2: Meet Urgent Conservation and Restoration Needs.** Supporting actions will build on existing conservation measures. Efforts to tackle Invasive Alien Species will be elevated. The protected area network will be expanded to include the Marine Protected Areas. The ambition of the EU Biodiversity Strategy will be considered as part of an evolving work programme across Government.
- **Objective 3: Secure Nature's Contribution to People.** Actions highlight the relationship between nature and people in Ireland. These include recognising the tangible and intangible values of biodiversity, promoting nature's importance to our culture and heritage and recognising how biodiversity supports our society and our economy.
- **Objective 4: Enhance the Evidence Base for Action on Biodiversity.** This objective focuses on biodiversity research needs, as well as the development and strengthening of long-term monitoring programmes that will underpin and strengthen future decision-making. Action

<sup>1</sup> <https://www.npws.ie/protected-sites/nha> (accessed 24th of October 2025).

will also focus on collaboration to advance ecosystem accounting that will contribute towards natural capital accounts.

- **Objective 5: Strengthen Ireland's Contribution to International Biodiversity Initiatives.** Collaboration with other countries and across the island of Ireland will play a key role in the realisation of this Objective. Ireland will strengthen its contribution to international biodiversity initiatives and international governance processes, such as the United Nations Convention on Biological Diversity.

In addition, the National Biodiversity Data Centre published guidance on Pollinator-friendly management of Wind Farms<sup>2</sup>. This identifies an evidence-based action plan for wind farm operators that can help pollinators by employing changes to existing management strategies.

Such policies have informed the evaluation of ecological receptors recorded within the Site and the ecological assessment process. Pollinator friendly measures have been incorporated into the Proposed Project, and these are detailed within the Biodiversity Enhancement and Management Plan (BEMP) (see **Appendix 6-1**).

### European Legislation

Habitats and species of European importance are provided legal protection under the EU Habitats Directive 92/43/EEC (the Habitats Directive) and the EU Birds Directive 2009/147/EC (the Birds Directive) this legislation forms the cornerstone of Europe's nature conservation within the EU. It is built around two pillars: the Natura 2000 network of protected sites (hereafter referred to as European sites<sup>3</sup>) and the strict system of species protection. Both the Habitats and Bird Directives have been transposed into Irish law by Part XAB of the Planning and Development Acts 2000 (as amended) (from a land use planning perspective) and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011).

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

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

<sup>2</sup> <https://pollinators.ie/wp-content/uploads/2022/12/Wind-Farm-Pollinator-Guidelines-2022-WEB.pdf> (accessed 24th of October 2025).

<sup>3</sup> The term Natura 2000 network was replaced by 'European site' under the EU (Environmental Impact Assessment and Habitats) Regulations 2011 S.I. No. 473 of 2011.

Protection Areas (SPAs) are to be identified and classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

In summary, the species and habitats provided National and International protection under these legislative and policy documents have been considered in this Ecological Impact Assessment. A detailed assessment of the likelihood of the Proposed Project having either a significant effect or an adverse impact on any relevant European Sites (i.e. SACs, cSACs<sup>4</sup>, SPAs or cSPAs) has been carried out in the Appropriate Assessment (AA) Screening Report and Natura Impact Statement (NIS). A separate assessment has not been carried out in this chapter, to avoid duplication of assessments. However, the relevant conclusions have been cross-referenced and incorporated.

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

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

## 6.1.2

### Review of Relevant Guidance and Sources of Consultation

The assessment methodology is based primarily upon the National Road Authority (NRA)'s Guidelines for Assessment of Ecological Impacts of National Road Schemes Rev 2 (NRA, 2009a) and the survey methodology is based on the NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (TII, 2008). Although these survey methodologies relate to road schemes, these standard guidelines are recognised survey methodologies that ensure good practice regardless of the development type.

In addition, the following guidelines were consulted in the preparation of this chapter to provide the scope, structure and content of the assessment:

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018).
- EPA Guidelines on information to be included in Environmental Impact Assessment Reports (EPA, 2022).

This assessment has been carried out in accordance with the Environmental Impact Assessment guidance as outlined in Chapter 1 (Introduction) of the EIAR.

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

- Tipperary County Development Plan 2022-2028.
- Limerick Development Plan 2022-2028.
- Ireland's 4<sup>th</sup> National Biodiversity Action Plan 2023-2030.

---

<sup>4</sup> Candidate SAC (cSAC) are afforded the same protection as SACs. The process of making cSAC into SACs by means of Statutory instrument has begun and while the process is ongoing the term SAC will be used to conform with nomenclature used in the National Parks and Wildlife Services (NPWS) databased. The name applies to candidate SPAs.

- › Regional Spatial & Economic Strategy for the Southern Region, Project Ireland 2040.

### 6.1.3 Statement of Authority

This Biodiversity Chapter was prepared by Stephanie Corkery (B.Sc., M.Sc.) and Deepali Mooloo (B.Sc., M.Sc.) and reviewed by Pádraig Desmond (B.Sc.) and Caroline Kelly (BSc., MSc., MCIEEM).

Multidisciplinary ecological walkover surveys were carried out in 2024 and 2025 by MKO Ecologists Pádraig Desmond, Stephanie Corkery, Deepali Mooloo, Nora Szijarto (B.Sc., M.Sc.), David Culleton (B.Sc., M.Sc.), Ciara Hackett (B.Sc.), Mairead Kavannah (B.Sc., M.Sc.), Sara Fissolo (BSc.), and Molly O' Hare (BSc., MSc.).

Dedicated aquatic surveys were carried out in 2024 by Aran von der Geest Moroney (B.Sc.), Niamh Rowan (B.Sc.) and Kieran Sugrue (B.Sc.) of MKO. Bat surveys were conducted in 2023 and 2024 by MKO ecologists Kate Greaney (MSc.), Ryan Connors (MSc.), Keith Costello (BSc.), Sara Fissolo (BSc.) and Frederick Mosely (MSc.) of MKO. The Proposed Grid Connection Route was visited by David Culleton, Mairead Kavannah, and Clare Mifsud (Ph.D.).

All surveyors have relevant academic qualifications and are competent in undertaking habitat and ecological assessments.

#### **Pádraig Desmond**

Pádraig is a Project Ecologist with MKO with five years post graduate ecological experience, four years of which have been in ecological consultancy. Pádraig holds a BSc (Hons) in Ecology and Environmental Biology from University College Cork. Pádraig took up his position with MKO in December 2021, prior to which he worked as a Junior Ecologist with Envirico. Through these consultancy roles Pádraig has gained excellent experience in producing ecological reports such as Natura Impact Statements, Ecological Impact Assessments, Biodiversity chapters, Invasive Species Management Plans, and Constraints Reports for a wide range of projects including small private developments to housing developments and renewable energy projects such as solar and wind farms. Prior to the above roles, Pádraig worked as a field ecologist for the Department of Conservation in New Zealand, where he developed a strong field-based skill set. Pádraig's key strengths and areas of expertise are in terrestrial ecology, including vegetation surveys, habitat identification, invasive species surveys, mammal surveys, Appropriate Assessment and Ecological Impact Assessment. Pádraig is also skilled in GIS.

#### **Caroline Kelly**

Caroline is a Senior Ecologist with MKO with over nine years' experience in ecological consultancy and is a Full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). Caroline holds a BSc in Environmental Biology from University College Dublin (UCD) and an MSc in Applied Ecological Assessment from University College Cork (UCC). In addition, Caroline has completed an Advanced Diploma in Planning and Environmental Law from Kings Inns Dublin. Prior to taking up her position with MKO in June 2025, Caroline worked as a Principal Ecologist with Scott Cawley Ltd. Caroline has strong generalist field ecology skills and has undertaken a range of ecological surveys including habitat, bird (both breeding and wintering), invasive species and protected fauna surveys. She has strong technical reporting skills and has extensive experience in a range of ecological assessments including Appropriate Assessment and Ecological Impact Assessment. She has undertaken ecological assessments and surveys on a variety of project types (e.g. linear infrastructure projects, industrial, commercial, residential, recreational, tourism and renewable energy developments).

**Stephanie Corkery**

Stephanie is an Ecologist with MKO with three years of experience in professional ecological consultancy. Stephanie holds a BSc. in Ecology and Environmental Biology, an MSc. in Marine Biology, and a HDip in Sustainability in Enterprise, all from University College Cork. Since joining MKO as a graduate in March 2022, Stephanie has worked on a wide variety of projects including wind farms, large scale residential developments, and County Council projects. Stephanie's key strengths include organising and carrying out both terrestrial and marine mammal surveys, as well as general ecological walkover surveys and bat surveys. She is also experienced in GIS, acoustic data analysis for bat species, and in preparing Appropriate Assessment Screening Reports (AASR), Natura Impact Statements (NIS), Ecological Impact Assessments (EcIA), Biodiversity Chapters, and Bat Survey Reports. Stephanie is also a JNCC Certified Marine Mammal Observer and has completed the ACCOBAMS Course for Highly Qualified Marine Mammal Observers (MMO) and Passive Acoustic Monitoring operators (PAM).

**Deepali Mooloo**

Deepali Mooloo is an Ecologist at MKO, having joined the company in September 2023. She holds an M.Sc. (Hons) in Applied Coastal and Marine Management from University College Cork, where she specialized in spatial ecology, field skills, and drone photogrammetry. Deepali's expertise lies in ecology and field surveys, with experience in a range of multidisciplinary assessments. Since joining MKO, she has conducted walkover surveys, marsh fritillary surveys, mammal surveys, winter bird surveys, and botanical surveys, including detailed relevés of plant species in both coastal and terrestrial habitats. She is also skilled in habitat assessments, utilizing Fossitt's Guide to Habitats in Ireland and the ERICA database. Her professional experience includes preparing Appropriate Assessment Screening Reports (AASR), Feasibility Studies, Ecological Impact Assessments (EcIA), and Natura Impact Statements (NIS). She is proficient in detailed habitat and ecological constraints mapping using QGIS and has expertise in cartography using both QGIS and ArcGIS. In 2024, Deepali successfully completed the Marine Mammal Observer Course with IDWG. She also has prior experience working in coastal and marine environments in Mauritius.

## 6.2 Methodology

The following sections describe the methodologies followed to establish the baseline ecological condition of the Site and surrounding area. Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to, and at the time of, the project proceeding. Ecological baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

### 6.2.1 Desk Study

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

- › Review of NPWS Article 17 maps 2019, 2013 and 2007<sup>5</sup>.
- › Review of online web-mappers: National Parks and Wildlife Service (NPWS)<sup>6</sup>, EPA maps<sup>7</sup>, Water Framework Directive (WFD) and Inland Fisheries Ireland (IFI)<sup>8</sup>.
- › Inland Fisheries Ireland (IFI) Reports<sup>9</sup>, where available.
- › Data on potential occurrence of protected bryophytes – as per NPWS online map viewer; Flora Protection Order Map Viewer – Bryophytes<sup>10</sup>.
- › Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper<sup>11</sup>.
- › Review of specially requested records from the NPWS Rare and Protected Species Database for the hectads in which the Proposed Project is located.
- › Records from the NPWS web-mapper and review of specially requested records from the NPWS Rare and Protected Species Database for the hectads in which the Proposed Project is located.
- › Potential for cumulative effects have been considered in Chapter 2 (Background to the Proposed Project) of this EIAR and Section 6.6 of this Chapter. This was informed by a review of the EIARs/NISs prepared for other plans and projects occurring in the wider area.

#### 6.2.1.1 Designated Sites

##### 6.2.1.1.1 Identification of the Designated Sites within the Likely Zone of Influence (ZOI) of the Proposed Project

The potential for the Proposed Project to impact on sites that are designated for nature conservation was considered in this Biodiversity Chapter.

Special Areas of Conservation (SACs) and Special Protection Areas for Birds (SPAs) are designated under the EU Habitats Directive and EU Birds Directive, respectively and are collectively known as 'European Sites'. The potential for significant effects and/or adverse impacts on the integrity of European Sites is fully assessed in the AA Screening Report and Natura Impact Statement that accompanies this application. As per EPA Guidance 2022, "a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact

<sup>5</sup> <https://storymaps.arcgis.com/collections/1a721520030d404f899d658d5b6e159a?item=1> Accessed: 24<sup>th</sup> of October 2025.

<sup>6</sup> <https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=8f7060450de3485fa1c1085536d477ba> Accessed: 24<sup>th</sup> of October 2025.

<sup>7</sup> <https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=8f7060450de3485fa1c1085536d477ba> Accessed: 24<sup>th</sup> of October 2025.

<sup>8</sup> <https://ifigis.maps.arcgis.com/apps/webappviewer/index.html?id=9a31fedb077c4fb2991184842b7ef025> Accessed: 24<sup>th</sup> of October 2025.

<sup>9</sup> <https://wfdfish.ie/index.php/wfd-map-viewer/> Accessed: 24<sup>th</sup> of October 2025.

<sup>10</sup> NPWS, 2019, Online map viewer; Flora Protection Order Map Viewer – Bryophytes. Online, Available at: <http://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e>, Accessed: 07/11/2024.

<sup>11</sup> [maps.biodiversityireland.ie/Map](https://maps.biodiversityireland.ie/Map) Accessed: 24<sup>th</sup> of October 2025.

*Statement*” but should “*incorporate their key findings as available and appropriate*”. Section 6.5.5 of this EIAR provides a summary of the key assessment findings with regard to European Designated Sites.

Natural Heritage Areas (NHAs) are designated under Section 18 the Wildlife (Amendment) Act 2000, and their management and protection is provided for by this legislation and planning policy. The potential for effects on these designated sites is fully considered in this Biodiversity Chapter (refer to Section 6.5.5.2).

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

The following methodology was used to establish which sites that are designated for nature conservation have the potential to be impacted by the Proposed Project:

- All designated sites within the vicinity of the Site were identified. In addition, the potential for connectivity with European or Nationally designated sites at greater distances from the Proposed Project was also considered in this initial assessment.
- The designation features of these sites, as per the NPWS website ([www.npws.ie](http://www.npws.ie)), were consulted and reviewed at the time of preparing this report.
- Where potential pathways for Significant Effect are identified, the Site is included within the Likely Zone of Influence (ZoI) and further assessment is required.

## 6.2.2 Scoping and Consultation

MKO undertook a scoping exercise during preparation of this EIAR, as described in Chapter 2 of this EIAR.

Copies of all scoping responses are included in **Appendix 2-1** of this EIAR. The recommendations of the consultees have informed the EIAR preparation process and the contents of this chapter. Table 2-9 in Chapter 2 of this EIAR describes where the comments raised in the scoping responses received have been addressed in this assessment. Table 6-1 provides a list of the organisations consulted regarding biodiversity during the scoping process and notes where scoping responses were received.

In addition, MKO requested consultation with the National Parks and Wildlife Services (NPWS) to discuss the Proposed Project and to welcome any feedback they may have. This meeting was held online on the 12<sup>th</sup> of December 2025, where MKO presented an overview of the project to NPWS representatives, the surveys undertaken and the key findings, as well as European Site which are being considered in the accompanying Natura Impact Statement.

The key points of feedback are summarised below, with responses.

- There was general concern about the efficacy of the proposed Biodiversity Enhancement and Management Plan (BEMP), regards implementation. In response, the BEMP has clearly stated that the responsibility of the full implementation of the measures and targets is with the client, who has legal agreements with landowners, and will be bound by any conditions of a granted permission of the project. It further notes that should any landowners pull out of any agreements, alternative landholdings in the vicinity of the Site will be sourced.
- The NPWS noted a known breeding site for hen harrier in the vicinity of the Proposed Project site. This has been addressed in Chapter 7.

Table 6-1 Organisations consulted regarding biodiversity.

Consultee	Scoping Response Date	Summary of Scoping Response
An Taisce	No response received	N/A
Bat Conservation Ireland	No response received	N/A
BirdWatch Ireland	No response received	N/A
Department of Agriculture, Food and the Marine	Response received on 30 <sup>th</sup> July 2024 and 22 <sup>nd</sup> November 2024.	No comment provided as the activity doesn't fall within the remit of EIA regulations under the Department of Agriculture, Food and the Marine.
Department of the Environment, Climate and Communications	Response received on 17 <sup>th</sup> April 2024, on behalf of Geological Survey of Ireland.	Geological Survey of Ireland response is highlighted below.
Department of Housing, Local Government and Heritage (NPWS)	Acknowledgement receipt of correspondence on 28 <sup>th</sup> March 2024 and 11 <sup>th</sup> October 2024 but no formal response has been received.	N/A
Forest Service	No response received.	N/A
Geological Survey of Ireland	Response received on 17 <sup>th</sup> April 2024	<ul style="list-style-type: none"> <li>➤ Records show that there are no County Geological Sites in the vicinity of the Proposed Wind Farm.</li> <li>➤ The Groundwater Vulnerability map indicates the range of groundwater vulnerabilities within the area covered is variable.</li> </ul>
Inland Fisheries Ireland	No response received	N/A
Irish Peatland Conservation Council	No response received	N/A
Irish Wildlife Trust	No response received	N/A
Heritage Officer-Tipperary County Council	No response received	N/A
The Heritage Council	No response received	N/A

### 6.2.3 Field Surveys

A comprehensive survey of the biodiversity within the Site was undertaken to inform this Biodiversity Chapter of the EIAR. The following sections fully describe the ecological surveys that have been

undertaken and provide details of the methodologies and guidance followed. Surveys were carried out on various dates in 2023, 2024, and 2025. These are summarised in Table 6-2 below.

*Table 6-2 Ecology Surveys Informing the EIAR.*

Date	Survey	Surveyors
May, July and September 2023	Manual Bat Transect Surveys	Kate Greaney, Ryan Connors, Keith Costello, Sara Fissolo, Frederick Mosely.  Detailed survey effort is provided in the Bat Survey Report ( <b>Appendix 6-2</b> ).
March, April, May, July, August and September 2024	Ground-level Static Bat surveys	
10 <sup>th</sup> – 12 <sup>th</sup> and 17 <sup>th</sup> July 2024, 7 <sup>th</sup> – 10 <sup>th</sup> October 2024 23 <sup>rd</sup> October 2025	Aquatic Surveys	Aran von der Geest Moroney, Niamh Rowan, Kieran Sugrue  Detailed survey effort is provided in the Aquatic Baseline Report ( <b>Appendix 6-3</b> ).
5 <sup>th</sup> of March 2024	Multidisciplinary Walkover	Pádraig Desmond, Stephanie Corkery, Deepali Mooloo, David Culleton, Ciara Hackett, Mairead Kavannagh
20 <sup>th</sup> of June 2024	Botanical Assessment	Pádraig Desmond, Deepali Mooloo
21 <sup>st</sup> of June 2024	Botanical Assessment	Pádraig Desmond, Deepali Mooloo
31 <sup>st</sup> of July 2024	Multidisciplinary Walkover	Pádraig Desmond, Deepali Mooloo
10 <sup>th</sup> of September 2024	Multidisciplinary Walkover (Grid Connection)	Deepali Mooloo, Ryan Connors
26 <sup>th</sup> of September 2024	Multidisciplinary Walkover/ Turbine Delivery Route (TDR) surveys	Stephanie Corkery, Deepali Mooloo
27 <sup>th</sup> of September 2024	Multidisciplinary Walkover/ Turbine Delivery Route (TDR) surveys	Stephanie Corkery, Deepali Mooloo
23 <sup>rd</sup> of January 2025	Multidisciplinary Walkover	Pádraig Desmond, Stephanie Corkery
4 <sup>th</sup> of March 2025	Multidisciplinary Walkover	Stephanie Corkery, Nora Szijarto
21 <sup>st</sup> of March 2025	Multidisciplinary Walkover	Stephanie Corkery
2 <sup>nd</sup> of October 2025	Multidisciplinary Walkover (Grid Connection)	Deepali Mooloo, Claire Mifsud
29 <sup>th</sup> of October 2025	Multidisciplinary Walkover	Stephanie Corkery

### 6.2.3.1 Multi-disciplinary Walkover Surveys (as per TII Guidelines, 2008)

Multidisciplinary walkover surveys were undertaken within the Site. The majority of surveys were undertaken within the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith *et al.*, 2011). A comprehensive walkover of the entire Site was completed with incidental records also incorporated from other dedicated species/habitat specific surveys. During the multidisciplinary surveys, a search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) was conducted.

The walkover surveys were also designed to detect the presence, or likely presence, of a range of protected species. The survey included a search for mammal signs (bats, badger, red squirrel etc.) and areas of suitable habitat to support these species, potential features likely to be of significance to bats and additional habitat features for the full range of other protected species that are likely to occur in the vicinity of the Proposed Project (e.g. otter etc). Bird species observed during the multi-disciplinary surveys of the Proposed Grid Connection were also recorded to gain an understanding of the bird species common to the surrounding area. The survey methodology and results of dedicated bird surveys of the Proposed Wind Farm site are detailed in Chapter 7 (Birds).

The multidisciplinary walkover surveys comprehensively covered the entire Site, including the Proposed Wind Farm site, Proposed Grid Connection Route, and Turbine Delivery Route (TDR). Based on the survey findings, further detailed targeted surveys were carried out for features and locations of ecological significance. Other targeted surveys undertaken within the Site are described in the following subsections.

### 6.2.3.2 Dedicated Habitat and Vegetation Composition Surveys

All habitats recorded on site and described in this EIAR chapter have been classified in accordance with Fossitt (2000). Full details of all the botanical surveys and results are provided in **Appendix 6-4**.

Detailed botanical surveys/relevé assessments of the Site were also undertaken throughout multidisciplinary walkover surveys carried out in 2024 and 2025. These surveys provided an understanding of the baseline and informed further survey work following finalisation of the Proposed Project layout.

Full details of all the botanical surveys and results are provided in **Appendix 6-4** and an assessment of the potential for the Site to support Annex I habitats is also provided in this Appendix.

Detailed habitat classification and assessment was undertaken by MKO at targeted locations within the Site, with relevés undertaken within representative habitats at each turbine base and associated Proposed Project infrastructure, see **Appendix 6-4** for all relevé data. The extent of each habitat on site was mapped using the ArcGIS Field Maps app. A representative photograph was also taken for each of the habitats recorded on the Site, and all relevés.

The habitat assessment surveys described in this report have been undertaken with reference to the following guidelines and interpretation documents:

- Commission of the European Communities (2013) Interpretation manual of European Union habitats. Eur 28. European Commission DG Environment.
- NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill
- Martin, J.R., O'Neill, F.H. & Daly, O.H. (2018), The monitoring and assessment of three EU Habitats Directive Annex I grassland habitats. Irish Wildlife Manuals, No. 102. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

- O'Neill, F.H., Martin, J.R., Devaney, F.M. & Perrin, P.M. (2013), The Irish semi-natural grasslands survey 2007-2012. Irish Wildlife Manuals, No. 78. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.

Plant nomenclature for vascular plants follows 'New Flora of the British Isles' (Stace, 2019).

Habitats considered to be of ecological significance, and in particular having the potential to correspond to those listed in Annex I of the EU Habitats Directive, where present, were identified and classified as KERs.

### 6.2.3.2.1 Vegetation Composition Assessment

Detailed habitat classification and assessment was undertaken by MKO at targeted locations within the Site, with relevés undertaken within representative habitats at each turbine base and associated Proposed Wind Farm infrastructure, see **Appendix 6-4** for all relevé data. The extent of each habitat on site was mapped using the ArcGIS Field Maps app. A representative photograph was also taken for each of the habitats recorded on site, including all relevés. The locations of all relevés are shown in **Appendix 6-4**.

The survey results were then analysed in accordance the Irish Vegetation Classification (IVC) system. The IVC is a project with aims to classify, describe, and map in detail all aspects of natural and semi-natural vegetation in Ireland within a single, unified framework. The National Vegetation Database (NVD), upon which the IVC is based, holds data for over 30,000 relevés and is the core resource upon which the classification system is based.

A fundamental requirement of the IVC is to *"aid in definition and identification of EU Habitat Directive (92/43/EEC) Annex I habitats"* and to *'inform the planning process, for example through environmental impact assessments'*.

The Engine for Relevés to Irish Communities Assignment (ERICA)<sup>12</sup> is a web application for assigning vegetation data to communities defined by the Irish Vegetation Classification (IVC). Data can be uploaded, checked for errors and analysed and the results can then be downloaded. ERICA works with both quantitative vegetation cover data (such as are recorded in relevés and other types of botanical recording plots) and presence/absence data, such as species lists. ERICA covers grasslands, woodland, duneland, heaths, bogs, fens, mires, freshwater, saline waters, rocky habitats, scrub, strandline, saltmarsh and weed communities (Perrin, 2018). The data collected from the botanical assessments was uploaded to ERICA, analysed and the results data downloaded.

The analysis procedure uses a clustering process to assign classification affinity to vegetation plots based on a degree of membership to each of the communities defined by the IVC. Table 6-3 details the categorizing types of plots utilising the clustering analysis. This categorizing procedure was utilised to determine if the grassland plots within the study area had any affinity to Annex I grassland and whether further assessment was required.

Table 6-3 Categorising types of plots using clustering analysis (after Wiser & de Cáceres, 2013).

Plot Type	Definition
<b>Assigned</b>	The plot has membership $\geq 0.5$ for one of the vegetation communities and therefore relates to the core definition of that vegetation community.
<b>Unassigned</b>	The plot has membership $\geq 0.5$ for the noise class and is poorly represented by the current classification scheme

<sup>12</sup> Perrin, 2019, ERICA – Engine for Relevés to Irish Communities Assignment V5.0 User's Manual, Online, Available at: [https://biodiversityireland.shinyapps.io/vegetation-classification/\\_w\\_9cd4889a/manual.pdf](https://biodiversityireland.shinyapps.io/vegetation-classification/_w_9cd4889a/manual.pdf), Accessed: 10.10.2025

<b>Transitional</b>	The plot has membership < 0.5 for all vegetation communities and for the noise class. It falls within the scope of the current classification scheme but does not relate to the core definition of any of the vegetation communities.
---------------------	---

Habitats considered to be of ecological significance and in particular having the potential to correspond to those listed in Annex I of the EU Habitats Directive where present were identified and classified as key ecological receptors (KERs).

### 6.2.3.3 Terrestrial Fauna Surveys

The results of the desk study, scoping replies, incidental records of protected species during ecological survey work and multidisciplinary walkover surveys were used to inform the scope of targeted ecological surveys required. Dedicated surveys for bats were undertaken across the Site and are detailed in the Bat Survey Report in **Appendix 6-2**. Otter, badger, and marsh fritillary surveys within the Site were carried out by MKO as part of the multidisciplinary walkover surveys and dedicated aquatic surveys. During the multidisciplinary walkover surveys, where observed, incidental records of birds and invertebrates including butterflies, dragonflies, etc. were recorded.

#### 6.2.3.3.1 Badger Survey

The badger survey was conducted adhering to best practice guidance *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Roads Schemes* (TII, 2008) and *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes* (NRA, 2006). Badgers occur within a wide variety of habitat types in both lowland and upland regions. Setts are often located within woodland and woodland edge, hedgerow and scrub habitats, especially where these occur adjacent to good foraging habitat such as grazed grasslands. Over half of badger setts in Ireland are found along hedgerows (NRA, 2009).

The survey was conducted to determine the presence and location of badger setts and signs within the boundary of the Proposed Project. The badger survey involved a search for all potential Badger signs as per NRA (2009) (latrines, badger paths and setts) and Scottish Natural Heritage (SNH) (2003):

- **Faeces:** Badgers usually deposit faeces in characteristic excavated pits, concentrations of which (latrine sites) are typically found at home range boundaries.
- **Setts:** comprising either single isolated holes or a series of holes, likely to be interconnected underground.
- **Pathways:** Paths between setts or leading to feeding areas.
- **Scratching posts:** Markings can be seen at the base of tree trunks.
- **Snuffle holes:** Small scrapes where Badgers have searched for insects, earthworms and plant tubers).
- **Day nests:** Bundles of grass and other vegetation where Badgers may sleep above ground.
- **Hair traces**
- **Prints**

Setts, if recorded, were classified using the conventions set out in NRA (2009). Classification of setts as per the *Best Practice Badger Survey Guidance Note* provided by SNH (2003) is provided in Table 6-4 below.

*Table 6-4 Classification of Badger Setts (Definition as per SNH 2003).*

Sett Type	Description
Main	Several holes with large spoil heaps and obvious paths emanating from and between sett entrances.
Annexe	Normally less than 150m from main sett, comprising several holes. May not be in use all the time, even if main sett is very active.

Subsidiary	Usually at least 50m from main sett with no obvious paths connecting to other setts. May only be used intermittently.
Outlier	Little spoil outside holes. No obvious paths connecting to other setts and only used sporadically. May be used by Foxes and rabbits.

Main setts normally have a large number of entrances (both used and disused), with obvious heaps of spoil. These setts look well used with obvious tracks between entrances. Annexe setts are close to the Main sett, are usually between 50 and 150m in distance from the Main sett and are usually connected to the Main sett by tracks. They usually have several holes but may not be in use all the time. Subsidiary setts are not connected to another sett by obvious paths and are not continuously active. Outlier setts have usually just one or two holes, without obvious spoil heaps or paths. They are used by badgers sporadically and are often taken over by foxes and rabbits (Smal, 1995).

Following the identification of potential badger setts in proximity to proposed road infrastructure within the Proposed Wind Farm site, two camera traps were deployed for a duration of two weeks to determine if the potential setts were occupied by badger. Further information and results are provided in Section 6.4.2.1.1.

#### 6.2.3.3.2 Otter Survey

As part of the multidisciplinary walkover survey and the targeted aquatic surveys throughout the Site, a search for indications of otter was carried out. This search was conducted in order to determine the presence or absence of otter within the Site. This involved a search for all potential indications of otter, as per NRA (2008) (spraint, tracks, couches, holts). The otter survey was conducted as per TII (2008) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes). Further information on this species is included in Aquatic Baseline Report in **Appendix 6-3**, and in Section 6.4.2.1.2.

#### 6.2.3.3.3 Bats

Detailed description of the survey methodologies undertaken in relation to bats is provided in the Bat Survey Report included in **Appendix 6-2** of this EIAR, together with full details of the survey times and the surveyors who carried out the bat survey and assessment work.

Survey design and effort in 2023 and 2024 was created in accordance with the standard best practice guidelines available, 'Bat Surveys: Good Practice Guidelines' prepared by the Bat Conservation Trust (Collins 2023). Surveys undertaken were carried out in strict accordance with those prescribed in NatureScot (2021) 'Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation'. This is in line with standard best practice industry guidelines.

#### 6.2.3.3.4 Marsh fritillary surveys

As part of the multidisciplinary surveys, a search for potential suitable habitat for marsh fritillary butterfly was carried out as per NRA (2009b). This included a search for devil's-bit scabious (*Succisa pratensis*) which is the food plant for the larval stage of this species.

#### 6.2.3.3.5 Deer Surveys

As part of the multidisciplinary walkover survey, a search for signs of deer was carried out. This search was conducted in order to determine the presence or absence of deer within the Site. This involved a search for all potential indications of deer, as per NRA (2008). The deer survey was conducted as per TII (2008) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes).

#### 6.2.3.3.6 Invasive species survey

During the multidisciplinary walkover surveys, a search for non-native invasive species was undertaken. The survey focused on the identification of invasive species listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) and the First Schedule of the European Union (Invasive Alien Species) Regulations 2024 (S.I. No 374 of 2024). Where recorded, the extent and location of infestations was recorded along with photographs.

