

6. BIODIVERSITY

6.1 Introduction

This chapter assesses the likely significant effects (both alone and cumulatively with other plans and projects) that the Proposed Borrisbeg Renewable Energy Development (the “Proposed Project”) may have on Biodiversity, Flora and Fauna and sets out the mitigation measures proposed to avoid, reduce, or offset any potential significant effects that are identified. The residual impacts on biodiversity are then assessed. Particular attention has been paid to species and habitats of ecological importance. These include species and habitats with national and international protection under the Wildlife Acts 1976-2022 as amended, EU Habitats Directive 92/43/EEC. Impacts on avian receptors are considered in Chapter 7 of this EIAR. The full description of the Proposed Project is provided in Chapter 4 of this EIAR.

The chapter is structured as follows:

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

The following defined terms are utilised in this chapter:

- As detailed in section 1.1 of Chapter 1, the ‘Proposed Wind Farm’ which is the subject of this Section 37 application, and the ‘Proposed Grid Connection’, which will be subject to a Section 182A application, are assessed within this Chapter and are referred together as the ‘Proposed Project’.
- The Proposed Project falls within the ‘EIAR Study Boundary’ or ‘Site’ as shown in Figure 6-1.
- The term ‘development footprint’ is used to describe the lands that will be subject to the Proposed Project infrastructure and associated construction works.
- “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.

Requirements for Ecological Impact Assessment

European Legislation

The EU Habitats Directive (92/43/EEC) (together with the Birds Directive (79/409/EEC), as subsequently codified by Council Directive 2009/147/EC on the conservation of wild birds) forms the cornerstone of Europe's nature conservation within the EU. It is built around two pillars: the Natura 2000 network of protected sites and the strict system of species protection. The Habitats Directive protects over 1,000 animal and plant species and over 200 "habitat types" (e.g., special types of forests, meadows, wetlands, etc.), which are of European importance. The Habitats Directive and Birds Directive, which were transposed into Irish law through Part XAB of the Planning and Development Acts 2000-2019 (from a land use planning perspective) recognise the significance of protecting rare and endangered species of flora and fauna, and more importantly, their habitats.

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.

Council Directive 2009/147/EC on the conservation of wild birds (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 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, SPAs or cSPAs) has been carried out in the Appropriate Assessment Screening Report and Natura Impact Statement, which accompany this planning application. 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.

National Legislation

The Wildlife Act, 1976–2022 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. These species are therefore considered in this report as ecological receptors.

Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) are heritage sites that are designated for the protection of flora, fauna, habitats, and geological sites. Only NHAs are designated under the Wildlife (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.¹ 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

The National Biodiversity Action Plan 2017-2021 (Department of Culture, Heritage and the Gaeltacht, 2017) (the “Plan”) demonstrates Ireland’s continuing commitment to meeting and acting on its obligations to protect Ireland’s biodiversity for the benefit of future generations through a series of targeted strategies and actions. The main objective of the Plan is to bring biodiversity into the mainstream of policy and decision-making. Objective 1 (*Mainstream biodiversity into decision-making across all sectors*) of the Plan identifies the following relevant measures in relation to future developments:

- “Incorporate into legislation the requirement for consideration of impacts on biodiversity to ensure that conservation and sustainable use of biodiversity are taken into account in all relevant plans and programmes and relevant new legislation;
- Public and Private Sector relevant policies will use best practice in SEA, AA and other assessment tools to ensure proper consideration of biodiversity in policies and plans;
- All Public Authorities and private sector bodies move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure;
- Strengthen ecological expertise in local authorities and relevant Government Departments and agencies;
- Local Authorities will review and update their Biodiversity and Heritage Action Plans;
- Local Authorities will review and update their Development Plans and policies to include policies and objectives for the protection and restoration of biodiversity;
- Develop Green Infrastructure at local, regional and national levels and promote the use of nature based solutions for the delivery of a coherent and integrated network;
- Continue to produce guidance on the protection of biodiversity in designated areas, marine and the wider countryside for Local Authorities and relevant sectors;
- Integrate Natura 2000 and Biodiversity financial expenditure tracking into Government Programmes internal paying agency management procedures including linkage to the Prioritised Action Framework and this NBAP;
- Develop a Natural Capital Asset Register and national natural capital accounts by 2020, and integrate these accounts into economic policy and decision-making;
- Initiate natural capital accounting through sectoral and small-scale pilot studies, including the integration of environmental and economic statistics using the framework of the UN System of Experimental-Ecosystem Accounting (SEEA);
- Establish a national Business and Biodiversity Platform under the CBD’s Global Business Partnership;

¹ <https://www.npws.ie/protected-sites/nha> (accessed 12th September 2023).

- Ensure Origin Green produces tangible benefits for biodiversity with increased emphasis on conservation and restoration of biodiversity;
- Implement actions from Ireland’s Biodiversity Climate Change Sectoral Adaptation Plan;
- Identify and take measures to minimise the impact of incentives and subsidies on biodiversity loss, and develop positive incentive measures, where necessary, to assist the conservation of biodiversity;
- Establish and implement mechanisms for the payments of ecosystem services including carbon stocks, to generate increased revenue for biodiversity conservation and restoration;
- Develop and implement a National Biodiversity Finance Plan to set out in detail how the actions and targets of this NBAP will be delivered from 2017 and beyond; and
- Monitor the implementation of the Plan.”

In addition, the National Biodiversity Data Centre (2021) Pollinator-friendly management of Wind Farms 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 features 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 Mitigation and Enhancement Plan (BMEP) (see Appendix 6-4).

6.3 Relevant Guidance

The assessment methodology follows that described in the National Road Authority (NRA)’s Guidelines for Assessment of Ecological Impacts of National Road Schemes Rev 2 (NRA, 2009) (referred to hereafter as the NRA Ecological Impact Assessment Guidelines), and the survey methodology follows that described in the NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009). Although these survey methodologies relate to road schemes, these standard guidelines are recognised survey methodologies that ensure good practice regardless of the development type.

In addition, the following guidelines were consulted in the preparation of this document to inform the scope of the assessment as well as the structure and content of this report:

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, and Coastal (CIEEM, 2018, updated 2022).
- Pollinator-friendly management of Wind Farms. All-Ireland Pollinator Plan, Guidelines 12. National Biodiversity Data Centre Series No. 26, Waterford. April 2021.
- Bats and onshore wind turbines: survey, assessment, and mitigation. Version: August 2021 (updated with minor revisions). NatureScot (2021).
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022).
- Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment. Department of the Environment, Community and Local Government DoEHLG (2013).
- Guidelines for assessment of Ecological Impacts of National Road Schemes, (NRA, 2009).
- Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA, 2009).
- Environmental Assessment and Construction Guidelines (NRA, 2006).
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (Environmental Protection Agency (EPA), 2003).

- Guidelines on the information to be contained in Environmental Impact Statements (EPA, 2002).
- European Commission Guidance on the preparation of the Environmental Impact Assessment Report (2017)
- European Commission Guidance document on wind energy developments and EU nature legislation (2020).
- Wind Energy Development Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DOEHLG), 2006. (referred to as the 2006 WEDGs)
- Draft Revised Wind Energy Development Guidelines, DOEHLG 2019. (referred to as the 2019 draft WEDGs)

This assessment has been carried out in accordance with the Environmental Impact Assessment guidance as outlined in section 1.7, Chapter 1 of the EIAR.

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

- The International Convention on Wetlands of International Importance especially Waterfowl Habitat (Concluded at Ramsar, Iran on 2 February 1971)
- S.I. No. 272 of 2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009 and S.I. No. 722 of 2003 European Communities (Water 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).

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

- Tipperary County Development Plan 2022-2028
- National Biodiversity Action Plan 2017-2021
- Draft National Biodiversity Action Plan 2023-2027.

6.3.1 Statement of Authority

This report has been prepared by Aran von der Geest Moroney (B.Sc.) and Viorel Anitei (B.Sc.), and reviewed by John Hynes. (BSc., MSc., MCIEEM).

Aran von der Geest Moroney is an ecologist with MKO having over 3 years' experience in professional ecological consultancy. Aran holds a first-class honours BSc (Hons) in Ecology and Environmental Biology from University College Cork. Aran has also completed a Level 8 Special Purpose Award in Digital Mapping and GIS. Aran's areas of expertise are wintering bird surveying and identification, freshwater macroinvertebrate identification and sampling, freshwater pearl mussel surveying, white-clawed crayfish surveying, electric fishing, bat surveys, GIS, habitat mapping, preparation of Stage 1 and Stage 2 Appropriate Assessment reports and Ecological Impact Assessment. Aran has been involved in a range of mixed use, residential, industrial, restoration, public services, wind energy and forestry projects. Aran has carried out a wide range ecological field surveys in accordance with NRA Guidelines, bat surveys, bird surveys, recording vegetation relevés and freshwater quality analysis using bioindicators. Aran has provided supervision as an ecological clerk of works in residential and wastewater infrastructure projects. Aran is trained in carrying out bat surveys, non-volant mammal surveys, bird surveys, freshwater pearl mussel surveys, white-clawed crayfish surveys, electric fishing surveys, river condition assessment surveys and in taking vegetation relevés of vascular plants and has experience in habitat identification

and habitat mapping. Aran is responsible for independently carrying out and planning a range of ecological field surveys in accordance with NRA Guidelines and carrying out Appropriate Assessment screenings, Natura Impact Statements, Ecological Impact Assessments, Biodiversity chapters for EIARs, Invasive Species Management Plans and Aquatic reports as part of the ecology team. Aran is a member of CIEEM, holds a current Bat Roost Disturbance licence and holds an IFM Certificate in Electric Fishing.

Viorel is an ecologist with MKO having over 3 years' experience in professional ecological consultancy. Viorel holds an honours B.Sc. degree in Environmental Science from National University Ireland, Galway. Viorel's key strengths and areas of expertise are in Ecological Appropriate Assessment, GIS mapping, geospatial analysis, site identification, feasibility studies and report writing. Viorel has a broad knowledge of forestry operations carried out in Ireland. Viorel's key strengths are technical report writing, Stage 1 and Stage 2 Appropriate Assessment, vegetation and mammal surveys, and advanced GIS software skills.

John is an Ecology Director with MKO with over 10 years of experience in both private practice and local authorities. John holds a B.Sc in Environmental Science and a M.Sc. in Applied Ecology. Prior to taking up his position with MKO in March 2014, John worked as an Ecologist with Ryan Hanley Consulting Ltd. and Galway County Council. John has specialist knowledge in Flora and Fauna field surveys. Geographic Information Systems, data analysis, Appropriate Assessment, Ecological Impact Assessment and Environmental Impact Assessment. John's key strengths and areas of expertise are in project management. GIS and impact assessment. Since joining MKO John has been involved as a Senior Ecologist on a significant range of energy infrastructure, commercial, national roads and private/public development projects. Within MKO John plays a large role in the management of staff and works as part of a large multi-disciplinary team to produce EIAR Reports. John has project managed a range of strategy and development projects across Ireland and holds CIEEM membership.

Surveys

Field assessments were conducted by MKO ecologists Aran von der Geest Moroney (B.Sc.), Rachel Walsh (B.Sc.), Ellen Tuck (B.Sc.), Stephanie Corkery (B.Sc., M.Sc.) and Cillian Burke (B.Sc.).

Rachel has worked as an Ecologist in MKO since June 2020. She currently holds a role as Senior Ecologist and manages a small team within the company. She holds a First-Class Honours BSc. degree in Environmental Science from NUI Galway. Rachel's key strengths are in botanical identification and habitats assessment, mammal surveying and report writing for the purposes of Ecological Impact Assessment and Appropriate Assessment.

Ellen Tuck is an ecologist with MKO having joined the company in May 2022 and has over 2 years' experience in professional ecological consultancy. Ellen holds a second-class honours Bachelor of Science degree in Environmental Science from University of Galway. Since joining MKO, Ellen has gained experience in ecological consultancy and has worked on wind farm projects, large scale residential developments, synchronous condenser projects, county council projects and National Parks and Wildlife Service projects. Ellen's key strengths are field surveying, terrestrial mammal surveying, habitat and vegetation surveying, habitat identification and habitat mapping, wintering bird surveying and identification, freshwater pearl mussel surveying, bat surveys, GIS, and the preparation of Appropriate Assessments and Natura Impact Assessments, and Ecological Impact Assessments. Ellen currently holds a Bat Roost Disturbance licence and a mammal and wildlife photography licence through the NPWS.

Stephanie Corkery is an ecologist with MKO having joined in March of 2022. She now has over 1.5 years' 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, 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 Reports.

Cillian worked as an Ecologist in MKO from February 2022 until May 2023. Cillian holds a BSc. degree in Environmental Science from NUI Galway. Cillian key strengths are in habitats assessment, mammal surveying and report writing for the purposes of Ecological Impact Assessment and Appropriate Assessment.

Methodology

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, updated 2022).

The following sections outline the methodologies utilised to establish the baseline ecological condition of the 'Site'.

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.
- Review of online web-mappers: National Parks and Wildlife Service (NPWS), EPA (Envision), Water Framework Directive (WFD) and Inland Fisheries Ireland (IFI).
- Inland Fisheries Ireland (IFI) Reports, where available.
- Data on potential occurrence of protected bryophytes – as per NPWS online map viewer; Flora Protection Order Map Viewer – Bryophytes².
- Review of relevant Plans, including the National Biodiversity Action Plan 2017-2021, Draft National Biodiversity Action Plan 2023-2027 the All Ireland Pollinator Plan 2021-2025.
- Review of the Bat Conservation Ireland (BCI) Private Database.
- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper.
- 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.
- Review of the EIS/EIARs prepared for other plans and projects occurring in the wider area. Potential for cumulative and in-combination effects have been considered in Chapter 2 of this EIAR and Section 6.8 of this Chapter.

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 2-3 of this EIAR. The recommendations of the consultees have informed the EIAR preparation process and the contents of this chapter. Table 2-6 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 with regard to biodiversity during the scoping process, their comments were fully considered in the preparation of this chapter.

² 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: 15/08/2023.