#### 6.2.3.3.7 Aquatic surveys

Dedicated aquatic baseline surveys were undertaken along natural watercourses in the vicinity of the Site by MKO across multiple dates in 2024 and 2025. All freshwater watercourses which could be affected directly or indirectly by the Proposed Project were considered as part of the current assessment. This included sites in the vicinity of the Site inclusive of watercourse crossings associated with the Proposed Wind Farm and the Proposed Grid Connection Route.

A total of 16 no. survey sites across two hydrological sub-catchments were selected within the vicinity of the Proposed Wind Farm site. Four survey sites were located within the Multeen [East]\_SC\_010 sub catchment (Sub catchment ID: 16\_4), with the remaining 12 no. survey sites located within the Suir\_SC\_060 sub catchment (Sub catchment ID: 16\_18). The Proposed Grid Connection underground cabling route was composed of 35 no. watercourse crossings. The Proposed Grid Connection Route was located across two hydrological catchments (Suir and Lower Shannon) and six hydrological sub-catchments (Suir\_SC\_060, Dead\_SC\_010, Mulkear\_SC\_010, Mulkear\_SC\_020, Bilboa\_SC\_010 and the Shannon [Lower]\_SC\_090).

Survey effort focused on both instream and riparian habitats at each aquatic sampling location. Surveys at each of these sites included a fisheries assessment (electro-fishing and or fisheries habitat appraisal), and (where suitable) eDNA survey, and biological water quality sampling (Q-sampling) and macro-invertebrate sweep sampling. The presence of otter (*Lutra lutra*) was determined through the recording of otter signs within a 150m radius of each survey site. Notes on the age and location of signs (ITM coordinates) were made, in addition to the quantity and visible constituents of spraint (i.e. remains of fish, crustaceans, molluscs etc.). To detect populations of freshwater pearl mussel and white-clawed crayfish, or the presence of crayfish plague within the Proposed Wind Farm site, a composite water sample was collected from the watercourse at each of the selected eDNA survey sites and analysed for freshwater pearl mussel, white-clawed crayfish, and Crayfish Plague. eDNA sampling sites were strategically chosen to maximise longitudinal (instream) coverage within the catchment, facilitating the likelihood of species detection. Full details of the methodology followed for the aquatic surveys as well as details of the locations of survey sites is provided in the Aquatic Baseline Report, **Appendix 6-3**.

## 6.2.4 Methodology for Assessment of Impacts and Effects

### 6.2.4.1 Identification of Target Receptors and Key Ecological Receptors

The criteria used to assess the ecological value and significance of the study area for habitats and species present follows Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009a) and *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2018).

### 6.2.4.2 Valuing Ecological Receptors

The importance of the ecological features identified within the study area was determined with reference to a defined geographical context. This was undertaken following a methodology that is set out in Chapter 3 of the NRA guidelines. These guidelines set out the context for the determination of value on a geographic basis with a hierarchy assigned in relation to the importance of any particular receptor. The guidelines provide a basis for determination of whether any particular receptor is of importance on the following scales:

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

The guidelines clearly set out the criteria by which each geographic level of importance can be assigned. Internationally Important sites are either designated for conservation as part of the Natura 2000 Network (SAC or SPA) or provide the best examples of habitats or internationally important populations of protected flora and fauna. Specific criteria for assigning each of the other levels of importance are set out in the guidelines and have been followed in this assessment. Where appropriate, the geographic frame of reference set out above was adapted to suit local circumstances. In addition, and where appropriate, the conservation status of habitats and species is considered when determining the significance of ecological receptors.

In accordance with these guidelines impact assessment is only undertaken of KERs. KERs are within the ZoI of the Proposed Project and are 'both of sufficient value to be material in decision making and likely to be affected significantly'. To qualify as KERs, features must be of Local Ecological Importance (Higher Value) or higher. Features valued at Local Ecological Importance (Lower Value) are not considered to be KERs and therefore not subject to impact assessment. This is not to say that they are of no biodiversity value, but that impacts on these habitat types in their local context are not likely to result in a significant effect on biodiversity. It should be noted that this relates to the impact on the habitat itself as distinct from considering the role these habitat types play in supporting KER fauna species.

### 6.2.4.3 Characterisation of Impacts and Effects

The Proposed Project will result in a number of impacts. The ecological effects of these impacts are characterised as per the CIEEM '*Guidelines for Ecological Impact Assessment in the UK and Ireland*' (2018). The headings under which the impacts are characterised follow those listed in the guidance document and are applied where relevant. A summary of the impact characteristics considered in the assessment is provided below:

- **Positive or Negative.** Assessment of whether the Proposed Project results in a positive or negative effect on the ecological receptor.

- **Extent.** Description of the spatial area over which the effect has the potential to occur.
- **Magnitude** to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.
- **Duration** is defined in relation to ecological characteristics (such as the lifecycle of a species) as well as human timeframes. For example, five years, which might seem short-term in the human context or that of other long-lived species, would span at least five generations of some invertebrate species.
- **Frequency and Timing.** This relates to the number of times that an impact occurs and its frequency. A small-scale impact can have a significant effect if it is repeated on numerous occasions over a long period.
- **Reversibility.** This is a consideration of whether an effect is reversible within a 'reasonable' timescale. What is considered to be a reasonable timescale can vary between receptors and is justified where appropriate in the impact assessment section of this report.

#### 6.2.4.4 Determining the Significance of Effects

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

For the purpose of this Biodiversity Chapter 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local (CIEEM, 2018).

When determining significance, consideration is given to whether:

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

#### 6.2.4.5 Incorporation of Mitigation

Constraint studies, as described in Section 3.2 of Chapter 3 of this EIAR, have been carried out to ensure that turbines and all ancillary infrastructure are located in the most appropriate areas of the Site. Section 6.5 of this Biodiversity Chapter assesses the potential effects of the Proposed Project to ensure that all effects on sensitive ecological receptors are adequately addressed. Where significant effects on sensitive ecological receptors are predicted, mitigation is incorporated into the project design or layout to address such effects. The implemented mitigation measures avoid or reduce potential significant residual effects, post mitigation.

#### 6.2.5 Limitations

The information provided in this document accurately and comprehensively describes the baseline ecological environment; provides an accurate prediction of the likely ecological effects of the Proposed Project; prescribes mitigation as necessary; and describes the residual ecological impacts. The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines. No significant limitations in the scope, scale or context of the assessment have been identified.

## 6.3 Establishing the Ecological Baseline

### 6.3.1 Desk Study

The following sections describe the results of a survey of published material that was consulted as part of the desk study for the purposes of the ecological assessment. It provides a baseline of the ecology known to occur in the existing environment based on data sources reviewed to inform the ecological impact assessment as outlined in Section 6.2.1.

#### 6.3.1.1 Hydrology

Full details on the hydrology and hydrogeology of the Site are included in 9.3 of Chapter 9 (Hydrology and Hydrogeology). Information pertinent to this Chapter has been reviewed, which includes the following from Chapter 9:

- › Regional and Local Hydrology – Section 9.3.3
- › Surface Water Quality – Section 9.3.8.
- › Water Framework Directive Water Body Status – Section 9.3.12.
- › Groundwater Body Status – Section 9.3.13.
- › Surface Water Body Status – Section 9.3.14.

#### 6.3.1.2 Designated Sites

##### 6.3.1.2.1 Identification of the Designated Sites within the Likely Zone of Influence of the Proposed Project

A map of all Nationally Designated Sites within the vicinity of the Proposed Project is provided in Figure 6-1 with all the European Sites shown in Figure 6-2.

Table 6-5 provides details of all relevant Nationally designated sites initially considered to potentially be within the Zone of Influence (ZoI) of the Proposed Project. No Natural Heritage Areas were identified to be within the ZoI. The following pNHAs were identified as being within the likely ZoI of the Proposed Project:

- › Aughnaglanny Valley pNHA [000948]
- › Kilbeg Marsh pNHA [001848]
- › Philipston Marsh pNHA [001847]
- › Inchinquillib and Dowlings Woods pNHA [000956]
- › Fergus Estuary and Inner Shannon, North Shore pNHA [002048]
- › Inner Shannon Estuary - South Shore [000435]

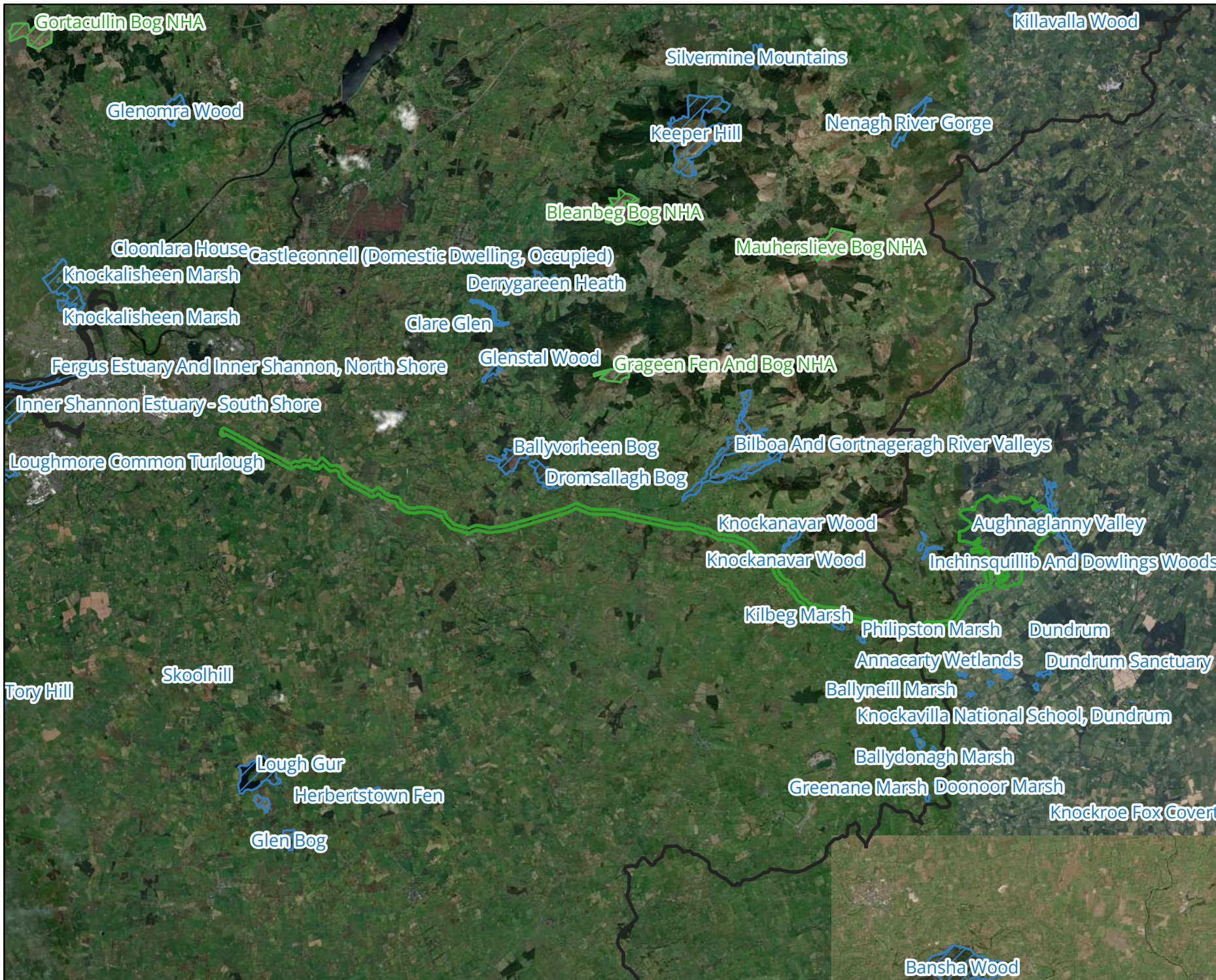
All European Designated Sites are fully described and assessed in the Natura Impact Statement that has been prepared to accompany this planning application. In summary, five European sites were identified to be within the ZoI of the Proposed Project, namely:

- › Lower River Suir SAC (002137)
- › Philipston Marsh SAC (001847)
- › Lower River Shannon SAC (002165)
- › Slievefelim to Silvermines Mountains SPA (004165)
- › River Shannon and River Fergus Estuaries SPA (004077)





Potential for likely significant effects on these European Sites was identified via deterioration of water quality (and associated indirect effects on QI habitats and species) and potential disturbance of Special




Conservation Interest (SCI) bird species during the construction, operation, and decommissioning phases of the Proposed Project in the absence of mitigation.



### Map Legend

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

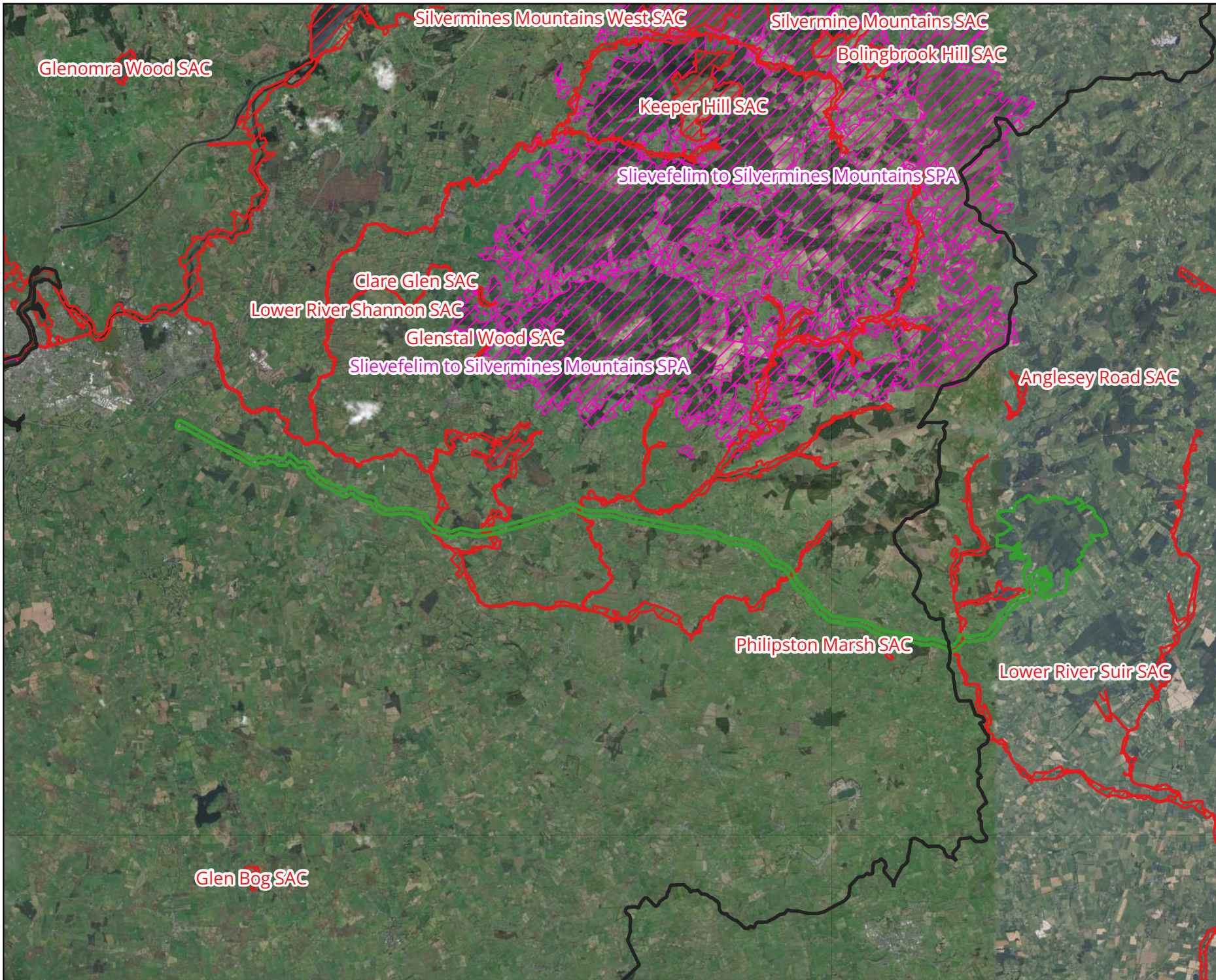


Microsoft product screen shots reprinted with permission from Microsoft Corporation  
© Ordnance Survey Ireland. All rights reserved. Licence number CYAL50267517

Drawing Title	
Nationally Designated Sites surrounding the Proposed Project	
Project Title	
Carrow Wind Farm	
Drawn By	Checked By
SC	PD
Project No.	Drawing No.
231102	Figure 6-1
Scale	Date
1:200,000	12.02.2026



**MKO**  
Planning and Environmental Consultants  
Tuam Road, Galway  
Inland, H91 VW84  
+353 (0) 91 735611  
email: info@mkofireland.ie  
Website: www.mkofireland.ie



**Map Legend**

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

Microsoft product screen shots reprinted with permission from Microsoft Corporation  
 © Ordnance Survey Ireland. All rights reserved. Licence number CYAL50267517



Drawing Title  
 European Designated Sites surrounding the site of the Proposed Project

Project Title  
**Carrow Wind Farm**

Drawn By	Checked By
SC	PD
Project No.	Drawing No.
231102	Figure 6-2
Scale	Date
1:180,000	08.12.2025


**MKO**  
 Planning and Environmental Consultants  
 Tuam Road, Galway  
 Inland, H91 VV84  
 +353 (0) 91 735611  
 email: info@mkofireland.ie  
 Website: www.mkofireland.ie

Table 6-5 Identification of Nationally designated sites within the Likely Zone of Influence.

Designated Site	Features of Interest	Likely Zone of Influence Determination
<b>Natural Heritage Areas (NHA)</b>		
Grageen Fen And Bog NHA [002186]  <b>Approx. Distance:</b> 5 km  <b>Hydrological Distance:</b> N/A	> Peatlands	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this NHA.</p> <p>The potential for indirect effects was also considered. Due to the distance between this NHA and the Proposed Project, in addition to its lack of hydrological connectivity and terrestrial nature, no pathway for significant indirect effect was identified.</p> <p>This NHA is considered to be <b>outside</b> the Likely Zone of Influence for the Proposed Project, and no further assessment is required.</p>
<b>Proposed Natural Heritage Area (pNHA)</b>		
Aughnaglanny Valley pNHA [000948]  <b>Approx. Distance:</b> 0 km  <b>Hydrological Distance:</b> 0 km	> Dry and wet broad-leaved woodland > Watercourses > Red squirrel ( <i>Sciurus vulgaris</i> ) > Fox ( <i>Vulpes vulpes</i> ) > Otter ( <i>Lutra lutra</i> ) > Woodland bird species.	<p>The potential for direct effects on this pNHA was considered as it partially overlaps with the eastern portion of the Proposed Wind Farm site. However, whilst there is overlap with the Proposed Project, the pNHA is located entirely outside of the Proposed Project footprint, and no potential for direct effects exists.</p> <p>The Site has hydrological connectivity to Aughnaglanny Valley pNHA via an unnamed Order 1 stream, the Doorish Order 1 stream, and the Upper Genough Order 2 stream within the north-eastern portion of the Proposed Wind Farm site. This drains the Aughnaglanny River, in which this pNHA is predominantly contained.</p> <p>Whilst the Site is located within the forging range of otter, no significant supporting habitat of this species was recorded within the Proposed Project footprint during the surveys undertaken. Therefore, there is no potential for direct effects on this QI species, as a result of <i>ex-situ</i> disturbance, during any phase of the Proposed Project.</p>

Designated Site	Features of Interest	Likely Zone of Influence Determination
		<p>The Proposed Wind Farm site provides suitable foraging and breeding habitat for red squirrel and fox. Given that these species are known to inhabit the area, potential exists for direct and indirect impacts on these species.</p> <p>Therefore, in the absence of best practice and mitigation, there is potential for direct and indirect effects on the habitats and species of this pNHA via disturbance and a deterioration of water quality arising from run-off/percolation of pollutants to surface or ground waters during the construction and operational phases of the Proposed Project.</p> <p><b>A pathway for effect on this pNHA was identified. The site is considered to be within the Likely Zone of Influence of the Proposed Project and is therefore considered further in this assessment.</b></p>
<p>Kilbeg Marsh pNHA [001848]</p> <p><b>Approx. Distance:</b> 320m</p> <p><b>Hydrological Distance:</b> No hydrological connectivity.</p>	<ul style="list-style-type: none"> <li>&gt; Alder (<i>Alnus glutinosa</i>) fen carr woodland</li> <li>&gt; Rich fen communities</li> </ul>	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>The potential for indirect effects was also considered. Whilst no direct hydrological connectivity was identified between the Site and this pNHA via mapped watercourses, the Proposed Grid Connection underground cabling route is partially located within the same hydrological sub-catchment (Dead_SC_10) and ground water catchment (Slieve Phelim) as this pNHA.</p> <p>Therefore, in the absence of best practice and mitigation and taking a precautionary approach due to the proximity of this pNHA to the Proposed Grid Connection works, there is potential for indirect effects on this pNHA via a deterioration of water quality arising from run-off/percolation of pollutants to surface or ground waters during the construction phase of the Proposed Project.</p> <p><b>A pathway for effect on this pNHA was identified. The site is considered to be within the Likely Zone of Influence of the Proposed Project and is therefore considered further in this assessment.</b></p>
<p>Knockanavar Wood pNHA [000961]</p> <p><b>Approx. Distance:</b> 550m</p> <p><b>Hydrological Distance:</b> 700m</p>	<p>No NPWS Site Synopsis available. Overlaps with Lower River Shannon SAC which is designated for:</p> <ul style="list-style-type: none"> <li>&gt; Coastal habitats</li> <li>&gt; Woodlands</li> <li>&gt; Grasslands</li> <li>&gt; Freshwater and marine species</li> </ul>	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>The potential for indirect effects was also considered. Due to this pNHA lying upstream and approx. 550m from the Site, no pathway for significant indirect effect was identified.</p> <p>This pNHA is considered to be <b>outside</b> the Likely Zone of Influence for the Proposed Project, and no further assessment is required.</p>

Designated Site	Features of Interest	Likely Zone of Influence Determination
<p>Philipston Marsh pNHA [001847]</p> <p><b>Approx. Distance:</b> 570m</p> <p><b>Hydrological Distance:</b> 1.1 km</p>	<p>No NPWS Site Synopsis available. Overlaps with Philipston Marsh SAC which is designated for:</p> <ul style="list-style-type: none"> <li>➤ [7140] Transition mires and quaking bogs</li> </ul>	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>The potential for indirect effects was also considered. The Site has direct hydrological connectivity to this pNHA. The Proposed Grid Connection underground cabling route crosses the Cappawhite Order 2 stream which flows through the northern extent of this pNHA. Additionally, the Proposed Grid Connection underground cabling route is partially located within the same hydrological sub-catchment (Dead_SC_10) and ground water catchment (Slieve Phelim) as this pNHA.</p> <p>Therefore, in the absence of best practice and mitigation and taking a precautionary approach due to the proximity of this pNHA to the Proposed Grid Connection underground cabling route, there is potential for indirect effects on this pNHA via a deterioration of water quality arising from run-off/percolation of pollutants to surface or ground waters during the construction phase of the Proposed Project.</p> <p><b>A pathway for effect on this pNHA was identified. The site is considered to be within the Likely Zone of Influence of the Proposed Project and is therefore considered further in this assessment.</b></p>
<p>Inchinquillib and Dowlings Woods pNHA [000956]</p> <p><b>Approx. Distance:</b> 750m</p> <p><b>Hydrological distance:</b> 800 km approx.</p>	<p>No NPWS Site Synopsis available. Overlaps with Lower River Suir SAC which is designated for:</p> <ul style="list-style-type: none"> <li>➤ Coastal habitats</li> <li>➤ Woodlands</li> <li>➤ Freshwater and marine species and habitats</li> </ul>	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>The potential for indirect effects was also considered. The Site has hydrological connectivity to Inchinquillib and Dowlings Woods pNHA via an unnamed Order 1 stream which originates in the north-western portion of the Proposed Wind Farm site. This drains the Multeen River, in which this pNHA is predominantly contained.</p> <p>Therefore, in the absence of best practice and mitigation, there is potential for indirect effects on this pNHA via a deterioration of water quality arising from run-off/percolation of pollutants to surface or ground waters during the construction and operational phases of the Proposed Project.</p> <p><b>A pathway for effect on this pNHA was identified. The site is considered to be within the Likely Zone of Influence of the Proposed Project and is therefore considered further in this assessment.</b></p>
<p>Dromsallagh Bog pNHA [001850]</p> <p><b>Approx. Distance:</b> 870 m</p>	<ul style="list-style-type: none"> <li>➤ Regenerating cutaway raised bog.</li> </ul>	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>The potential for indirect effects was also considered. Due to the associated distance between this pNHA and the Proposed Project, in addition to its terrestrial nature, no pathway for significant indirect effect was identified.</p>

Designated Site	Features of Interest	Likely Zone of Influence Determination
<p><b>Hydrological Distance:</b> N/A</p>		<p>This pNHA is considered to be <b>outside</b> the Likely Zone of Influence for the Proposed Project, and no further assessment is required.</p>
<p>Bilboa and Gortnageragh River Valleys pNHA [001851]</p> <p><b>Approx. Distance:</b> 900m</p> <p><b>Hydrological Distance:</b> 5 km approx.</p>	<p>No NPWS Site Synopsis available. Overlaps with Lower River Shannon SAC which is designated for:</p> <ul style="list-style-type: none"> <li>➤ Coastal habitats</li> <li>➤ Woodlands</li> <li>➤ Grasslands</li> <li>➤ Freshwater and marine species</li> </ul>	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>The potential for indirect effects was also considered. Due to this pNHA lying upstream and approx. 900m from the Site, no pathway for significant indirect effect was identified.</p> <p>This pNHA is considered to be <b>outside</b> the Likely Zone of Influence for the Proposed Project, and no further assessment is required.</p>
<p>Annacarty Wetlands pNHA [000639]</p> <p><b>Approx. Distance:</b> 1.9 km</p> <p><b>Hydrological Distance:</b> No direct hydrological connectivity.</p>	<ul style="list-style-type: none"> <li>➤ Wetlands</li> </ul>	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>The potential for indirect effects was also considered. The Proposed Grid Connection underground cabling route lies approximately 1.9 km from this pNHA. That said, the proposed works associated with the Proposed Grid Connection are minor in nature and short-term. The Proposed Wind Farm site lies approximately 3.4 km from this pNHA. Given the distance between the Proposed Project and this pNHA, no potential for indirect effects on the pNHA were identified.</p> <p>This pNHA is considered to be <b>outside</b> the Likely Zone of Influence for the Proposed Project, and no further assessment is required.</p>
<p>Ballyvorheen Bog pNHA [001849]</p>	<p>No NPWS Site Synopsis available. Overlaps with Lower River Shannon SAC which is designated for:</p>	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>The potential for indirect effects was also considered. Due to the terrestrial nature of this pNHA, in addition to lying upstream of the Site, no pathway for significant indirect effect was identified.</p>

Designated Site	Features of Interest	Likely Zone of Influence Determination
<p><b>Approx. Distance:</b> 2 km</p> <p><b>Hydrological Distance:</b> No hydrological connectivity.</p>	<ul style="list-style-type: none"> <li>➤ Coastal habitats</li> <li>➤ Woodlands</li> <li>➤ Grasslands</li> <li>➤ Freshwater and marine species</li> </ul>	<p>This pNHA is considered to be <b>outside</b> the Likely Zone of Influence for the Proposed Project, and no further assessment is required.</p>
<p>Ballyneill Marsh pNHA [001846]</p> <p><b>Approx. Distance:</b> 2.1 km</p> <p><b>Hydrological Distance:</b> No hydrological connectivity.</p>	<ul style="list-style-type: none"> <li>➤ Marsh</li> <li>➤ Rich and poor fen communities</li> </ul>	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>The potential for indirect effects was also considered. The Proposed Grid Connection Route underground cabling route lies approximately 2.1 km from this pNHA. That said, the proposed works associated with the Proposed Grid Connection Route are minor in nature and short-term. The Proposed Wind Farm site lies approximately 6 km from this pNHA. Given the distance and lack of direct hydrological connectivity between the Proposed Project and this pNHA, no potential for indirect effects on the pNHA were identified.</p> <p>This pNHA is considered to be <b>outside</b> the Likely Zone of Influence for the Proposed Project, and no further assessment is required.</p>
<p>Dundrum pNHA [002096]</p> <p><b>Approx. Distance:</b> 2.7 km</p> <p><b>Hydrological Distance:</b> N/A</p>	<ul style="list-style-type: none"> <li>➤ Colony of Whiskered Bats (<i>Myotis mystacinus</i>)</li> </ul>	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>The potential for indirect effects was also considered. The proposed TDR component of the Proposed Project lies approximately 1.29 km from this pNHA. That said, the proposed works associated with the TDR are minor in nature and short-term. The Proposed Wind Farm site lies approximately 2.7 km from this pNHA. Given the distance between the Proposed Project and this pNHA, no potential for indirect effects on the pNHA were identified.</p> <p>This pNHA is considered to be <b>outside</b> the Likely Zone of Influence for the Proposed Project, and no further assessment is required.</p>
<p>Dundrum Sanctuary pNHA [000950]</p>	<ul style="list-style-type: none"> <li>➤ Wet carr woodland of Alder (<i>Alnus glutinosa</i>), willows (<i>Salix</i> spp.) and birches (<i>Betula</i> spp.)</li> </ul>	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>The potential for indirect effects was also considered. The proposed TDR component of the Proposed Project lies approximately 1.1 km from this pNHA. That said, the proposed works associated with the TDR are minor in nature and short-term. The Proposed</p>

Designated Site	Features of Interest	Likely Zone of Influence Determination
<p><b>Approx. Distance:</b> 3.6 km</p> <p><b>Hydrological Distance:</b> No hydrological connectivity.</p>	<p>➤ Water Sedge (<i>Carex aqualitis</i>)</p>	<p>Wind Farm site lies approximately 3.6 km from this pNHA. Given the distance between the Proposed Project and this pNHA, no potential for indirect effects on the pNHA were identified.</p> <p>This pNHA is considered to be <b>outside</b> the Likely Zone of Influence for the Proposed Project, and no further assessment is required.</p>
<p>Ballydonagh Marsh pNHA [001844]</p> <p><b>Approx. Distance:</b> 3.7 km</p> <p><b>Hydrological Distance:</b> 25 km approx.</p>	<p>➤ Poor fen and swamp communities</p>	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of these pNHAs.</p> <p>The potential for indirect effects was also considered. These pNHAs either have no direct hydrological connectivity or lie upstream of the Proposed Project. Given the associated terrestrial distance between the Proposed Wind Farm and these pNHAs and the lack of hydrological connectivity, no potential for indirect effects on these pNHAs were identified.</p> <p>These pNHAs are considered to be <b>outside</b> the Likely Zone of Influence for the Proposed Project, and no further assessment is required.</p>
<p>Glenstal Wood pNHA [001432]</p> <p><b>Approx. Distance:</b> 5.5 km</p> <p><b>Hydrological Distance:</b> No hydrological connectivity.</p>	<p>No NPWS Site Synopsis available. Overlaps with Glenstal Wood SAC which is designated for:</p> <p>➤ [1421] Killarney Fern <i>Trichomanes speciosum</i></p>	
<p>Doonoor Marsh pNHA [001845]</p>	<p>➤ Rare liverworts</p>	

Designated Site	Features of Interest	Likely Zone of Influence Determination
<p><b>Approx. Distance:</b> 5.9 km</p> <p><b>Hydrological Distance:</b> 28 km approx.</p>		
<p>Greenan Marsh pNHA [001984]</p> <p><b>Approx. Distance:</b> 6.4 km</p> <p><b>Hydrological Distance:</b> 28.5 km approx.</p>	<p>➤ Freshwater marsh with carr woodland</p>	
<p>Knockavilla National School, Dundrum pNHA [000649]</p> <p><b>Approx. Distance:</b> 6.6 km</p> <p><b>Hydrological Distance:</b> N/A</p>	<p>➤ Leisler's Bat (<i>Nyctalus leisleri</i>)</p>	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>The potential for indirect effects was also considered. The proposed TDR component of the Proposed Project lies approximately 870m from this pNHA. That said, the proposed works associated with the TDR are minor in nature and short-term. The Proposed Wind Farm site lies approximately 6.6 km from this pNHA. Given the distance between the Proposed Project and this pNHA, no potential for indirect effects on the pNHA were identified.</p> <p>This pNHA is considered to be <b>outside</b> the Likely Zone of Influence for the Proposed Project, and no further assessment is required.</p>

Designated Site	Features of Interest	Likely Zone of Influence Determination
<p>Ardmayle Pond [000945]</p> <p><b>Approx. Distance:</b> 9.8 km</p> <p><b>Hydrological Distance:</b> No hydrological connectivity.</p>	<p>No NPWS Site Synopsis available. Overlaps with Lower River Suir SAC which is designated for:</p> <ul style="list-style-type: none"> <li>➤ Freshwater and marine species and habitats</li> <li>➤ Coastal habitats</li> <li>➤ Woodlands</li> </ul>	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of these pNHAs.</p> <p>The potential for indirect effects was also considered. These pNHAs either have no direct hydrological connectivity with the Site. Given the associated terrestrial distance between the Site and these pNHAs and the lack of hydrological connectivity, no potential for indirect effects on these pNHAs were identified.</p> <p>These pNHAs are considered to be <b>outside</b> the Likely Zone of Influence for the Proposed Project, and no further assessment is required.</p>
<p>Knockroe Fox Covert [000964]</p> <p><b>Approx. Distance:</b> 12.6 km</p> <p><b>Hydrological Distance:</b> No hydrological connectivity.</p>	<ul style="list-style-type: none"> <li>➤ Woodland</li> </ul>	
<p>Fergus Estuary and Inner Shannon, North Shore pNHA [002048]</p> <p><b>Approx. Distance:</b> 5.9 km</p>	<p>No NPWS Site Synopsis available. Overlaps with Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA which is designated for:</p> <ul style="list-style-type: none"> <li>➤ Coastal habitats</li> <li>➤ Woodlands</li> <li>➤ Grasslands</li> </ul>	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of these pNHAs.</p> <p>The potential for indirect effects was also considered. There is hydrological connectivity between the Proposed Grid Connection underground cabling route and these pNHAs via the Groody Order 4 watercourse which traverses the Proposed Grid Connection underground cabling route. This subsequently discharges into these pNHAs approximately 10.5 km and 12.4 km downstream respectively at its closest point.</p> <p>Taking a precautionary approach, a potential pathway for significant effect was identified via the deterioration of water quality arising from the runoff or percolation of pollutants into surface or ground waters during the construction phase of the Proposed Project.</p>

Designated Site	Features of Interest	Likely Zone of Influence Determination
<p><b>Hydrological</b> <b>Distance:</b> 10.5 km approx.</p>	<ul style="list-style-type: none"> <li>&gt; Freshwater and marine species</li> <li>&gt; Waterbirds</li> </ul>	<p><b>A pathway for effect on these pNHAs was identified. The sites are considered to be within the Likely Zone of Influence of the Proposed Project and are therefore considered further in this assessment.</b></p>
<p>Inner Shannon Estuary - South Shore [000435]</p> <p><b>Approx. Distance:</b> 6.7 km</p>	<p>No NPWS Site Synopsis available. Overlaps with Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA which is designated for:</p>	
<p><b>Hydrological</b> <b>Distance:</b> 12.4 km approx.</p>	<ul style="list-style-type: none"> <li>&gt; Coastal habitats</li> <li>&gt; Woodlands</li> <li>&gt; Grasslands</li> <li>&gt; Freshwater and marine species</li> <li>&gt; Waterbirds</li> </ul>	

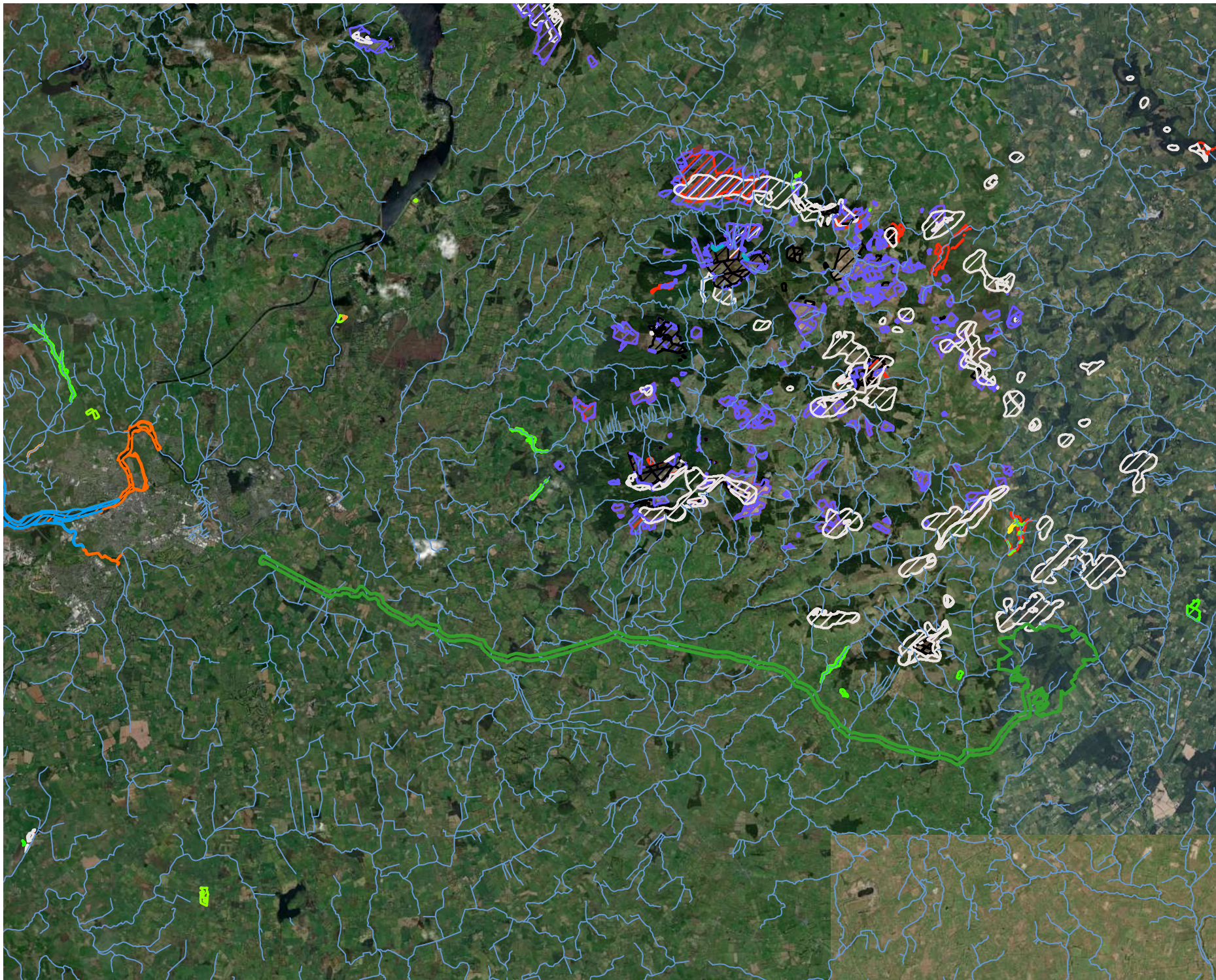
### 6.3.1.3 NPWS Article 17 Reporting

Available NPWS Article 17 datasets were downloaded and overlain on the Proposed Project on the 24<sup>th</sup> of November 2025.

A search of the NPWS Article 17 datasets (2019) was undertaken to identify Article 17 habitats within or adjacent to the Site, as shown in Figure 6-3. There is overlap between the Site and mapped Article 17 Alpine and Subalpine Heath [4060] in the northern portion of the Proposed Wind Farm site (6.3 ha). In the wider environment, to the north of the Site, there are mapped records of Active Raised bog [7130], Alpine and Subalpine Heath [4060], Dry heaths [4030], Lowland hay meadows [6510], Nardus rich grassland [6230], and Old oak woodland [7130]. Article 17 Estuaries [1330] and Tidal Mudflats and Sandflats [1140] lie downstream to the western position of the Proposed Grid Connection underground cabling route.

A review of the Irish Reports for Article 17 of the Habitats Directive (92/42/EEC), including the Heath, Bogs and Mires, Irish Semi-Natural Grassland Survey datasets, National Survey of Native Woodlands and Ancient and Long-Established Woodland datasets were conducted prior to undertaking the multi-disciplinary walkover surveys within the Site.

The closest Ancient Long-established Woodland is located approximately 3.6 km south (Marl Bog) and 4 km east (Drum Wood) of the Site. The nearest Native Woodland according to the 2003-2008 survey is located within and along the northeastern boundary of the Proposed Wind Farm site. This woodland was classified as a combination of Oak-birch-holly woodland (WN1) and Wet willow-alder-ash woodland (WN6). According to the Native Woodland survey, the WN6 habitat conforms to Annex I Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Pandion*, *Alnion incanae*, *Salicion albae*) (91E0). The nearest semi natural grasslands are located approximately 1.5 km south of the Proposed Grid Connection underground cabling route. The nearest semi natural grassland habitat that conforms to Annex I habitat is Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) located approximately 3.8 km north of the Proposed Wind Farm site.



### Map Legend

-  Site Boundary
-  WFD Watercourses
-  Active Blanket Bog
-  Alpine and Subalpine Heath
-  Dry Heath
-  Estuaries
-  Hydrophilous Tall Herb
-  Lowland Hay Meadows
-  Molinia Meadows
-  Nardus Rich Upland Grassland
-  Old Oak Woodlands
-  Tidal Mudflats and Sandflats
-  Wet Heath

  
 Microsoft product screen shots reprinted with permission from Microsoft Corporation  
 © Ordnance Survey Ireland. All rights reserved. Licence number CYAL50267517

Drawing Title  
 Article 17 Habitats surrounding the Proposed Project

Project Title  
 Carrow Wind Farm

Drawn By <b>SC</b>	Checked By <b>PD</b>
Project No. <b>231102</b>	Drawing No. <b>Figure 6-3</b>
Scale <b>1:200,000</b>	Date <b>12.02.2026</b>

  
**MKO**  
 Planning and Environmental Consultants  
 Tuam Road, Galway  
 Ireland, H91 VV84  
 +353 (0) 91 735611  
 email: info@mkofireland.ie  
 Website: www.mkofireland.ie

### 6.3.1.4 New Flora Atlas

A search was made in the New Atlas of the British & Irish Flora (Preston et al., 2002) to investigate whether any rare or unusual plant species listed on Annex II of the Habitats Directive, Ireland Red List No. 10 Vascular Plants (Wyse Jackson et al., 2016) or protected under the Flora (Protection) Order, 2022 had been recorded in the relevant 10 km squares in which the study site is situated. Species of conservation concern are given in Table 6-6 below.

*Table 6-6 Species listed designated under the Flora Protection Order or the Irish Red Data Book within hectads R65, R75, R84, R85, R94, and R95.*

Common Name	Scientific Name	Hectad	Status
Corn Marigold	<i>Chrysanthemum segetum</i>	R65, R95	RL, NT
Fragrant Agrimony	<i>Agrimonia procera</i>	R94, R84, R85	RL, NT
Slender Tufted-sedge	<i>Carex acuta</i>	R94, R84, R65	RL, NT
Tubular Water-dropwort	<i>Oenanthe fistulosa</i>	R94, R84, R65	RL, NT
Water-violet	<i>Hottonia palustris</i>	R84	RL, CR
Basil Thyme	<i>Clinopodium acinos</i>	R84	FPO, RL, NT
Opposite-leaved Pondweed	<i>Groenlandia densa</i>	R65	FPO, RL, NT
Annual Knawel	<i>Scleranthus annuus</i>	R65	FPO, RL, VU
Meadow Saxifrage	<i>Saxifraga granulata</i>	R75	FPO, RL, RE
Irish Spleenwort	<i>Asplenium onopteris</i>	R85	RL, VU
Killarney Fern	<i>Trichomanes speciosum</i> (sporophyte)	R75	Annex II
Wood Cranesbill	<i>Geranium sylvaticum</i>	R75	RL, EN
Frog Orchid	<i>Coeloglossum viride</i>	R75	RL, NT
Black Horehound	<i>Ballota nigra</i>	R65	RL, NT
Slender Thistle	<i>Carduus tenuiflorus</i>	R65	RL, NT
Spiked Sedge	<i>Carex spicata</i>	R65	RL, NT
Wood Club-rush	<i>Scirpus sylvaticus</i>	R65	RL, NT

*Red List (RL), Near Threatened (NT), Vulnerable (VU), Critically Endangered (CR), Regionally Extinct (RE), Flora Protection Order (FPO), Annex II – Of EU Habitats Directive.*

### 6.3.1.5 Bryophytes

A search of the NPWS online database for bryophytes (non-vascular land plants comprising of mosses, hornworts, and liverworts) was also undertaken with no protected bryophytes recorded within or adjacent to the Proposed Project (NPWS, 2020).

### 6.3.1.6 Bats and Birds

Please note the result of desktop studies in relation to bats and birds are detailed in the Bat Survey Report, **Appendix 6-2**, and Chapter 7 (Birds).

### 6.3.1.7 National Biodiversity Data Centre (NBDC) Records

A search of the National Biodiversity Data Centre (NBDC) records for the relevant hectads, R65, R75, R84, R85, R94, and R95, provided records on a number of fauna species of conservation concern. These are provided in Table 6-7. Fauna

*Table 6-7 NBDC Records for Species of Conservation Interest in hectads R65, R75, R84, R85, R94, and R95.*

Common name	Scientific name	Designation	Hectad
Common Frog	<i>Rana temporaria</i>	HD Annex V, WA	R65, R75, R84, R85, R94
Smooth Newt	<i>Lissotriton vulgaris</i>	WA	R65, R75, R84, R94

Common Lizard	<i>Zootoca vivipara</i>	WA	R65, R94
Daubenton's Bat	<i>Myotis daubentonii</i>	HD Annex IV, WA	R65, R75, R84, R85, R94, R95
Lesser Noctule	<i>Nyctalus leisleri</i>	HD Annex IV, WA	R75, R84, R94, R95
Common Pipistrelle	<i>Pipistrellus pipistrellus sensu stricto</i>	HD Annex IV, WA	R65, R75, R84, R94, R95
Pipistrelle	<i>Pipistrellus pipistrellus sensu lato</i>	HD Annex IV, WA	R65, R75, R85
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	HD Annex IV, WA	R65, R75, R84, R85, R94, R95
Whiskered Bat	<i>Myotis mystacinus</i>	HD Annex IV, WA	R94
Brown Long-eared Bat	<i>Plecotus auritus</i>	HD Annex IV, WA	R65, R75, R84, R94
Pine Marten	<i>Martes martes</i>	HD Annex V, WA	R65, R75, R84, R85, R94, R95
Red Deer	<i>Cervus elaphus</i>	WA	R84
European Otter	<i>Lutra lutra</i>	HD Annex II, IV, WA	R65, R75, R84, R85, R94, R95
Eurasian Badger	<i>Meles meles</i>	WA	R65, R75, R84, R85, R94, R95
Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	WA	R65, R75, R84, R85, R94, R95
West European Hedgehog	<i>Erinaceus europaeus</i>	WA	R65, R75, R84, R85, R94
Freshwater White-clawed Crayfish	<i>Austropotamobius pallipes</i>	HD Annex II, V, WA	R65, R75, R84, R94
Marsh Fritillary	<i>Euphydryas aurinia</i>	HD Annex II	R75, R84, R85, R94, R95
Freshwater Pearl Mussel	<i>Margaritifera margaritifera</i>	HD Annex II, V, WA	R94
Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>	HD Annex II, IV, WA	R65
Myotis Bat Species	<i>Myotis</i> sp.	HD Annex IV, WA	R65
Pygmy Shrew	<i>Sorex minutus</i>	WA	R65

HD Annex II, Annex IV, Annex V – Of EU Habitats Directive, WA - Wildlife Acts – Irish Wildlife Acts (1976).

### 6.3.1.7.1 Invasive Species

The NBDC database also contains records of invasive species identified within the relevant hectad's. Records of invasive species under regulation S.I.477/2011 for hectads R65, R75, R84, R85, R94, and R95 are provided in Table **Error! Reference source not found.**6-8.

Table 6-8 Invasive species records from the NBDC Database.

Common Name	Scientific Name	Hectad
Eastern Grey Squirrel	<i>Sciurus carolinensis</i>	R65, R75, R84, R85, R94
Fallow Deer	<i>Dama dama</i>	R65, R75, R84, R94, R95
Sika Deer	<i>Cervus nippon</i>	R75, R94
Spanish Bluebell	<i>Hyacinthoides hispanica</i>	R94
Japanese Knotweed	<i>Reynoutria japonica</i>	R65, R75, R85, R94, R95
Bohemian knotweed	<i>Reynoutria japonica x sachalinensis</i> = <i>R. x bohemica</i>	R94, R95
Indian Balsam	<i>Impatiens glandulifera</i>	R84, R85, R94, R95
Giant Hogweed	<i>Heracleum mantegazzianum</i>	R65, R75, R84, R94, R95
Rhododendron	<i>Rhododendron ponticum</i>	R75, R84, R94
Himalayan Knotweed	<i>Persicaria wallichii</i>	R85, R95
Greylag Goose	<i>Anser anser</i>	R65, R75
American Mink	<i>Neovison vison</i>	R75, R85
Canadian Waterweed	<i>Elodea canadensis</i>	R65
Giant Knotweed	<i>Reynoutria sachalinensis</i>	R65
Nuttall's Waterweed	<i>Elodea nuttallii</i>	R65
Coypu	<i>Myocastor coypus</i>	R85

### 6.3.1.7.2 NPWS Protected Species Records

National Parks and Wildlife Service (NPWS) online records were searched to see if any rare or protected species of flora or fauna have been recorded from hectads' R65, R75, R84, R85, R94, and R95 within which the Proposed Wind Farm is located. An information request was also sent to the NPWS requesting records from the Rare and Protected Species Database. Table 6-9 lists rare and protected species records obtained from NPWS, as received on the 20<sup>th</sup> of May 2024 and 3<sup>rd</sup> of December 2025 as well as those recorded available through the online NPWS map viewer.

Table 6-9 National Parks and Wildlife Service Records

Common name	Scientific name	Designation	Hectad
Opposite-leaved pondweed	<i>Groenlandia densa</i>	FPO, RL, NT	R65
Sea Lamprey	<i>Petromyzon marinus</i>	HD Annex II, WA	R65
River Lamprey	<i>Lampetra fluviatilis</i>	HD Annex II, WA	R65
Spiked sedge	<i>Carex spicata</i>	RL, NT	R65
Kingfisher	<i>Alcedo atthis</i>	BD Annex I, WA	R65
Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>	HD Annex II, IV, WA	R65
Darnel	<i>Lolium temulentum</i>	RL, EN	R65
Smooth newt	<i>Lissotriton vulgaris</i>	WA	R65
Irish stout	<i>Mustela erminea subsp. hibernica</i>	WA	R65, R85
Brook-side Feathermoss	<i>Amblystegium fluviatile</i>	N/A	R75, R85
Cladonia portentosa	<i>Cladonia portentosa</i>	HD Annex V	R75
Killarney fern	<i>Trichomanes speciosum</i>	HD Annex II, IV, FPO, RL	R75
Marsh fritillary	<i>Eurodryas Aurinia</i>	HD Annex II, WA	R75
Eurasian red squirrel	<i>Sciurus vulgaris</i>	WA	R85
Hasselquist's Hyssop	<i>Entosthodon fascicularis</i>	RL, NT	R85
Tufted Apple-moss	<i>Philonotis caespitosa</i>	NT	R85
Common frog	<i>Rana temporaria</i>	HD Annex V, WA	R65, R75, R84, R85, R94
Common lizard	<i>Zootoca vivipara</i>	WA	R65, R94
West European hedgehog	<i>Erinaceus europaeus</i>	WA	R75, R94
Eurasian badger	<i>Meles meles</i>	WA	R65, R75, R84, R85, R94, R95
Fallow Deer	<i>Dama dama</i>	WA	R75, R84, R85, R94, R95
Irish Hare	<i>Lepus timidus subsp. Hibernicus</i>	HD Annex V, WA	R65, R75, R84, R85, R94, R95
White-clawed Crayfish	<i>Austropotamobius pallipes</i>	HD Annex II, V, WA	R65, R75, R84, R94, R95
Barn Owl	<i>Tyto alba</i>	WA, RL	R84, R94
European Otter	<i>Lutra lutra</i>	HD Annex II, IV, WA	R65, R75, R84, R85, R94, R95
Pine marten	<i>Martes martes</i>	WA, Annex V	R75, R94
Eurasian Pygmy Shrew	<i>Sorex minutus</i>	WA	R75, R94
Shepherd's-needle	<i>Scandix pecten-veneris</i>	RE	R95
Hen Harrier	<i>Circus cyaneus</i>	HD Annex I	R84, R95
Freshwater Pearl Mussel	<i>Margaritifera margaritifera</i>	HD Annex II, V, WA	R94

HD Annex II, Annex IV, Annex V – Of EU Habitats Directive, BD Annex I – of EU Birds Directive, WA - Wildlife Acts – Irish Wildlife Acts (1976), RL = Red List, EN = Endangered, RE = Regionally Extinct, NT = Near Threatened.,

### 6.3.1.8 Marsh fritillary (*Euphydryas aurinia*)

Marsh fritillary has been recorded within hectads R75, R84, R85, R94, and R95, within which the Proposed Project is located.

The NPWS point dataset for Marsh Fritillary (*Euphydryas aurinia*) was reviewed on GIS to ascertain whether records for the species are present in the vicinity of the Site. The closest NPWS datapoint is located in grassland habitat approximately 225m southwest of the Proposed Wind Farm site.

### 6.3.1.9 Freshwater Pearl Mussel (*Margaritifera Margaritifera*)

The majority of Site, including the Proposed Wind Farm site and the eastern extent of the Proposed Grid Connection underground cabling route, is located within the Suir – Multeen catchment, a catchment for other known extant populations of Freshwater Pearl Mussel. The Site is not within any catchment with any SAC populations of this species.

The Proposed Wind Farm site is located wholly within an area classified as having 'Catchments of other extant populations of *Margaritifera*', The Proposed Grid Connection Route survey sites, with the exception of one, was located outside of any *Margaritifera* sensitive area.

Further information on this species is included in Aquatic Baseline Report in **Appendix 6-3**.

### 6.3.1.10 White-clawed Crayfish (*Austropotamobius pallipes*)

The incidence of Annex II and V species White-clawed Crayfish (*Austropotamobius pallipes*) has been recorded by NPWS within the Proposed Wind Farm study area, as well as downstream of the Site.

Further information on this species is included in Aquatic Baseline Report in **Appendix 6-3**.

### 6.3.1.11 Bats

As per Article 17 reporting, the Proposed Project is located outside the current known range for Nathusius' pipistrelle, Natterer's bat and Lesser horseshoe bat. The Site is within the range of all other species.

Full details of the desktop studies in relation to bats are detailed in the Bat Survey Report, **Appendix 6-2**.

### 6.3.2 Conclusions of the Desk Study

The desk study revealed that the Proposed Wind Farm site is located within an area that is dominated by conifer forestry and agricultural practices. There is overlap with sites designated for nature conservation located within the Proposed Wind Farm footprint, therefore potential exists for direct effects on National and European Sites. However, the Proposed Wind Farm and Proposed Grid Connection Route have hydrological connectivity to the following pNHAs which have been considered within the likely Zone of Influence and for which further consideration is therefore required:

- Aughnaglanny Valley pNHA [000948]
- Kilbeg Marsh pNHA [001848]
- Philipston Marsh pNHA [001847]
- Inchinquilib and Dowlings Woods pNHA [000956]
- Fergus Estuary and Inner Shannon, North Shore pNHA [002048]
- Inner Shannon Estuary - South Shore pNHA [000435]

In addition, as per the NIS which accompanies this application, the Proposed Project has further surface water connectivity with the following downstream European Sites:

- Lower River Suir SAC (002137)
- Philipston Marsh SAC (001847)
- Lower River Shannon SAC (002165)
- Slievefelim to Silvermines Mountains SPA (004165)
- River Shannon and River Fergus Estuaries SPA (004077)

These sites are further considered in the Natura Impact Statement prepared for the Proposed Project.

A number of rare and protected habitats, flora and fauna have been recorded from the hectads in which the Proposed Project is located. The field surveys were thus designed to identify habitats, flora and fauna, or additional ecological receptors occurring within the Site.

## 6.4 Baseline Ecological Survey Results

### 6.4.1 Description of Habitats and Flora within the Site

This section describes the habitats recorded within the Proposed Wind Farm site with associated Plates representative of the main habitats present. The majority of the Site is located in an area dominated by commercial forestry and agriculture.

A total of seventeen habitats were recorded within the Site which are listed in Table 6-10 below. A habitat map of the Proposed Wind Farm is presented in Figure 6-4, with a habitat map with the proposed layout overlain in Figure 6-5.

*Table 6-10 Habitats recorded within the Site.*

Habitat Name	Fossitt Code
Conifer plantation	WD4
Improved agricultural grassland	GA1
Wet grassland	GS4
Improved agricultural grassland	GA1
Mixed broadleaved/ conifer woodland	WD2
Wet willow-alder-ash woodland	WN6
Buildings and artificial surfaces	BL3
Scrub	WS1
Dense bracken	HD1
Wet heath	HH3
Hedgerows	WL1
Treelines	WL2
Stone walls and other stonework	BL1
Recolonising bare ground	ED3
Dry meadows and grassy verges	GS2
Eroding/ upland rivers	FW1
Depositing/ lowland rivers	FW2

#### 6.4.1.1 Habitats within the Proposed Wind Farm site

##### Improved agricultural grassland (GA1)

Several of the lands within the Proposed Wind Farm site were characterised as ***Improved agricultural grassland (GA1)*** pasture (Plate 6-1). These were generally found along the south, west and north-east portions of the Proposed Wind Farm site. The sward within most fields of this nature was dominated by perennial rye grass (*Lolium perenne*) with frequent occurrences of Yorkshire Fog (*Holcus lanatus*), creeping buttercup (*Ranunculus repens*), meadow buttercup (*Ranunculus acris*), dandelion (*Taraxacum officinale agg.*), red clover (*Trifolium pratense*), white clover (*Trifolium repens*), broad-leaved dock (*Rumex obtusifolius*), and spear thistle (*Cirsium vulgare*). These areas of grassland are under agricultural management, used for silage and grazed by livestock. Turbine 9 (and associated infrastructure) is located within Improved agricultural grassland (GA1) habitat.

Given the modified nature and low biodiversity value of this habitat, it has been assessed as Local Importance (*lower value*) only. The Proposed Wind Farm has been designed to utilise this habitat where possible, to reduce loss of higher value habitats within the Site.



Plate 6-1 Example of Improved agricultural grassland (GAI) in the vicinity of Turbine 9, in the northwestern portion of the Proposed Wind Farm site.

### Wet Grassland (GS4)

Areas of **Wet grassland (GS4)** were recorded within and bordering fields of **Improved agricultural grassland (GAI)** throughout the Proposed Wind Farm site (Plate 6-2). Wet grassland (GS4) habitat was generally dominated by rushes, in particular soft rush (*Juncus effusus*), jointed rush, and sharp-flowered rush (*Juncus acutiflorus*). Yorkshire-fog (*Holcus lanatus*), common bent grass (*Agrostis capillaris*), and creeping buttercup (*Ranunculus repens*) were also abundant. Other herbaceous and grass species that occurred frequently included perennial ryegrass (*Lolium perenne*), meadow buttercup (*Ranunculus acris*), sweet vernal grass (*Anthoxanthum odoratum*), common sorrel (*Rumex acetosa*), red fescue (*Festuca rubra*), hoary willowherb (*Epilobium parviflorum*), marsh thistle (*Cirsium palustre*), false oat, clover, common ragwort (*Jacobaea vulgaris*) and gorse (*Ulex europaeus*).

Two relevés were carried out in representative areas of the above Wet grassland (GS4) habitat and were analysed in accordance with the Irish Vegetation Classification (IVC) system. The Engine for Relevés to Irish Communities Assignment (ERICA) assigned the surveyed areas as communities of GL2B *Juncus effusus* - *Holcus lanatus*. These communities, as per the IVC community classification, are not considered to have affinity with Annex I listed habitats.

The Proposed substation, Turbine 1, Turbine 14, and the proposed access road to Turbine 3 are partially located within Wet grassland (GS4) habitat. Grazing by cattle or horses was noted during the surveys in some Wet grassland (GS4) areas.

Whilst this Wet grassland (GS4) habitat presented some diversity, species recorded, as well as the habitat itself, are common and widespread in the local environment, and therefore, have been assessed as Local Importance (*lower value*) only.



Plate 6-2 Wet grassland (GS4) habitat in the southeast area of the Proposed Wind Farm site, showing vegetation dominated by soft rush, sharp-flowered rush, and creeping buttercup. This grassland is bordered by Conifer plantation (WD4) to the west, extended Improved agricultural grassland (GA1) habitat to the north.

Wet grassland (GS4) habitat located adjacent to Turbine 3 (Plate 6-3) and Turbine 4 was characterised by a dominant cover of rushes, in particular soft rush (*Juncus effusus*), hard rush (*Juncus inflexus*), sharp-flowered rush (*Juncus acutiflorus*), jointed rush (*Juncus articulatus*), tormentil (*Potentilla erecta*), devil's bit scabious (*Succisa pratensis*), star sedge (*Carex echinata*), carnation sedge (*Carex panacea*), purple moor-grass (*Molinia caerulea*), ragged robin (*Silene flos-cuculi*), field forget-me-not (*Myosotis arvensis*), marsh cinquefoil (*Comarum palustre*), water mint (*Mentha aquatica*), common knapweed (*Centaurea nigra*), compact rush (*Juncus conglomeratus*), field wood rush (*Luzula campestris*), heath grass (*Danthonia decumbens*), common sedge (*Carex nigra*) as well as Yorkshire-fog (*Holcus lanatus*), common bent grass (*Agrostis capillaris*), and creeping buttercup (*Ranunculus repens*). Occasional herbaceous and grass species recorded in this habitat included meadow buttercup (*Ranunculus acris*), sweet vernal grass (*Anthoxanthum odoratum*), common sorrel (*Rumex acetosa*), red fescue (*Festuca rubra*), and meadow thistle (*Cirsium dissectum*).

Two relevés were carried out in representative areas of the above species rich Wet grassland (GS4) habitat and were analysed in accordance the Irish Vegetation Classification (IVC) system. The Engine for Relevés to Irish Communities Assignment (ERICA) assigned the surveyed areas as communities of GL2B *Juncus effusus* - *Holcus lanatus*.