Table 6-1 Organisations consulted with regard to biodiversity

Consultee	Response Yes/No	Response Details	Report Section where Comments are Addressed
An Taisce	Response received 28/10/2022	Unable to respond to every query. If it is a statutory referral to them as per their role as a prescribed body, it will be processed as normal.	N/A
Bat Conservation Ireland	Response received 26/04/2023	Do not have the capacity to comment nor do they provide opinions or comments on developments.	While no detailed comments were outlined; All bat surveys have been carried out according to relevant survey guidelines as detailed in the Bat Report (Appendix 6-2)
BirdWatch Ireland	Automatic Reply 28/10/2022	N/A	N/A
Department of Housing, Local Government and Heritage (NPWS)	Response received 26/04/2023	The Department is not in the position to make a comment on this referral at this time. The Department may submit observations/ recommendations at a later stage in the process. Meeting arranged as requested by the Board and held over Teams on the 13 th of June 2023	The Proposed Project was discussed with the NPWS. The NPWS welcomed river enhancement proposals within the Site. Appendix 6-4 Biodiversity Management and Enhancement Plan (BMEP) details river enhancement and other biodiversity enhancement plans for the Proposed Project.
Inland Fisheries Ireland	Automatic Reply 28/10/2022	Meeting requested with IFI on August 8 th 2023 and held over teams on August 9 th 2023 Meeting held at the Site with IFI on October 4 th 2023	Mitigations with regard to protection of water quality and fisheries habitats during construction and operation of the Proposed Project are provided in Section 6.7.2.1.1 and 6.7.3.1.1. River Restoration proposal is discussed in Appendix 6-4 Biodiversity Management and Enhancement Plan
Irish Raptor	No response received to date	N/A	N/A
Irish Wildlife Trust	Response received 27/04/2023	Do not have the staff capacity to respond to the consultation at the time of response but will endeavour to respond if possible.	N/A
The Heritage Council	No response	N/A	N/A

	received to date		
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6.4.3 Other Relevant Consultations/ Meetings

Full details of all other consultations can be found in Chapter 2 of this EIAR. Below is the detail of meetings held with the National Parks and Wildlife Service and Inland Fisheries Ireland. This information is also detailed in Chapter 2.

6.4.3.1 National Parks and Wildlife Service

Upon recommendation by An Bord Pleanála, a meeting was requested and subsequently held with the National Parks and Wildlife Service on the 13th of June 2023 over Teams. In attendance were:

- > Brian Duffy NPWS
- > Aran von der Geest Moroney MKO
- > Laura McEntegart MKO
- > Susan Doyle MKO
- > Roisin Towe MKO
- > Karen Mulryan – MKO
- > Grainne Griffin – MKO
- > William O’Connor – Buirios Limited
- > Niall Galvin – Buirios Limited

Items discussed:

- > Site Location & Project Design
- > Site baseline, survey effort and findings to date
 - Mammal survey effort
 - Botanical survey effort
 - Bat survey effort
 - Aquatic Survey effort
 - Bird survey effort
 - Habitat survey effort
- > Main ecological considerations

It was noted by the MKO ecologists that the river water quality at the Site was poor and the NPWS representative welcomed any enhancement proposals to counteract this.

6.4.3.2 Inland Fisheries Ireland

Upon recommendation by An Bord Pleanála, a meeting was requested and subsequently held with the Inland Fisheries Ireland (IFI) on the 9th of August 2023 over Teams. In attendance were:

- > Oliver McGrath IFI
- > Thomas Blackwell MKO
- > Aran von der Geest Moroney MKO
- > Karen Mulryan – MKO
- > Grainne Griffin – MKO
- > William O’Connor – Buirios Limited
- > Niall Galvin – Buirios Limited

Items discussed:

- > Site Location & Project Design
- > Site baseline, survey effort and findings to date, particularly the Aquatic Survey findings
- > River Restoration Proposal: MKO ecologists along with the applicant have designed a proposal to restore a segment of the Eastwood River which currently lacks good quality in-stream or riparian habitat. It is proposed to restore appropriate pattern, profile and dimension to the channel with a view to improving stability of the channel and restoring in stream habitat. It is also proposed to establish a natural wooded riparian buffer and to exclude livestock from accessing the restored channel. Please see Appendix 6-4 Biodiversity Management and Enhancement Plan (BMEP) for details.

The IFI representative welcomed the proposal and noted it has not been offered by similar projects before and highlighted the local benefit this would have on aquatic habitats and species, water quality and general biodiversity in the area. It was agreed at the meeting that the IFI representative would meet with MKO at the Site to discuss the proposal on the ground and to facilitate further discussion/ideals. This onsite meeting was held on the 4th of October 2023 where the IFI representative welcomed the proposal acknowledging the innovation of the proposal and benefit it will have for local alluvial habitats and terrestrial and aquatic biodiversity.

6.4.4 Field Surveys

Comprehensive surveys of the biodiversity of the entire site were undertaken on various dates during 2022 and 2023 as detailed below. The following sections fully describe the ecological surveys that have been undertaken and provide details of the methodologies, dates of survey and guidance followed.

6.4.4.1 Multi-disciplinary Walkover Surveys (as per NRA Guidelines, 2009)

Multidisciplinary walkover surveys were undertaken on the 11th August 2022, 25th August 2022, 18th October 2022, 13th April 2023, 27th April 2023, 11th May 2023 and the 21st September 2023. Excluding the October visit, the habitat surveys of the Site covered 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 including for otter, bats, aquatic invertebrate surveys and quadrat surveys.

The walkover surveys were also designed to detect the presence, or likely presence, of a range of protected species. The survey included a search for badger setts and areas of suitable habitat, potential features likely to be of significance to bats and additional habitat features for the full range of other protected species that are likely to occur within the vicinity of the Proposed Project (e.g. otter). In addition, an inventory of other species of local biodiversity interest was compiled including invertebrates (butterflies, dragonflies, damselflies, beetles), plants, fungi etc.

The multi-disciplinary walkover surveys comprehensively covered the lands within the Site (EIAR Study Boundary) and based on the survey findings, further detailed targeted surveys were carried out for features and locations of ecological significance. These surveys were carried out in accordance with NRA *Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna* on National Road Schemes (NRA, 2009).

During the multidisciplinary surveys, a search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) was conducted.

Other targeted survey methodologies undertaken at the site are described in the following subsections.

6.4.4.2 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 6.1 and an assessment of the potential for the Site to support Annex I habitats is also provided in this Appendix.

Botanical surveys of the Site were also undertaken throughout multidisciplinary walkover surveys carried out in 2022 and 2023. These surveys provided an understanding of the baseline and informed further survey work following finalisation of the Proposed Project layout. The habitat assessment surveys described in this report have been undertaken in accordance with the following guidelines and interpretation documents:

- Commission of the European Communities (2013) *Interpretation manual of European Union habitats*. Eur 27. European Commission DG Environment.
- NPWS (2019) *The Status of EU Protected Habitats and Species in Ireland. Habitat Assessments Volume 1. Version 1.1.* Unpublished Report, National Parks and Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- 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.
- Perrin, P., Martin, J., Barron, S., O'Neill, F., McNutt, K. & Delaney, A. (2008) *National Survey of Native Woodlands 2003-2008*. Unpublished report submitted to National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.

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

6.4.4.2.1 Vegetation composition assessment

Detailed habitat classification and assessment was undertaken by MKO at targeted locations within the development footprint, with botanical surveys and relevés undertaken in 2022 and 2023 within representative habitats at each turbine base, borrow pit, met mast, roads, construction compounds, substation, underground cabling route, spoil management areas, river restoration area and end masts breaking the existing overhead line. The extent of each habitat on site was mapped using aerial photography, handheld GPS and smartphone technology. A representative photograph was also taken for each of the habitats recorded on site, including all relevés. The location of all quadrats is shown in Figure 6-1.

The survey results were then analysed in accordance with 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)³ 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, 2019).

The data collected from the botanical assessments was uploaded to ERICA, analysed and the results data downloaded.

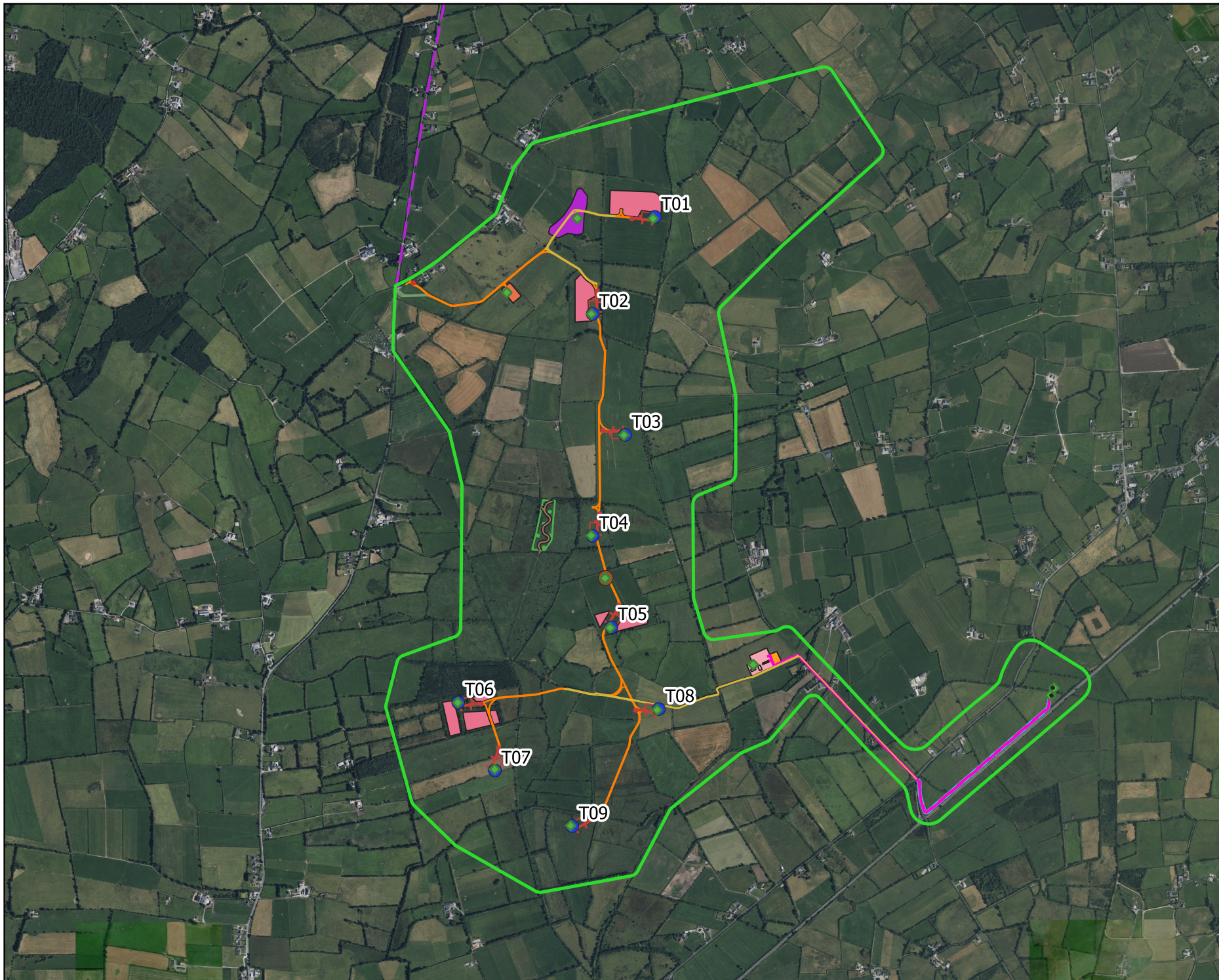
The analysis procedure uses a clustering process to assign classification affinity to vegetation plots based on a degree of membership to each of the communities defined by the IVC. Table 6-2 details the categorizing types of plots utilizing the clustering analysis. This categorizing procedure was utilized to determine if the Relevés within the Site had any affinity to Annex I habitats and whether further assessment was required.

Table 6-2 Categorising types of plots using clustering analysis (after Wisser & de Cáceres, 2013).

Plot Type	Definition
Assigned	The plot has membership ≥ 0.5 for one of the vegetation communities and therefore relates to the core definition of that vegetation community.
Unassigned	The plot has membership ≥ 0.5 for the noise class and is poorly represented by the current classification scheme
Transitional	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 92/43/EEC were identified and classified as Key Ecological Receptors (KERs).

³ 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, Accessed: 10.11.2020



Map Legend

- ◆ Relevé Locations
- Proposed Turbines
- Proposed Met Mast
- Proposed Haul Route
- Proposed Grid Connection Cable Route
- Existing Roads
- Proposed New Roads
- Proposed Turbine Hardstands
- Proposed New Road for Underground Cable
- Proposed End Masts
- Proposed Permanent 110KV Substation
- Proposed Temporary Security Cabins
- Proposed Temporary Borrow Pit
- Proposed Spoil Management Areas
- Temporary Substation Construction Compound
- Temporary Wind Farm Construction Compound
- River Enhancement Stream Concept
- River Enhancement 5m Riparian Buffer
- River Enhancement 1.8ha Natural Woodland
- EIAR Study Boundary

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Drawing Title	
Relevé Locations	
Project Title	
Borrisbeg Renewable Energy Development	
Drawn By	Checked By
AvdGM	JH
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6.4.4.3 Fauna Surveys

The results of the desk study, scoping replies and incidental records of protected species recorded during multidisciplinary walkover surveys were all used to inform the scope of targeted ecological surveys required. Based on these findings dedicated surveys for bats, otter and badger were undertaken at the times set out below following the methodologies also provided below. Following the completion of ecological walkover surveys, no requirement for further dedicated faunal surveys was identified. During the multidisciplinary walkover surveys, records of invertebrates including butterflies, damselflies, dragonflies, moths, beetles etc. were recorded.

6.4.4.3.1 Badger Survey

Dedicated badger surveys were conducted on the 11th of August 2022, 25th of August 2022, 18th of October 2022, 13th of April 2023, 27th of April 2023 and the 11th of May 2023. In addition, records of any badger activity within the Site were also recorded during other faunal and habitat surveys of the site. The badger surveys covered the entire development footprint and surrounding boundary hedgerows/treelines. The site was systematically searched for signs of badger, incidental setts, prints, latrines, foraging signs, or sightings. If encountered, setts were classified as per the convention set out in NRA (2009) (i.e., main, annexe, subsidiary, outlier). The badger survey was not constrained by vegetation given the nature of the habitats within the site and the timing of the surveys (NRA 2006a).

The badger survey was conducted adhering to best practice guidance (NRA, 2009) and followed the 'Guidelines for the Treatment of Badger Prior to the Construction of National Roads Schemes' (NRA, 2006a) and following CIEEM best practice competencies for species surveys (CIEEM, 2013⁴).

6.4.4.3.2 Otter Survey

Following a review of the initial Site walkover ecological surveys for constraints identification and the results of the multi-disciplinary walkover survey; areas identified as providing potential habitat for otter were subject to specialist targeted survey. The otter survey of watercourses was conducted on the 11th of August 2022, 25th of August 2022, 18th of October 2022, 13th of April 2023, 27th of April 2023, 11th of May 2023 and the 21st of September 2023. Otter surveys of watercourses downstream of the Site were also carried out in September 2022 as detailed in the Aquatic Baseline Report in Appendix 6-3.