This section of Wet grassland (GS4) habitat conformed to Annex I *Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)* and supported marsh fritillary (Section 6.4.2.3). As per Martin et al. (2018), to conform to this Annex I habitat, there is a requirement for  $\geq 7$  indicator species, or  $\geq$  high quality indicator species to be identified within the relevés. Indicators species of this Annex I habitat recorded, as set out in Martin et al. (2018), included tormentil, devil's bit scabious, star sedge, carnation sedge, purple moor-grass, water mint, sharp-flowered rush, jointed rush, and common sedge. High quality indicator species recorded included compact rush.

Given these areas of Wet grassland (GS4) conform to an Annex I habitat and support high diversity, but are designated under any National or European Site, they have been assessed to County Importance.



Plate 6-3 Annex I conforming habitat adjacent to Turbine 3 which contained supporting habitat for marsh fritillary.

### Wet heath (HH3)

Marginal **Wet heath (HH3)** habitat was present throughout the Proposed Wind Farm site, primarily bordering forestry track adjacent to conifer plantation, as well as bordering **Wet grassland (GS4)** habitat as indicated in Plate 6-4. Instances of this habitat recorded within the Proposed Wind Farm site were often degraded, and contained occasional ling heather (*Calluna vulgaris*), bilberry (*Vaccinium myrtillus*) and bell heather (*Erica cinerea*), but was heavily dominated by purple more grass (*Molinia caerulea*). Encroaching bramble and gorse, as well willow saplings and Sitka spruce saplings were recorded throughout this habitat.

Whilst heath habitats are generally considered of high ecological importance, given that degraded heath habitat was marginal and primarily of low quality and diversity in the local environment, this habitat within the Proposed Wind Farm site has been assessed as Local Importance (*higher value*) only.



Plate 6-4 Example of degraded wet heath habitat in close proximity to Turbine 5.

#### Conifer plantation (WD4)

**Conifer plantation (WD4)** habitat (Plate 6-5 and Plate 6-6) dominated several portions of the Proposed Wind Farm site. Conifer plantation occurs within the central southern half of the Proposed Wind Farm site, extending through the greater central vicinity and spanning the majority of the northern portion of the Proposed Wind Farm site. These forestry blocks were dominated by *Picea* species with ground cover flora dominated by bryophyte species, including *Sphagnum* moss, as well as occasional bramble, fern species (*Pteridium aquilinum*), *Juncus effuses*, *Equisetum* species, and Foxglove (*Digitalis purpurea*).

Mature and sapling Willow species (*Salix* spp.) predominantly occurred along the boundaries of conifer stands, with other mature broadleaf species including ash (*Fraxinus excelsior*) and sycamore (*Acer pseudoplatanus*) also present. Moderate Ivy (*Hedera helix*) cover occurred on the trunks of mature broadleaf trees.

Given the modified nature and low biodiversity value of these habitats, they have been assigned Local Importance (lower value) only. The Proposed Wind Farm has been designed to utilise this habitat where possible, to reduce loss of higher value habitats within the Site.

Whilst this habitat is of some local importance for wildlife, it presented low diversity and is common and widespread in the local and wider landscape and has been assessed as Local Importance (*lower value*).



Plate 6-5 Example of Conifer plantation (WD4) habitat, dominant in *Picea* species, in the south of the Proposed Wind Farm site.



Plate 6-6 Example of bryophyte-dominant woodland floor cover within conifer plantation (WD4) habitat.

### Mixed broadleaved/ conifer woodland (WD2)/ Dense Bracken (HD1)

A large area of **Mixed broadleaved/conifer woodland (WD2)** (Plate 6-7) habitat was recorded within the north-western portion of the Proposed Wind Farm site, where the proposed new road infrastructure crosses this habitat between Turbine 8 and Turbine 5. This woodland consists of a mosaic of species including two large areas of **Dense bracken (HD1)** along with frequent to occasional gorse (*Ulex europaeus*), willow (*Salix* spp.), rowan (*Sorbus aucuparia*), Sitka spruce (*Picea sitchensis*) and sycamore (*Acer pseudoplatanus*).

This habitat contains high biodiversity value and helps maintain links and ecological corridors between features of higher ecological value and is likely to be utilised by protected faunal species. Therefore, this habitat has been assessed as Local Importance (*higher value*).



Plate 6-7 Example of Mixed broadleaved/ conifer (WD2) woodland habitat east of T07.

### Scrub (WS1)

Several areas of **Scrub (WS1)** (Plate 6-8) were recorded within the Proposed Wind Farm site, including within the proposed location of Turbine 7, and the proposed new road infrastructure accessing the proposed borrow pit. Scrub occurred in areas of previously felled woodland with a diversity of herbaceous species including frequent bramble (*Rubus fruticosus*), willow (*Salix* sp.), and soft rush (*Juncus effuses*) and occasional common heather (*Calluna vulgaris*), heath bedstraw (*Galium saxatile*), rosebay willowherb (*Chamaenerion angustifolium*) and tormentil (*Potentilla erecta*). Moss species, spinulose wood fern (*Dryopteris carthusiana*), gorse (*Ulex europaeus*), spruce species, spruce saplings and grasses were also recorded to a lesser extent, as was occasional patches of bare earth.

Whilst this habitat is of some local importance for wildlife, it presented low diversity and is common and widespread in the local and wider landscape and has been assessed as Local Importance (*lower value*).



Plate 6-8 Example of Scrub (WS1) habitat showing vegetation of soft rush, willow, and spruce saplings, establishing in an area of previously felled woodland around Turbine 2, east of the Proposed Wind Farm site.

### Wet willow-alder-ash woodland (WN6)

A large area of **Wet willow-alder-ash woodland (WN6)** habitat (Plate 6-9) was recorded in the north central part of the Proposed Wind Farm site along with small areas recorded along boundaries of **Conifer plantation (WD4)** along the west and north-east. The canopy of this woodland was low and was dominated by willow (*Salix* spp.) with an understory of dominant to frequent gorse (*Ulex europaeus*), bramble (*Rubus fruticosus* agg.) and sycamore (*Acer pseudoplatanus*) saplings.

Whilst this Fossitt habitat can often conform to the Annex I habitat: Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-padion*, *Alnion incanae*, *Salicion albae*) (91E0), given the typically willow dominant and low diversity canopy, the lack of positive indicators as set out in Daly et al. (2023), as well as the thick understory of scrub species, this woodland habitat does not conform to any Annex I woodland habitat.

Nonetheless, this habitat contains high biodiversity value in the local environment and helps maintain links and ecological corridors between features of higher ecological value and is likely to be utilised by protected faunal species. Therefore, this habitat has been assessed as Local Importance (*higher value*).

This habitat was recorded within the proposed location for Turbine 5 within the central portion of the Proposed Wind Farm site which is bordered by **Conifer plantation (WD4)** and **Wet grassland (GS4)**.



Plate 6-9 Example of Wet willow-alder-ash woodland (WN6) within the Proposed Wind Farm site.

### Hedgerows (WL1)

An extensive network of hedgerows (Plate 6-10) occurs within the Proposed Wind Farm site, forming boundaries around agricultural fields and bordering existing roads. Field boundary hedgerows were primarily dominated by hawthorn (*Crataegus monogyna*), gorse (*Ulex europaeus*) and bramble (*Rubus fruticosus agg.*). Other species recorded frequently in hedgerow habitat within the Proposed Wind Farm site included blackthorn (*Prunus spinosa*), ash (*Fraxinus excelsior*), and holly (*Ilex aquifolium*).

This habitat contains high biodiversity value and helps maintain links and ecological corridors between features of higher ecological value and is likely to be utilised by protected faunal species. Therefore, this habitat has been assessed as Local Importance (*higher value*).



Plate 6-10 West-facing view of Hedgerow (WL1) habitat bordering pastures and Conifer plantations (WD4) located on the northwestern portion of the Proposed Wind Farm site.

### Treelines (WL2)

Where linear 'hedgerow' features were over 5m in height and were made up of semi-mature to mature trees, these were categorised as **Treelines (WL2)** in line with Fossitt (2000). *Picea* species and *Salix* species were the dominant species in treeline habitat within the Proposed Wind Farm site (Plate 6-11 and Plate 6-12). An understory of unmanaged common species such as hawthorn (*Crataegus monogyna*), ivy (*Hedera helix*), and bramble (*Rubus fruticosus* agg.) was occasionally noted, particularly where commercial conifer stands were not directly adjacent.

This habitat contains high biodiversity value to the local environment and helps maintain links and ecological corridors between areas of higher ecological value and is likely to be utilised by protected faunal species. Therefore, this habitat has been assessed as Local Importance (*higher value*).



Plate 6-11 Conifer Treeline (WL2) along a field boundary separating agricultural grasslands, located in the southwestern portion of the Proposed Wind Farm site and within a proposed borrow pit location.



Plate 6-12 A mixed conifer (*Picea* spp.) and deciduous (*Fraxinus excelsior*) Treeline (WL2) with an understory predominantly consisting of bramble (*Rubus* spp.) and gorse (*Ulex europaeus*) bordering an Improved agricultural grassland (GA1) in the north-centre area of the Proposed Wind Farm site at a proposed road between Turbine 5 and Turbine 8.

### Recolonising bare ground (ED3)

Existing forestry roads within the Proposed Wind Farm site were categorised as **Recolonising bare ground (ED3)** (Plate 6-13). Species recolonising these areas included a frequent cover of bramble (*Rubus fruticosus agg.*), gorse (*Ulex europaeus*), grey willow (*Salix cinerea*), fireweed (*Chamaenerion angustifolium*), *Sphagnum* moss, common bent grass (*Agrostis capillaris*), marsh thistle (*Cirsium palustre*), and soft rush (*Juncus effusus*). This habitat also contained an occasional to rare cover of coltsfoot (*Tussilago farfara*), tufted hair grass (*Deschampsia cespitosa*), eyebright (*Euphrasia officinalis*), little robin (*Geranium purpureum*), oxeye daisy (*Leucanthemum vulgare*), club moss, and common butterwort (*Pinguicula vulgaris*). Rare occurrences of ling heather (*Calluna vulgaris*) and bell heather (*Erica cinerea*) were present on the edge of the forestry roads bordering conifer plantation.

Whilst this habitat is of some local importance for wildlife, it presented low diversity and is common and widespread in the local and wider landscape and has been assessed as Local Importance (*lower value*).



Plate 6-13 Example of Recolonising bare ground (ED3) habitat within the Proposed Wind Farm site.

### Eroding/ upland rivers (FW1)

Three watercourses drain the eastern, southern and western sections of the Proposed Wind Farm site.

The Lackenacombe River (EPA code: 16L73) originates in the northern section of the Proposed Wind Farm site and along with several tributaries, flows in a westerly direction (Plate 6-14 and Plate 6-15). This watercourse flows through native woodlands and agricultural grassland, and presented as a typically upland stream, with sections of small glides, riffles, and pools. Typical stream width was 0.8m and approximately 0.10m deep, with a cobble/gravel substrate.

The Scarrough River (EPA code: 16S38) originates in the east of the Proposed Wind Farm site and along with two tributaries, flow in a westerly direction. The upper reaches of this watercourse flow through maturing forestry, with the low reaches within the Site flowing through agricultural grasslands. This watercourse was heavily modified, and presented a moderate flowing, channelised drain. Typical stream width was 0.5m and approximately 0.10m deep, with a cobble/gravel substrate.

The Upper Genough River (EPA code: 16U16) originates in the northeast of the Site, and two tributaries originate in the northeast and southeast area of the Site. The Upper Genough River, described as an **Upland eroding river (FW1)**, flows through agricultural pasture and conifer plantation. Within the conifer plantation, the stream is a channelised narrow watercourse with steep high banks. Bankside vegetation cover extended along the channel and consisted of moss species cover, with dense overhanging vegetation of *Picea saplings*, *bramble* (*Rubus fruticosus* agg.), *fireweed* (*Chamaenerion angustifolium*) and other herbaceous species.

All watercourses recorded within the Proposed Wind Farm site have downstream connectivity to the Lower River Suir SAC and/or the Lower River Shannon SAC and serve as important foraging and commuting corridors for protected fauna. Therefore eroding/upland rivers have been assessed as being of Local Importance (higher value).



Plate 6-14 Example of the Lackenacoombe Eroding/ upland river (FW1) habitat within native woodland in the Proposed Wind Farm site.



Plate 6-15 Example of the Lackenacoombe Eroding/ upland river (FW1) habitat within the Proposed Wind Farm site.



Plate 6-16 Example of the Scarrough Eroding/ upland river (FW1) habitat within the southern section of the Proposed Wind Farm site



Plate 6-17 Example of the Upper Genough Eroding/ upland river (FW1) habitat within the eastern section of the Proposed Wind Farm site.

### 6.4.1.2 Habitats and Flora along the Proposed Grid Connection Route

The Proposed Grid Connection underground cabling route between the Proposed Wind Farm and the national electricity grid will be necessary to export electricity from the Proposed Wind Farm. It is proposed to connect the Proposed Carrow Wind Farm development to the national electricity grid via a 110kV underground electrical cabling connection to the existing 110 kV Killonan substation, in the townland of Milltown, southeast of Limerick City, Co. Limerick. The underground electrical cabling route measures approximately 38 km in length the majority of which is located within the curtilage of the public road network. The Proposed Grid Connection underground cabling route will exit the wind farm site to the west and will be lain entirely within a combination existing road infrastructure and agricultural fields.

The Proposed Grid Connection underground cabling route will predominantly follow existing roads classified as **Buildings and artificial surfaces (BL3)** (Plate 6-18). The Proposed Grid Connection underground cabling route will also cross fields classified as **Improved agricultural grassland (GA1)** on occasion (Plate 6-19).

Habitats recorded adjacent to the Proposed Grid Connection Route included typical verge habitats such as **Dry meadows and grassy verges (GS2)**, **Hedgerows (WL1)**, **Treelines (WL2)**, **Improved agricultural grassland (GA1)**, **Stonewalls and other stonework (BL1)**, **Mixed broadleaved woodland (WD1)** and **Buildings and artificial surfaces (BL3)**.

The Proposed Grid Connection underground cabling route is composed of 23 crossing sites located across two hydrological catchments and six hydrological sub-catchments. These included **Depositing/lowland rivers (FW2)** (Plate 6-20) and **Eroding/upland rivers (FW1)** (Plate 6-21). Smaller watercourses were typically highly vegetated banks, comprised of scrub and treeline species such as bramble, willow, sycamore, and alder.

Full details on watercourses along the Proposed Grid Connection underground cabling route are provided in **Appendix 6-3**.



Plate 6-18 Existing roadway corridor classified as Buildings and Artificial surfaces (BL3) with Grassy verges (GS2) and Hedgerows (WL1).



Plate 6-19 Example of Improved agricultural grassland habitat (GA1) and Hedgerow (WL1) habitat along the Proposed Grid Connection underground cabling route.



Plate 6-20 Example of Depositing/lowland rivers (FW2) along the Proposed Grid Connection underground cabling route.



Plate 6-21 Example of Eroding/upland rivers (FW1) along the Proposed Grid Connection underground cabling route.

### 6.4.1.3 Habitats and Flora along the proposed Turbine Delivery Route

It is envisaged that large wind turbine components will be delivered to the Proposed Wind Farm site, from the Port of Cork (Ringaskiddy) (other ports such as Galway Port, Shannon Foynes or Dublin Port could also be

used), via the N28 and N40 national primary road, the M8 Motorway, N74 National Secondary Road, R639 and R505 regional roads followed by the L1291, L1283, L1282 and L1154 local roads.

The current proposed Turbine Delivery Route (TDR) for the Proposed Wind Farm is predominantly located within existing public road infrastructure. The TDR will travel along the road network to the southeast of the Proposed Wind Farm site.

Where accommodation works are required along the proposed TDR, these points are delineated by similar habitat to that of the Proposed Grid Connection underground cabling route which predominantly contains ***Buildings and artificial surfaces (BL3)***, ***Dry meadows and grassy verges (GS2)***, ***Hedgerows (WL1)***, ***Treelines (WL2)***, and ***upland/eroding rivers (FW1)***, and bordered by agricultural grasslands and amenity grasslands.

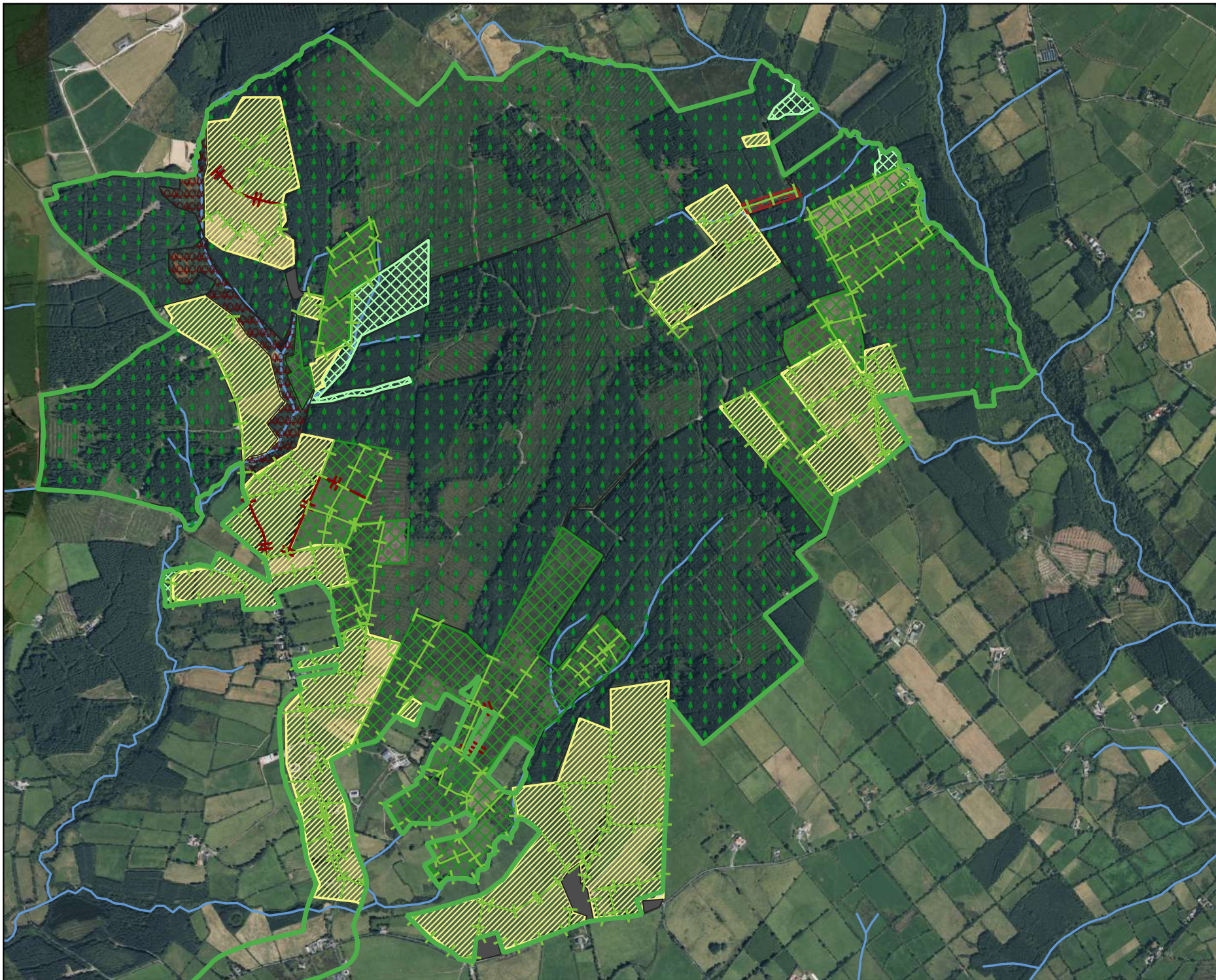
Hedgerow habitat was dominated by bramble (*Rubus fruticosus agg*), and contained occasional occurrences of bracken, snowberry (*Symphoricarpos albus*), and willowherb (*Epilobium hirsutum*) (Plate 6-22). Common species recorded within Treeline habitat included sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*), oak (*Quercus robur*), birch (*Betula sp.*) and beech (*Fagus sylvatica*) (Plate 6-23).













Plate 6-22 Example of Hedgerow habitat along the proposed Turbine Delivery Route.



Plate 6-23 Example of Treeline habitat along the proposed Turbine Delivery Route.



### Map Legend

-  EIAR Boundary
-  Hedgerows (WL1)
-  Treelines (WL2)
-  Improved agricultural grassland (GA1)
-  Wet grassland (GS4)
-  Mixed broadleaved/conifer woodland (Wd2)
-  Conifer plantation (WD4)
-  Wet willow-alder-ash woodland (WN6)
-  Buildings and artificial surfaces (BL3)
-  WFD Watercourses



Microsoft product screen shots reprinted with permission from Microsoft Corporation  
 © Ordnance Survey Ireland. All rights reserved. Licence number CYAL50267517

Drawing Title

## Habitat Map

Project Title

Carrow Wind Farm

Drawn By

SC/DM

Checked By

PD

Project No.

231102

Drawing No.

Figure 6-4

Scale

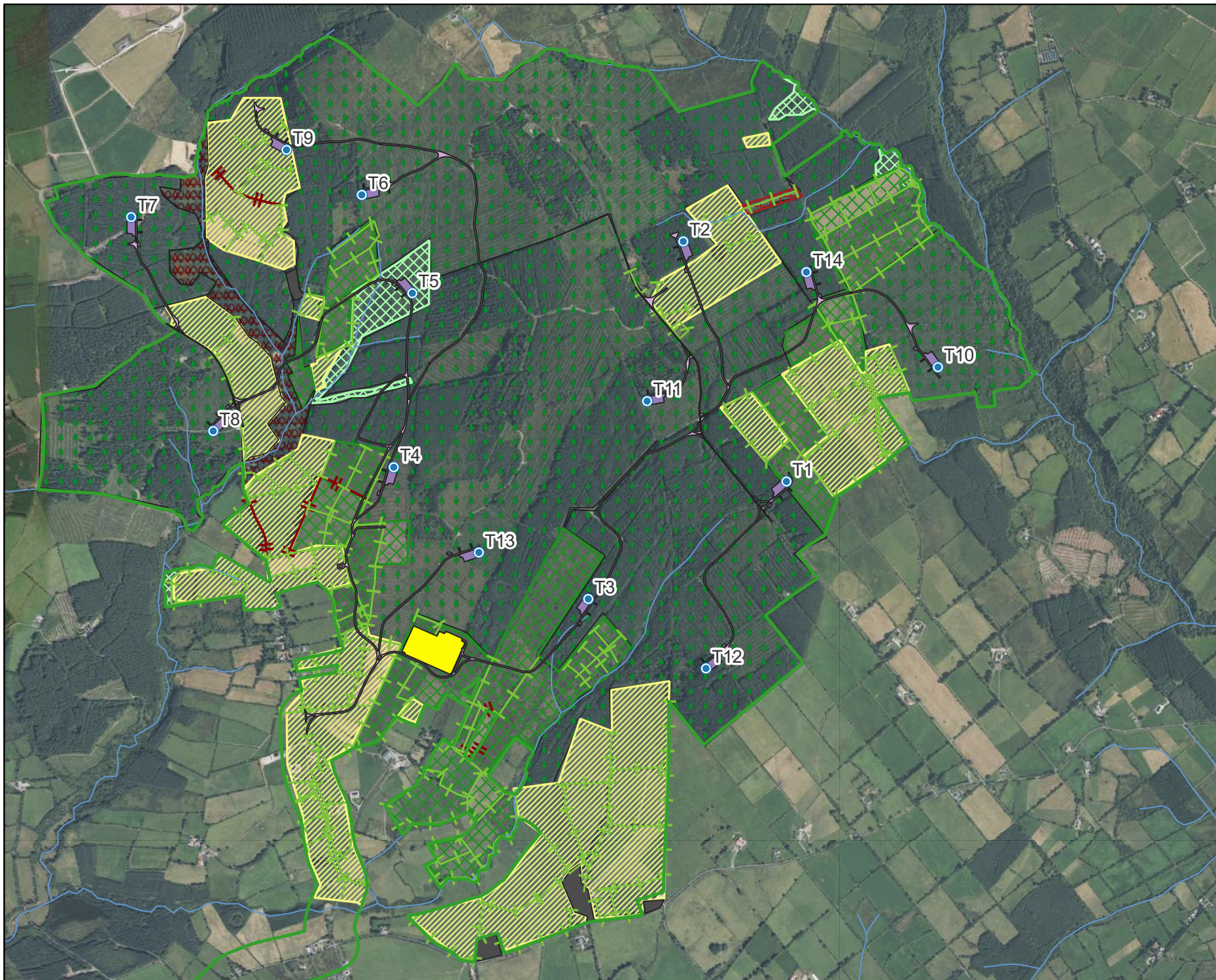
1:20,000

Date















12.02.2026



**MKO**  
 Planning and  
 Environmental  
 Consultants  
 Tuam Road, Galway  
 Ireland, H91 VW84  
 +353 (0) 91 735611  
 email: info@mkofireland.ie  
 Website: www.mkofireland.ie



### Map Legend

-  EIAR Boundary
-  Turbine Layout
-  Turbine Hstand
-  Road Layout
-  Substation
-  Hedgerows (WL1)
-  Treelines (WL2)
-  Improved agricultural grassland (GA1)
-  Wet grassland (GS4)
-  Mixed broadleaved/ conifer woodland (Wd2)
-  Conifer plantation (WD4)
-  Wet willow-alder-ash woodland (WN6)
-  Buildings and artificial surfaces (BL3)
-  WFD Watercourses

  
 Microsoft product screen  
 shots  
 reprinted with permission  
 from Microsoft Corporation  
 © Ordnance Survey, Ireland. All  
 rights reserved. Licence  
 number CYAL50267517

Drawing Title  
**Habitat Map with Site  
 Layout Underlain**

Project Title  
**Carrow Wind Farm**

Drawn By	Checked by
<b>SC</b>	<b>PD</b>
Project No.	Drawing No.
<b>231102</b>	<b>Figure 6-5</b>
Scale	Date
<b>1:20,000</b>	<b>12.02.2026</b>

  
**MKO**  
 Planning and  
 Environmental  
 Consultants  
 Tuam Road, Galway  
 Ireland, H91 VW84  
 +353 (0) 91 735611  
 email: info@mkofireland.ie  
 Website: www.mkofireland.ie

#### 6.4.1.4 Invasive Species

During field surveys, a search for Invasive Alien Species (IAS) listed under the 'Third Schedule' of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) and the 'First Schedule' of the European Union (Invasive Alien Species) Regulations 2024 (S.I. 374 of 2024) was conducted.

Four species, included on the aforementioned Schedules, were recorded; Giant Hogweed (*Heracleum mantegazzianum*) was recorded at three locations along the Proposed Grid Connection underground cabling route. Rhododendron (*Rhododendron ponticum*) was recorded at one location along the Proposed Grid Connection underground cabling route in addition to one location along the proposed TDR, although not within an area of the proposed accommodation works. Japanese knotweed (*Reynoutria japonica*) and Giant knotweed (*Reynoutria sachalinensis*) were recorded within the Proposed Wind Farm site approximately 45m and 220m respectfully from the hardstand of Turbine 8. Another stand of Japanese knotweed was recorded approximately 275m from the hardstand of Turbine 5.

Full details of all scheduled invasive species recorded during the surveys, with locations, are provided in the Invasive Species Management Plan (ISMP) in **Appendix 6-5**.

#### 6.4.1.5 Protected Habitats/ Flora

No botanical species listed under the Flora (protection) Order (1999, as amended 2022), listed in the EU Habitats Directive (92/43/EC), or listed in the Irish Red Data Books were recorded within the Site. All species recorded are common in the Irish landscape. No rare and protected plant species recorded in the desk study, including those obtained from the NPWS data request, were recorded within the Site during the surveys undertaken.

### 6.4.2 Fauna in the Existing Environment

The following subsections provide the results of the faunal surveys undertaken within the Site.

#### 6.4.2.1 Non-volant mammals

##### 6.4.2.1.1 Badger

Surveys for badger were undertaken during the multidisciplinary walkover surveys, in addition to incidental records recorded during other species-specific surveys. During the surveys, signs of badger i.e., snuffles holes, worn trails, latrines etc. were searched for. Several signs of badger were recorded throughout all sections of the Proposed Wind Farm site, which included snuffle holes, (Plate 6-24), scatt, hair (Plate 6-25), and mammal tracks (Plate 6-26), in addition to five sett entrances recorded approximately 7.5m from the proposed Turbine 5 road infrastructure at its closest point within the edge of scrub habitat. One entrance appeared to be used frequently by badger (Plate 6-27). The others did not appear to be frequently used (Plate 6-28). Following the deployment of two camera traps, these were determined to be annexe setts<sup>13</sup> and were used by badger on occasion.

No evidence of badger was recorded along the Proposed Grid Connection underground cabling route and proposed TDR.

Based on the desk study and multidisciplinary walkover surveys of the study area, the Site contains regularly occurring populations of badger, which is protected under the Wildlife Act. Additionally, the Site provides suitable habitat with good connectivity for this species throughout.

---

<sup>13</sup> Normally less than 150m from main sett, comprising several holes. May not be in use all the time, even if main sett is very active. (SNH, 2003).

Therefore, badger has been assigned as Local Importance (*higher value*).



Plate 6-24 Snuffle hole recorded within the Site.



Plate 6-25 Badger hair recorded within the Site.



Plate 6-26 Example of mammal track recorded within the Site.



Plate 6-27 Badger sett recorded within the vicinity of T05.



Plate 6-28 Example of annexe badger sett entrance in proximity to T05.

#### 6.4.2.1.2 Otter

Watercourses throughout the vicinity of the Proposed Wind Farm and along the Proposed Grid Connection underground cabling route and proposed TDR were surveyed for signs of otter, including spraint, prints, trails, holt and couches.

No otter resting or breeding sites were recorded during the surveys undertaken for both the Proposed Wind Farm site and Proposed Grid Connection.

Otter prints were identified at one survey location along the Proposed Grid Connection underground cabling route (ITM X 572184, Y 650798). No holts were identified 150m upstream or downstream of the bridge crossing at this location (GC 28) at the time of survey, although the Mulkear River provided high quality commuting and foraging habitat for otter at this location. Further details are provided in **Appendix 6-3**.

Although no otter resting or breeding sites were recorded within the Site, the Site lies within the foraging range of otter, which is a Qualifying Interest of both Lower River Suir SAC and Lower River Shannon SAC and are likely to frequent the Site, at least on occasion.

Therefore, otter has been assigned as being of International Importance.

#### 6.4.2.1.3 **Deer**

Worn mammal trails were recorded adjacent to woodland and hedgerows throughout the Proposed Wind Farm site, and as per the desk studies undertaken, red deer, fallow deer, and sika deer are known to occur in the wider area. These species are likely to utilise the Site, at least on occasion.

Based on the desk study and multidisciplinary walkover surveys of the study area, the Proposed Wind Farm site contains regularly occurring populations of deer species, which are protected under the Wildlife Act. Additionally, the Site provides suitable habitat with good connectivity for this species throughout.

Therefore, deer has been assigned as Local Importance (*higher value*).

#### 6.4.2.1.4 **Other non-volant mammals**

Mustelid scats were recorded within forestry. Red squirrel (*Sciurus vulgaris*) feeding signs were present within conifer forestry, however no dreys were recorded within the Proposed Wind Farm footprint. Pine marten (*Martes martes*) was confirmed to frequent the Proposed Wind Farm following the camera trap deployment to monitor badger activity in the vicinity of Turbine 5. No other indications of any protected mammals were recorded during the surveys undertaken.