The otter surveys were conducted as per NRA (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes). This involved a search for all otter signs e.g., spraints, scat, prints, slides, trails, couches and holts. In addition to the width of the rivers/watercourses, a 10m riparian buffer (both banks) was considered to comprise part of the otter habitat (NPWS 2009). The dedicated otter surveys also followed the guidance as set out in NRA (2008) 'Guidelines for the Treatment of Otters Prior to the Construction of National Roads Schemes' and following CIEEM best practice competencies for species surveys (CIEEM, 2013).

6.4.4.3.3 Bats

A detailed bat survey report with survey times, dates, the methodologies followed along with details of all the surveyors is provided in Appendix 6-2 of this ELAR. This document provides a detailed description of all survey methodologies as undertaken at the site during the period 2022-2023.

Habitat suitability for bats was assessed according to Collins (2016), which provides a grading protocol for roosting habitats and for commuting and foraging areas. All further bat activity and roost surveys were undertaken in strict accordance with those prescribed in NatureScot (2021) '*Bats and onshore wind*

⁴ CIEEM, 2013, Technical Guidance Series – Competencies for Species Survey, Online, Available at: <https://cieem.net/resource/competencies-for-species-survey-css/> Accessed: 20.08.2023

turbines: survey, Assessment and mitigation'. This is in line with standard best practice industry guidelines.

6.4.4.3.4 Aquatic surveys

The watercourses that flow through the Site and downstream watercourses, were subject to biological evaluation and assessment through kick sampling, fish stock assessment (electro-fishing) and white-clawed crayfish surveys between the 28th and 29th September 2022. Full details of the results of these surveys are provided in Appendix 6-3.

The survey included a general habitat assessment and biological water quality assessment at watercourses within, upstream and downstream of the Site. The water quality, as per Q-value (Quality Rating System)⁵, is fully described in Appendix 6-3. Biological water quality was assessed through kick-sampling each of these watercourses. Macro-invertebrate samples were converted to Q-ratings as per Toner et al. (2005). The applied Q ratings followed the EPA water quality classes and Water Framework Directive status categories. All riverine samples were taken with a standard kick sampling hand net (250mm width, 500µm mesh size) from areas of riffle/glide utilising a two-minute sample, as per ISO standards for water quality sampling (ISO 10870:2012). Large cobble was also washed at each site where present. The results of the surveys are provided in Aquatic Baseline Report in Appendix 6-3.

Aquatic plant species protected under Flora (Protection) Order, 2022 (S.I. No. 235 of 2022) were searched for during all aquatic surveys.

6.4.4.3.5 Invasive species survey

During the multi-disciplinary 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 (Birds and Natural Habitats) Regulations 2011 (As Amended) (S.I. 477 of 2015).

⁵ Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C., & MacGarthaigh, M. (2005). *Water quality in Ireland*. Environmental Protection Agency, Co. Wexford, Ireland.

6.4.5 Methodology for Assessment of Impacts and Effects

6.4.5.1 Identification of Target Receptors and Key Ecological Receptors

The methodology for assessment followed a precautionary screening approach with regard to the identification of Key Ecological Receptors (KERs). Following a comprehensive desk study, site visits were undertaken on the dates listed in Section 6.4.4.1 and “Target receptors” likely to occur in the zone of influence of the Proposed Project were identified. The target receptors included habitats and species that were protected under the following legislation:

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

6.4.5.2 Determining Importance of Ecological Receptors

The importance of the ecological features identified within the Site was determined with reference to a defined geographical context. This was undertaken following a methodology that is set out in Chapter 3 of the ‘Guidelines for Assessment of Ecological Impacts of National Roads Schemes’ (NRA, 2009). 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. Locally Important (lower value) receptors contain habitats and species that are widespread and of low ecological significance and of any importance only in the local area. Internationally Important sites are either designated for conservation as part of the Natura 2000 Network (SAC or SPA) or provide the best examples of habitats or internationally important populations of protected flora and fauna. Specific criteria for assigning each of the other levels of importance are set out in the guidelines and have been followed in this assessment. Where appropriate, the geographic frame of reference set out above was adapted to suit local circumstances. In addition, and where appropriate, the conservation status of habitats and species is considered when determining the significance of ecological receptors.

Any ecological receptors that are determined to be of National or International, County or Local importance (Higher Value) following the criteria set out in NRA (2009) are considered to be Key Ecological Receptors (KERs) for the purposes of ecological impact assessment if there is a pathway for effects thereon. Any receptors that are determined to be of Local Importance (Lower Value) are not considered to be Key Ecological Receptors.

6.4.5.3 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, updated 2022). These guidelines are the industry standard for the completion of Ecological Impact Assessment in the UK and Ireland. This chapter has also been prepared in accordance with the

corresponding EPA guidance (EPA 2022). The headings under which the impacts are characterised follow those listed in the guidance document and are applied where relevant. A summary of the impact characteristics considered in the assessment is provided below:

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

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

The EPA Guidelines on information to be included in Environmental Impact Assessment Reports (EPA, 2022) and the *Guidelines for assessment of Ecological Impacts of National Road Schemes*, (NRA, 2009) were also considered when determining significance and the assessment is in accordance with those guidelines.

The terminology used in the determination of significance follows the suggested language set out in the EPA Guidelines (2022) as shown in Table 6-3 below.

Table 6-3 Criteria for determining significance of effect, based on (EPA, 2022) guidelines.

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

As per TII (NRA, 2009) and CIEEM (2018) best practice guidelines, the following key elements should also be examined when determining the significance of effects:

- The likely effects on ‘integrity’ should be used as a measure to determine whether an impact on a site is likely to be significant (NRA, 2009).
- A ‘significant effect’ is an effect that either supports or undermines biodiversity conservation objectives (CIEEM, 2018).

Integrity

In the context of EcIA, ‘integrity’ refers to the coherence of the ecological structure and function, across the entirety of a site, that enables it to sustain all of the ecological resources for which it has been valued (NRA, 2009). Impacts resulting in adverse changes to the nature, extent, structure and function of component habitats and effects on the average population size and viability of component species, would affect the integrity of a site, if it changes the condition of the ecosystem to unfavourable.

Conservation status

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status. According to CIEEM (2018) guidelines the definition for conservation status in relation to habitats and species are as follows:

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

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

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

The conservation of a species is favourable when:

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

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

6.4.5.5 Incorporation of Mitigation

Section 6.7 of this EIAR assesses the potential effects of the Proposed Project to ensure that all effects on Key Ecological Receptors (KERs) are adequately addressed. Where effects on Key Ecological Receptors are predicted, mitigation is incorporated into the project design or layout to address such impacts. The implemented mitigation measures avoid or reduce or offset potential significant residual effects, post mitigation.

6.4.5.6 Limitations

The information provided in this assessment accurately and comprehensively describes the baseline ecological environment following surveys on numerous dates during all seasons during 2023; it provides an accurate prediction of the likely ecological effects of the Proposed Project alone and together with potential cumulative effects; prescribes best practice and mitigation as necessary; and describes the residual ecological impacts.

The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines.

The habitats and species on the site were readily identifiable and comprehensive assessments were made during the field visit. No significant limitations in the scope, scale or context of the assessment have been identified.

6.5 Establishing the Ecological Baseline

6.5.1 Desk Study Results

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 for the ecology of the existing environment. Material reviewed includes the Site Synopses for Designated Sites for their conservation importance compiled by the National Parks and Wildlife Service (NPWS) of the Department of Culture, Heritage and the Gaeltacht, bird and plant distribution atlases and other research publications.

6.5.1.1 Designated Sites

6.5.1.1.1 Identification of the Designated Sites within the Likely Zone of Influence of the Proposed Project

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

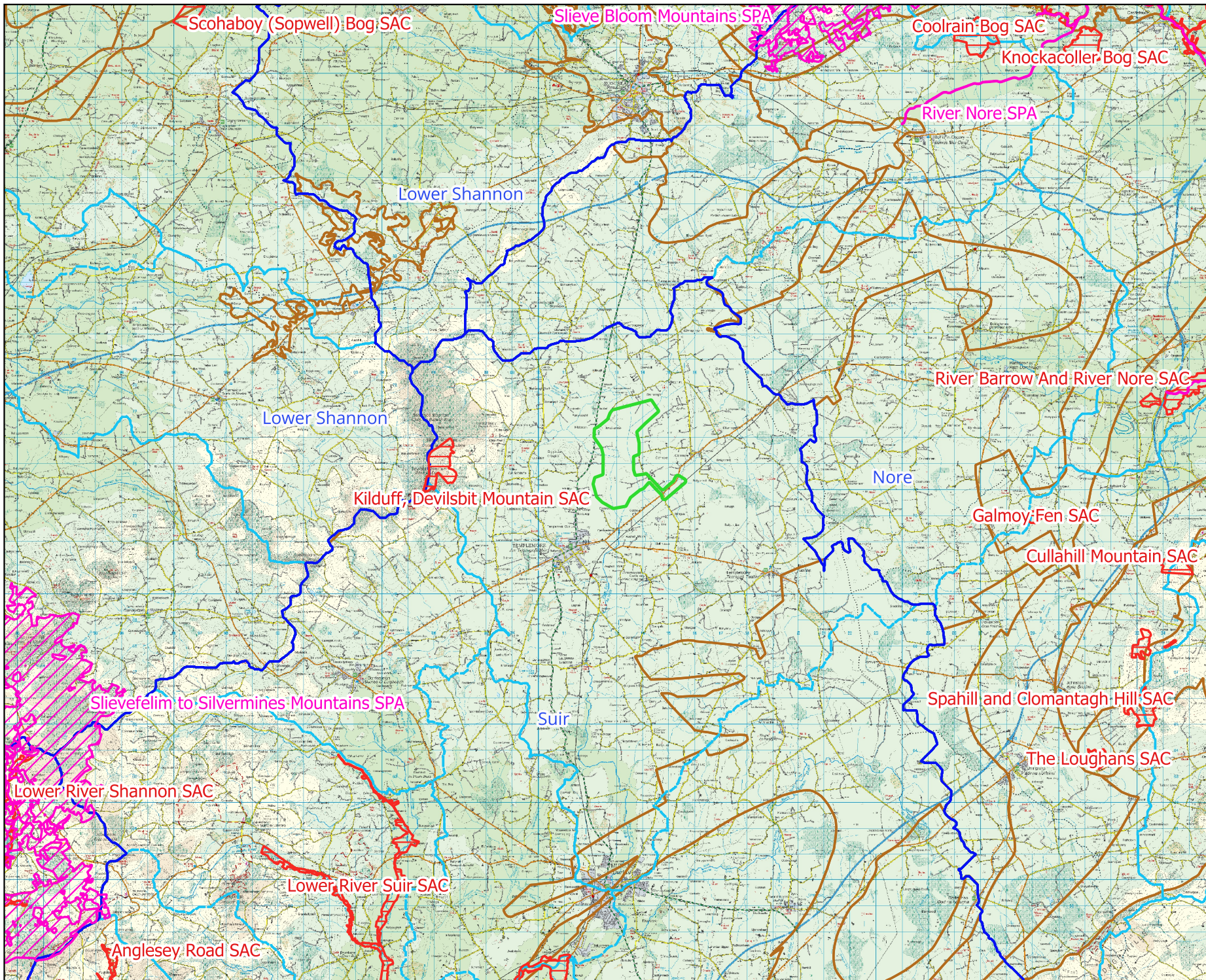
Special Areas of Conservation (SACs) and Special Protection Areas for Birds (SPAs) are designated under the EU Habitats Directive and EU Birds Directive, respectively and are collectively known as 'European Sites'. The potential for significant effects and/or adverse impacts on the integrity of European 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, 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 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. It may also utilise data that is also included in the Appropriate Assessment documentation." Section 6.7.5 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.

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:

- Initially the most up to date GIS spatial datasets for European and Nationally designated sites and water catchments were downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) on the 12/09/2023. The datasets were utilised to identify Designated Sites which could feasibly be affected by the Proposed Project.
- All designated sites in the vicinity of the Proposed Project were identified.
- A map of all the European Sites within the vicinity of the Proposed Project is provided in Figure 6-2. A map of all Nationally Designated Sites within the vicinity of the Proposed Project is provided in Figure 6-3.
- The table below provides details of all relevant Nationally designated sites as identified in the preceding steps and assesses which are within the likely Zone of Impact.
- All relevant European Designated Sites are fully described and assessed in the Screening for Appropriate Assessment and Natura Impact Statement reports submitted as part of this planning application.
- The designation features of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of preparing this report 12/09/2023.
- Where potential pathways for Significant Effect are identified, the site is included within the Likely Zone of Impact and further assessment is required.