Given the size and variety of habitats in the Proposed Wind Farm site, other mammals such as Pygmy Shrew (*Sorex minutus*), Hedgehog (*Erinaceus europaeus*) and Stoat (*Mustela erminea*) are also likely to be present, at least on occasion.

Based on the desk study and multidisciplinary walkover surveys of the study area, Site contains regularly occurring populations of non-volant mammal species, which are protected under the Wildlife Act. Additionally, the Site provides suitable habitat with good connectivity for such species throughout.

Therefore, other non-volant mammals has been assigned as Local Importance (*higher value*).

#### 6.4.2.2 **Bats**

Habitats within the Site were assessed for their suitability to support roosting, foraging and commuting bats. Connectivity with the wider landscape was also considered. Suitability was assessed according to Collins (2023) which provides a grading protocol for roosting habitats and for commuting and foraging areas. Suitability categories are divided into *High*, *Moderate*, *Low*, *Negligible*, *None* and are described fully in **Appendix 2** of the Bat Survey Report.

Five structures were identified within the Proposed Wind Farm site as having roosting potential. These structures varied from *Low* to *High* roosting potential. No trees were identified with roosting potential. Overall, four roosts were confirmed on site. No large or significant maternity roosts (i.e. >100 individuals or of National Importance) were identified within the Proposed Wind Farm. With regard to foraging and commuting bats, exposed areas of grassland and farmland (tilled and arable) habitats outlined above were considered *Low* suitability, i.e. *Habitat that could be used by small numbers of bats as flight paths such as a gappy hedgerow or unvegetated stream, but isolated* (Collins, 2023). Areas of scrub, hedgerows, tree lines, conifer plantation and eroding upland rivers

provide connectivity via linear features to the surrounding landscape. As such, they were assessed as having *Moderate* suitability i.e. *Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.* (Collins, 2023). Due to their varying levels of maturity and connectivity, tree lines and hedgerows were assessed as having *Moderate* to *High* suitability. While mixed woodland areas were assessed as having *High* suitability, i.e. *Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight paths such as river valleys, streams, hedgerows, lines of trees and woodland edge.* (Collins, 2023).

With regard to commuting and foraging bats along the Proposed Grid Connection underground cabling route, habitats such as stone walls, grassland habitats, hedgerows and mixed broadleaved woodland were assessed as having *Low* to *Moderate* suitability i.e. *Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water* (Collins, 2023). With regard to roosting bats, habitat features along the underground cable route, including grassland habitats, hedgerows, stone walls and woodland edges adjacent to the grid connection route, were assessed as having *Negligible* suitability i.e. *Negligible habitat features likely to be used by roosting bats/trees of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential* (Collins, 2023). Twenty-three watercourse crossings and one rail crossing occur along the Proposed Grid Connection underground cabling route. Of the culverts and bridges assessed, eight had no (*None*) roosting potential, six had *Negligible* roosting potential, nine had *Low* roosting potential and one had *Moderate* roosting potential. No bats were identified roosting within the culverts and bridges, and no evidence of roosting was found during the surveys.

Regarding foraging and commuting bats along the TDR, habitats were considered to have *Negligible* to *Moderate* suitability. Regarding roosting bats, habitats along the TDR were assessed as having no (*None*) roosting potential. No trees with potential roosting features that could support roosting bats were identified within the TDR accommodation works pathway. As such trees along the TDR accommodation areas were assessed as having no (*None*) to *Negligible* roosting potential due to their size and lack of available roosting features.

Bat species recorded within the Site during roost and static surveys included Common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), *Myotis* species, Leisler's bat (*Nyctalus leisleri*), Nathusius' pipistrelle (*Pipistrellus nathusii*), and brown long-eared bat (*Plecotus auritus*).

Bats have been assigned as being of Local Importance (*higher value*).

The methodologies and results of all bats surveys undertaken for the Proposed Project are included in the Bat Survey Report provided in **Appendix 6-2**.

### 6.4.2.3 Birds

Please note the results of the dedicated bird surveys undertaken within the Proposed Wind Farm site are detailed in Chapter 7 (Birds). Bird species recorded along the Proposed Grid Connection consisted of an assemblage of common birds that are typical of the grassland habitats in the wider area. No species listed on Annex I of the EU Birds Directive or on the Birds of Conservation Concern Ireland (BOCCI) red list (Gilbert et al. 2021) were recorded within the Proposed Grid Connection.

### 6.4.2.4 Marsh Fritillary

Devil's-Bit Scabious (*Succisa pratensis*), the food plant for the larval stage of Marsh fritillary butterfly (*Euphydryas aurinia*), was identified within Wet grassland (GS4) habitat within the Proposed Wind Farm site. Several adult Marsh Fritillary were also noted within this habitat, to the west of Turbine 3, confirming that the Site supports Marsh Fritillary.

Given the population dynamics of this species, and the abundance of Devil's-Bit Scabious recorded throughout Wet grassland (GS4) within the Site, it is assumed that all Wet grassland (GS4) potentially supports this species.

Marsh fritillary has been assigned as being of County Importance.

#### 6.4.2.5 Aquatic Assessments

Watercourses surveyed within the vicinity of the Proposed Wind Farm site consisted of *Eroding/Upland Rivers (FW1)*, with upland, headwater rivers profiles at various survey locations. The Site also contained wider, lowland stretches of watercourse, with varying degree of modification but overall high fisheries potential.

Q-value scores calculated for the survey sites in the vicinity of the wind farm ranged from Q2-3 – Poor to Q3-4 –Moderate, Q4 –Good and Q4-5 – High.

There were no positive results for freshwater pearl mussel or crayfish plague eDNA at any of the wind farm survey locations. Positive results for white-clawed crayfish eDNA were found at sites WF 8 (6/12 replicates) and WF 16 (3/12 replicates) indicated the presence of this species at or upstream of these locations.

No otter signs, otter holts or couches were identified at the survey sites in the vicinity of the Proposed Wind Farm, although some survey locations provided good potential commuting and foraging habitat for otter in the form of good connectivity through the wider area and high fisheries potential.

No kingfisher was observed utilising the watercourses in the vicinity of the Proposed Wind Farm survey sites, with no kingfisher burrows identified at any of the survey locations at the time of survey.

Watercourses surveyed along the Proposed Killonan Grid Connection Route consisted of stretches of both *Eroding/Upland River (FW1)* and *Depositing/Lowland River (FW2)*, with varying degrees of modification. Q-value scores calculated for the survey sites ranged from Q2-3 – Poor to Q3-4 –Moderate.

Five sites along the Proposed Grid Connection underground cabling route offered the highest quality potential fisheries habitat along the Proposed Grid Connection Route, as well as the best potential commuting and foraging habitat for otter. No otter signs, holts or couches were identified along the Proposed Grid Connection underground cabling route at the time of survey, with the exception of otter prints identified at GC 28.

The locations, methodologies, and results of all aquatic surveys undertaken for the Proposed Project are included in the Aquatic Baseline Report provided in **Appendix 6-3**.

### 6.4.3 Identification of Key Ecological Receptors

Table 6-11 lists all identified receptors and assigns them an ecological importance in accordance with the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009). This table also provides the rationale for this determination and identifies the habitats that are Key Ecological Receptors. These ecological receptors are considered in Section 6.8 of this Biodiversity Chapter and mitigation/ measures will be incorporated into the Proposed Project where required, to avoid potential significant impacts on the features.

Table 6-11 Ecological Receptors identified during the assessment.

Ecological feature or species	KER Y/N	Rationale
<b>Nationally Important Sites</b>		
<p><b>Nationally Important Sites</b></p> <ul style="list-style-type: none"> <li>➤ Aughnaglanny Valley pNHA [000948]</li> <li>➤ Kilbeg Marsh pNHA [001848]</li> <li>➤ Philipston Marsh pNHA [001847]</li> <li>➤ Inchinquilib and Dowlings Woods pNHA [000956]</li> <li>➤ Dundrum Sanctuary pNHA [000950]</li> <li>➤ Annacarty Wetlands pNHA [000639]</li> <li>➤ Ballyneill Marsh pNHA [001846]</li> <li>➤ Fergus Estuary and Inner Shannon, North Shore pNHA [002048]</li> <li>➤ Inner Shannon Estuary - South Shore [000435]</li> </ul>	Yes	<p>These pNHAs have been assigned National Importance as they are sites proposed to be designated as Natural Heritage Areas (NHAs).</p> <p>The Site has hydrological connectivity to these National Sites via several mapped watercourses that lie within and border the Site.</p> <p>Following the precautionary principle, a potential pathway for both direct and indirect effects on these sites was identified via a deterioration of water quality arising from the construction and operational phases of the Proposed Project.</p> <p><b>Therefore, these Nationally important sites are considered KERs.</b></p>
<b>Internationally Important Sites</b>		
<p><b>Internationally Important Sites</b></p> <ul style="list-style-type: none"> <li>➤ Lower River Suir SAC (002137)</li> <li>➤ Philipston Marsh SAC (001847)</li> <li>➤ Lower River Shannon SAC (002165)</li> <li>➤ Slievefelim to Silvermines Mountains SPA (004165)</li> <li>➤ River Shannon and River Fergus Estuaries SPA (004077)</li> </ul>	Yes	<p>These European Sites have been identified as being within the Likely Zone of Influence and are assessed fully in the NIS that accompanies this application.</p> <p>These sites have been assigned International Importance and are included as KERs as there is potential for both direct and indirect effects on them via a deterioration of water quality arising from the construction and operational phases of the Proposed Project.</p> <p><b>Therefore, these European Sites are included as KERs.</b></p> <p>Note: European Sites within the ZoI are considered in the NIS that accompanies this planning application.</p>

Ecological feature or species	KER Y/N	Rationale
<b>Habitats</b>		
<p>Local Importance (<i>lower value</i>) habitats</p> <ul style="list-style-type: none"> <li>➤ Improved agricultural grassland (GA1)</li> <li>➤ Wet grassland (GS4) (low diversity)</li> <li>➤ Buildings and artificial surfaces (BL3)</li> <li>➤ Conifer plantation (WD4)</li> <li>➤ Dense bracken (HD1)</li> <li>➤ Dry meadows and grassy verges (GS2)</li> <li>➤ Recolonising bare ground (ED3)</li> <li>➤ Wet heath (HH3)</li> <li>➤ Scrub (WS1)</li> </ul>	<i>No</i>	<p>These habitats are classified as of Local Importance (<i>lower value</i>). Despite some containing small areas of semi-natural habitat that are of some local importance for wildlife, these are common and widespread in the local and wider landscape.</p> <p>Whilst there will be loss of some of these habitats to facilitate the Proposed Project, these habitats are <b>not</b> included as KERs.</p>
<p>Local Importance (<i>higher value</i>) habitats</p> <ul style="list-style-type: none"> <li>➤ Hedgerows (WL1)</li> <li>➤ Treelines (WL2)</li> </ul>	<i>Yes</i>	<p>Linear habitat comprising hedgerows and treelines have been assessed as of Local Importance (<i>higher value</i>) as they contain high biodiversity value and help maintain links and ecological corridors between features of higher ecological value and are likely to be utilised by protected faunal species.</p> <p>Furthermore, hedgerow conservation is provided for in the Tipperary County Development Plan (2022-2028), under policies 11-4 and 11-17.</p> <p>To facilitate the Proposed Project, there will be an approximate loss of 2.2 km of hedgerow and 18m of treeline habitat within the Proposed Wind Farm site, an approximate loss of 100m along the Proposed Grid Connection underground cabling route, and 450m along the proposed TDR.</p> <p><b>Therefore, these habitats are included as KERs.</b></p>

Ecological feature or species	KER Y/N	Rationale
<p>Local Importance (<i>higher value</i>) habitats</p> <ul style="list-style-type: none"> <li>➤ Mixed broadleaved/ conifer woodland (WD2)</li> <li>➤ Wet willow-alder-ash woodland (WN6)</li> </ul>	Yes	<p>These habitats contain high biodiversity value and help maintain links and ecological corridors between features of higher ecological value and is likely to be utilised by protected faunal species.</p> <p>Mixed broadleaved/conifer woodland was recorded within the proposed new road infrastructure between Turbine 5 and Turbine 8, meaning there will be a loss of this habitat of approximately 0.16 ha.</p> <p>Wet willow-alder ash woodland (WN6) was recorded within the turbine and hardstanding area of Turbine 5 within the Proposed Wind Farm site, and therefore approximately 2.5 ha of this habitat will be lost to facilitate the construction of the Proposed Project. Additionally, Wet willow-alder-ash woodland (WN6) was recorded within the north central portion of the Proposed Wind Farm site boundary along with small areas recorded along boundaries of Conifer plantation (WD4). This habitat contains high biodiversity value in the local environment and helps maintain links and ecological corridors between features of higher ecological value and is likely to be utilised by protected faunal species. Therefore, this habitat has been assessed as Local Importance (<i>higher value</i>).</p> <p><b>Therefore, these habitats are included as KERs.</b></p>
<p>County Importance</p> <ul style="list-style-type: none"> <li>➤ Wet grassland (GS4) (species rich)</li> </ul>	Yes	<p>This habitat is present within a field to the west of the proposed Turbine 3. It is a species rich area and has affinity with Annex 1 <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caerulea</i>). It was confirmed to support a population of marsh fritillary. Therefore, it has been assessed as County Importance. Grassland to the west of Turbine 4 also contained habitat suitable to support marsh fritillary.</p> <p>The Proposed Wind Farm has been designed specifically to avoid loss of this habitat. However, given that construction works are proposed in close proximity to this habitat, it is included as a KER for further assessment</p>
<p>Local Importance (<i>higher value</i>) to County Importance</p> <ul style="list-style-type: none"> <li>➤ Oak-birch-holly woodland (WN1)</li> </ul>	No	<p>This habitat contains high biodiversity value and helps maintain links and ecological corridors between features of higher ecological value and is likely to be utilised by protected faunal species. Additionally, this habitat was not common in the wider landscape.</p> <p>Oak-birch-holly woodland (WN1) has been mapped in the NPWS Native Woodland dataset along the Site boundary in the northeastern portion of the Proposed Wind Farm site along the Aughnaglanny Order 4 watercourse.</p> <p>However, this habitat is not proposed to be removed, altered, or impacted to facilitate the construction of the Proposed Project.</p> <p>Therefore, this habitat is <b>not</b> included as a KER.</p>

Ecological feature or species	KER Y/N	Rationale
<p>International Importance</p> <p>➤ Aquatic receptors (surface/groundwater and associated aquatic faunal species, including, lamprey, white-clawed crayfish, freshwater pearl mussel, European eel, salmonids, coarse fish, otter, and other aquatic species)</p>	Yes	<p>Both the Proposed Wind Farm and Proposed Grid Connection Route have downstream connectivity to National Sites and European Sites via several mapped watercourses and therefore, aquatic receptors have been assessed as International Importance.</p> <p>There is potential for direct and indirect effects on surface and groundwater systems via the deterioration of water quality arising from the runoff of pollutants during the construction and operational phases of the Proposed Project and the decommissioning phase of the proposed Wind Farm.</p> <p>The potential for significant effects on aquatic species is restricted to indirect effects on their habitat resulting from degradation of water quality.</p> <p><b>Therefore, Aquatic receptors are included as a KER.</b></p>
Faunal Species		
<p>Local Importance (<i>higher value</i>)</p> <p>➤ Bats</p>	Yes	<p>All bat species in Ireland are protected under the Bonn Convention (1992), Bern Convention (1982) and the EU Habitats Directive (92/43/EEC). Additionally, in Ireland, bat species are afforded further protection under the Birds and Natural Habitats Regulations (2011) and the Wildlife Acts 1976 (as amended).</p> <p>The following bat species were recorded within the Site:</p> <ul style="list-style-type: none"> <li>➤ Common pipistrelle</li> <li>➤ Soprano pipistrelle</li> <li>➤ Nathusius' pipistrelle</li> <li>➤ Leisler's bat</li> <li>➤ Brown long-eared bat</li> <li>➤ <i>Myotis</i> spp.</li> </ul> <p>The majority of trees within the Proposed Wind Farm site are comprised of conifer plantation and provide no (<i>None</i>) roosting habitat for bats, as per Collins (2023) guidance for assessing the suitability of trees for roosting bats. No trees with PRFs along the Proposed Grid Connection underground cabling route or TDR are being removed to facilitate the Proposed Project.</p> <p>Three vacant properties and an inhabited dwelling were confirmed to contain roosting bats following emergence surveys. These will not be removed or directly affected to facilitate the Proposed Project.</p> <p>Bats as an Ecological Receptor have been assigned Local Importance (<i>higher value</i>) on the basis that the habitats within the Site are utilized by a regularly occurring bat population of Local Importance.</p> <p>Given the nature of the Proposed Project, the potential for significant effects on bats, as a result of both the construction and operational phases of the Proposed Project, requires consideration.</p> <p><b>Therefore, bats are included as a KER.</b></p>

Ecological feature or species	KER Y/N	Rationale
Local Importance ( <i>higher value</i> ) > Badger ( <i>Meles meles</i> )	Yes	<p>Hedgerow, treeline, woodland, and open grassland habitats within the Site provide suitable supporting habitat for badger. Based on the results of the desk study and badger evidence recorded during the multidisciplinary walkover surveys, badger is widespread in the surrounding environment. Badger is protected under the Wildlife Act and has been assessed as being of Local Importance (<i>higher value</i>).</p> <p>In total, 5 potential badger setts were recorded within the Site. One main badger sett with multiple annexe setts were recorded and was assessed as active.</p> <p>All setts were recorded in the raised banks within the edge of wet willow-alder-ash woodland and scrub habitat in the vicinity of Turbine 5 and were within approximately 20m of the proposed Wind Farm infrastructure. Further evidence of badger utilising the Site for foraging and commuting purposes, including trails and snuffle holes, were recorded throughout the Proposed Wind Farm site.</p> <p>Therefore, potential for direct and indirect impacts on badger are considered further in this assessment and <b>the species has been included as a KER for further assessment.</b></p>
International Importance > Otter ( <i>Lutra lutra</i> )	Yes	<p>Based on the information identified within the desk study and the assessment of the habitats and features on site during the site visit, otter have been assessed as of International Importance due to the Site lying within the foraging range of SAC populations of this species. The Site has downstream connectivity to the Lower River Suir SAC and Lower River Shannon SAC, which are both designated for otter.</p> <p>No otter resting or breeding sites were identified within the Site. Furthermore, the watercourses and drainage ditches within and adjacent to the Site did not provide significant supporting habitat for this species. Therefore, there is no potential for significant effects on this species, as a result of disturbance and/or displacement.</p> <p>However, there is potential for significant effects on supporting aquatic habitat for this species, as a result of deterioration of water quality arising from the construction and operational phases of the Proposed Project.</p> <p><b>Therefore, otter is included as a KER.</b></p>
Local Importance ( <i>higher value</i> ) > Pine marten ( <i>Martes martes</i> ) > Red squirrel ( <i>Sciurus vulgaris</i> )	Yes	<p>The Proposed Wind Farm site provides suitable foraging and breeding habitat for pine marten and red squirrel. In Ireland, these species are protected under the Wildlife Acts 1976 (as amended). These species as ecological receptors have been assigned Local Importance (<i>higher value</i>) on the basis that a locally occurring population of Local Importance is likely utilising the Site.</p> <p>Given that the species are known to inhabit the area, potential for direct and indirect impacts on these species are therefore considered further in this assessment and they <b>have been included as KERs for further assessment.</b></p>

Ecological feature or species	KER Y/N	Rationale
County Importance > Marsh fritillary ( <i>Euphydryas aurinia</i> )	Yes	<p>This species is listed under Annex II of the EU Habitats Directive and there are records of marsh fritillary from the Site. As the species utilising the Proposed Wind Farm site is designated under any National or International Designated Site, it has been assessed as County Importance.</p> <p>Suitable marsh fritillary habitat was recorded within species rich Wet grassland (GS4) habitat west of Turbine 3, in addition to incidental sightings of adult marsh fritillary in this area. Suitable habitat containing Devil's bit scabious was also recorded west of Turbine 4, although no marsh fritillary was recorded. Therefore, supporting habitat for marsh fritillary was recorded within the Site in proximity to the proposed turbine layout and road infrastructure.</p> <p>Although any loss of high-quality marsh fritillary habitat has been avoided, taking a precautionary approach, there is potential for indirect effects on this species during construction works.</p> <p><b>Therefore, marsh fritillary is included as a KER.</b></p>
Local Importance ( <i>higher value</i> ) > Amphibians	Yes	<p>It is considered that the Proposed Project will not result in a significant loss of suitable habitat for amphibians. No evidence of populations of amphibians being significant at more than a local level was recorded. No likely significant effects on amphibians are anticipated and therefore further survey/assessment was not deemed necessary. Based on the few observations of amphibians within the Proposed Wind Farm site (common frog) and the lack of any significant breeding sites for them, amphibians are <b>not</b> considered a KER.</p>
Local Importance ( <i>higher value</i> ) > Reptiles	No	<p>No significant supporting habitat for reptiles, nor any signs of them, was recorded within the Site.</p> <p>No significant effects on these species are anticipated as a result of the Proposed Project.</p> <p>Therefore, are <b>not</b> included as a KER.</p>
Local Importance ( <i>higher value</i> ) > Deer species	No	<p>Based on the information identified within the desk study and the assessment of the habitats and features on site during the site visit, deer have been assessed as of Local Importance (<i>higher value</i>). Whilst the Site provides potential foraging and resting habitat for deer species, including red deer, potential supporting habitat is abundant in the wider environment. No significant effects on deer species, as a result of the Proposed Project, are anticipated.</p> <p>Therefore, deer are <b>not</b> included as a KER.</p>
Local Importance ( <i>higher value</i> ) > Other fauna	No	<p>No species of conservation concern or protected under Annexes of the EU Habitats Directive were recorded. Although other common species may occur within the Site, at least on occasion, no potential for significant effect has been identified on any other faunal species associated with the Proposed Project and are thus <b>not</b> included as KERs.</p>

## 6.5 Ecological Impact Assessment

### 6.5.1 Do-Nothing Effect

The land that forms the Proposed Wind Farm comprises commercial forestry, agricultural pastoral land, mixed forest and transitional woodland-shrub. Current land-use along the Proposed Grid Connection Route comprises of public road corridor, public open space, low-density residential, urban fabric, agriculture, mineral extraction, commercial forestry and mixed forest.

If the Proposed Wind Farm and Proposed Grid Connection were not to proceed, no changes would be made to the current land-use practice of conifer forestry, and the Site would continue to be managed under the existing arrangements. The biodiversity on the Site would likely remain similar to its current state as activity levels and land use would not change significantly.

However, if the Proposed Wind Farm does not proceed, the opportunity to capture the available renewable energy resource within a highly suitable location would be lost, as would the opportunity to contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions.

Furthermore, as this application includes a Biodiversity Enhancement and Management Plan (BEMP) to be implemented during the Projects operation, the opportunity to enhance the Site for biodiversity, at a local scale, would also be lost.

At a global scale, climate change has been proven to have negative impacts on biodiversity, either through reduced quality of habitat, displacement due to the changing baselines, and reduced or altered food sources. With Irelands climate action plans in mind and the potential contribution of this Proposed Wind Farm in reducing dependency of fossil fuels, should it not proceed, this would contribute to the inhibition of the national targets in reducing greenhouse gas emissions in Ireland.

### 6.5.2 Assessment of Significant Effects During Construction Phase

#### 6.5.2.1 Effects on Habitats During Construction

##### Habitat of Local Importance (Lower Value)

The Proposed Project footprint is dominated by habitats considered to be of low ecological value. Such habitats include Conifer plantation (WD4), Recolonising bare ground (ED3), low diversity Wet grassland (GS4), and Improved agricultural grassland (GA1). These habitats have not been identified as KERs and although there will be loss of these habitats as a result of the Proposed Project, the loss is not considered to represent a significant effect at any geographic scale.

##### Habitat of Local Importance (Higher Value)

The loss, degradation or fragmentation of habitats that have been identified as Key Ecological Receptors to facilitate construction is described in the following sections.

#### 6.5.2.1.2 Assessment of Potential Effects on Linear Habitat Features – Hedgerows and Treelines

*Table 6-12 Assessment of potential effects on linear habitats during construction.*

Description of Effect	Proposed Wind Farm site
-----------------------	-------------------------

	<p>The Proposed Project has been designed to minimise the loss of existing linear features within the Site, using existing forestry tracks and field entrances, where feasible. However, to facilitate the Proposed Wind Farm, there will be requirement for the loss of linear features within the Site. These losses are primarily to facilitate the construction of road infrastructure creating new field entrances.</p> <p>It is anticipated that the construction phase of the Proposed Wind Farm will require the loss of approximately 2.2 km of hedgerow habitat and approximately 18m of treeline. Approximately 32.4 km of hedgerows and 1.6 km of treelines were recorded within the Proposed Wind Farm site. Therefore, the unmitigated loss of hedgerow and treeline would constitute 6.8% and 11.3% of these habitats respectfully within the Proposed Wind Farm site.</p> <p>These losses would constitute permanent negative effect on these habitats, as they are within the Proposed Project footprint.</p> <p><b>Proposed Grid Connection Route</b></p> <p>The Proposed Grid Connection underground cabling route will predominantly be lain within existing road infrastructure and low biodiversity agricultural grassland. However, it will require the minor loss of hedgerows during construction, amounting to approximately 100m lost along the Proposed Grid Connection underground cabling route.</p> <p><b>TDR</b></p> <p>The Proposed TDR is located within existing road infrastructure, with areas of accommodation requiring the removal of approximately 450m of linear habitat.</p>
Assessment of Significance prior to mitigation	<p>The total loss of approximately 2.2 km of hedgerow habitat and 18m of treeline within the Proposed Wind Farm site, 100m along the Proposed Grid Connection underground cabling route, in addition to approximately 450m along the proposed TDR is not considered to be a significant effect at any scale greater than of local importance, as these habitats are widespread and common within the Site and in the wider environment. Removal of these habitats at this scale would not cause any significant fragmentation of habitat connectivity within the landscape. These losses are considered significant at the local geographic scale only.</p>
Mitigation	<p>As part of the Proposed Project, a Biodiversity Enhancement and Management Plan (BEMP) has been prepared and detailed in <b>Appendix 6-1</b>.</p> <p>The BEMP has been included in the planning application to ensure that the Proposed Project will result in a net gain in biodiversity, should it proceed. The BEMP provides for the following:</p> <ul style="list-style-type: none"> <li>➤ Management of 30.2 ha of species-rich grasslands.</li> <li>➤ Establishment and Management of 3.3 ha of woodland habitat.</li> <li>➤ Planting of 9.9 ha riparian woodland buffers throughout the Site which will create approximately 10.3 km of woodland edge habitat.</li> </ul> <p>Whilst the BEMP does not provide for hedgerows, with the implementation of the above, the losses of linear habitats to facilitate the Proposed Project will be offset via the establishment of woodland habitats, as foraging and commuting corridors will be created resulting in an overall net gain.</p>
Residual Effect following Mitigation	<p>Following the implementation of the BEMP, no significant loss of linear habitats is anticipated, at any geographical scale, as a result of the Proposed Project. Furthermore, the BEMP will ensure an overall net gain in important habitats, as a result of the Proposed Project.</p>

### 6.5.2.1.3 Assessment of Potential Effects Wet willow-alder-ash woodland (WN6) and Mixed broadleaved/ conifer woodland (WD2)

Table 6-13 Assessment of potential effects on wet willow-alder-ash woodland during construction.

<b>Description of Effect</b>	<p><b>Proposed Wind Farm</b></p> <p>The Proposed Project has been designed to minimise the impacts on the receiving environment and maximises the use of existing infrastructure within the Site, which includes using existing forestry tracks and field entrances where feasible. However, to facilitate the Proposed Wind Farm, there will be requirement for the minor loss of wet willow-alder-ash woodland habitat to facilitate the construction of Turbine 5 and mixed broadleaved/conifer woodland habitat to facilitate the proposed road layout between Turbine 5 and Turbine 8 within the Site.</p> <p>It is anticipated that the construction phase will require the loss of approximately 2.5 ha of wet willow-alder-ash woodland habitat out of a total area of 12.2 ha, and 0.16 ha of mixed broadleaved/conifer woodland habitat out of a total of 13.4 ha, totalling a loss of approximately 20.5% and 4.5% respectfully.</p> <p>These losses would constitute permanent negative effect on these habitats, as they are within the Proposed Project footprint.</p> <p><b>Proposed Grid Connection Route</b></p> <p>There will be no loss of wet willow-alder-ash woodland and mixed broadleaved/conifer woodland as a result of works associated with the Proposed Grid Connection Route.</p> <p><b>TDR</b></p> <p>There will be no loss of wet willow-alder-ash woodland and mixed broadleaved/conifer woodland as a result of accommodation works associated with the proposed TDR.</p>
<b>Assessment of Significance prior to mitigation</b>	<p>The loss of 2.5 ha of wet willow-alder-ash woodland habitat and 0.16 ha of mixed broadleaved/ conifer woodland is not considered to be a significant effect at any scale greater than of local importance. Removal of these habitats at this scale would not cause any significant fragmentation of habitat connectivity within the surrounding landscape. These losses are considered significant at the local geographic scale only.</p>
<b>Mitigation</b>	<p>As part of the Proposed Project, a Biodiversity Enhancement and Management Plan (BEMP) has been prepared and detailed in <b>Appendix 6-1</b>.</p> <p>The BEMP has been included in the planning application to ensure that the Proposed Project will result in a net gain in biodiversity, should it proceed. The BEMP provides for the following:</p> <ul style="list-style-type: none"> <li>➤ Management of 30.2 ha of species-rich grasslands.</li> <li>➤ Establishment and Management of 3.3 ha of woodland habitat.</li> <li>➤ Planting of 9.9 ha riparian woodland buffers throughout the Site which will create approximately 10.3 km of woodland edge habitat.</li> </ul> <p>With the implementation of the above, the losses of these habitats to facilitate the Proposed Project will be offset, and a net gain in woodland habitat will be achieved.</p>
<b>Residual Effect following Mitigation</b>	<p>Following the implementation of the BEMP, no significant impacts on woodland habitats are anticipated as a result of the Proposed Project.</p>

### 6.5.2.1.4 Assessment of Potential Effects on Species Rich Wet grassland (GS4) Habitats

Table 6-14 Assessment of potential effects on species rich grassland habitats during construction.