Map Legend

- EIAR Study Boundary
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- WFD Catchments
- WFD Subcatchments
- WFD Groundwater Bodies



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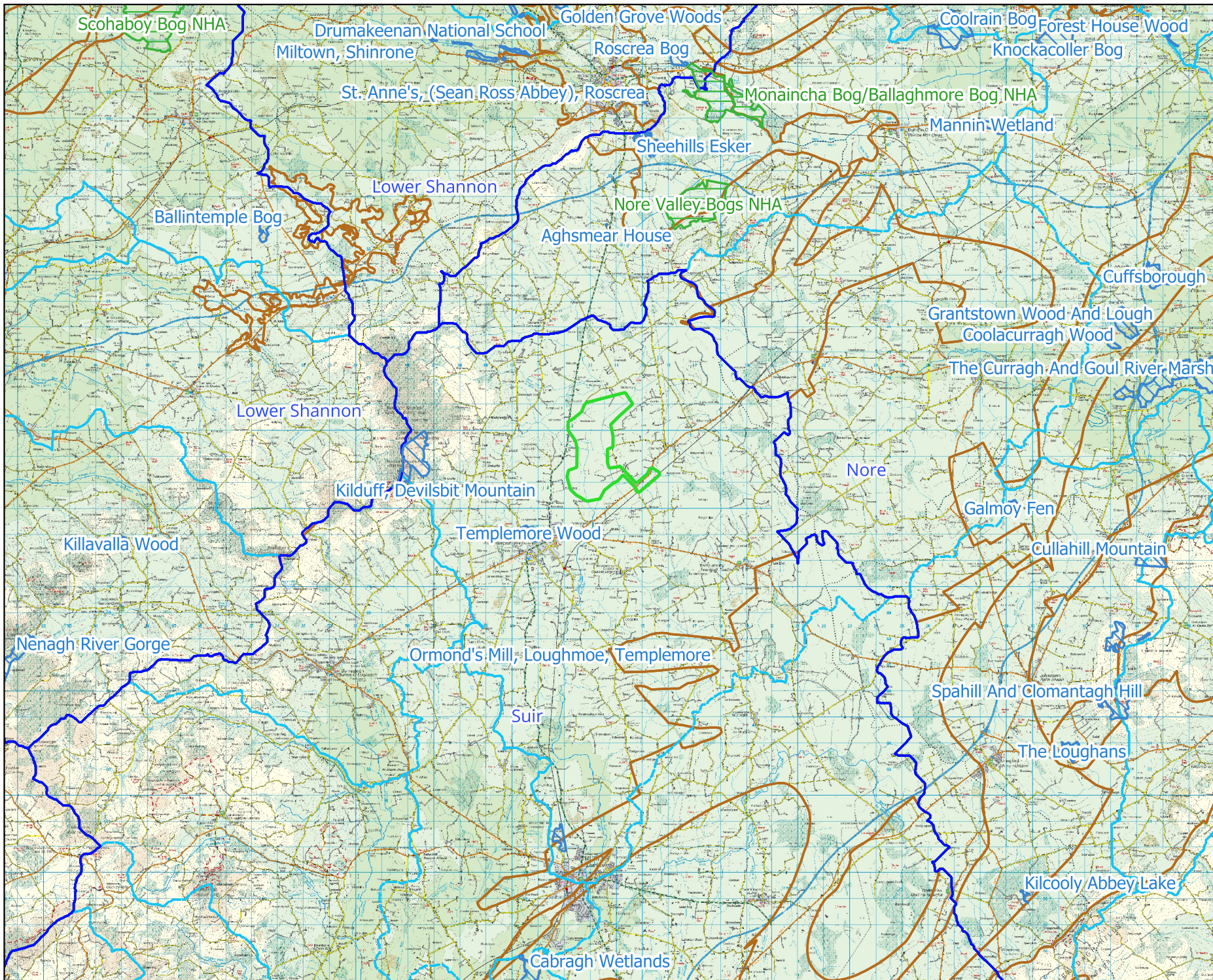
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Drawing Title
European Designated Sites within the Likely Zone of Impact

Project Title
Borrisbeg Renewable Energy Development

Drawn By AvdGM	Checked By JH
Project No. 220310	Drawing No. Figure 6-2
Scale 1:190,000	Date 23.11.2023


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Map Legend

-  EIAR Study Boundary
-  Natural Heritage Area (NHA)
-  Proposed Natural Heritage Area (pNHA)
-  WFD Catchments
-  WFD Subcatchments
-  WFD Groundwater Bodies

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Drawing Title Nationally Designated Sites within the Likely Zone of Impact	
Project Title Borrisbeg Renewable Energy Development	
Drawn By AvdGM	Checked By JH
Project No. 220310	Drawing No. Figure 6-3
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Table 6-4 Designated sites in the Zone of Influence

Designated Site	Distance from EIAR Study Boundary (km)	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)		
Kilduff, Devilsbit Mountain SAC [000934]	5.3km	<p>There will be no direct effects as the Proposed Project is located entirely outside the SAC.</p> <p>Due to the intervening distance between the Site and the SAC, and the terrestrial nature of the habitats for which the SAC is designated, no potential pathway for likely significant indirect effect was identified.</p> <p>No pathway for likely significant effect on this SAC was identified, when considered in the absence of any mitigation, individually or cumulatively with other plans or projects. The SAC is not within the Likely Zone of Impact and is not considered further in this assessment.</p>
Galmoy Fen SAC [001858]	13.2km	<p>There will be no direct effects as the Proposed Project is located entirely outside the SAC.</p> <p>The Site is within a separate hydrological catchment and groundwater body to the SAC and there is therefore no potential surface water or groundwater connectivity between the Proposed Project and the SAC. No pathway for indirect effects on the aquatic QIs of the SAC was identified.</p> <p>No pathway for likely significant effect on this SAC was identified, when considered in the absence of any mitigation, individually or cumulatively with other plans or projects. The SAC is not within the Likely Zone of Impact and is not considered further in this assessment.</p>
Lower River Suir SAC [002137]	13.2km 23.1km downstream of the Proposed Project	<p>There will be no direct effects as the Proposed Project is located entirely outside the SAC.</p> <p>The Site is located approximately 23.1km upstream of the Lower River Suir SAC via the River Suir, which flows through the Site. Taking a precautionary approach, a potential for likely significant effect was identified via deterioration of water quality associated with the Proposed Project.</p> <p>Additionally, the potential for a significant effect in the form of ex-situ disturbance to the QI species Otter was identified during the construction phase.</p> <p>A complete source pathway receptor chain was identified and in the absence of mitigation, there is potential for the Proposed Project to result in likely significant effects on this SAC. Therefore, the SAC is located within the Likely Zone of Impact and is considered further in this assessment.</p>

Designated Site	Distance from EIAR Study Boundary (km)	Likely Zone of Impact Determination
Special Protection Area (SPA)		
Slieve Bloom Mountains SPA [004160]	13.4km	<p>There will be no direct effects as the Proposed Project is located entirely outside the SPA.</p> <p>The Site is located 13.4km from the SPA. The Site is outside the core foraging distance of hen harrier (Core range of 2km, with maximum range of 10km) as per Scottish Natural Heritage Guidelines (SNH, 2016). According to the Site-specific Conservation Objectives for this SPA, the core area used by breeding pairs is within 5km of nest sites.</p> <p>No pathway for likely significant effect on this SPA was identified, when considered in the absence of any mitigation, individually or cumulatively with other plans or projects. The SPA is not within the Likely Zone of Impact and is not considered further in this assessment.</p>
River Nore SPA [004233]	14.3km	<p>There will be no direct effects as the Proposed Project is located entirely outside the SPA.</p> <p>There is no direct hydrological connectivity with the SPA and no pathway for indirect effects on its aquatic SCI species has been identified. The SPA is located within a separate sub catchment, therefore there will be no indirect effects on the SPA via surface or groundwater deterioration.</p> <p>According to TII guidance (TII/ NRA 2009) the core foraging range for Kingfisher is 1km along a watercourse. As the Proposed Project is located over 14.3km from the SPA and within a separate sub catchment no significant effects as a result of disturbance or displacement to Kingfisher are anticipated.</p> <p>No pathway for likely significant effect on this SPA was identified, when considered in the absence of any mitigation, individually or cumulatively with other plans or projects. The SPA is not within the Likely Zone of Impact and is not considered further in this assessment.</p>
Natural Heritage Areas (NHA)		
Nore Valley Bogs NHA [001853]	6.5km	<p>There will be no direct effects as the Proposed Project is located entirely outside the designated sites.</p>
Monaincha Bog/Ballaghmore Bog NHA [000652]	10.9km	<p>Due to the intervening distance between the Site and the NHAs, and the terrestrial nature of the peatland habitats for which they are designated, no potential pathway for likely significant indirect effect was identified.</p>

Designated Site	Distance from EIAR Study Boundary (km)	Likely Zone of Impact Determination
		No pathway for likely significant effect on these NHAs was identified. The sites are considered to be outside the Likely Zone of Impact and are not considered further in this assessment.
Proposed Natural Heritage Areas (pNHA)		
Templemore Wood pNHA [000942]	2km	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>Due to the intervening distance between the Site and the pNHA, and the terrestrial nature of the habitats for which the pNHA is designated, no potential pathway for likely significant indirect effect was identified.</p> <p>The pNHA is considered to be outside the Likely Zone of Impact and no further assessment is required.</p>
Kilduff, Devilsbit Mountain pNHA [000934]	5.3km	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>Due to the intervening distance between the Site and the pNHA, and the terrestrial nature of the habitats for which the pNHA is designated, no potential pathway for likely significant indirect effect was identified.</p> <p>The pNHA is considered to be outside the Likely Zone of Impact and no further assessment is required.</p>
Ormond's Mill, Loughmoe, Templemore pNHA [002066]	6km	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>This pNHA is designated for a roost of Natterer's Bat (<i>Myotis nattereri</i>) and Brown Long-eared Bat (<i>Plecotus auritus</i>). As per the '<i>Bat Surveys for Professional Ecologists Good Practice Guidance (BCT 2023)</i>', Natterers bat has a 4km core sustenance zone (CSZ) and Bown long-eared bat has a 3km CSZ. The Site is 6km from the pNHA and is outside of these CSZs. Therefore, no potential pathway for likely significant indirect effect was identified.</p> <p>The pNHA is considered to be outside the Likely Zone of Impact and no further assessment is required.</p>
Aghsmear House pNHA [002060]	6.5km	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>This pNHA is designated for a nursery roost of Natterer's Bat (<i>Myotis nattereri</i>). As per the '<i>Bat Surveys for Professional Ecologists Good Practice Guidance (BCT 2023)</i>', Natterers bat has a 4km core</p>

Designated Site	Distance from EIAR Study Boundary (km)	Likely Zone of Impact Determination
		<p>sustenance zone (CSZ). The Site is 6.5km from the pNHA and is outside of this CSZ. Therefore, no potential pathway for likely significant indirect effect was identified.</p> <p>The pNHA is considered to be outside the Likely Zone of Impact and no further assessment is required.</p>
<p>Sheehills Esker pNHA [000938]</p>	9.1km	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>Due to the intervening distance between the Site and the pNHA, and the terrestrial nature of the habitats for which the pNHA is designated, no potential pathway for likely significant indirect effect was identified.</p> <p>The pNHA is considered to be outside the Likely Zone of Impact and no further assessment is required.</p>
<p>St. Anne's, (Sean Ross Abbey), Roscrea pNHA [000656]</p>	11.1km	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>This pNHA is designated for a roost of Leisler's Bat (<i>Nyctalus leisleri</i>). As per the '<i>Bat Surveys for Professional Ecologists Good Practice Guidance (BCT 2023)</i>', Leisler's bat has a 3km core sustenance zone (CSZ). The Site is 11.1km from the pNHA and is outside of this CSZ. Therefore, no potential pathway for likely significant indirect effect was identified.</p> <p>The pNHA is considered to be outside the Likely Zone of Impact and no further assessment is required.</p>
<p>Cabragh Wetlands pNHA [001934]</p>	<p>12.5km</p> <p>24.1km hydrological distance</p>	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>There is potential for indirect effect to the pNHA via releasing sediment, nutrients or other pollutants into watercourses directly or via surface water run-off during the works related to the Site. The River Suir and its tributary Eastwood River are located within the Site and provide hydrological connectivity with this pNHA, which is located approx. 24.1km downstream of the Site.</p> <p>A pathway for likely significant effect on this pNHA was identified. The pNHA is considered to be within the Likely Zone of Impact and is considered further in this assessment.</p>
<p>Roscrea Bog pNHA [000583]</p>	12.8km	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>Due to the intervening distance between the Site and the pNHA, and the terrestrial nature of the peatland habitats for which the pNHA is designated, no</p>

Designated Site	Distance from EIAR Study Boundary (km)	Likely Zone of Impact Determination
		<p>potential pathway for likely significant indirect effect was identified.</p> <p>The pNHA is considered to be outside the Likely Zone of Impact and no further assessment is required.</p>
<p>Galmoy Fen pNHA [001858]</p>	13.1km	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>The pNHA is located within a separate hydrological catchment and groundwater body to the Site. Therefore, there is no potential for indirect effect on the pNHA.</p> <p>The pNHA is considered to be outside the Likely Zone of Impact and no further assessment is required.</p>
<p>Mount St. Joseph Woods pNHA [000913]</p>	13.5km	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>Due to the intervening distance between the Site and the pNHA, and the terrestrial nature of the habitats for which the pNHA is designated, no potential pathway for likely significant indirect effect was identified.</p> <p>The pNHA is considered to be outside the Likely Zone of Impact and no further assessment is required.</p>
<p>Ballintemple Bog pNHA [000882]</p>	13.5km	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this designated site.</p> <p>Due to the intervening distance between the Site and the pNHA, and the terrestrial nature of the peatland habitats for which the pNHA is designated, no potential pathway for likely significant indirect effect was identified.</p> <p>The pNHA is considered to be outside the Likely Zone of Impact and no further assessment is required.</p>
<p>St. Joseph's, Mountheaton pNHA [002063]</p>	13.5km	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>This pNHA is designated for a roost of Brown Long-eared Bat (<i>Plecotus auritus</i>). As per the 'Bat Surveys for Professional Ecologists Good Practice Guidance (BCT 2023)', Brown long-eared bat has a 3km core sustenance zone (CSZ). The Site is 13.5km from the pNHA and is outside of this CSZ. Therefore, no potential pathway for likely significant indirect effect was identified.</p> <p>The pNHA is considered to be outside the Likely Zone of Impact and no further assessment is required.</p>

Designated Site	Distance from EIAR Study Boundary (km)	Likely Zone of Impact Determination
Drumakeenan National School pNHA [002064]	14.5km	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>This pNHA is designated for a roost of Brown Long-eared Bat (<i>Plecotus auritus</i>). As per the ‘<i>Bat Surveys for Professional Ecologists Good Practice Guidance (BCT 2023)</i>’, Brown long-eared bat has a 3km core sustenance zone (CSZ). The Site is 14.5km from the pNHA and is outside of this CSZ. Therefore, no potential pathway for likely significant indirect effect was identified.</p> <p>The pNHA is considered to be outside the Likely Zone of Impact and no further assessment is required.</p>
Miltown, Shinrone pNHA [002065]	14.7km	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>This pNHA is designated for a Natterer’s Bat roost (<i>Myotis nattereri</i>) of National Importance. As per the ‘<i>Bat Surveys for Professional Ecologists Good Practice Guidance (BCT 2023)</i>’, Natterers bat has a 4km core sustenance zone (CSZ). The Site is 14.7km from the pNHA and is outside of this CSZ. Therefore, no potential pathway for likely significant indirect effect was identified.</p> <p>The pNHA is considered to be outside the Likely Zone of Impact and no further assessment is required</p>
Golden Grove Woods pNHA [000903]	14.9km	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this designated pNHA.</p> <p>Due to the intervening distance between the Site and the pNHA, and the terrestrial nature of the habitats for which the pNHA is designated, no potential pathway for likely significant indirect effect was identified.</p> <p>The pNHA is considered to be outside the Likely Zone of Impact and no further assessment is required.</p>
Drumakeenan, Eagle Hill and Perry’s Mill pNHA [000900]	15km	<p>There is no potential for direct effects as the Proposed Project is located entirely outside of this pNHA.</p> <p>Due to the intervening distance between the Site and the pNHA, and the terrestrial nature of the habitats for which the pNHA is designated, no potential pathway for likely significant indirect effect was identified.</p> <p>The pNHA is considered to be outside the Likely Zone of Impact and no further assessment is required.</p>