<p><b>Description of Effect</b></p>	<p><b>Proposed Wind Farm</b></p> <p>As described in Section 6.4.1, there is an area of species rich Wet grassland (GS4) habitat within the eastern footprint of the substation and sections of the access road to Turbine 3. This habitat conforms to Annex 1 ‘Molinia meadows (6410)’ and as such, was assessed as County Importance.</p> <p>The potential for impacts to species rich Wet grassland (GS4) habitat as a result of construction works associated with the substation and road infrastructure has been considered. The construction of the Proposed Wind Farm will result in the loss of approximately 0.2 ha of this grassland. Approximately 11.7 ha of species rich wet grassland habitat was recorded within the Proposed Wind Farm site. Therefore, the unmitigated loss of approximately 0.2 ha of species rich Wet grassland would constitute 1.7% of this habitat within the Proposed Wind Farm site.</p> <p>These losses would constitute permanent negative effect on these habitats, as they are within the Proposed Project footprint.</p> <p>There is additionally the potential for indirect effects on this habitat, as a result of dust generated during construction, which could smother important indicator species of this habitat.</p> <p><b>Proposed Grid Connection Route</b></p> <p>There will be no loss of species rich wet grassland as a result of works associated with the Proposed Grid Connection Route.</p> <p><b>TDR</b></p> <p>There will be no loss of species rich wet grassland as a result of accommodation works associated with the proposed TDR.</p>
<p><b>Assessment of Significance prior to mitigation</b></p>	<p>The unmitigated loss of species diverse Wet grassland (GS4) as a result of the Proposed Project would constitute a significant effect at County scale. No significant effects at any higher geographical scale are anticipated.</p>
<p><b>Mitigation</b></p>	<p><b>Mitigation by Design</b></p> <p>The Proposed Project has been specifically designed to minimise the loss of Annex I habitat. This was achieved through an early-stage ecological constraints study informed by field surveys and habitat mapping. The proposed layout was thereby altered through the iterative design process to minimise loss of any Annex I habitat.</p> <p>As part of the Proposed Project, a Biodiversity Enhancement and Management Plan (BEMP) has been prepared and detailed in <b>Appendix 6-1</b>.</p> <p>The BEMP has been included in the planning application to ensure that the Proposed Project will result in a net gain in biodiversity, should it proceed. The BEMP provides for the following:</p> <ul style="list-style-type: none"> <li>➤ Management of 30.2 ha of species-rich grasslands will offset any losses of wet grassland.</li> <li>➤ Establishment and Management of 3.3 ha of woodland habitat.</li> <li>➤ Planting of 9.9 ha riparian woodland buffers throughout the Site which will create approximately 10.3 km of woodland edge habitat.</li> </ul>

	<p><b>Dust Mitigation</b></p> <p>The dust mitigations outlined in Section 6.5.2.2.5 below will be applied.</p>
<p><b>Residual Effect following Mitigation</b></p>	<p>With the implementation of the mitigations set out above and Section 6.2.2.5, there is no potential for residual significant effect on species rich Wet grassland (GS4) habitat. With the implementation of the BEMP, there will be an overall positive impact on existing wet grassland habitat through proposed management regimes, as a result of the Proposed Project.</p>

### 6.5.2.1.5 Assessment of Potential Effects on Groundwater, Surface Watercourses, and Sensitive Aquatic Faunal Species

Table 6-15 Assessment of potential effects on aquatic receptors during construction.

<p><b>Description of Effect</b></p>	<p>Chapter 9 (Hydrology and hydrogeology) of the EIAR assess the potential for significant effects on water quality as a result of the following pathways during construction:</p> <ul style="list-style-type: none"> <li>➤ Potential Effects from Clear Felling of Coniferous Plantation</li> <li>➤ Potential Effects from Earthworks resulting in Suspended Solids Entrainment in Surface Waters Resulting in Suspended Solids Entrainment in Surface Waters</li> <li>➤ Potential Effects on Groundwater Levels during Excavation Works</li> <li>➤ Potential Effects on Surface Water Quality from Excavation Dewatering</li> <li>➤ Potential Effects from Hydrocarbons Leaks and Spills</li> <li>➤ Release of Cement-Based Products</li> <li>➤ Potential Effects due to Watercourse Crossing Works</li> <li>➤ Potential Effects on Designated Sites</li> <li>➤ Potential Effects on Local Groundwater Well Supplies from Excavations</li> <li>➤ Potential Surface Water Quality Effects of the Proposed Grid Connection Earthworks Works and Watercourse Crossings</li> <li>➤ Use of Siltbuster and Effect on Downstream Surface Water Quality</li> <li>➤ Potential Effects on Surface Water and Groundwater WFD</li> <li>➤ Potential Effects on Public Water Supplies (Surface Water and Groundwater)</li> </ul> <p>The effects on water quality are fully described in Chapter 9 (Hydrology and Hydrogeology) and are described here in relation specifically to ecology. This section assesses the potential for significant effects on surface/ groundwater and associated aquatic faunal species during construction, including, lamprey, white-clawed crayfish, freshwater pearl mussel, European eel, salmonids, coarse fish, otter, and other aquatic species identified during the desk study and dedicated aquatic surveys and likely to occur within or downstream of the Site.</p> <p><b>Proposed Wind Farm - Direct Impacts (mortality)</b></p> <p>Construction of 9 no. new watercourse crossing (clear span bridge/culvert design) and upgrade of 2 no. existing crossings on forestry tracks will be required to facilitate the Proposed Wind Farm site infrastructure. No sensitive aquatic receptors were recorded within any of the watercourses within the Proposed Wind Farm site during the surveys. Therefore, there is no potential for significant direct impacts on any sensitive aquatic receptors associated with the Proposed Wind Farm.</p> <p><b>Proposed Wind Farm - Indirect Impacts (water quality)</b></p> <p>A direct surface water pathway exists between the proposed Wind Farm and downgradient watercourses. Within the proposed Wind Farm, there are 11 no. proposed water crossing locations and a number of forestry drainage ditches which flow into these watercourses. There is a risk that pollutants and sediment laden surface water run-off generated during construction could discharge to surrounding ditches and watercourses impacting on sensitive watercourses and aquatic species downstream.</p>
-------------------------------------	--

	<p>There is also risk that pollutants will seep into groundwater systems, impacting on groundwater quality and associated groundwater dependant receptors.</p> <p>Potential sources of pollution to surface and ground waters within the Proposed Wind Farm site include:</p> <ul style="list-style-type: none"> <li>&gt; Slit laden surface water run-off;</li> <li>&gt; Release of chemicals, including hydrocarbons, from onsite machinery, concrete and other cement-based products.</li> <li>&gt; Drainage and seepage water resulting from infrastructure excavations;</li> <li>&gt; Stockpiled excavated material providing a point source of exposed sediment;</li> <li>&gt; Erosion of sediment from emplaced site drainage channels.</li> </ul> <p><b>Proposed Grid Connection Route - Direct Impacts (mortality)</b></p> <p>The Proposed Grid Connection underground cabling route contains 35 no. watercourse crossing locations (23 no. are EPA mapped watercourses crossing sites, which are detailed in Chapter 9 and in the Aquatic Baseline Report in <b>Appendix 6-3</b>). These watercourses are hydrologically connected to downstream European and Nationally designated sites.</p> <p>There are no in-stream works proposed to facilitate the Proposed Grid Connection Route, with clear span and Horizontal Directional Drilling (HDD) methods to be used to cross these watercourses. Therefore, there is no potential for direct impacts on any sensitive aquatic receptor associated with the Proposed Grid Connection Route.</p> <p><b>Proposed Grid Connection Route - Indirect impacts (water quality)</b></p> <p>Watercourses were assessed as being of International Importance along the Proposed Grid Connection underground cabling route and primarily comprised faster flowing Upland eroding streams (FW1). Fisheries value varied from negligible to low between watercourses, as did their potential to support protected aquatic species such as white clawed crayfish, freshwater pearl mussel, otter, and salmonids. Full assessments are provided in <b>Appendix 6-3</b>.</p> <p>There is a risk that pollutants and sediment laden surface water run-off could discharge into the 35 no. crossing sites along the Proposed Grid Connection underground cabling route will cross, impacting on sensitive watercourses and aquatic species.</p> <p>There is also a risk that pollutants will seep into groundwater systems, impacting on groundwater quality and associated groundwater dependant receptors.</p> <p><b>TDR</b></p> <p>There is no potential for direct or indirect impacts on any sensitive aquatic receptor associated with the proposed TDR as the associated accommodation works involve vegetation removal only and are not in proximity to any watercourse.</p>
<b>Assessment of Significance prior to mitigation</b>	<p>In the absence of mitigation, and following the precautionary principle, there is potential for the Proposed Project to result in significant indirect effects on the identified aquatic habitats and species assessed from local importance to International Importance, in the form of pollution to surface and groundwater during the construction phase of the Proposed Project.</p>
<b>Mitigation</b>	<p><b>Proposed Wind Farm</b></p> <p>Detailed mitigation measures in relation to the protection of surface and ground water during construction are provided in Section 9.5.2 of Chapter 9 (Hydrology and Hydrogeology). In summary the key mitigation measure during the construction phase is the avoidance of sensitive hydrological features, by application of suitable buffer zones. A self-imposed buffer zone of 50m has been put in place for on-site streams and rivers, where</p>

<p><b>Residual Effect following Mitigation</b></p>	<p>possible. Manmade forestry drains at the Site are not considered a hydrological constraint and therefore no buffering of forestry drains has been undertaken. All of the proposed turbine locations, and where possible turbine associated infrastructure such as hardstanding areas, will be located outside of the delineated 50m watercourse buffer zones with the exception of proposed roads and roads to be upgraded. Detailed control measures in relation to the protection of surface and ground waters during construction are detailed in Section 9.5.2. of Chapter 9 (Hydrology and Hydrogeology). In addition, the Construction Environmental Management Plan (CEMP) that is provided as Appendix 4-3 of the EIAR, provides the details of exactly how the measures will be implemented during construction.</p> <p>A drainage management plan for the Proposed Project is provided the Surface Water Management Plan (SWMP), included as Appendix 4-3 of this EIAR. This plan provides details of how water quality will be protected during the construction of the Proposed Project. The maintenance plan for the on-site construction drainage system will be prepared in advance of commencement of any works with regular inspections of all installed drainage systems undertaken throughout the Site.</p> <p><b>Proposed Grid Connection Route</b></p> <p>Mitigations around the protection of watercourses from the construction of the Proposed Grid Connection Route are provided in Section 9.5.2.10 of Chapter 9. The mitigations include for:</p> <ul style="list-style-type: none"> <li>➤ Pre-commencement of works</li> <li>➤ Underground cabling watercourse crossing works</li> <li>➤ Fracture Blow-out (Frac-out) Prevention and Contingency Plan for Horizontal Directional Drilling (HDD)</li> </ul> <p><b>TDR</b></p> <p>There will be no adverse effects on aquatic receptors as a result of accommodation works associated with the proposed TDR.</p>
<p><b>Residual Effect following Mitigation</b></p>	<p>Following the implementation of mitigation, there will be no significant residual effect on aquatic habitats or species, at any geographic scale, as a result of the Proposed Project.</p>

### 6.5.2.2 Effects on Fauna During Construction

The Proposed Project has the potential to result in habitat loss and disturbance impacts on faunal species included as KERs, see Table 6-11. The following faunal species have been brought forward for further assessment:

- Bats
- Badger
- Otter
- Pine marten
- Red squirrel
- Marsh fritillary

As no instream works are proposed as part of the Proposed Project, the potential for significant effects on sensitive aquatic species, with the of exception of otter, is restricted to effects on their habitat resulting from water pollution. This has been assessed in Table 6-15 in Section 6.5.2.1.5 above and is not repeated below.

### 6.5.2.2.1 Assessment of Potential Effects on Bats during Construction

The impact assessment and recommended mitigation measures have been designed in accordance with NatureScot (2021)<sup>14</sup>, with further consideration of the Northern Ireland Environment Agency (NIEA)<sup>15</sup> Natural Environment Division guidance (August 2021, amended April 2024).

The impact assessment in relation to bats has been undertaken in accordance with and NatureScot Guidance. As per the NatureScot Guidance, wind farms present five potential risks to bats:

- Collision mortality, barotrauma and other injuries
- Loss or damage to commuting and foraging habitat
- Loss of, or damage to, roosts
- Displacement of individuals or populations
- Disturbance

For each of these five risks, the detailed knowledge of bat distribution and activity within the Site has been utilised to predict the potential effects of the Proposed Project on bats.

A full impact assessment for bats is provided in the Bat Survey Report in **Appendix 6-2** and is summarised below.

*Table 6-16 Assessment of potential effects on bats during construction.*

<b>Description of Effect</b>	<p><b>Loss of, or Damage to, Roosts</b></p> <p><u>Proposed Wind Farm site</u></p> <p>The Proposed Project is predominantly located within conifer plantations (at various stages of maturity) and agricultural grassland habitats. The trees contained within the commercial conifer forestry do not provide significant suitable roosting habitat for bats. There will be some requirement to remove trees to facilitate the proposed bat buffers. Trees within the bat buffers consist of conifer species and were assessed as having no (<i>None</i>) potential suitability for roosting bats.</p> <p>Four vacant properties and one inhabited dwelling exist within the Site and were subject to inspections and dusk activity surveys. Three vacant properties and the inhabited dwelling were confirmed to contain roosting bats following emergence surveys. Common and soprano pipistrelle roosts were identified in these structures, ranging from approximately &gt; 5 to &gt; 68 individuals. Further details are provided in Section 4.3.2.2 of <b>Appendix 6-2</b>. These structures will be retained, and no building works on these structures are proposed as part of the Proposed Project. Therefore, there is no potential for direct effects on these confirmed roosts as a result of the Proposed Project.</p> <p><u>Proposed Grid Connection Route</u></p> <p>The Proposed Grid Connection Route will predominantly be constructed within existing road infrastructure and low biodiversity value agricultural grassland. However, it will require the minor loss of hedgerows at several locations during construction, amounting to approximately 100m lost along the Proposed Grid Connection underground cabling route. Habitats recorded along the Proposed Grid Connection underground cabling route were assessed as having <i>Negligible</i> suitability for roosting bats and therefore no significant effects on bats are anticipated as a result of loss or damage to roosts during the construction of the Proposed Grid Connection Route. No structural works are required for the bridge crossings</p>
------------------------------	---

<sup>14</sup> NatureScot published *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*. Version: August 2021 (NatureScot, 2021).

<sup>15</sup> Northern Ireland Environment Agency Natural Environment Division (NED) published *Guidance on Bat Surveys, Assessment and Mitigation for Onshore Wind Turbine Developments in Northern Ireland* (NIEA, 2021).

along the grid connection route, all were assessed as having *Low* roosting potential. As such, no loss or damage to potential roosting structures is anticipated as a result of these works. Further details are provided in **Appendix 6-2**.

**TDR**

There will be some requirement minor accommodation works resulting in the loss of approx. 450m of linear habitat across several locations to allow for oversail during the delivery of turbine components. No significant potential roost features were identified along the TDR pinch points and trees were assessed as having no (*None*) to *Negligible* roosting potential due to their size and lack of available roosting features.

**Loss or Damage to Commuting and Foraging Habitat**

**Proposed Wind Farm site**

In the absence of appropriate design, the loss or degradation of commuting/foraging habitat has potential to reduce feeding opportunities and/or displace bat populations. The Proposed Project is predominantly located in conifer plantation with existing turbine infrastructure present.

Approximately 51.6 ha of Conifer plantation (WD4) will be felled to accommodate the Proposed Project and its associated infrastructure. The felling of trees is required to achieve the required buffer distance for the protection of bats, from the turbines to the canopy of the nearest habitat feature.

Bat buffers will be created around turbines as detailed in Section 6.1.3 of the Bat Survey Report (Appendix 6-2). The creation of buffers will not sever existing corridors but has the potential to create additional habitat for foraging and commuting bats along proposed keyholes, where trees are not harvested by ongoing forestry operations.

The Proposed Project has been designed to minimise the loss of existing linear features and broadleaved woodland within the site, using existing forestry tracks and field entrances, where feasible. However, to facilitate the Proposed Wind Farm, there will be requirement for the loss of some linear features within the site. These losses are primarily to facilitate the construction of road infrastructure creating new field entrances. It is anticipated that the construction phase of the Proposed Wind Farm will require the loss of approximately 2.2 km of hedgerow habitat, approximately 18m of treeline, 2.5 ha of wet willow-alder-ash woodland habitat and 0.16 ha of mixed broadleaved/conifer woodland habitat. Given the extensive area of habitat that will remain undisturbed throughout the Proposed Project, the avoidance of the most significant areas of faunal habitat no significant effects with regard to loss of commuting and foraging habitat are anticipated.

**Proposed Grid Connection Route**

Features along the Proposed Grid Connection underground cabling route such as stone walls, grassland habitats, hedgerows and mixed broadleaved woodland were assessed as having *Low to Moderate* suitability for commuting and foraging bats i.e. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water (Collins, 2023). Approximately 100m of linear habitat across several locations will be lost along the Proposed Grid Connection underground cabling route which will not result in a significant effect on bats at any geographical scale.

**TDR**

Habitats along the proposed TDR ranged from *Negligible* to *Moderate* suitability for commuting and foraging bats. There will be some requirement minor accommodation works across several locations resulting in the loss of approx. 450m of linear habitat across several locations to allow for oversail during the delivery of turbine components. These losses will be reinstated post-construction. Therefore, no significant effects on bats as a result of loss or

	<p>damage to commuting and foraging habitat as a result of the TDR are anticipated at any geographical scale.</p> <p><b>Disturbance/Displacement of Individuals or Populations</b></p> <p><u>Proposed Wind Farm site</u></p> <p>The Proposed Project is predominantly located within conifer plantation and agricultural grassland habitats, with existing infrastructure present. There will be a loss of approximately 2.5 km of linear landscape features within the Proposed Wind Farm site, which is not significant on a local scale for commuting and foraging bats. Additionally, there will be no loss of any roosting site of ecological significance. The habitats on the Site will remain suitable for bats and no significant displacement of individuals or populations is anticipated as a result of the Proposed Project.</p> <p><u>Proposed Grid Connection Route</u></p> <p>The Proposed Grid Connection Route will predominantly be constructed within existing road infrastructure and low biodiversity value agricultural grassland, which have been assessed as Negligible for roosting bats, and <i>Low to Moderate</i> for commuting and foraging bats. No bat roosts were recorded along the Proposed Grid Connection route.</p> <p>Given the short-term nature of the construction of the Proposed Grid Connection Route, it's location within low value bat habitats, and the avoidance of potential commuting and foraging corridors where possible, no significant effects as a result of disturbance or displacement of individual bats or local bat populations are anticipated during the construction of the Proposed Grid Connection Route.</p> <p><u>TDR</u></p> <p>There will be some requirement minor accommodation works resulting in potential noise and lighting effects as a result of the TDR. However, no roosting potential was recorded at the accommodation work areas. Given the short-term nature of these works, which will be undertaken during daylight hours, no significant effects as a result of disturbance or displacement of individual bats or local bat populations are anticipated during the construction of the Proposed Grid Connection Route.</p>
<p><b>Assessment of Significance prior to mitigation</b></p>	<p><b>Loss of, or Damage to, Roosts</b></p> <p>No potential for significant effect with regard to the loss of, or damage to, roosting habitat as a result of the Proposed Project is anticipated. No mitigation is required.</p> <p><b>Loss or Damage to Commuting and Foraging Habitat</b></p> <p>Given the extensive area of habitat that will remain undisturbed throughout the Site and the avoidance of the most significant areas of faunal habitat, no significant effects with regard to loss of commuting and foraging habitat are anticipated.</p> <p><b>Disturbance/Displacement of Individuals or Populations</b></p> <p>No potential for significant effect with regard to the disturbance/displacement of bats as a result of the Proposed Project is anticipated. No mitigation is required.</p>
<p><b>Mitigation</b></p>	<p><b>Loss of, or Damage to, Roosts</b></p> <p>No mitigation required.</p> <p>However, on a precautionary basis, a pre-commencement inspection of the trees proposed for trimming along the TDR will be undertaken prior to works to reassess their baseline condition and ensure no significant potential roosting features have developed over time. This measure is in line with best practice guidance to assess any changes in baseline given</p>

	<p>the likely lapse in time from when the surveys were undertaken and when the construction phase will take place.</p> <p><b>Loss or Damage to Commuting and Foraging Habitat</b></p> <p>No mitigation required as no significant effect on bat commuting and foraging habitat are anticipated as a result of the construction phase of the Proposed Project.</p> <p>Whilst no mitigation is required, a BEMP has been included in the planning application to ensure that the Proposed Project will result in a net gain in biodiversity, should it proceed. The BEMP provides for the following:</p> <ul style="list-style-type: none"> <li>➤ Management of 30.2ha of species-rich grasslands.</li> <li>➤ Establishment and Management of 3.3 ha of woodland habitat.</li> <li>➤ Planting of 9.9 ha riparian woodland buffers throughout the Site which will create approximately 10.3 km of woodland edge habitat.</li> </ul> <p>Full details on this enhancement are provided in the BEMP in <b>Appendix 6-1</b>.</p> <p><b>Disturbance/Displacement of Individuals or Populations</b></p> <p>No mitigation required.</p> <p>However, the following construction best practice will be employed to minimise general noise and disturbance potential. During the construction phase, plant machinery will be turned off when not in use and all plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (S.I. No. 632 of 2001).</p> <p>Where lighting is required, directional lighting will be used to prevent overspill on to forestry edges. Exterior lighting during construction, shall be designed to minimize light spillage, thus reducing the effect on areas outside the Proposed Project footprint, and consequently on bats i.e. Lighting will be directed away from trees/treelines around the periphery of the Proposed Project footprint to minimize disturbance to bats. Directional accessories can be used to direct light away from these features, e.g. through the use of light shields (Stone, 2013). The luminaries will be of the type that prevent upward spillage of light and minimize horizontal spillage away from the intended lands.</p> <p>The proposed lighting around the Site shall be designed in accordance with the Institute of Lighting Professionals Guidance Note 08/23 Bats and artificial lighting in the UK.</p> <p>In addition, should it be required, the Applicant commits to the use of lights during construction (such that they are necessary) in line with the following guidance that is provided in the Dark Sky Ireland Lighting Recommendations:</p> <ul style="list-style-type: none"> <li>➤ Every light needs to be justifiable,</li> <li>➤ Limit the use of light to when it is needed,</li> <li>➤ Direct the light to where it is needed,</li> <li>➤ Reduce the light intensity to the minimum needed,</li> <li>➤ Use light spectra adapted to the environment,</li> <li>➤ When using white light, use sources with a “warm” colour temperature (less than 2700k).</li> </ul> <p>Full details of best practice measures during construction to negate impacts on bats is provided in Section 6.1 of the Bat Survey Report.</p>
<p><b>Residual Effect following Mitigation</b></p>	<p>Taking into consideration the sensitive design of the Proposed Project and the proposed best practice measures, significant residual effects on bats as a result of loss or damage to commuting and foraging habitat, loss of, or damage to, roosts, displacement of individuals or populations, and disturbance, are not anticipated.</p>

### 6.5.2.2.2 Assessment of Potential Effects on Badger during Construction

Table 6-17 Assessment of potential effects on badger during construction.

<b>Description of Effect</b>	<p><b>Habitat Loss/Fragmentation</b></p> <p>Given the nature of the Proposed Project, there will be some minimal loss of suitable badger foraging and commuting habitat i.e. Conifer plantation (WD4) and linear habitat features associated with the footprint of the Proposed Wind Farm infrastructure. However, annexe setts were recorded within approximately 20m of the Proposed Wind Farm road infrastructure in proximity to Turbine 5.</p> <p><b>Disturbance/Mortality</b></p> <p>Several badger sett entrances were recorded at the edge of habitat classified as wet willow-alder ash and scrub in proximity to Turbine 5 within the Proposed Wind Farm site, as well as other signs such as tracks and snuffle holes recorded throughout the entirety of the Proposed Wind Farm site.</p> <p>Given the proximity of the identified setts to the proposed road infrastructure, there is potential for disturbance and direct mortality of badger using the setts as a result of noise/tunnel or sett collapse during works associated with the Proposed Wind Farm road infrastructure. In addition to this, there is potential for new badger setts to be created during the interim between baseline ecological surveying and commencement of construction, therefore a potential for impact via disturbance/mortality of badger exists should new setts be created in close proximity to the Proposed Project works.</p> <p>Noise and earth works during construction have the potential to disturb badgers occupying setts in close proximity to Proposed Wind Farm infrastructure during construction. Badger tunnel systems can extend some distance from sett entrances (over 20m in some cases) and therefore any excavation by heavy machinery in close proximity to sett entrances risks causing damage to setts and/or direct harm to badgers in the absence of mitigation. In the event that a new badger sett is established within or near the footprint of the Proposed Wind Farm during the interim between baseline ecological surveys and commencement of construction, there is potential for disturbance/mortality to badger using the setts as a result of noise/tunnel or sett collapse during construction.</p>
<b>Assessment of Significance prior to mitigation</b>	<p><b>Habitat Loss/Fragmentation</b></p> <p>In the absence of mitigation, the loss of badger habitat in proximity to the Proposed Wind Farm road infrastructure is not considered significant given the extent of suitable habitat in the wider area.</p> <p><b>Disturbance/Mortality</b></p> <p>In the absence of mitigation, the potential for disturbance, displacement or direct mortality of badger is a significant effect at the local geographic scale.</p>
<b>Mitigation</b>	<p><b>Habitat Loss/Fragmentation</b></p> <p>The loss of habitat will be small scale in nature and suitable habitat is abundant in the wider landscape. As such no specific mitigation is required for the avoidance of habitat loss.</p> <p><b>Disturbance/Mortality</b></p> <p>Prior to the commencement of any construction works associated with the Proposed Wind Farm, Proposed Grid Connection Route and Turbine Delivery Route, the following measures will be undertaken for the avoidance of disturbance and/or direct mortality to badger and to ensure no additional setts have been established since the original surveys</p>

<b>Residual Effect following Mitigation</b>	<p>undertaken. The following measures are in line with <i>Guidelines For The Treatment Of Badgers Prior To The Construction Of National Road Schemes</i> (TII 2009).</p> <ul style="list-style-type: none"> <li>➤ From a precautionary basis, a pre-commencement badger survey will be undertaken in accordance with standard best practice guidance prior to the commencement of site works to determine whether the identified sett is still in use and to ensure that no additional setts in close proximity to proposed infrastructure have been established. In the event that a badger sett is identified within or immediately adjacent to the Proposed Project footprint, mitigations as per the above referenced TII document will be implemented for the new sett.</li> </ul> <p>In relation to the identified setts in close proximity to Proposed Wind Farm road infrastructure, an exclusion of the existing setts will be carried out to ensure no badgers are present within the setts during construction works. The exclusion will be carried out in line with TII guidelines as follows:</p> <ul style="list-style-type: none"> <li>➤ Local NPWS staff will be informed in advance of the exclusion works.</li> <li>➤ The exclusion will not take place during badger breeding season (December to June inclusive)</li> <li>➤ One way exclusion gates will be installed on each sett entrance.</li> <li>➤ The one-way gates will be left in place for a period of 21 days and works will proceed immediately after once exclusion of badgers has been confirmed by an Ecologist.</li> <li>➤ An Ecologist will monitor the gates every 3 to 5 days during the 21-day period to ensure badgers do not succeed in re-entering the sett.</li> <li>➤ If badgers succeed in re-entering during the 21-day period, the exclusion process and 21-day period must start again.</li> </ul> <p>All of the above works will be undertaken or supervised by an appropriately qualified ecologist.</p>
<b>Residual Effect following Mitigation</b>	<p>Following the incorporation of the mitigation measures described above, no significant negative effects to badger is anticipated at any geographic scale.</p>

### 6.5.2.2.3 Assessment of Potential Effects on Otter during Construction

Table 6-18 Assessment of potential effects on badger during construction.

<b>Description of Effect</b>	<p>The Proposed Project has been designed to minimise impacts on the receiving environment and maximises the use of existing access roads at the Site. Consequently, the Proposed Wind Farm footprint is predominantly located in areas of modified habitats, associated with the existing access road and conifer plantation.</p> <p><u>Proposed Wind Farm site</u></p> <p>No indication of otter was recorded within the Proposed Wind Farm site during any of the surveys undertaken.</p> <p>The watercourses within the Proposed Wind Farm site are typically first order streams and present limited supporting habitat for otter due to low fisheries potential. Whilst there will be 9 no. new watercourse crossings and 2 no. watercourse crossing upgrades within the Proposed Wind Farm site, these are small streams and only provide marginal commuting habitat for otter.</p> <p><b>Habitat Loss/Fragmentation</b></p> <p>Given the proposed works and the findings of the baseline surveys for otter within the Proposed Wind Farm site, no significant habitat destruction and no loss of breeding or resting places for this species are anticipated. However, given otter is a mobile species</p>
------------------------------	--

which could establish holts between planning being granted (if approved) and works commencing, taking a precautionary approach, should a breeding site establish within or in close proximity to the Project footprint, there is potential for significant effects on otter, as a result of habitat loss.

**Disturbance/ Mortality**

In relation to disturbance and direct mortality related impacts, no significant commuting, foraging, or breeding habitat for otter was recorded within the Proposed Wind Farm site. Additionally, otter is predominantly crepuscular in nature (i.e. fauna that are most active during twilight hours - dawn and dusk), and it is anticipated that construction activity associated with the Proposed Project will be confined to daytime hours, thus minimising potential disturbance related impacts to the species. Any disturbance impacts would be short-term in nature and not considered to have a significant impact on the local otter population. No further assessment is required.

**Habitat Degradation (impacts on water quality)**

Taking a precautionary approach, it is assumed that otter may occur within and near the Proposed Wind Farm site on occasion, particularly the lower reaches of the main watercourses downstream. There is potential for construction works to result in the run-off of silt and other pollutants such as hydrocarbons and cementitious material into watercourses downstream of the Proposed Wind Farm site. This represents a potential indirect effect on otter in the form of habitat degradation/loss of prey resource through water pollution. The potential for significant impacts on water quality as a result of the Proposed Project is fully considered above in Table 6-15.

Proposed Grid Connection Route

The Proposed Grid Connection underground cabling route contains 35 no. crossing sites. Targeted otter surveys were carried out at each watercourse crossing, the details of which are provided in the Aquatic Baseline Report in **Appendix 6-3**.

No indication of breeding otter was recorded at any watercourse crossing location, however this species is likely using these watercourses for foraging and commuting, at least on occasion.

**Habitat Loss/ Fragmentation**

Given the findings of the baseline surveys for otter along the Proposed Grid Connection underground cabling route, no significant habitat destruction and no loss of breeding or resting places for this species are anticipated. However, given otter is a mobile species which could establish holts between planning being granted (if approved) and works commencing, taking a precautionary approach, should a breeding site establish within or in close proximity to the Proposed Project footprint, there is potential for significant effects on otter, as a result of habitat loss.

**Disturbance/ Mortality**

In relation to disturbance and direct mortality impacts, no breeding habitat for otter was recorded along the Proposed Grid Connection underground cabling route. Additionally, otter is predominantly crepuscular in nature, and it is anticipated that construction activity associated with the Proposed Project will be confined to daytime hours, thus minimising potential disturbance related impacts to the species. However, given otter is a mobile species which could establish holts between planning being granted (if approved) and works commencing, taking a precautionary approach, should a breeding site establish within or in close proximity to the Proposed Project footprint, there is potential for significant effects on otter, as a result of disturbance/ direct mortality.

**Habitat Degradation (impacts on water quality)**

<p><b>Assessment of Significance prior to mitigation</b></p>	<p>As otter are known to be utilising habitats at watercourse crossings along the Proposed Grid Connection underground cabling route, there is potential for significant effects on this receptor as a result of construction works via the run-off of silt and other pollutants such as hydrocarbons and cementitious material. This represents a potential indirect effect on otter in the form of habitat degradation/loss of prey resource through water pollution. The potential for significant impacts on water quality as a result of the Proposed Project is fully considered above in Table 6-15.</p> <p><u>Proposed Turbine Delivery Route</u></p> <p>No significant effects on otter, as a result of the TDR, are anticipated as the associated accommodation works involve vegetation removal only and are not in proximity to any watercourse.</p>
<p><b>Mitigation</b></p>	<p><b>Habitat Loss</b></p> <p>Significant effects regarding habitat loss are not currently anticipated as a result of the Proposed Project. However, should a breeding site for otter establish within or in close proximity to the Proposed Project footprint, there is potential for significant effects on otter, as a result of habitat loss.</p> <p><b>Disturbance, Mortality</b></p> <p>Significant effects regarding disturbance and/or mortality are not anticipated as a result of the Proposed Project. However, should a breeding site for otter establish within or in close proximity to the Proposed Project footprint, there is potential for significant effects on otter, as a result of disturbance/ direct mortality.</p> <p><b>Habitat Degradation (impacts on water quality)</b></p> <p>Otter is known to occur downstream of the Proposed Project. As there is a potential for deterioration to water quality, as a result of the construction phase of the Proposed Project, there is a potential for significant effects on otter, assessed as being of International Importance, via deterioration of supporting habitat.</p> <p><b>Habitat Loss</b></p> <p>Due to the time that can elapse between the original surveys, any future planning consent and construction, a pre-construction survey for otter will be carried out no more than 10 to 12 months prior to construction, as per NRA (2008) guidance, to identify the presence of any new breeding sites. The pre-construction survey will aim to ensure that adequate mitigation, as provided below under ‘Disturbance, Mortality’ is provided at each watercourse crossing (or other habitat of value to otters) affected by the Proposed Project.</p> <p><b>Disturbance, Mortality</b></p> <p>No significant effects are anticipated. However, taking a precautionary approach, and due to the time that can elapse between the original surveys, any future planning consent and construction, a pre-construction otter survey will be carried out by a qualified ecologist to identify the presence of any breeding sites within the Site, that may have been established in the intervening period. The requirement for a pre-construction survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice.</p> <p>Any holts identified within 50m of proposed infrastructure will subsequently be monitored for a minimum period of 2 weeks using remote cameras in order to ascertain use by otter and levels of activity. If an active otter holt is identified and works can be undertaken safely then an exclusion zone will be set up around the hold as follows:</p>

<b>Residual Effect following Mitigation</b>	<p>➤ Exclusion zone fencing and appropriate signage will be put in place between working areas and otter holt exclusion zones to ensure that there will be no encroachment of the breeding site exclusion zones by construction activities.</p> <p>If a newly established and active holt was identified within an area where works could not avoid direct impacts on the holt, the holt would likely need to be excluded, with the provision of a derogation licence from NPWS, prior to works commencing. This would involve the erection of one-way fencing, only allowing egress from the holt and will be undertaken in line with current guidelines by an appropriately qualified ecologist in advance of construction works commencing.</p> <p>Currently based on the finding of the surveys and current information regarding the Site, no derogation licence is required for this application, as no breeding sites have been recorded in close proximity to the Proposed Project. However, should the pre-commencement surveys identify a new breeding site and exclusion is required, a derogation licence must be in place from the NPWS.</p> <p><b>Habitat Degradation (impacts on water quality)</b></p> <p>The potential for deterioration of water quality, and degradation of otter habitat, has been considered in Table 6-15 above, which assess the potential for significant impacts on aquatic receptors, and provides mitigations to prevent any such effects.</p>
<b>Residual Effect following Mitigation</b>	<p>Following the incorporation of the mitigation measures described above, no significant negative effects to otter are anticipated at any geographic scale.</p>

#### 6.5.2.2.4 Assessment of Potential Effects on Red Squirrel/ Pine Marten during Construction.

Table 6-19 Assessment of potential effects on red squirrel and pine marten during construction.

<b>Description of Effect</b>	<p><b>Habitat Loss/Fragmentation</b></p> <p>Red squirrel and pine marten are known to occur within the Proposed Wind Farm site. Conifer plantation provides suitable foraging and breeding habitat for both species. Approximately 522.6 ha of conifer plantation was recorded within the Site. The Proposed Project will result in the loss of approximately 51.6 ha of conifer plantation. This habitat loss will not be significant in the context of the widespread alternative foraging/breeding habitat available within the Site and the wider area surrounding the Site. There will be no significant fragmentation of red squirrel or pine marten habitat as a result of the Proposed Project.</p> <p><b>Disturbance, Mortality</b></p> <p>The Proposed Wind Farm site provides suitable foraging and breeding habitat for both species. No breeding sites (e.g. dreys, dens) were identified for either species during the ecological surveys undertaken of the Proposed Wind Farm site, however, there is potential for breeding sites to be created during the interim between baseline ecological surveying and commencement of construction. Tree felling works associated with the Proposed Wind Farm have the potential to disturb or destroy occupied dreys and or dens during construction. Both species would be a particularly vulnerable to the risk of mortality when young are to be found within breeding sites (spring/summer period). In the event that new breeding sites were established within or near the clear-felling footprint there is potential for disturbance/mortality to red squirrel or pine marten through destruction of breeding sites during construction.</p>
<b>Assessment of Significance prior to mitigation</b>	<p><b>Habitat Loss/Fragmentation</b></p> <p>No significant overall loss or fragmentation of red squirrel or pine marten habitat is anticipated at any geographic scale.</p>

	<p><b>Disturbance/Mortality</b></p> <p>Whilst no breeding sites for these species were recorded within the Proposed Wind Farm site, baseline surveys identified that the Proposed Wind Farm site is being utilised by a local red squirrel and pine marten population. Any potential for physical damage or significant disturbance of occupied breeding sites (if established prior to construction) for these species has been identified as significant at the local geographic scale in the absence of mitigation.</p>
<b>Mitigation</b>	<p><b>Habitat Loss/Fragmentation</b></p> <p>No specific mitigation is required for habitat loss.</p> <p><b>Disturbance/Mortality</b></p> <p>Due to time that can elapse between the original surveys, any future planning consent and construction, a pre-construction survey for pine marten/red squirrel will be carried out to identify the presence of any new breeding sites. These surveys will focus on areas of conifer plantation to be felled and all suitable habitat within 50m of the felling blocks. Any potential breeding sites should be monitored to ascertain if they are active breeding sites. Surveys will be undertaken in line with Nature Scot<sup>16</sup> and NRA<sup>17</sup> guidelines.</p> <p>Should active dreys/dens be identified within the blocks to be felled, the following mitigations and best practice procedures will be followed to ensure that no breeding site for either red squirrel or pine marten are impacted:</p> <ul style="list-style-type: none"> <li>➤ Felling works within 50m of any drey or den to be undertaken in October–January inclusive, this will avoid the main breeding season (February–September) when vulnerable young are most likely to be found within breeding sites for both species.</li> <li>➤ Any breeding sites within forestry identified within the 50m buffer that wouldn't be directly affected by felling works but may be affected by disturbance related impacts should be clearly marked out with an exclusion zone and works/access through these areas avoided as much as possible.</li> <li>➤ Plant machinery will be turned off when not in use.</li> <li>➤ Operating machinery will be restricted to the Proposed Wind Farm works site area (and outside any exclusion zone)</li> </ul>
<b>Residual Effect following Mitigation</b>	<p>Following the incorporation of the mitigation and enhancement measures described above, no significant negative effects to pine marten and red squirrel is anticipated at any geographic scale.</p>

### 6.5.2.2.5 Assessment of Potential Effects on Marsh Fritillary during Construction.

Table 6-20 Assessment of potential effects on marsh fritillary during construction.

<b>Description of Effect</b>	<p><b>Direct Effects/ Mortality</b></p> <p>The Proposed Wind Farm has been designed, through an iterative design process, to avoid areas of suitable breeding marsh fritillary habitat. Given the proximity of the construction works required for Turbine 3 and associated road infrastructure to the identified marsh fritillary breeding area, the potential for direct impacts on the species has been considered. The construction of the access road to Turbine 3 will occur approximately 50m from identified marsh fritillary populations. In the absence of mitigation, direct effects such as mortality of marsh fritillary larvae could occur.</p> <p><b>Indirect Effects</b></p>
------------------------------	--

<sup>16</sup> <https://www.nature.scot/sites/default/files/2018-09/Species%20Planning%20Advice%20-%20red%20squirrel.pdf>

<sup>17</sup> TII guidance (TII, 2008, Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. Dublin: National Roads Authority).

	<p>In the absence of mitigation, construction works adjacent to existing breeding areas has the potential to indirectly impact marsh fritillary, due to dust related impacts. Airborne dust from construction works could settle on marsh fritillary larval webs resulting in suffocation or degradation of breeding habitat.</p> <p><b>Loss of Suitable Breeding Habitat</b></p> <p>The Proposed Wind Farm has been designed, through an iterative design process, to avoid areas of breeding marsh fritillary and suitable habitat. As a result, there is no potential for direct impacts on the identified main breeding populations. The Proposed Project infrastructure will result in the loss of approx. 0.2 ha of species rich Wet grassland (GS4) habitat in close proximity to the recorded marsh fritillary. Whilst this habitat was assessed as marginal marsh fritillary habitat only, on a precautionary basis, it is nonetheless considered a loss of potential supporting habitat.</p>
<p><b>Assessment of Significance prior to mitigation</b></p>	<p><b>Direct Effects/ Mortality</b></p> <p>Taking a precautionary approach, in the absence of mitigation, the potential for direct impacts to marsh fritillary would be a significant effect to the population at the County scale.</p> <p><b>Indirect Effects/ Dust Impacts</b></p> <p>Taking a precautionary approach, the potential for indirect effects to marsh fritillary as a result of adjacent construction works has the potential to be a significant effect to the population at the County scale.</p> <p><b>Loss of Suitable Breeding Habitat</b></p> <p>Given that high quality and existing breeding habitat for marsh fritillary has been avoided, and the Proposed Wind Farm footprint contains only some areas of lower quality, fragmented and less structurally developed areas of devils bit scabious, it is considered that there is no potential for significant effect to marsh fritillary at the County scale. However, given the requirements of marsh fritillary populations on a small landscape scale due their narrow range where they occur, the loss of 0.2 ha of fragmented potential marsh fritillary habitat is considered, on a precautionary basis, to have the potential to be significant at the local scale.</p>
<p><b>Mitigation</b></p>	<p><b>Mitigation by Design</b></p> <ul style="list-style-type: none"> <li>➤ The Proposed Wind Farm has been specifically designed to minimise direct impacts on identified marsh fritillary within the Proposed Wind Farm site. This was achieved through an early-stage ecological constraints study informed by field surveys and habitat mapping. The Proposed Wind Farm layout was thereby altered where possible through the iterative design process to minimise loss of marsh fritillary breeding habitat as well as significant areas of potential breeding habitat (i.e., large areas containing devils bit scabious).</li> <li>➤ Consequently, the Proposed Wind Farm permanent footprint is over 50m from the main populations of marsh fritillary identified within the Site.</li> </ul> <p><b>Direct Effects/ Mortality</b></p> <p>Construction works will occur within approximately 50m of identified marsh fritillary populations west of Turbine 3 and the associated proposed road infrastructure. The following mitigations will be applied at these construction locations:</p> <ul style="list-style-type: none"> <li>➤ A pre-commencement survey for marsh fritillary larvae will be undertaken at the suitable time of year in advance of construction throughout footprint areas of the Proposed Wind Farm.</li> </ul>

	<ul style="list-style-type: none"> <li>➤ If active larval webs are recorded within the Proposed Project footprint, these webs will be translocated by a suitably qualified ecologist to adjacent suitable existing foraging habitat outside of the Proposed Project footprint. This will be achieved by translocating a sod of earth with entire, intact devil's bit scabious plants upon which the larvae are feeding.</li> <li>➤ Larval webs and associated food plants would only be translocated by the ECoW to existing breeding areas.</li> <li>➤ Existing breeding areas will be fully fenced off with a minimum exclusion zone distance of 5 metres near Turbine 3.</li> <li>➤ ECoW supervision will be required for construction of components near existing breeding areas (Turbine 3 and the associated proposed access road infrastructure).</li> <li>➤ Where suitable marsh fritillary habitat occurs in close proximity to Proposed Wind Farm infrastructure, side casting of material will be to the opposite side of the proposed infrastructure to where the suitable habitat occurs.</li> </ul> <p><b>Dust Mitigation</b></p> <p>The following mitigation applies to construction areas within 20m of recorded marsh fritillary larval webs (in line with Table 4 of Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction 2024):</p> <ul style="list-style-type: none"> <li>➤ Groundworks (i.e. works with potential to create dust) associated with Turbine 3 will be fully supervised by an ECoW.</li> <li>➤ The ECoW will regularly monitor adjacent marsh fritillary larval web areas on a daily basis for potential signs of dust deposition or any other habitat degradation. Dust level thresholds and weather will also be monitored.</li> <li>➤ If any signs of habitat degradation are noted, the dust-producing works will be immediately halted and further mitigation to protect larval web areas from dust will be implemented in advance of resuming work.</li> <li>➤ The ECoW will have power to halt construction works if required as outlined above.</li> <li>➤ Standard dust suppression measures are outlined in Chapter 10: Air, in addition to measures outlined in the CEMP (<b>Appendix 4-2</b>).</li> </ul> <p><b>Loss of Suitable Breeding Habitat</b></p> <p>As described above, the Proposed Project will result in the loss of approx. 0.2 ha of potentially suitable marsh fritillary habitat. As part of the BEMP proposed as part of the Project (<b>Appendix 6-1</b>) it is proposed to manage Wet grassland (GS4) habitat throughout the Site. In addition, it is also proposed to implement monitoring of existing marsh fritillary breeding areas within the Proposed Wind Farm site.</p> <p>Full details on habitat establishment and monitoring are provided in the BEMP.</p>
<p><b>Residual Effect following Mitigation</b></p>	<p>With the above mitigation in place, there is no potential for significant residual effect to marsh fritillary.</p>

## 6.5.3 Assessment of Significant Effects During Operational Phase

### 6.5.3.1 Effects on Habitats during Operation

The operation of the Proposed Project will not result in any additional loss of habitats considered as KERs and as such, there is no potential for any significant effects in this regard. These habitats are not considered to be KERs in the context of the operation of the Proposed Project.

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

#### 6.5.3.1.1 Assessment of Potential effects on Groundwater, Surface Watercourses and Sensitive Aquatic Faunal Species during Operation

Table 6-21 Assessment of potential effects on rivers, streams and sensitive aquatic faunal species during operation.

<p><b>Description of Effect</b></p>	<p>This section assesses the potential for significant effects on aquatic receptors including aquatic habitats (i.e. watercourses), salmonids, otter, lamprey, coarse fish, white-clawed crayfish, European eel, aquatic invertebrates, molluscs (including Freshwater Pearl Mussel) and other aquatic species during the operation of the Proposed Project.</p> <p>The Proposed Project has been designed to minimise impacts on the receiving environment and maximises the use of existing access roads at the Site. Consequently, the Proposed Wind Farm footprint is predominantly located in areas of modified habitats, associated with the existing access road and conifer plantation.</p> <p>The relatively small-scale increase in the amount of hard standing associated with the proposed infrastructure has the potential to result in faster water runoff from the Proposed Wind Farm site to the surrounding watercourses. This may have the indirect effect of causing erosion, which could lead to deterioration of surface water and supporting habitat quality as a result of sedimentation. Additionally, there is the potential for the faster run off of any pollutants that may be associated with the operation of the Proposed Project, including hydrocarbons associated with the operational maintenance, potentially impacting on supporting aquatic faunal habitats.</p> <p>The impacts on water quality during operation are fully described in Chapter 9 (Hydrology &amp; Hydrogeology) of this EIAR and are discussed here specifically in relation to biodiversity.</p>
<p><b>Assessment of Significance prior to mitigation</b></p>	<p>Given the minor increase in hardstanding as a result of the Proposed Project, significant effects on water quality are not anticipated at any geographic scale during the operation of the Proposed Project.</p> <p>Whilst no significant effects on water quality are anticipated, potential for effects on water quality associated with the operational phase drainage of the Proposed Wind Farm has been fully mitigated through appropriate design and mitigation as fully described in Section 9.5.3 of Chapter 9 (Hydrology &amp; Hydrogeology).</p>
<p><b>Mitigation</b></p>	<p>Chapter 9 (Hydrology and hydrogeology) of the EIAR assess the potential for significant effects on water quality as a result of the following pathways during operation:</p> <ul style="list-style-type: none"> <li>➤ Potential Effects from the Replacement of Natural Surface with Low Permeability Surfaces</li> <li>➤ Potential Effects from Runoff</li> <li>➤ Potential Effects on WFD Status</li> </ul>

<b>Residual Effect following Mitigation</b>	<p>The operational phase drainage system of the Proposed Project will be installed and constructed in conjunction with the road and hardstanding construction work as described in Section 9.5.3 of Chapter 9 and as shown on the drainage drawings (<b>Appendix 4-3</b>) submitted with this planning application.</p> <p>With regards potential impacts on water quality, and thus aquatic receptors, as a result of the runoff during operations, the mitigations provided in Sections 9.5.2 and 9.5.3 of Chapter 9 will ensure all surface water runoff from upgraded roads and new road surfaces (including hardstand and turbine base areas) will be captured and treated prior to discharge/release. Settlement ponds, checks dams and buffered outfalls will prevent roads acting as preferential flow paths by providing attenuation and water quality treatment.</p>
<b>Residual Effect following Mitigation</b>	<p>Following the successful implementation of the mitigation measures outlined above, no potential for significant effect on water quality or aquatic receptors has been identified at any geographic scale, as a result of the operation of Proposed Project.</p>

### 6.5.3.2 Effects on Fauna during Operation

The operation of the Proposed Project will not result in any additional loss of fauna habitats and as such, there is no potential for any significant effects in this regard.

There is no potential for significant negative effects on terrestrial faunal KERs during the operational phase of the Proposed Project. The Proposed Project footprint maximises the existing infrastructure within the Proposed Wind Farm site and there will be minimal requirement for operational works along the Proposed Grid Connection underground cabling route. Any maintenance works associated with the operation of the project will be confined to the Proposed Project footprint.

Given the proposed minimal lighting, no significant disturbance effects as a result of lighting on any faunal species is anticipated.

Any proposed lighting around the Proposed Wind Farm site will be designed in accordance with the Institute of Lighting Professionals Guidance Note 08/23 Bats and artificial lighting at night. Operational lighting will be confined to the site of the proposed substation. Additionally, there will be some illumination of the turbines in the form of aviation lighting. Post-construction monitoring will be carried out to assess any potential changes in bat activity patterns and collision risk.

It should be noted that no significant habitat for salmonids, lamprey, freshwater pearl mussel, European eel, or other aquatic species was recorded within the footprint of the Proposed Project. Additionally, all proposed turbine bases and associated site infrastructure lie outside the 50m buffer zone, where feasible, from the watercourses within the Proposed Wind Farm site. The potential for significant effects on aquatic species is restricted to indirect effects on their habitat resulting from water pollution. This has been assessed in Section 6.5.3.1.1 and is not repeated below.

Potential for effects on bat species resulting from the operation of the Proposed Project was identified and therefore, bat species are discussed and assessed in relation to the operational phase below.

#### 6.5.3.2.1 Assessment of Potential Effects on Bats during Operation

*Table 6-22 Assessment of potential effects on bats during operation.*

<b>Description of Effect</b>	<p>The Proposed Project has been designed to minimise impacts on the receiving environment and maximises the use of existing infrastructure at the Site including internal access tracks. The Proposed Project footprint is dominated by modified habitats associated with the existing infrastructure and conifer plantation.</p> <p>A full impact assessment for bats is provided in the Bat Survey Report in <b>Appendix 6-2</b> and is summarised below.</p> <p>As per SNH Guidance, wind farms present four potential risks to bats:</p> <ul style="list-style-type: none"> <li>➤ Collision mortality, barotrauma and other injuries;</li> <li>➤ Loss or damage to commuting and foraging habitat;</li> <li>➤ Loss of, or damage to, roosts;</li> <li>➤ Displacement of individuals or populations.</li> </ul> <p>No significant effects in relation to 1) Loss or damage to commuting and foraging habitat; 2) Loss of, or damage to, roosts; and 3) Displacement of individuals or populations is anticipated as a result of the operation of the Proposed Project.</p> <p><b>Collision mortality, barotrauma, and other injuries</b></p> <p>Activity levels for low-risk species at the Site which included <i>Myotis</i> species and brown long eared bat. As per SNH guidance, these species are not identified as being particularly vulnerable to collision mortality. Given the low levels of activity recorded, no significant effects are anticipated.</p>
------------------------------	---

<p><b>Assessment of Significance prior to mitigation</b></p>	<p>The following high-risk species were recorded during the dedicated surveys:</p> <ul style="list-style-type: none"> <li>&gt; Leisler’s bat,</li> <li>&gt; Common pipistrelle,</li> <li>&gt; Soprano pipistrelle,</li> <li>&gt; Nathusius’ pipistrelle.</li> </ul> <p>Site-level collision risk for high collision risk bat species was typically <b>Low to Medium</b>. Overall bat activity levels were typical of the nature of the Site, which is predominantly conifer plantations and agricultural grassland. During manual transect surveys, the majority of activity recorded was that of common pipistrelle. Several detectors recorded High median activity levels for common pipistrelle and soprano pipistrelle during 2023 and 2024, as detailed in <b>Appendix 6-2</b>. While High median activity was recorded, it is noted that habitats at these locations would have been altered during the construction phase of the Proposed Project with the required implementation of the bat buffers.</p>
<p><b>Mitigation</b></p>	<p>A potential for long-term negative effects was identified for bats due to the <b>Low to Medium</b> collision risk for high-risk bat species. The potential unmitigated effects on these high-risk species as a result of their potential interaction with wind turbines are considered significant at a local geographic scale only.</p> <p>No significant effects are anticipated at any other geographic scale.</p> <p>In order to reduce the value of the habitat for bat species in the areas surrounding the turbines, a buffer of at least 50m between the tip of the blade and any trees or other tall vegetation that could provide high quality foraging habitat for bat species will be implemented.</p> <p>Detailed mitigation measures in relation to bats is provided in Section 6 of the Bat Survey Report in <b>Appendix 6-2</b> and summarised below. Mitigation measures are proposed together with post-construction monitoring:</p> <ul style="list-style-type: none"> <li>&gt; Introduce felling buffers around turbines</li> <li>&gt; Implement blade feathering as a standard</li> <li>&gt; Lighting and noise restrictions</li> <li>&gt; Implement curtailment, as required, on proposed turbines which recorded high median activity levels.</li> <li>&gt; A minimum of three years operational monitoring to assess changes in bat activity patterns post construction and to monitor the implementation of the mitigation strategy.</li> <li>&gt; Adaptive mitigation strategy based on the results of the post-construction monitoring.</li> </ul> <p>In addition, as per Section 6.2 of the Bat Survey Report, an adaptive bat monitoring plan will be implemented for three years post construction, to assess the ongoing health on local population of bats within the Site.</p> <p>Full details of all the above mitigations are provided in the Bat Survey Report.</p>
<p><b>Residual Effect following Mitigation</b></p>	<p>Following the implementation of the monitoring and mitigation described above, there is no potential for significant effects on bat species as a result of the operational phase of Proposed Project.</p>

## 6.5.4 Assessment of Significant Effects During Decommissioning Phase

The proposed turbines are expected to have a lifespan of approximately 35 years. Following the end of the operational life of the Proposed Wind Farm, the wind turbines may be retained and the operational life extended or replaced with a new set of turbines, subject to planning permission being obtained. In the event that neither of the above options are implemented, the Proposed Wind Farm will be decommissioned fully as agreed with the Planning Authority. The onsite substation will remain in place as it will be under the ownership of the Eirgrid and will form a permanent part of the national electricity grid.

Decommissioning of the Proposed Project is discussed in Section 4.10 of Chapter 4 (Description of the Proposed Project) and is fully detailed in the Decommissioning Plan in **Appendix 4-6**.

The same mitigation to prevent significant impacts on water quality and associated aquatic fauna and other terrestrial fauna as a result of disturbance during construction will be applicable to the decommissioning phase. It can be concluded that following the implementation of preventative mitigation, there is no potential for the decommissioning of the Proposed Project to result in significant effects on biodiversity.

## 6.5.5 Effects on Designated Sites

### 6.5.5.1 Impacts on European Sites

The Proposed Grid Connection component of the Proposed Project has overlap with the Lower River Suir SAC and Lower River Shannon SAC. Additionally, watercourses within the Site have hydrological connectivity to the below listed European Sites, upon which a potential for likely significant effect was identified:

- Lower River Suir SAC (002137)
- Philipston Marsh SAC (001847)
- Lower River Shannon SAC (002165)
- Slievefelim to Silvermines Mountains SPA (004165)
- River Shannon and River Fergus Estuaries SPA (004077)

In relation to European sites, an Appropriate Assessment Screening Report and Natura Impact Statement (NIS) have been prepared to provide the competent authorities with the information necessary to complete an Appropriate Assessment for the Proposed Project in compliance with Article 6(3) of the Habitats Directive.

As per the EPA Guidance (2022), “A biodiversity section of an EIAR, for example, should not repeat the detailed assessment of potential effects on European sites contained in documentation prepared as part of the Appropriate Assessment process, but it should refer to the findings of that separate assessment in the context of likely significant effects on the environment, as required by the EIA Directive”. This section provides a summary of the key assessment findings with regard to potential impacts on European sites.

The Stage 1 Screening Assessment concluded as follows:

*‘It cannot be excluded beyond reasonable scientific doubt, in view of best scientific knowledge, on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the Proposed Project, individually or in combination with other plans and projects, would be likely to have a significant effect on the following European Sites:*

- Lower River Suir SAC (002137)
- Philipston Marsh SAC (001847)
- Lower River Shannon SAC (002165)
- Slievefelim to Silvermines Mountains SPA (004165)
- River Shannon and River Fergus Estuaries SPA (004077)

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

The findings presented in the NIS are that:

*‘Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction and operation of the Proposed Project does not adversely affect the integrity of European sites.*

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

### 6.5.5.2 Impacts on Nationally Designated Sites

Impacts on nationally designated sites including NHAs and pNHAs are considered in this section of the report.

The following pNHAs were identified to be within the Likely Zone of Influence of the Proposed Project as they have direct overlap with the Site or are hydrologically connected to either the Proposed Wind Farm site or the Proposed Grid Connection Route:

- Aughnaglanny Valley pNHA [000948]
- Kilbeg Marsh pNHA [001848]
- Philipston Marsh pNHA [001847]
- Inchinquilib and Dowlings Woods pNHA [000956]
- Dundrum Sanctuary pNHA [000950]
- Annacarty Wetlands pNHA [000639]
- Ballyneill Marsh pNHA [001846]
- Fergus Estuary and Inner Shannon, North Shore pNHA [002048]
- Inner Shannon Estuary - South Shore [000435]

With the implementation of the mitigations and best practice procedures for both the construction and operational phases of the Proposed Project, as described in Table 6-15 and 6-21, respectively, which aim to negate potential impacts from deterioration of surface water quality, as well as those in Chapter 9 (Hydrology & Hydrogeology) and in the SWMP (**Appendix 4-3**), no significant impacts on these National Sites are anticipated.

## 6.6 Cumulative Impact Assessment

The Proposed Project was considered in combination with other plans and projects in the area that could result in cumulative impacts on the KERs identified in Table 6-11 of this report, including European and Nationally Designated Sites. This included a review of online Planning Registers and served to identify past, present and future plans and projects, their activities and their predicted environmental effects. The projects considered are listed in **Appendix 2-4** of Chapter 2 (Background to the Proposed Project) of this EIAR.

### 6.6.1 Assessment of Plans

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

- > Tipperary County Development Plan 2022-2028
- > Limerick Development Plan 2022-2028
- > Ireland's 4th National Biodiversity Action Plan 2023-2030
- > Regional Spatial & Economic Strategy for the Southern Region, Project Ireland 2040

The review focused on policies and objectives that relate to nationally designated sites for nature conservation, biodiversity and protected species. An overview of the search results with regard to plans is provided in Table 6-23.

Potential for cumulative impacts on European sites are considered within the Natura Impact Statement that accompanies this application.