Potential for effects on European sites is summarised in this report and is fully addressed in the Natura Impact Statement submitted as part of the statutory consent process. The following European Designated Site has been identified as being within the Zone of Likely Impact:

- Lower River Suir SAC [002137]

The following Nationally Designated Site has been identified as being within the Zone of Likely Impact and is assessed further in Section 6.7.5:

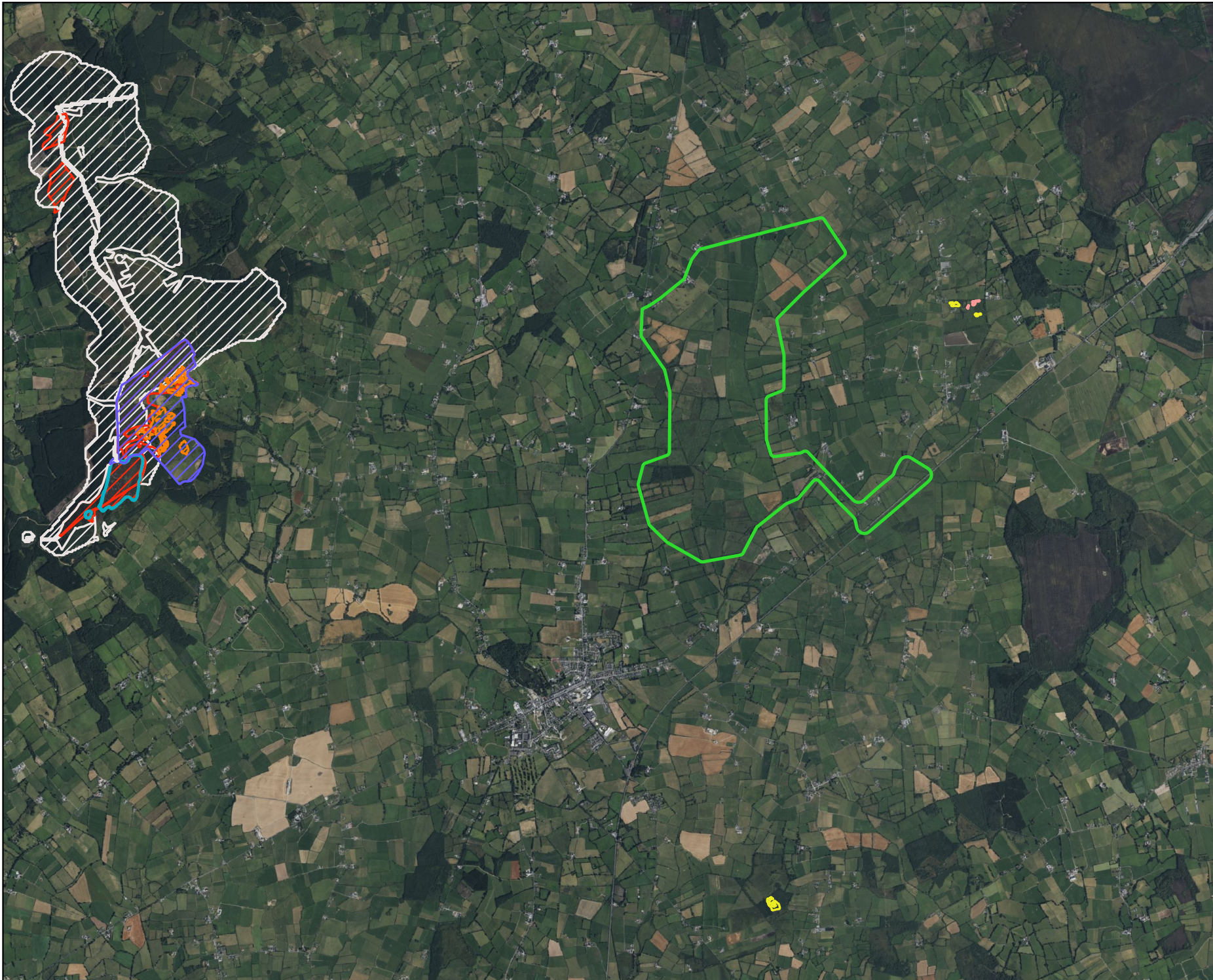
- Cabragh Wetlands pNHA [001934]

6.5.1.2 NPWS Article 17 Reporting

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 (Templemore Demense_1604, 1605 and 1606) is located approx. 2.1km southwest of the Site. The nearest Native Woodland according to the 2003-2008 survey is located approx. 2.1km from the Site. The nearest semi natural grasslands are located approx. 1.3km from the Site.

A search of the NPWS Article 17 datasets⁶ (2019) was undertaken to identify Article 17 habitats within or adjacent to the Site, as shown in Figure 6-4. Isolated patches of mapped Annex 1 Orchid Rich Calcareous Grassland and Molinia Meadows are present in excess of 1.4km east of the Site. Mapped Annex I Molinia meadows also occur approx. 4.1km to the south of the Site. A number of Annex I habitats are mapped between approx. 4.3 and 8km west of the Site including Nardus Rich Upland Grassland, Wet Heath, Alpine and Subalpine Heath, Dry Heath and Siliceous Rocky Slopes.

⁶ Including bog 2012 and 2019 datasets, Online, Available at: <https://www.npws.ie/publications/article-17-reports>



Map Legend

-  EIAR Study Boundary
-  Alpine and Subalpine Heath
-  Dry Heath
-  Molinia Meadows
-  Nardus Rich Upland Grassland
-  Orchid Rich Calcareous Grassland
-  Siliceous Rocky Slopes
-  Wet Heath



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Drawing Title
Article 17 Habitats

Project Title
Borrisbeg Renewable Energy Development

Drawn By AvdGM	Checked By JH
Project No. 220310	Drawing No. Figure 6-4
Scale 1:60,000	Date 23.11.2023



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6.5.1.3 Vascular plants

A search was made in the New Atlas of the British and Irish Flora (Preston *et al*, 2002) to investigate whether any rare or unusual plant species listed under Annex I of the EU Habitats Directive, The Irish Red Data Book, 1, Vascular Plants (Curtis, 1988) or the Flora (Protection) Order (1999, as amended 2022) had been recorded in the relevant 10km squares in which the Site is situated (S17). Species of conservation concern are given in the table below.

6-5 Records of species listed under the Flora Protection Order 2022 or the Irish Red Data Book for Vascular Plants

Common Name	Scientific Name	Status
Green-winged Orchid	<i>Orchis morio</i>	(VU) Vulnerable
Autumn Gentian	<i>Gentianella amarella</i>	(NT) Near Threatened
Corn marigold	<i>Chrysanthemum segetum</i>	(NT) Near Threatened
Pale Flax	<i>Linum bienne</i>	(NT) Near Threatened
Common Gromwell	<i>Lithospermum officinale</i>	(NT) Near Threatened
Brown Beak-sedge	<i>Rhynchospora fusca</i>	(NT) Near Threatened
Least Bur-reed	<i>Sparganium natans</i>	(NT) Near Threatened
Green field-speedwell	<i>Veronica agrestis</i>	(NT) Near Threatened

6.5.1.4 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 Site (NPWS, 2020).

6.5.1.5 National Biodiversity Data Centre (NBDC) Records

A search of the National Biodiversity Data Centre (NBDC) records for the relevant hectad, S17, provided records on a number of fauna species of conservation concern, excluding marine species. These are provided in Table 6-6. NBDC records for protected bird species are presented in Table 6-7.

Table 6-6 National Biodiversity Data Centre Records

Common Name	Scientific Name	Habitats Directive
European Otter	<i>Lutra lutra</i>	Annex II, Annex IV, WA
Daubenton's Bat	<i>Myotis daubentonii</i>	Annex IV, WA
Lesser Noctule	<i>Nyctalus leisleri</i>	Annex IV, WA
Pipistrelle	<i>Pipistrellus pipistrellus sensu lato</i>	Annex IV, WA
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	Annex IV, WA

Common Name	Scientific Name	Habitats Directive
Common Frog	<i>Rana temporaria</i>	Annex V, WA
Pine Marten	<i>Martes martes</i>	Annex V, WA
Smooth Newt	<i>Lissotriton vulgaris</i>	WA
Eurasian Badger	<i>Meles meles</i>	WA
Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	WA
West European Hedgehog	<i>Erinaceus europaeus</i>	WA

Annex II, Annex IV, Annex V – Of EU Habitats Directive, WA – Irish Wildlife Acts (1976-2022), OSPAR – OSPAR Convention

Table 6-7 NBDC Records for Birds (S17)

Common Name	Scientific Name	Status
Corn Crake	<i>Crex crex</i>	Annex I, WA, BoCCI Red List
Red Grouse	<i>Lapogus lapogus</i>	Annex II, Annex III, WA, BoCCI Red List
European Golden Plover	<i>Pluvialis apricaria</i>	Annex I, Annex III, WA, BoCCI Red List
Little Egret	<i>Egretta garzetta</i>	Annex I, WA
Peregrine Falcon	<i>Falco peregrinus</i>	Annex I, WA
Common Kingfisher	<i>Alcedo atthis</i>	Annex I, WA
Eurasian Curlew	<i>Numenius arquata</i>	Annex II, WA, BoCCI Red List
Northern Lapwing	<i>Vanellus vanellus</i>	Annex II, WA, BoCCI Red List
Rock Pigeon	<i>Columba livia</i>	Annex II, WA
Common Pheasant	<i>Phasianus colchicus</i>	Annex II, Annex III, WA
Common Wood Pigeon	<i>Columba palumbus</i>	Annex II, Annex III, WA
Mallard	<i>Anas platyrhynchos</i>	Annex II, Annex III, WA
Common Coot	<i>Fulica atra</i>	Annex II, Annex III, WA
Common Pochard	<i>Aythya ferina</i>	Annex II, Annex III, WA
Eurasian Teal	<i>Anas crecca</i>	Annex II, Annex III, WA
Eurasian Wigeon	<i>Anas penelope</i>	Annex II, Annex III, WA
Tufted Duck	<i>Aythya fuligula</i>	Annex II, Annex III, WA
Common Snipe	<i>Gallinago gallinago</i>	Annex II, Annex III, WA
Greylag Goose	<i>Anser anser</i>	Annex II, Annex III, WA

Common Name	Scientific Name	Status
Barn Owl	<i>Tyto alba</i>	WA, BoCCI Red List
Yellowhammer	<i>Emberiza citrinella</i>	WA, BoCCI Red List
Common Kestrel	<i>Falco tinnunculus</i>	WA, BoCCI Red List

Annex I – Of EU Birds Directive, Red List – Birds of Conservation Concern in Ireland (Population for which the species is red listed in brackets).

6.5.1.5.1 Invasive Species

The NBDC database also contains records of invasive species identified within the relevant grid square S17. Records of invasive species for within the hectad S17 are provided in Table 6-8.

Table 6-8 NBDC records for Third Schedule invasive species in the hectad S17

Common Name	Scientific Name
Cherry Laurel	<i>Prunus laurocerasus</i>
Eastern Grey Squirrel	<i>Sciurus carolinensis</i>
Rhododendron ponticum	<i>Rhododendron ponticum</i>
Fallow Deer	<i>Dama dama</i>
Greylag Goose	<i>Anser anser</i>

6.5.1.6 NPWS Data

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 hectad S17. An information request was also sent to the NPWS requesting records from the Rare and Protected Species Database. A response to this request was received on the 13th of April 2023. Table 6-8 lists rare and protected species records obtained from NPWS data request as well as those records available through the online NPWS map viewer.

Table 6-9 National Parks and Wildlife Service Records

Common name	Scientific name	Designation	Hectad
Green-winged Orchid	<i>Orchis morio</i>	VU	S17
Common frog	<i>Rana temporaria</i>	HD Annex V, WA	S17
Eurasian badger	<i>Meles meles</i>	WA	S17
European Otter	<i>Lutra lutra</i>	Annex II, IV, WA	S17
Fallow Deer	<i>Dama dama</i>	WA	S17

FPO = Flora Protection Order; RL = Red List, VU = Vulnerable, WA = Protected Species: Wildlife Acts, Annex (No.) – Protected Species: EU Habitats Directive, BoCCI – RL = Red Listed, AL = Amber Listed, GL = Green Listed

6.5.1.7 Bat Records

A review of the National Bat Database of Ireland maintained by Bat Conservation Ireland, was made on the 21st November 2023, to obtain bat records from within 10km of the Site. The search yielded records for four bat species within 10km. Table 6-6 lists the bat species recorded within the hectads which pertain to the current study area (S17, S07, S06 and S16 lie within 10km of the Site).

Table 6-10 NBDC Bat Records within 10km of the Site

Hectad	Species	Database	Designation
S17, S16, S07, S06	Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	National Bat Database of Ireland	HD Annex IV, WA
S17, S16, S07, S06	Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	National Bat Database of Ireland	HD Annex IV, WA
S17, S16, S06	Daubenton's bat (<i>Myotis daubentonii</i>)	National Bat Database of Ireland	HD Annex IV, WA
S06, S16, S17	Leisler' bat (<i>Nyctalus leisleri</i>)	National Bat Database of Ireland	HD Annex IV, WA
S16	Brown long-eared bat (<i>Plecotus auritus</i>)	National Bat Database of Ireland	HD Annex IV, WA

6.5.1.8 Marsh fritillary (*Euphydryas aurinia*)

No records of marsh fritillary have been recorded within the Site. The closest NBDC records for marsh fritillary were located approx. 4.6km to the northeast of the EIAR boundary.

6.5.1.9 Inland Fisheries Ireland (IFI) Data

The IFI online database was reviewed for fish species records within the catchments downstream of the Site. The Site encompasses several small streams and rivers in north Tipperary, including the River Suir, Eastwood River and Clonmore Stream. The closest waterbody with IFI data is the River Suir.

A range of fish species including Atlantic salmon (*Salmo salar*) and Brown trout (*Salmo trutta*) were returned. Table 6-11 provides a summary of the available online data⁷.

Table 6-11 Fish data available from IFI National Research Survey Programme

Waterbody Name & Site Code	Species	Species Richness	Draft Fish Ecological Status
River Suir Site code: IE_SE_16S020200	Brown Trout (<i>Salmo trutta</i>), Minnow (<i>Phoxinus phoxinus</i>), Atlantic salmon (<i>Salmo salar</i>), Roach (<i>Rutilus rutilus</i>), Stone loach (<i>Barbatula barbatula</i>), Gudgeon (<i>Gobio gobio</i>), European eel (<i>Anguilla anguilla</i>), Three-spined stickleback (<i>Gasterosteus aculeatus</i>), Lamprey sp. (<i>Lampetra sp.</i>), Pike (<i>Esox lucius</i>)	10	Moderate

⁷ IFI National Research Survey Programme, Online, Available at:
<https://ifigis.maps.arcgis.com/apps/webappviewer/index.html?id=9a31fedb077c4fb2991184842b7ef025>

6.5.1.10 Local Hydrology and Hydrogeology

The following description has been summarised from Chapter 9 Hydrology and Hydrogeology of the EIAR and provides a baseline of the local watercourses within and downstream of the Site.

'Regionally the Site is located in the Suir WFD catchment in Hydrometric Area 16 and the Suir_010 sub-catchment which is a headwater sub-catchment of the River Suir.

Locally the Site is mapped within 2 no. WFD river sub-basins, the Suir_020 sub-basin and the Eastwood_010 sub-basin (Eastwood River). The majority of the Site lies within the Suir_020 sub-basin in the north, east and south, whilst the western portion of the Site is situated in the Eastwood_010 sub-basin.

Within the Suir_020 river sub basin the River Suir enters the Site from the north and continues southwards within the eastern portion of the Site. The Shanakill Stream enters the Site from the northeast. Within the Eastwood_010 river sub basin, the Eastwood River flows easterly, and enters the Site from the west.

The proposed underground grid connection cable route runs easterly within the southeast of the Site and into the Clonmore Stream (Suir_010 river sub basin). The Clonmore Stream (Suir_010 flows in a south-westerly direction and joins the River Suir within the southeast of the Site. An unnamed 2nd order tributary stream joins the Eastwood River, and at this point it continues southwards and discharges into the River Suir approximately 500m downstream of the Site. The River Suir continues south and eventually discharge into the Upper Suir Estuary approximately 56.8km southeast from the Site (as the crow flies), just west of Carrick on Suir.

To facilitate turbine delivery to the Site, minor temporary stoning up of verges at junction 22 on the M7 and the construction of a temporary abnormal load access from the L-3248 road into the Site will be required. These works are located within the Nore_SC_010 and the Suir WFD catchments, respectively.

*A regional hydrology map and local hydrology map for the Site is shown as **Figure 9-1** and **Figure 9-2** respectively.*

The Site is located in the Templemore Ground Water Body (GWB) (IE_SE_G_131) where the WFD description is "poorly productive bedrock". The majority of the GWB comprises Locally Important Aquifers. The overall groundwater flow direction is southerly with discharge into the River Suir and its tributaries. Discharge occurs via springs, which flow towards the surface water bodies or via baseflow directly into the rivers (GSI, 2004).

The majority of groundwater flow in this GWB is considered to take place in the upper weathered zone (3m). Below this the amount of groundwater flow decreases gradually with depths and large flows are not expected below 10m except in isolated open fractures (GSI, 2004).

The Ballysteen Formation (Dinantian Lower Impure Limestones), which are mapped to underlie the majority of the Site are classified by the GSI (www.gsi.ie) as a Locally Important Aquifer (LI), having bedrock which is moderately productive only in local zones. The Waulstorian limestones (Dinantian Pure Unbedded Limestones) on the northwest of the Site are also classified LI.

The band of the Lisduff Oolite Member (Dinantian Pure Bedded Limestones) mapped across the centre of the Site is classified as a Locally Important Aquifer (Lm), bedrock which is generally moderately productive.

There are no GSI mapped karst features in the area of the Site.'

6.5.1.11 Water Quality

River Basin Management Plans (RBMPs) have been published for all River Basin Districts in Ireland in accordance with the requirements of the Water Framework Directive. The online EPA Envision map viewer provides access to water quality information at individual waterbody status for all the River Basin Districts in Ireland. The EPA Envision map viewer was consulted, most recently, on 9th of November 2023 concerning the water quality status of the rivers which run within and directly adjacent to the Site. The WFD River Waterbody Status 2016 – 2021 for the watercourses which flow through the Site have been assessed in Table 6-12.

Table 6-12 Watercourses within the Site with relevant water quality statuses

Name	Location	Q-Value	Status	Risk (WFD 3 rd cycle)
Suir	Flows in a southerly direction through the Site where it then merges with the Eastwood River south of the Site and continues flowing in a southerly direction.	3-4	Moderate	At Risk
Shanakill 16	The Shanakill 16 flows in a south westerly direction through the north eastern portion of the Site until it merges with the Suir River within the north of the Site.	-	Poor	At Risk
Farranacahill	The Farranacahill flows from within the north of the Site in a southerly direction and merges with the Eastwood river within the west of the Site.	-	Moderate	Review
Unnamed watercourse	The unnamed watercourse flows through the west of the Site in a south easterly direction and into the Faranacahill within the west of the Site before the Faranacahill flows into the Eastwood.	-	Moderate	At Risk
Eastwood	The Eastwood flows into the Site from the west in a south easterly direction and then flows in a southerly direction through the west of the Site merging with the Suir River below the Site.	-	Moderate	Review
Clonmore (Stream)	The Clonmore Stream flows westerly passing in and out of the south eastern section of the Site several times and flows into the Suir River within the south east of the Site.	3-4	Moderate	At Risk
Lahagh 16	The Lahagh 16 watercourse is a tributary of the Clonmore (stream) which flows in a north westerly direction and into the Clonmore (stream) within the eastern portion of the Site.	-	Moderate	At Risk
Strogue	The Strogue watercourse is a tributary of the Clonmore (stream) which flows in a north westerly direction and into the Clonmore (stream) within the eastern portion of the Site.	-	Moderate	At Risk

Status– WFD River Waterbody Status 2010-2015 Risk – WFD River Waterbodies Risk

Conclusions of the Desk Study

The desktop study has provided information about the existing environment in hectad S17, within which the Proposed Project is located. The mammal species recorded within the relevant hectad have widespread range and distributions in Ireland and are likely to be recorded frequently throughout Ireland (Marnell et al, 2009⁸). Bat records within 10km of the Site revealed that the wider area has been studied for bats. This suggests that the area offers potential for foraging and commuting bat species.

As part of the desk study, the Article 17 mapped Annex I habitats data set was searched. Isolated patches of mapped Annex I Orchid Rich Calcareous Grassland and Molinia Meadows are present in excess of 1.4km east of the Site. Mapped Annex I Molinia meadows also occur approx. 4.1km to the south of the Site. A number of Annex I habitats are mapped between approx. 4.3 and 8km west of the Site including Nardus Rich Upland Grassland, Wet Heath, Alpine and Subalpine Heath, Dry Heath and Siliceous Rocky Slopes.

A number of watercourses within the Site, lead to downstream National and EU Designated Sites. The EU designated sites are further considered in the Natura Impact Statement prepared for the Proposed Project.

The desk study identified that a variety of protected faunal species are known to occur within the Site, including bats, otter, and badger. The mammal species recorded during the desk study informed the survey methodologies undertaken during the site visits. The desk study also provided useful information to inform the ecological surveys undertaken within the Site as well as the identification of pathways for potential impact on sensitive ecological receptors.

⁸Marnell, F., Kingston, N. & Looney, D. (2009) Ireland Red List No. 3: Terrestrial Mammals, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

6.6

Description of the Existing Environment

6.6.1

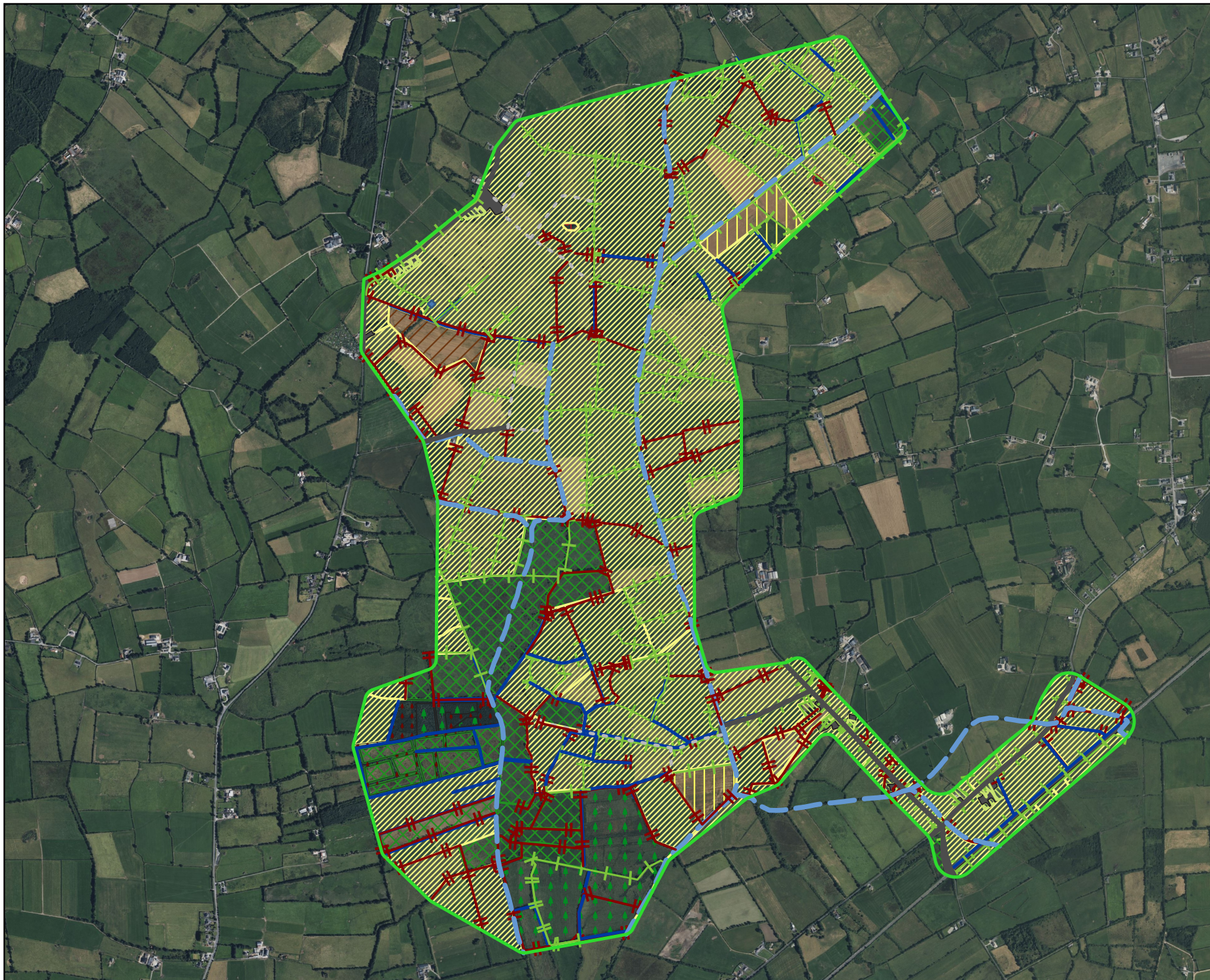
Description of Habitats within EIAR Study Boundary

A total of seventeen habitats were recorded within the Site (see Habitat Map – Figure 6-5), including;

















- > Improved Agricultural Grassland (GA1)
- > Wet Grassland (GS4)
- > Arable Crops (BC1)
- > Tilled Land (BC3)
- > Scrub (WS1)
- > Buildings and Artificial Surfaces (BL3)
- > Amenity Grassland (GA2)
- > Conifer Plantation (WD4)
- > (Mixed) Broadleaved Woodland (WD1)
- > Hedgerow (WL1)
- > Treeline (WL2)
- > Depositing Lowland Rivers (FW2)
- > Drainage Ditches (FW4)
- > Non-calcareous springs (FP2)
- > Dry Meadows and Grassy Verges (GS2)
- > Spoil and Bare Ground (ED2)
- > Recolonising Bare Ground (ED3)

Areas of GS2, ED2 and ED3 are small in area and are mapped part of mosaics with other habitats in the Habitat Map.

Detailed botanical data from botanical surveys and relevés recorded at the development footprint including the locations of the proposed turbines, substation, met mast, end masts, roads, construction compounds, a proposed borrow pit, underground cabling route, spoil management areas and river restoration area are provided in Appendix 6-1 of the EIAR.



Map Legend

-  EIAR Study Boundary
-  Non-calcareous spring (FP2)
-  Spoil and Bare Ground (ED2)
-  Depositing/ Lowland Rivers (FW2)
-  Drainage Ditches (FW4)
-  Hedgerows (WL1)
-  Treelines (WL2)
-  Arable crops (BC1)
-  Tilled land (BC3)
-  Buildings and artificial surfaces (BL3)
-  Improved agricultural grassland (GA1)
-  Amenity grassland (GA2)
-  Wet grassland (GS4)
-  (Mixed) broadleaved woodland (WD1)
-  Conifer plantation (WD4)
-  Scrub (WS1)



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Drawing Title

Habitat Map

Project Title

Borrisbeg Renewable Energy Development

Drawn By

AvdGM

Checked By

JH

Project No.

220310

Drawing No.