Table 6-23 Assessment of Plans

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Development Compliance with Policy
<p><b>Tipperary County Development Plan 2022 – 2028</b></p>	<p><b>SO-1:</b> To support the just transition to a climate resilient, biodiversity-rich, environmentally sustainable and climate-neutral economy.</p> <p><b><u>Policies</u></b></p> <p><b>11 - 1</b> In assessing proposals for new development to balance the need for new development with the protection and enhancement of the natural environment and human health. In line with the provisions of Article 6(3) and Article 6 (4) of the Habitats Directive, no plans, programmes, etc. or projects giving rise to significant cumulative, direct, indirect or secondary impacts on European sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan (either individually or in combination with other plans, programmes, etc. or projects).</p> <p><b>11 - 2</b> Ensure the protection, integrity and conservation of European Sites and Annex I and II species listed in EU Directives. Where it is determined that a development may individually, or cumulatively, impact on the integrity of European sites, the Council will require planning applications to be accompanied by a NIS in accordance with the Habitats Directive and transposing Regulations, ‘Appropriate Assessment of Plans and Projects, Guidelines for Planning Authorities’, (DEHLG 2009) or any amendment thereof and relevant Environmental Protection Agency (EPA) and European Commission guidance documents.</p> <p><b>11 - 3</b> Ensure the conservation and protection of existing, and proposed NHAs, and to ensure that Proposed Developments within or in close proximity to an existing or proposed NHA would not have a significant adverse impact on the status of the site as described</p> <p><b>11 - 4 (a)</b> Conserve, protect and enhance areas of local biodiversity value, habitats, ecosystems and ecological corridors, in both urban and rural areas, including rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands in accordance with the objectives of the National Biodiversity Plan (DCHG 2017)</p>	<p>The Development Plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity, protected species and designated sites.</p> <p>The Proposed Project has been designed in order to avoid likely significant effect on biodiversity. Where the potential for adverse effect on biodiversity has been identified, mitigation will be implemented as prescribed within this chapter to ensure that there is no significant impact.</p> <p>Where pathways for effects on Designated Sites have been identified, mitigation shall also be implemented to ensure that there are no significant effects.</p> <p>No potential for negative cumulative impacts when considered in conjunction with the Proposed Project were identified.</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Development Compliance with Policy
	<p>and any review thereof. <b>(b)</b> Safeguard, enhance and protect water bodies (rivers/canals/lakes) and river walks and to provide links, where possible, to wider green infrastructure networks as an essential part of the design process. <b>(c)</b> Require an ‘Ecosystems Services’ approach for new development to incorporate nature-based solutions to SUDS, in so far as practical, as part of water management systems, public realm design and landscaping, in line with best practice. <b>(d)</b> Where trees or hedgerows are of particular local value, the Council may seek their retention, or where retention is not feasible, their replacement and will seek a proactive focus on new tree-planting as part of new development</p> <p><b>11 - 5</b> Ensure that new developments proposed in or near ‘Ground Water Protection Schemes’ and ‘Zones of Contribution’ which contribute to public water supplies, do not result in a significant negative impact on the integrity, function and management of these important assets.</p> <p><b>11 - 6</b> Ensure the integration of river corridors with green infrastructure in settlements in line with the ‘Planning for Watercourses in the Urban Environment’ (Inland Fisheries Ireland, 2020).</p> <p><b>11 - 7 a)</b> Ensure the protection of water quality in accordance with the EU WFD and support the objectives and facilitate the implementation of the associated Programme of Measures of the River Basin Management Plan 2018-2021 and any successor. This includes contributing towards the protection of Blue-Dot catchments and drinking water resources. Also, have cognisance of the EU’s Common Implementation Strategy Guidance Document No. 20 and 36 which provide guidance on exemptions to the environmental objectives of the WFD. <b>b)</b> Support an integrated and collaborative approach to catchment management in accordance with the River Basin Management Plan 2018-2021 and any successor. <b>c)</b> Require an undisturbed edge or buffer zone to be maintained, where appropriate, between new developments and riparian zones of water bodies to maintain the natural function of existing ecosystems associated with water courses and their riparian zones, and to enable sustainable public access</p> <p><b>11 - 8</b> Provide for the sustainable development of fisheries, in compliance with the Habitats and Birds Directives, and other ecological protection objectives. New infrastructure should be positioned at already modified locations where feasible; and sedimentation and siltation issues should be considered, with floating infrastructure used where feasible. Fishery related developments may necessitate the preparation of a Visitor/Habitat Management Plan that includes requirements in</p>	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Development Compliance with Policy
	<p>relation to: sustainable fishing practices that would not affect the ecological site integrity; and invasive species</p> <p><b>11 - 13</b> Seek to control the spread of invasive plant and animal species, including consideration of potential pathways for invasive species spread, i.e., watercourses.</p> <p><b>11 - 15</b> Support the diversification of peatlands, whilst ensuring the protection of their ecological, archaeological, cultural and educational significance in line with the National Peatlands Strategy (DAHG 2015). The Council may request landowners to prepare a 'Peatland Master Plan', especially for areas of industrial cut-over peatland, and will work with all stakeholders involved in the process in this regard. Any Masterplan should identify any significant tourism, amenity and recreation potential of these lands</p> <p><b>11 - D (a)</b> Support the objectives of the All-Ireland Pollinator Plan 2021- 2025 by incorporating pollinator friendly native trees and plants within grass verges along public roads and existing and future greenways, new hedgerows, public parks and public open spaces in towns and villages, including part of mixed use and residential developments. <b>(b)</b> Prepare a 'Pollinator Action Plan' for Tipperary over the lifetime of the Plan, having consideration to the All-Ireland Pollinator Plan, 2021 - 2025.</p> <p><b>11 - G</b> Apply best practice in sustainable environmental standards in the design and development of collaborative and/or public sector development in Tipperary, including: <b>(a)</b> Ensure that biodiversity issues are considered at the earliest possible stages of plan making; <b>(b)</b> Ensure that plans and strategies comply with nature conservation legislation and policy as required (fulfil SEA and AA requirements); and <b>(c)</b> Carry out ecological impact assessment of plans and strategies as appropriate.</p>	
<p><b>Limerick Development Plan 2022 – 2028</b></p>	<p><b>Policy EH P1 Protection of Natural Heritage and Biodiversity</b></p> <p>It is a policy of the Council to: a) Protect and conserve Limerick's natural heritage and biodiversity, in particular, areas designated as part of the European Sites Natura 2000 network, such as Special Protection Areas (SPAs) and Special Areas of Conservations (SACs), in accordance with relevant EU Directives and national legislation and guidelines. b) Maintain the conservation value of all Natural Heritage Areas and proposed Natural Heritage Areas (pNHAs) for the benefit of existing and future generations.</p>	<p>The Development Plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity, protected species and designated sites.</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Development Compliance with Policy
	<p><b>Objective EH O1 Designated Sites and Habitats Directive</b> It is an objective of the Council to ensure that projects/plans likely to have significant effects on European Sites (either individually or in combination with other plans or projects) are subject to an appropriate assessment and will not be permitted under the Plan unless they comply with Article 6 of the Habitats Directive. The Council, will through the planning enforcement process where applicable, seek to restore the ecological functions of designated sites, where they have been damaged through inappropriate development.</p> <p><b>Objective EH O11 Invasive Species</b> It is an objective of the Council to:</p> <ul style="list-style-type: none"> <li>a) Work with and facilitate the work of agencies addressing the issue of terrestrial and aquatic invasive alien species (IAS), by implementing biosecurity measures, selected control measures and surveys, where appropriate.</li> <li>b) Address the presence of invasive alien species on derelict sites under the provisions of the Derelict Sites Act through the preparation of a management and eradication plan for these species.</li> <li>c) Require the submission of a control and management program for the particular invasive species as part of the planning process, if developments are proposed on sites where invasive species are present.</li> <li>d) Employ biosecurity measures to prevent the spread of invasive alien species and disease and to insist that all such measures are employed on all development sites.</li> </ul> <p><b>TO 10-2 Wild Atlantic Way and Irelands Ancient East</b> Continue to actively engage, invest, encourage and promote the development of the Wild Atlantic Way and Irelands Ancient East regional brands through sustainable tourism, which will enable visitors to have enjoyable experiences while having regard for the cultural, built and natural heritage, and environmental impacts, including the protection of Natura 2000 sites.</p> <p><b>WM 11-1: EU Water Framework Directive and the River Basin Management Plan</b> f) Support the prioritisation of the provision of water services infrastructure in:</p>	<p>The Proposed Project has been designed in order to avoid likely significant effect on biodiversity. Where the potential for adverse effect on biodiversity has been identified, mitigation will be implemented as prescribed within this chapter to ensure that there is no significant impact.</p> <p>Where pathways for effects on Designated Sites have been identified, mitigation shall also be implemented to ensure that there are no significant effects.</p> <p>No potential for negative cumulative impacts when considered in conjunction with the Proposed Project were identified.</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Development Compliance with Policy
	<ul style="list-style-type: none"> <li>All settlements where services are not meeting current needs, are failing to meet the requirements of the Urban Wastewater Treatment Directive, and where these deficiencies are               <ul style="list-style-type: none"> <li>having negative impacts on Natura 2000 sites.</li> </ul> </li> </ul> <p><b>ET 13-7: Open to Consideration</b> Commercial wind energy development is open to consideration in these areas where proposals can avoid adverse impacts on:</p> <ul style="list-style-type: none"> <li>Natura 2000 Sites (SPA's and SAC's), Natural Heritage Areas (NHA's), proposed Natural Heritage Areas and other sites and locations of significant ecological value</li> </ul> <p><b>GI 14-1: Countywide Green and Blue Infrastructure Objectives</b></p> <p>b) Develop the green infrastructure network (including green corridors) to ensure the conservation and enhancement of biodiversity, including the protection of Natura 2000 European Sites, the provision of accessible parks, open spaces and recreational facilities (particularly within settlements), the sustainable management of water, the maintenance of landscape character and the protection and enhancement of architectural and archaeological heritage.</p>	
<p><b>Ireland's 4<sup>th</sup> National Biodiversity Action Plan 2023-2030</b></p>	<ul style="list-style-type: none"> <li><b>Objective 1: Adopt a Whole-of-Government, Whole of-Society Approach to Biodiversity.</b> Proposed actions include capacity and resource reviews across Government; determining responsibilities for the expanding biodiversity agenda providing support for communities, citizen scientists and business; and mechanisms for the governance and review of this National Biodiversity Action Plan.</li> <li><b>Objective 2: Meet Urgent Conservation and Restoration Needs.</b> Supporting actions will build on existing conservation measures. Efforts to tackle Invasive Alien Species will be elevated. The protected area network will be expanded to include the Marine Protected Areas. The ambition of the EU Biodiversity Strategy will be considered as part of an evolving work programme across Government.</li> <li><b>Objective 3: Secure Nature's Contribution to People.</b> Actions highlight the relationship between nature and people in Ireland. These include recognising the tangible and intangible values of biodiversity, promoting nature's importance to our culture and heritage and recognising how biodiversity supports our society and our economy.</li> <li><b>Objective 4: Enhance the Evidence Base for Action on Biodiversity.</b> This objective focuses on biodiversity research needs, as well as the development and strengthening of long-term monitoring</li> </ul>	<p>The action plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity, protected species and designated sites.</p> <p>The Proposed Project has been designed in order to avoid likely significant effect on biodiversity. Where the potential for adverse effect on biodiversity has been identified, mitigation will be implemented as prescribed within this chapter to ensure that there is no significant impact.</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Development Compliance with Policy
	<p>programmes that will underpin and strengthen future decision-making. Action will also focus on collaboration to advance ecosystem accounting that will contribute towards natural capital accounts.</p> <ul style="list-style-type: none"> <li>• <b>Objective 5: Strengthen Ireland’s Contribution to International Biodiversity Initiatives.</b> Collaboration with other countries and across the island of Ireland will play a key role in the realisation of this Objective. Ireland will strengthen its contribution to international biodiversity initiatives and international governance processes, such as the United Nations Convention on Biological Diversity.</li> </ul>	<p>Where pathways for effects on Designated Sites have been identified, mitigation shall also be implemented to ensure that there are no significant effects.</p> <p>No potential for negative cumulative impacts when considered in conjunction with the Proposed Project were identified.</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Development Compliance with Policy
<p><b>Regional Spatial and Economic Strategy for the Southern Region, Project Ireland 2040</b></p>	<p><b>Regional Policy Objective 1:</b></p> <p><b>b</b> - The RSES seeks to protect, manage, and through enhanced ecological connectivity, improve the coherence of the Natura 2000 Network in the Southern Region.</p> <p><b>c</b> - RSES support for other plans/ programmes (and initiatives arising) is on the basis of appropriate SEA, SFRA, EIA and AA processes being undertaken in order to ensure the avoidance of adverse effects on European Sites and ensure implementation of mitigation measures where required</p> <p><b>d</b> - Development Plans shall include an objective for the protection of European sites and Natural Heritage Areas (designated and notified proposed NHAs).</p> <p><b>Regional Policy Objective 38.c</b> - Support initiatives that retrofit environmental amenities to address adverse effects on biodiversity and the environment.</p> <p><b>Regional Policy Objective 117</b> - It is an objective to avail of opportunities to enhance biodiversity and amenity and to ensure the protection of environmentally sensitive sites and habitats, including where flood risk management measures are planned. Plans and projects that have the potential to negatively impact on Natura 2000 sites are subject to the requirements of the Habitats Directive.</p>	<p>The strategy was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity, protected species and designated sites.</p> <p>The Proposed Project has been designed in order to avoid likely significant effect on biodiversity and designated sites.</p> <p>Where pathways for effects on Designated Sites have been identified, mitigation shall be implemented to ensure that there are no significant effects.</p> <p>No potential for negative cumulative impacts when considered in conjunction with the Proposed Project were identified.</p>

## 6.6.2 Assessment of Projects

As described in Section 2.9 of the EIAR, relevant projects have been assessed in-combination with the Proposed Project and include planning applications in the vicinity of the Site, within the likely zone of influence of all habitats and species considered in this report and include other wind energy applications within the wider area. These have not been repeated here to reduce the duplication of information within this EIAR. However, they have been fully considered in the assessment with further detail provided below. In addition, Section 6.6.6 concludes on their potential for impact on biodiversity. Table 6-24 provides the cumulative study areas for individual EIAR topics that are also relevant in relation to ecological receptors i.e., hydrological connectivity is important for assessing potential for effects on designated sites. Potential for cumulative effects in relation to birds is assessed separately within Chapter 7 (Birds) of this EIAR.

*Table 6-24: Cumulative Study Areas in relation to ecological receptors (birds are assessed separately within Chapter 7 of this EIAR).*

Individual Topic	Maximum Extent	Justification
<b>Biodiversity (including bats)</b>	10 km from the Proposed Wind Farm (comprising of turbines and associated infrastructure)  200m from Proposed Grid Connection Route.  Consideration for the Biodiversity cumulative extent is also given to the Birds and Water Cumulative geographical boundaries.	Using the precautionary approach and given the nature and scale of the Proposed Project, the geographical boundary for terrestrial ecological aspects, i.e. habitats and species, is 10 km for cumulative assessment for the Proposed Wind Farm, and 200m from the Proposed Grid Connection Route.  In particular, this approach aligns with Nature Scot (2021) guidance: Bats and Onshore Wind Turbines.
<b>Water</b>	<b>Proposed Wind Farm:</b>  Multeen[East]_SC_010 and Suir_SC_060, sub-catchments for large infrastructural developments such as wind farms, energy and public transport developments. River Sub Basins for all smaller proposed, permitted or existing plans or projects (i.e. private and commercial type developments).  <b>Proposed Grid Connection Route:</b>  Within a 200m buffer zone of the Proposed Grid Connection Route.	Regional surface water catchments are used for cumulative impact assessment with regard large infrastructural developments such as wind farms, energy and public transport developments. The potential for cumulative effects for these developments likely exists on a regional catchment scale (i.e. significant works likely existing in several sub-basins). Therefore, other wind-farm developments are considered within the Multeen (East) and Suir sub-catchments for cumulative effects.  River Sub Basins are used for smaller developments (i.e. private & commercial type developments). These developments are not likely to present a significant cumulative impact risk on a regional catchment scale as any effects would likely be imperceptible as a result of the setback distances and localised nature of the

		<p>associated works. Given the nature and scale of the proposed works and the lack of hydrological cumulative impact potential beyond the river sub basin scale, the Water cumulative study area is defined by river sub basins in which the Proposed Wind Farm is located.</p> <p>Due to the narrow nature of the Proposed Grid Connection Route trench (0.6m wide and 1.2m deep), a 200m buffer zone is an appropriate scale when considering potential cumulative effects on the water environment.</p>
--	--	--

### 6.6.2.1 Other Wind Farm Projects

For the purposes of this cumulative assessment, wind farms within a 10-kilometre radius of the Proposed Project area were considered in further detail below, in line with NatureScot (2021) guidance. Details of wind farm projects within 10 km of the Proposed Project are provided in **Appendix 2-3** of this EIAR and are summarised below also in the context of terrestrial ecology. Fifteen wind farm developments were identified as being within the cumulative study boundary as outlined in Table 6-25 below. Potential for in-combination effects in relation to European sites are fully assessed in Section 8.1.3 in the NIS accompanying this application.

*Table 6-25 Wind farm projects considered to be within the cumulative study area (Biodiversity) of the Proposed Project.*

Wind Farm	Planning Status	Number of Turbines	Separation Distance (turbine to turbine)	County
Glencarbry 1 Wind Farm	Existing	7	c. 0.6 km	Co. Tipperary
Glenough Wind Farm	Existing	14	c. 2.4 km	Co. Tipperary
Glencarbry 2 Wind Farm	Existing	2	c. 2.7 km	Co. Tipperary
Cappawhite B Extension	Existing	9	c. 2.9 km	Co. Tipperary
Turaheen Lower Wind Farm	Existing	3	c. 3.2 km	Co. Tipperary
Holyford Wind Farm	Existing	3	c. 3.5 km	Co. Tipperary
Cappawhite A	Existing	8	c. 4 km	Co. Tipperary
Falleennafnoga Wind Farm	Existing	2	c. 4.3 km	Co. Tipperary
Garracummer Wind Farm	Existing	15	c. 4.4 km	Co. Tipperary
Mienvee Turbine	Existing	1	c. 4.7 km	Co. Tipperary
Turaheen Upper Turbine	Existing	1	c. 5.1 km	Co. Tipperary
Inchivara Turbine	Existing	1	c. 7.2 km	Co. Tipperary
Upperchurch Wind Farm	Existing	22	c. 7.5 km	Co. Tipperary
Milestone Wind Farm	Existing	3	c. 8 km	Co. Tipperary
Knocknastanna Wind Farm	Existing	4	c. 8.4 km	Co. Limerick

#### 6.6.2.1.1 Glencarbry 1 Wind Farm

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside Glencarbry Wind Farm (7 turbines) which is located 0.6 km north of the proposed turbines within the Proposed Wind Farm site was considered.

The Environmental Impact Assessment for Glencarbry Wind Farm concluded that no significant residual effects on designated sites, protected habitats or flora, in addition to fauna were anticipated as a result of the construction or operation of the Proposed Wind Farm. The habitats were concluded to not

be of significant value and primarily included pastoral land and conifer plantation. Some areas of heath of local value were present, however these areas were small and isolated.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project. Taking into consideration also the fact that no significant residual effects on biodiversity have been identified for the Proposed Project (post mitigation), significant cumulative effects on key ecological receptors are not anticipated.

#### 6.6.2.1.2 **Glenough Wind Farm**

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the Glenough Wind Farm (14 no. turbines) which is located c. 2.4 km north of the turbines within the Proposed Wind Farm site was considered.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential residual effects on ecological receptors was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely conifer plantations, mapped heath habitat, and agricultural grasslands) and the lack of significant residual impacts on biodiversity associated with the Proposed Project when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project. Taking into consideration also the fact that no significant residual effects on biodiversity have been identified for the Proposed Project (post mitigation), significant cumulative effects on key ecological receptors are not anticipated.

#### 6.6.2.1.3 **Glencarbry 2 Wind Farm**

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside Glencarbry Wind Farm (2 no. turbines) which is located 2.7 km north of the proposed turbines within the Proposed Wind Farm site was considered.

The Environmental Impact Assessment for Glencarbry Wind Farm concluded that no significant residual effects on designated sites, protected habitats or flora, in addition to fauna were anticipated as a result of the construction or operation of the wind farm. The habitats were concluded to not be of significant value and primarily included pastoral land and conifer plantation. Some areas of heath of local value were present, however these areas were small and isolated.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project. Taking into consideration also the fact that no significant residual effects on biodiversity have been identified for the Proposed Project (post mitigation), significant cumulative effects on key ecological receptors are not anticipated.

#### 6.6.2.1.4 **Cappawhite B Extension**

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the Cappawhite B Extension Wind Farm (9 turbine extension) which is located c. 2.9 km west of the turbines within the Proposed Wind Farm site was considered.

it was found that no rare or protected plant species were recorded within the study area. Existing aerial imagery suggests this wind farm is primarily located in areas of conifer plantation, mapped heath habitat, and agricultural grasslands. No rare or endangered mammals were confirmed on site. An area of blanket bog recorded was deemed to be of International Importance, although has been recognised as an area to be managed for biodiversity.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project. Taking into consideration also the fact that no significant residual effects on biodiversity have been identified for the Proposed Project (post mitigation), significant cumulative effects on key ecological receptors are not anticipated.

#### 6.6.2.15 **Turaheen Upper Wind Farm**

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the Cappawhite B Extension Wind Farm (3 no. turbines) which is located c. 3.2 km northeast of the turbines within the Proposed Wind Farm site was considered.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential residual effects on ecological receptors was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely conifer plantations, mapped heath habitat, and agricultural grasslands) and the lack of significant residual impacts on biodiversity associated with the Proposed Project when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project. Taking into consideration also the fact that no significant residual effects on biodiversity have been identified for the Proposed Project (post mitigation), significant cumulative effects on key ecological receptors are not anticipated.

#### 6.6.2.16 **Holyford Wind Farm**

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the Holyford Wind Farm project (3 no. turbines), which is located 3.5 km northwest of the turbines within the Proposed Wind Farm site was considered.

The Environmental Impact Assessment for Holyford Wind Farm concluded that owing to the relatively low ecological interests of the habitats within the site, and the absence of rare or vulnerable species of flora and fauna, it is considered that the proposed development would not have any significant adverse ecological impact. This is due to the development only affecting a limited area of the Site which mostly consisted of improved grassland.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project. Taking into consideration also the fact that no significant residual effects on biodiversity have been identified for the Proposed Project (post mitigation), significant cumulative effects on key ecological receptors are not anticipated.

#### 6.6.2.17 **Cappawhite A Wind Farm**

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the Cappawhite A Wind Farm (8 no. turbines) which is located c. 4 km west of the turbines within the Proposed Wind Farm site was considered.

It was determined that the greatest likely impacts arising from this development included the loss of habitat, disturbance to birds/mammals, and a risk of a deterioration of water quality. That said, none of these were considered to be significant provided the relevant outlined mitigation measures were implemented in the application.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project. Taking into consideration also the fact that no significant residual effects on biodiversity have been identified for the Proposed Project (post mitigation), significant cumulative effects on key ecological receptors are not anticipated.

#### 6.6.2.1.8 **Falleennafinoga Wind Farm**

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the Falleennafinoga Wind Farm project (2 no. turbines), which is located 4.3 km north of the turbines within the Proposed Wind Farm site was considered.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on ecological receptors available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely conifer plantations, mapped heath habitat, and agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project. Taking into consideration also the fact that no significant residual effects on biodiversity have been identified for the Proposed Project (post mitigation), significant cumulative effects on key ecological receptors are not anticipated.

#### 6.6.2.1.9 **Garracummer Wind Farm**

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the Garracummer Wind Farm project (15 no. turbines), which is located 4.4 km northwest of the turbines within the Proposed Wind Farm site was considered.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on ecological receptors was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely conifer plantations, mapped heath habitat, and agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project. Taking into consideration also the fact that no significant residual effects on biodiversity have been identified for the Proposed Project (post mitigation), significant cumulative effects on key ecological receptors are not anticipated.

#### 6.6.2.1.10 **Mienvee Turbine**

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the Mienvee Turbine project (1 no. turbine), which is located 4.7 km northwest of the turbines within the Proposed Wind Farm site was considered.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on ecological receptors was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely conifer plantations, mapped heath habitat, and agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project. Taking into consideration also the fact that no significant residual effects on biodiversity have been identified for the Proposed Project (post mitigation), significant cumulative effects on key ecological receptors are not anticipated.

#### 6.6.2.1.11 **Turraheen Upper Turbine**

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the Turraheen Upper Turbine project (1 no. turbine), which is located 5.1 km northeast of the turbines within the Proposed Wind Farm site was considered.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on ecological receptors was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely conifer plantations, and agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project. Taking into consideration also the fact that no significant residual effects on biodiversity have been identified for the Proposed Project (post mitigation), significant cumulative effects on key ecological receptors are not anticipated.

#### 6.6.2.1.12 **Inchivara Turbine**

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the Inchivara Turbine project (1 no. turbine), which is located 7.2 km north of the turbines within the Proposed Wind Farm site was considered.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on ecological receptors was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project. Taking into consideration also the fact that no significant residual effects on biodiversity have been identified for the Proposed Project (post mitigation), significant cumulative effects on key ecological receptors are not anticipated.

#### 6.6.2.1.13 **Upperchurch Wind Farm**

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the Upperchurch Wind Farm project (22 no. turbines), which is located 7.5 km north of the turbines within the Proposed Wind Farm site was considered.

The Ecological Impact Assessment for Upperchurch Wind Farm concluded that there will be no residual impacts on biodiversity as a result of the development. Based on the information available, significant cumulative impacts in combination with the Proposed Project were not anticipated. Existing aerial imagery suggests this wind farm is primarily located in areas of conifer plantation, mapped heath habitat, and agricultural grasslands.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project. Taking into consideration also the fact that no significant residual effects on biodiversity have been identified for the Proposed Project (post mitigation), significant cumulative effects on key ecological receptors are not anticipated.

#### 6.6.2.1.14 Milestone Wind Farm

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside Milestone Wind Farm (3 no. turbines) which is located c. 8 km north of the turbines within the Proposed Wind Farm site was considered.

The Environmental Impact Assessment for Milestone Wind Farm concluded that there will be an overall neutral and imperceptible on biodiversity as a result of the development. With the implementation of the mitigation measures outline in the Environmental Impact Statement, it was considered that this development adequately considered the ecology in its design. Existing aerial imagery suggests this wind farm is primarily located in areas of conifer plantation, mapped heath habitat, and agricultural grasslands.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project. Taking into consideration also the fact that no significant residual effects on biodiversity have been identified for the Proposed Project (post mitigation), significant cumulative effects on key ecological receptors are not anticipated.

#### 6.6.2.1.15 Knocknastanna Wind Farm

The potential for the Proposed Project to result in significant cumulative effects when assessed alongside the Knocknastanna Wind Farm project (4 no. turbines), which is located 8.4 km west of the turbines within the Proposed Wind Farm site was considered.

A search was made on the Tipperary County Council planning document viewer, however, no specific information regarding potential significant cumulative effects on ecological receptors was available for this wind farm. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography, namely agricultural grasslands) and the lack of significant residual impacts associated with the Proposed Project when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the Proposed Project. Taking into consideration also the fact that no significant residual effects on biodiversity have been identified for the Proposed Project (post mitigation), significant cumulative effects on key ecological receptors are not anticipated.

### 6.6.3 Cumulative Effects with Agriculture

Agricultural practices such as the movement of soil and the addition of fertilizers and pesticides can lead to nutrient losses and the entrainment of suspended solids in local surface watercourses. This can have a negative effect on local and downstream surface water quality.

In an unmitigated scenario the Proposed Project would have the potential to interact with these agricultural activities and contribute to a deterioration of downstream surface water quality through the emissions of elevated concentrations of suspended solids and ammonia.

However, the mitigation measures detailed in Section 9.5 of Chapter 9 for the construction, operation and decommissioning phases of the Proposed Project will ensure the protection of downstream surface water quality.

For these reasons, we consider that there will not be a significant cumulative effect associated with agricultural activities.

#### 6.6.4 Cumulative Effects with Commercial Forestry

The most common water quality problems arising from forestry relate to the release of sediment and nutrients to the aquatic environment and impacts from acidification. Forestry works can also give rise to modified stream flow regimes caused by associated land drainage.

However, the mitigation measures detailed for the construction, operation and decommissioning phases of the Proposed Project will ensure the protection of downstream surface water quality.

For these reasons we consider that there will not be a significant cumulative effect associated with commercial forestry activities.

#### 6.6.5 Cumulative Effects with one Off Housing Developments

A detailed cumulative assessment has been carried out for all planning applications (granted and awaiting decisions) within the cumulative assessment area described above.

There are applications for new dwellings or renovations of existing dwellings, as well as for the erection of farm buildings. Based on the scale of the works, their proximity to the Site and the temporal period of likely works, no cumulative effects will occur as a result of the Proposed Project (construction, operation and decommissioning phases).

#### 6.6.6 Assessment of Cumulative Effects

The residual construction, operational and decommissioning impacts of the Proposed Project are considered cumulatively with other plans and projects as described in Sections 6.6.1 and 6.6.2. Particular focus has been placed on those plans and projects that are in closest proximity to the Proposed Project and those that could potentially result in cumulative impacts on designated sites, surface water, habitats and species.

Following the detailed surveys undertaken and impact assessment provided in Section 6.5 (including mitigation measures), it is concluded that there will be no significant residual habitat loss, disturbance, deterioration of water quality associated with the Proposed Project and therefore it cannot contribute to any cumulative effect when considered in-combination with other plans and projects. The other wind farms in the area were considered (among other projects) but the Proposed Project has been deliberately designed to minimise the effects on biodiversity through the siting of the Proposed Wind Farm on habitats of low ecological value and an emphasis on protection of surface water features (and associated aquatic fauna) during construction of the Proposed Project. The Proposed Project also includes a Biodiversity Enhancement and Management Plan, which will offset any significant losses of important habitats as well as ensuring an overall net gain in biodiversity, ensuring no potential for individual or cumulative negative effects on biodiversity.

No significant effects as a result of the Proposed Project in relation to disturbance, displacement or mortality of faunal species has been identified. Therefore, there is no potential for the Proposed Project to contribute to any cumulative effect in this regard.

In the review of the projects and plans that was undertaken, no connection that could potentially result in additional or cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the Proposed Project.

## 6.7 Conclusion

Following consideration of the residual effects (following the implementation of the mitigation measures outlined in Section 6.5 above) it is concluded that the Proposed Project will not result in any significant effects on any of the identified KERs. No significant residual effects on receptors of International, National, County Importance or Local Importance (*higher value*) were identified.

The potential for effects on European Designated Sites is fully described in the Natura Impact Statement that accompanies this application. The NIS concludes that, in view of best scientific knowledge and on the basis of objective information, the Proposed Project either individually or in combination with other plans or projects, is not likely to have adverse effects on the European Sites that were assessed as part of the Appropriate Assessment process. Similarly, with the prescribed mitigations in place, there is no potential for impact on any nationally designated site.

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

## 6.8 EIA Classification Table

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

**Please note:**

The approach to assessing effects on biodiversity within this EIAR draws on guidance published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) and the Transport Infrastructure Ireland (TII, 2009). These documents provide ecologically focused frameworks for evaluating the significance of effects on biodiversity (habitats, species, and ecosystems). While the overall EIAR relies primarily on the Environmental Protection Agency (EPA, 2022) methodology for impact assessment, the CIEEM and TII guidance is considered more appropriate for biodiversity as it provides finer ecological resolution and reflects best practice within the discipline. Assessment methodology is fully discussed in Section 6.2.4 of Chapter 6.

Topic	Pre-Mitigation Effect	Mitigation Section Reference	Residual Effect	Significance
<b>Construction Phase</b>				
<b>Annex I Habitats</b>	<b>Direct Habitat Loss:</b> Potential significant effect at a county scale only.	Section 6.5.2.1.4	No potential for significant residual effects	Not Significant
<b>Watercourses and Sensitive Aquatic Faunal Species</b>	<b>Direct effects</b> Potential significant effects from local scale to International Importance.	Section 6.5.2.1.5	No potential for significant residual effects	Not Significant

	<p><b>Indirect effects</b></p> <p>Potential significant effects from local scale to International Importance.</p>			
Hedgerows/ Treelines	<p><b>Direct Loss:</b></p> <p>Potential significant effect at a local scale only.</p>	Section 6.5.2.1.2	No potential for significant residual effects	Not Significant
Bats	<p><b>Loss of, or Damage to, Roosts</b></p> <p>Potential significant effect at a local scale only.</p> <p><b>Loss or Damage to Commuting and Foraging Habitat</b></p> <p>Potential significant effect at a local scale only.</p> <p><b>Disturbance/Displacement of Individuals or Populations</b></p> <p>Potential significant effect at a local scale only.</p>	Section 6.5.2.2.1	No potential for significant residual effects	Not Significant
Otter	<p><b>Habitat Loss/Fragmentation</b></p> <p>Potential significant effects from local scale to International Importance.</p> <p><b>Disturbance, Mortality</b></p> <p>Potential significant effects from local scale to International Importance.</p> <p><b>Habitat Degradation</b></p> <p>Potential significant effects from local scale</p>	Section 6.5.2.2.3	No potential for significant residual effects	Not Significant

	to International Importance.			
<b>Badger</b>	<p><b>Habitat Loss/Fragmentation</b></p> <p>Potential significant effect at a local scale only.</p> <p><b>Disturbance/Mortality</b></p> <p>Potential significant effect at a local scale only.</p>	Section 6.5.2.2.2	No potential for significant residual effects	Not Significant
<b>Red squirrel &amp; pine marten</b>	<p><b>Habitat Loss/Fragmentation</b></p> <p>No potential for significant effects, at any geographical scale</p> <p><b>Disturbance/Mortality</b></p> <p>Potential significant effect at a local scale only.</p>	Section 6.5.2.2.4	No potential for significant residual effects	Not Significant
<b>Marsh Fritillary</b>	<p><b>Direct Effects/ Mortality</b></p> <p>Potential significant effect at a county scale only.</p> <p><b>Indirect Effects/ Dust Impacts</b></p> <p>Potential significant effect at a county scale only.</p> <p><b>Loss of Suitable Breeding Habitat</b></p> <p>Potential significant effect at a county scale only.</p>	Section 6.5.2.2.5	No potential for significant residual effects	Not Significant
<b>Operational Phase</b>				
<b>Watercourses and Sensitive Aquatic Faunal Species</b>	<p><b>Indirect effects</b></p> <p>Potential significant effects from local scale to International Importance.</p>	Section 6.5.3.1.1	No potential for significant residual effects	Not Significant

<b>Bats</b>	<p><b>Collision mortality, barotrauma, and other injuries</b></p> <p>Potential significant effect at a local scale only.</p>	Section 6.5.3.2.1	No potential for significant residual effects	Not Significant
<b>Decommissioning Phase</b>				
<b>Watercourses and Sensitive Aquatic Faunal Species</b>	<p><b>Indirect effects</b></p> <p>Potential significant effects from local scale to International Importance.</p>	Section 6.5.4	No potential for significant residual effects	Not Significant