Figure 6-5

Scale



















1:22,500

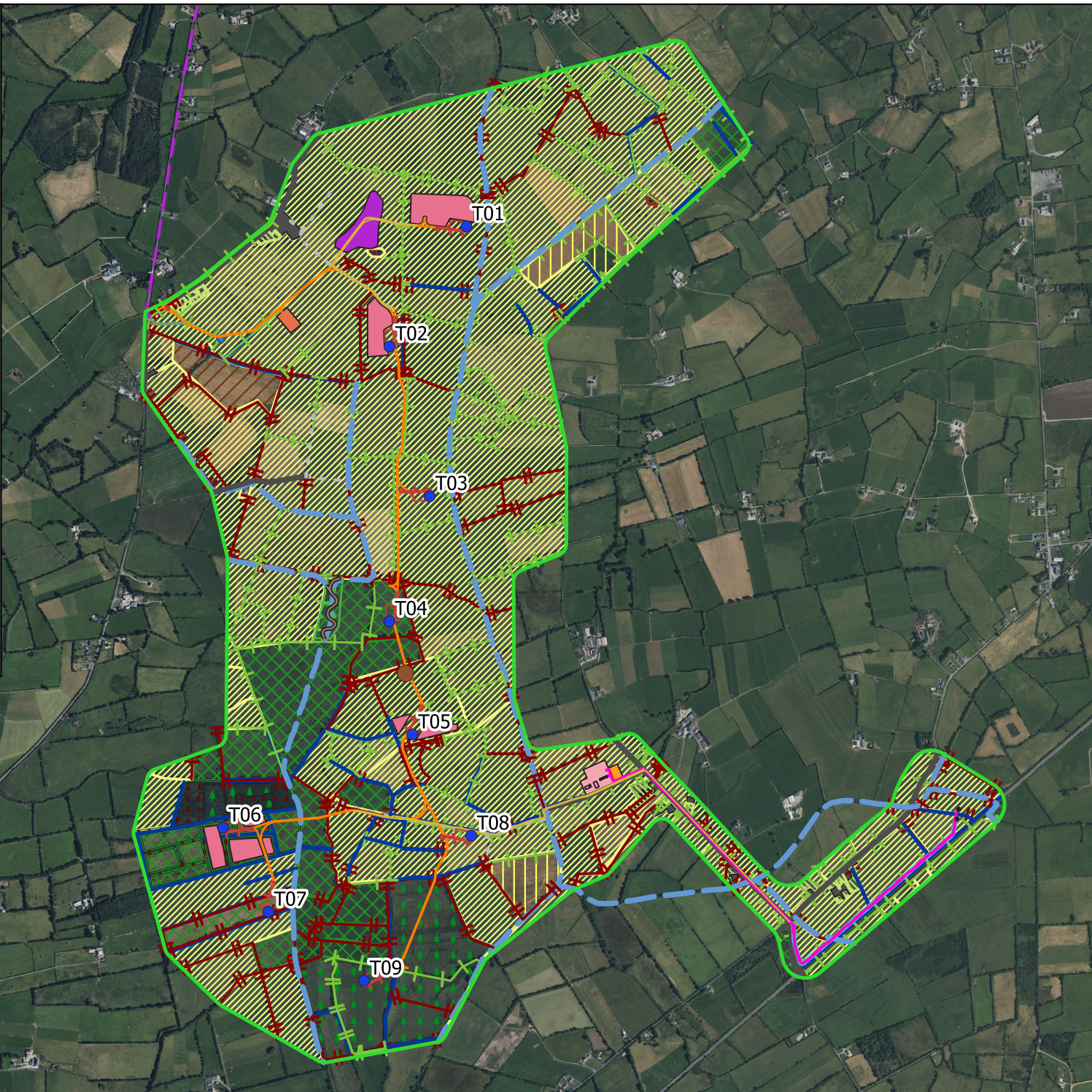
Date

23.11.2023



















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-  Proposed Turbines
-  Proposed Met Mast
-  Proposed Haul Route
-  Proposed Grid Connection Cable Route
-  Existing Roads
-  Proposed New Roads
-  Proposed Turbine Hardstands
-  Proposed New Road for Underground Cable
-  Proposed End Masts
-  Proposed Permanent 110kV Substation
-  Proposed Temporary Security Cabins
-  Proposed Temporary Borrow Pit
-  Proposed Spoil Management Areas
-  Temporary Substation Construction Compound
-  Temporary Wind Farm Construction Compound
-  River Enhancement Stream Concept
-  River Enhancement 5m Riparian Buffer
-  River Enhancement 1.8ha Natural Woodland



Map Legend

-  EIAR Study Boundary
-  Non-calcareous spring (FP2)
-  Spoil and Bare Ground (ED2)
-  Depositing/ Lowland Rivers (FW2)
-  Drainage Ditches (FW4)
-  Hedgerows (WL1)
-  Treelines (WL2)
-  Arable crops (BC1)
-  Tilled land (BC3)
-  Buildings and artificial surfaces (BL3)
-  Improved agricultural grassland (GA1)
-  Amenity grassland (GA2)
-  Wet grassland (GS4)
-  (Mixed) broadleaved woodland (WD1)
-  Conifer plantation (WD4)
-  Scrub (WS1)


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Drawing Title
Habitat Map with Proposed Project overlaid

Project Title
Borrisbeg Renewable Energy Development

Drawn By AvdGM	Checked By JH
Project No. 220310	Drawing No. Figure 6-6
Scale 1:22,500	Date 23.11.2023


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6.6.2 Proposed Wind Farm

6.6.2.1 Grassland Habitats

6.6.2.1.1 Improved agricultural grasslands (GA1)

The dominant habitat throughout the Site is Improved Agricultural Grassland (GA1) (Plate 6-1). These improved agricultural grasslands are generally species poor consisting predominantly of perennial rye grass (*Lolium perenne*) and other commonly occurring species such as broad-leaved dock (*Rumex obtusifolius*), dandelion (*Taraxacum officinale* agg), creeping buttercup (*Ranunculus repens*) and white clover (*Trifolium repens*). The majority of the Proposed Project infrastructure is located within this habitat including both temporary construction compounds, the permanent 110kV substation, Turbines 1, 2, 3, 5 and 8, spoil management areas around Turbines 1, 2 and 5, met mast, proposed new road for underground cable route, end masts and a large proportion of the proposed internal site access tracks.



Plate 6-1 Example of typical sward of Improved agricultural grassland within the Site.

6.6.2.1.2 Wet Grassland (GS4)

Areas of grasslands within the southwest of the site are classified as wet grasslands (GS4) (Plate 6-2). The majority of the areas of Wet grassland border the Eastwood river (A Depositing Lowland River (FW2)) on both of its banks. These areas tended to be dominated by the following plant species; Soft rush (*Juncus effusus*), Creeping buttercup (*Ranunculus repens*), Broad-leaved dock (*Rumex obtusifolius*), Yorkshire fog (*Holcus lanatus*), Common sorrel (*Rumex acetosa*), Creeping bent grass (*Agrostis stolonifera*), Perennial ryegrass (*Lolium perenne*). Other species also occurring within these grasslands include; White clover (*Trifolium repens*), Marsh thistle (*Cirsium palustre*), Marsh bedstraw (*Galium palustre*), Meadow sweet (*Filipendula ulmaria*), Silverweed (*Argentina anserina*), Lesser celandine (*Ficaria verna*), Creeping thistle (*Cirsium arvense*), Cuckoo flower (*Cardamine pratensis*), Spear thistle (*Cirsium vulgare*), Tansy ragwort (*Jacobaea vulgaris*) and Willow herb (*Epilobium hirsutum*). Site infrastructure located within this habitat includes Turbine 4, 6 and 7, the spoil management areas around Turbine 6 and a small proportion of the internal site access tracks.



Plate 6-2 Example of typical sward of Wet grassland within the Site.

6.6.2.1.3 Dry meadows and grassy verges (GS2)

Small areas of Dry meadows and grassy verges (GS2) were recorded at various locations along existing tracks and throughout the Site (Plate 6-3). These areas were mostly dominated by the following plant species, yorkshire fog (*Holcus lanatus*), perennial rye grass (*Lolium perenne*), cleavers (*Galium aparine*), nettles (*Urtica dioica*), silverweed (*Potentilla anserina*), white and red clover (*Trifolium repens, pratense*), hogweed (*Heracleum sphondylium*), Common Knapweed (*Centaurea nigra*), creeping buttercup (*Ranunculus repens*), and Bush Vetch (*Vicia sepium*).



Plate 6-3-3 Example of Dry meadows and grassy verges located at the northwest of the Site.

6.6.2.1.4 Amenity Grassland (GA2)

Small areas of Amenity grassland (GA2) were recorded adjacent to the Site and in private dwelling gardens mapped within the Site, outside the proposed development footprint. These areas were predominantly made up of managed lawns, and managed hedgerows of cherry laurel (*Prunus laurocerasus*), portuguese laurel (*Prunus lusitanica*), and fuchsia (*Fuchsia magellanica*).

6.6.2.2 Woodland Habitats

6.6.2.2.1 (Mixed) Broadleaved woodland (WD1)

This habitat is found within the south-western area of the Site surrounding Turbine 6 (Plate 6-4). The area surrounding Turbine 6 occurs as linear strips of woodland that define the boundaries of wet grassland (GS4) fields. This woodland has originated as hedgerows/ treelines established on both sides of drains merged and expanded outwards into neighbouring fields. This has resulted in thin layers of woodland forming between the areas of wet grassland (GS4). The species found within this habitat area dominated by hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), common hazel (*Corylus avellana*), and ash (*Fraxinus excelsior*), and also contain spindle (*Euonymus europaeus*), dog rose (*Rosa canina*), willow spp, bramble (*Rubus fruticosus* agg.), common gorse (*Ulex europaeus*), holly (*Ilex aquifolium*), primrose (*Primula vulgaris*), ivy (*Hedera helix*) barren strawberry (*Potentilla sterilis*), Wood sedge (*Carex sylvatica*), common dog violet (*Viola riviniana*), pig nut (*Conopodium majus*), wood sanicle (*Sanicula europaea*), male fern (*Dryopteris filix-mas*), cleavers (*Galium aparine*), harts-tongue fern (*Asplenium scolopendrium*), dandelion (*Taraxacum officinale* agg), and lesser celandine (*Ficaria verna*). A portion of this habitat is found within the Turbine 6 hardstand footprint (Plate 6-5). This habitat also occurs north of Turbine 6 alongside areas of Conifer plantation (WD4) and is classified as a commercial ash plantation (Plate 6-6).



Plate 6-4 Example of (Mixed) broadleaved woodland within the Site North of Turbine 6, representative of habitat to be removed within the Bat Buffer surrounding Turbine 6.



Plate 6-5 Drain and woodland within the Turbine 6 hardstand footprint .



Plate 6-6 Commercial ash Plantation classified as a (mixed) broadleaved woodland (WD1) north of Turbine 6

6.6.2.2.2 Conifer plantation (WD4)

Areas within the Site comprise of different stages of coniferous plantation forestry including recent clear-fell, immature, and semi-mature to mature forestry. The species mainly comprises of Sitka spruce (*Picea sitchensis*). Semi-mature and mature stands of conifer plantation with an ash buffer occur north of Turbine 6 (Plate 6-7). Given the nature of such densely planted coniferous plantations, few other woody plant species occur. Turbine 9 and the associated access road occurs entirely within newly planted immature conifer plantation habitat (Plate 6-9).



Plate 6-7 Example of plantation forestry with ash buffer (WD4) north of Turbine 6.



Plate 6-8 Example of recently planted immature plantation forestry (WD4) occurring at Turbine 9.

6.6.2.3 Aquatic habitats

Watercourses within the Site generally flow in a southerly, south westerly and south easterly direction, are generally straightened and silted. River depths below represent seasonal low flows. Throughout surveys of the Site, river levels fluctuated with the season. A detailed study of the watercourses and fisheries value in the vicinity and within the Site was also conducted and can be found in Appendix 6-3. A number of watercourses are identified within the Site and correspond to Depositing/lowland rivers (FW2) and are discussed below.

6.6.2.3.1 Depositing/lowland river (FW2)

Shanakill River

The Shanakill River flows through the northeastern portion of the Site and averages 2-2.5m in width and between 0.2 and 0.3m in depth. The riverbed substrate consists of compacted cobble and small boulder with areas of interstitial mixed gravels however large portions of the watercourse are heavily silted. Much of the channel is heavily tunnelled with species including hawthorn (*Crataegus monogyna*), great willowherb (*Epilobium hirsutum*), dog rose (*Rosa canina*), bramble (*Rubus fruticosus agg.*), willow (*Salix spp.*) and elder (*Sambucus nigra*). Habitats found alongside the banks of the Shanakill river are dominated by improved agricultural grassland and hedgerows. Instream vegetation within the Shanakill River consists largely of foals watercress (*Apium nodiflorum*), common reed (*Phragmites australis*) and water mint (*Mentha aquatica*) with filamentous algae observed throughout.

Suir River

The Suir River flows north to south through the Site. Within the Site, it averages 4-6m in width and has been straightened and deepened. It has steep banks up to 2.5m in height. The riverbed substrate consists of large areas of sand and silt with gravels cobbles and small boulder confined to faster flowing sections. Areas of compacted clay are also present along the watercourse. Poaching is evident at multiple locations along the riverbank within the Site and the riverbed is heavily silted in many areas, with siltation evident throughout. Habitats found alongside the banks of the Suir river are dominated by improved agricultural grassland, treelines and hedgerows as well as an area of recently planted conifer plantation at the southern end of the Site. Instream and marginal vegetation within the river include foals watercress (*Apium nodiflorum*), water mint (*Mentha aquatica*), water crowfoot (*Ranunculus spp.*) and reed canary grass (*Phalaris arundinaceae*) with filamentous algae observed in areas throughout the river channel.

Farranacahill River

The Farranacahill River flows through the western portion of the Site in a southerly direction. It is approx. 2.5m in width and has experienced extensive straightening and deepening. The substrate consists almost exclusively of deep fine sediments up to 0.3m deep and bank heights of up to 2m. The watercourse is heavily vegetated throughout with abundant fool's watercress, duckweed (*Lemna. Spp.*), water mint, branched burreed (*Sparganium erectum*) and water starwort (*Callitriche sp.*). Habitats found alongside the banks of the Farranacahill river are dominated by improved agricultural grassland, treelines and hedgerows.

Eastwood River

The Eastwood River flows into the Site from the west before turning south down through the western side of the Site. The river averages 3m in width and between 0.2 and 0.7m in depth. The riverbed substrate consists of heavily silted clay dominated sediment with small boulders and cobbles heavily bedded in silt. Segments of the river are heavily shaded with hawthorn, blackthorn (*Prunus spinosa*), willow (*Salix. spp*) and bramble among other shrubs and tree species while other areas of the river flow through grassland habitats with very sparse shading. Habitats found alongside the banks of the river are dominated by improved agricultural grassland, wet grassland, hedgerows, treelines and areas of mixed broadleaved woodland and conifer plantation. Instream vegetation within the river is sparse through large sections and consists largely of foals watercress (*Apium nodiflorum*), water mint (*Mentha aquatica*), brooklime (*Veronica beccabunga*) and small areas of water crowfoot.

Clonmore River

The Clonmore River and its tributaries flow through the eastern side of the Site, under several bridges and culverts, in a westerly direction and flows into the Suir River in the southeast of the Site. The river is bordered by grassland, hedgerows and treelines. It averages 4-5m in width and 0.2-0.3m deep. Banks are generally up to 3m in height and the watercourse shows evidence of historical straightening and deepening. Siltation is heavy throughout.

Unnamed stream

An unnamed stream flows through an area of the western portion of the Site in a south easterly direction and merges with the Farranahill River. The unnamed stream averages 1-1.5m in width and between 0.2 and 0.3m in depth. The riverbed substrate consists almost entirely of deep sediments up to 0.3m deep and is heavily vegetated with fools water cress and branched bur-reed. Habitats found alongside the banks of the unnamed stream are dominated by improved agricultural grassland and hedgerows.



Plate 6-9 River Suir in the north of the Site.



Plate 6-10 River Suir within the south of the Site with evidence of heavy poaching.



Plate 6-11 Representative image of the Eastwood River in high flow within the south of the Site.



Plate 6-12 The Eastwood River in flood within the area proposed for river restoration.

6.6.2.3.2 **Drainage Ditches (FW4)**

There are numerous drainage ditches throughout the Site associated with agricultural field boundaries, hedgerows, and treelines. Drainage ditches also occurred between conifer plantation boundaries.

Many of the drainage ditches associated with agricultural grassland areas (Plate 6-13) have very little to no instream vegetation. Species include water horsetail (*Equisetum fluviatile*), perennial rye grass (*Lolium perenne*), yorkshire fog (*Holcus lanatus*), creeping buttercup (*Ranunculus repens*), *Sphagnum* spp., Sorrel (*Rumex acetosa*), common dandelion (*Taraxacum officinale*), common ragwort (*Jacobaea vulgaris*), common gorse (*Ulex europaeus*), silverweed (*Argentina anserina*), and white clover (*Trifolium repens*).

Drainage ditches found bordering the conifer plantations and broad-leaved woodlands tended to be flooded in parts, with bare soil dominating much of the drain bed. (Plate 6-14). The species found here mainly consist of ivy (*Hedera Hibernica*), common sorrel (*Remex acetose*), foxglove (*Digitalis purpurea*), *Sphagnum* spp., bramble (*Rubus fruticosus*), nettle (*Urtica dioica*), common dandelion (*Taraxacum officinale*), cuckoo-pint (*Arum maculatum*), Pendulous sedge (*Carex pendula*), cleavers (*Galium aparine*), and bracken (*Pteridium aquilinum*).

Drainage ditches found along treelines and hedgerows within agricultural grassland and wet grasslands tended to be heavily vegetated and flooded in parts. (Plate 6-15). The species found here mainly consist of common sorrel (*Remex acetose*), *Sphagnum* spp., bramble (*Rubus fruticosus*), nettle (*Urtica dioica*), meadow sweet (*Filipendula ulmaria*), lesser celandine (*Ficaria verna*), timothy (*Phleum pratense*), cow parsley (*Anthriscus sylvestris*), water mint (*Mentha aquatica*), hairy willowherb (*Epilobium hirsutum*), lesser water parsnip (*Berula erecta*), creeping buttercup (*Ranunculus repens*), ribwort plantain (*Plantago lanceolata*), cleavers (*Galium aparine*), and primrose (*Primula vulgaris*).



Plate 6-13 An example of drainage ditch (FW4) that is located south of turbine 7 within an agricultural grassland (GA1) within the Site.



Plate 6-14 An example of a drainage ditch (FW4) located at the north of turbine 6 in between the existing confer plantation (WD4) and mixed broadleaved woodland (WD1).



Plate 6-15 An example of drainage ditches (FW4) found along treelines (WL2) and hedgerows (WL1) south of turbine 7 within agricultural grasslands (GA1) and wet grasslands (GS4) within the Site.

6.6.2.3.3 Non-calcareous springs (FP2)

A non-calcareous spring was identified approximately 11m southeast of a proposed access road at the north of the Site (Plate 6-16). This spring is located within an agricultural grassland and water flows southeast toward an unnamed stream at the southeast border of the field. The spring is heavily vegetated with species such as Marsh Pennywort (*Hydrocotyle vulgaris*), nettle (*Urtica dioica*), creeping buttercup (*Ranunculus repens*), *Sphagnum spp.*, yorkshire fog (*Holcus lanatus*), hairy willowherb (*Epilobium hirsutum*), common plantain (*Plantago major*), yellow flag iris (*Iris pseudacorus*), soft rush (*Juncus*

effusus), lesser water parsnip (*Berula erecta*), water mint (*Mentha aquatica*), broad leaved doc (*Rumex obtusifolius*), and cuckoo flower (*Cardamine pratensis*).



Plate 6-16 Non-calcareous spring (FP2) located west of turbine 2 at the north of the Site.

6.6.2.4 Other Habitats

6.6.2.4.1 Scrub (WS1)

Large areas of scrub and linear periods of scrub are present at various locations throughout the Site including field boundaries, (Plate 6-17) along drainage ditches, treelines, edges of woodland and waterways. Species predominantly comprise gorse (*Ulex europaeus*), willow (*Salix cspp.*), Hazel (*Corylus avellana*), birch (*Betula spp.*), bramble (*Rubus fruticosus agg.*), bracken (*Pteridium aquilinum*) and nettle (*Urtica dioica*), dog rose (*Rosa canina*), blackthorn (*Prunus spinosa*), (Plate 6-18) and hawthorn (*Crataegus monogyna*).



Plate 6-17 Example of Scrub (WS1) habitat made up of bramble, willow, and blackthorn bordering a wet grassland located to the west of turbine 6.



Plate 6-18 Example of Scrub (WS1) habitat made up of blackthorn, encroaching on an agricultural grassland (GA1) located north of turbine 5.

6.6.2.4.2 Hedgerows (WL1) and Treelines (WL2)

Hedgerow and Treeline habitats border various grasslands, farm tracks, waterways, and drainage ditches throughout the development footprint. Species found in the treeline habitats are predominantly hawthorn (*Crataegus monogyna*), hazel (*Corylus avellana*), ash (*Fraxinus excelsior*), and blackthorn (*Prunus spinosa*). (Plate 6-19). The understory comprises bramble (*Rubus fruticosus*), nettle (*Urtica dioica*), ivy (*Hedera hibernica*), and dog rose (*Rosa canina*).

Species found in the hedgerow habitats are predominantly hawthorn (*Crataegus monogyna*), *Fuchsia* (*Fuchsia magellanica*), blackthorn (*Prunus spinosa*), bramble (*Rubus fruticosus*), nettle (*Urtica dioica*), common ivy (*Hedera hibernica*), dog rose (*Rosa canina*), willow (*Salix spp.*), elder (*Sambucus nigra*), cleavers (*Galium aparine*), common gorse (*Ulex europaeus*), and holly (*Ilex aquifolium*) (Plate 6-20).



Plate 6-19 An example of a treeline (WL2) located in a wet grassland (GS4) in between turbine 6 and 7 at the south of the Site.



Plate 6-20 Example of a hedgerow (WL1) located at the southeast of the site within an agricultural grassland (GA1) within the Site

6.6.2.4.3 Buildings and artificial surfaces (BL3)

Buildings and artificial habitats within the Site mainly consist of agricultural sheds and farmyards, dwelling houses and existing roadways, excluding minor farm access tracks. Species associated with this habitat predominantly comprises bracken (*Pteridium aquilinum*), bramble (*Rubus fruticosus agg.*), yorkshire fog (*Holcus lanatus*), common nettle (*Urtica dioica*), common ivy (*Hedera hibernica*), perennial ryegrass (*Lolium perenne*), and elder (*Sambucus nigra*).



Plate 6-21 Example farm shed categorised under the buildings and artificial surfaces (BL3) within the Site.

6.6.2.4.4 **Recolonising bare ground (ED3) and Spoil and bare ground (ED2)**

Farm tracks and other areas of disturbed land are located within the Site. These tracks are made up of loose stone chippings and compacted dirt with small amounts of plant species colonising parts of the centre of the track. A number of areas where ground disturbance has been undertaken in the recent past have begun to recolonise (Plate 6-22).



Plate 6-22 Example of a farm track that runs through the northern end of the Site for land access and categorised as Spoil and bare ground (ED2).

6.6.2.4.5 Tilled land (BC3) and Arable Crops (BC1)

A number of fields located within the Site are considered under these habitat classifications. A number of fields at the north of the Site west of Turbine 2 are categorised as Tilled Land (BC3). At the time of the walkover (27th April 2023), these fields were prepared for planting (evident by recent soil rotation), but the crop type could not be established (Plate 6-23). A number of fields at the north of the site east of Turbine 1 and at the south of the site southeast of Turbine 8 are categorised as Arable Crops (BC1).



Plate 6-23 Example of Tilled land (BC3) located at the north of the Site, west of turbine 2.

6.6.2.5 Habitats within the turbine hardstand footprint

Turbines 1, 2, 3, 5 and 8 are located on Improved agricultural grassland (GA1) habitat as described in Section 6.6.1.1.1. Turbines 4, 6 and 7 are located on wet grassland (GS4) as described in Section 6.6.1.1.2 with an area of the Turbine 6 hardstand overlapping with a thin strip of mixed broadleaved woodland (WD1). Turbine 9 is located within conifer plantation (WD4) as described in Section 6.6.1.2.2. Details of the relevés undertaken within the footprint of the turbine bases are provided in Appendix 6-1.

6.6.2.1 Habitat within the Temporary Construction Compound

The habitat within the proposed temporary construction compound consists entirely of Improved agricultural grassland (GA1). Relevés within the footprint of the temporary construction compound are provided in Appendix 6-1.

6.6.2.2 Habitats within the temporary Borrow Pit

The temporary borrow pit is located within an area of improved agricultural grassland (GA1) present on either side of a gravel and dirt farm access track classified as Spoil and bare ground (ED2). Species present within the grassland include Perennial ryegrass (*Lolium perenne*), Germander Speedwell (*Veronica chamaedrys*), Nettle (*Urtica dioica*), Yorkshire fog (*Holcus lanatus*) and Cocks foot (*Dactylis glomerata*). A relevé within the footprint of this area is provided in Appendix 6-1.

6.6.2.3 Habitats at the Proposed Met Mast

The habitat within the proposed met mast consists entirely of Improved agricultural grassland (GA1). Relevés undertaken at its footprint are provided in Appendix 6-1.

6.6.2.4 Internal Road Water-crossing Structures

A proposed internal road which leads to Turbine 6 and Turbine 7 will cross the Eastwood River in the southwest of the Site. This road will cross the river and pass through treeline that is located east of Turbine 6. The treeline here consists of hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), ash (*Fraxinus excelsior*), holly (*Ilex aquifolium*), gorse (*Ulex europaeus*), and elder (*Sambucus nigra*). This road will allow access to the proposed Turbine 6 and Turbine 7 locations within the Site (Plate 6-24). The internal site road continues east toward T8 and from this location the proposed substation location is accessed along an existing road (L-70391) which crosses over the Suir River at an existing bridge (Plate 6-25).



Plate 6-24 Proposed crossing location on the Eastwood River east of turbine 6.



Plate 6-25 View of existing crossing at the Suir River located at the southeast of the Site leading the proposed substation location from turbine 8.

6.6.2.5 Habitats at the Proposed River Restoration Area

As part of the Proposed Wind Farm design, it is proposed to restore a portion of the Eastwood River by improving the channel stability and instream habitat and establishing a natural wooded riparian buffer either side of the channel in the form of a 1.8ha plantation of natural woodland species.

The existing habitats within the proposed river restoration area consist predominantly of a highly modified depositing/ lowland river (FW2) (Eastwood River) which flows through a wet grassland (GS4). Species found within the wet grassland habitat found on both sides of the Eastwood River include meadowsweet (*Filipendula ulmaria*), ribwort plantain (*Plantago lanceolata*), creeping buttercup (*Ranunculus repens*), meadow buttercup (*Ranunculus acris*), ragwort (*Jacobea vulgaris*), areas of yellow flag iris (*Iris pseudoacorus*), curly dock (*Rumex crispus*), broad leaved dock (*Rumex obtusifolius*), silver weed (*Potentilla anserina*), spear thistle (*Cirsium vulgare*), selfheal (*Prunella vulgaris*), small areas of bramble (*Rubus fruticosus* agg.) near the river's edge, nettle (*Urtica dioica*), occasional willow species (*Salix* spp.) on the banks of the watercourse, Yorkshire fog (*Holcus lanatus*), occasional hawthorn (*Crataegus monogyna*) on the banks of the watercourse, cocks foot (*Dactylis glomerata*), knapweed (*Centaurea nigra*), chickweed (*Stellaria media*), clover (*Trifolium* spp.), creeping thistle (*Cirsium arvense*), daisy (*Belis perennis*) and hard rush (*Juncus inflexus*). A hedgerow and some willow (*Salix* spp.) scrub is located on the western boundary of the proposed river restoration/ biodiversity enhancement area. Species within the hedgerow include marsh woundwort (*Stachys palustris*), nettle (*Urtica dioica*), willow (*Salix* spp.), bramble (*Rubus fruticosus* agg.), hedge bindweed (*Calstegia sepium*), hawthorn (*Crataegus monogyna*), and blackthorn (*Prunus spinosa*). The hedgerow along the western boundary of the river will not be altered by the restoration. A description of the Eastwood River within the Site is detailed in Section 6.6.1.3.1.

At the time of survey the river restoration area of the Eastwood River was in high flow (near flood) with the width of the river (in this area) between 4 and 7 metres (Plate 6-26). The river bed was heavily silted with no course material visible and the water depth was approximately 1.2m in depth. There is very little instream vegetation however marginal vegetation consists of watercress (*Nasturtium officinale*) and water forget me not (*Myosotis scorpioides*) in patches along the watercourse. Areas of the river banks as well as the surrounding grassland have been heavily poached.



Plate 6-26 Eastwood River within the river restoration area bordered by wet grassland (GS4) on both banks.

6.6.2.6 Habitats along the turbine delivery route

As detailed in Section 4.5.21 of Chapter 4 ‘Description’:

‘To facilitate the transportation of turbine components off the M7 and onto the N62 which runs along the western boundary of the Site, minor accommodating works are required at junction 22 off the M7 which involves the temporary stoning up of the verges. All works are minor, temporary and contained within the road carriage. Once the abnormal loads have been delivered, these areas will be reseeded.

The swept path analysis undertaken for this junction indicates that as the abnormal load vehicle turns left off the M7, in order to minimise the impact on the eastern corner of the M7 /slip road junction, the blade tip will be required to over-sail into the eastbound carriageway of the M7. This will require to be managed in consultation with TII and will require a short-term closure of the eastbound arm of the motorway during the delivery of the turbine blades. It should be noted that the delivery of the abnormal loads will take place under Garda escort and at night to minimise traffic disruptions. Please see Chapter section 15.1 of this EIAR for further details.’

Junction 22 (M7 Motorway and N62 national road).

Junction 22 located approx. 9.4km north of the Site, connects the M7 to the N62 which runs along the western boundary of the Site. This area comprises buildings and artificial surfaces (BL3) as well as built up earth banks (BL2) now colonised and considered to have dry meadows and grassy verges (GS2) on top. Species composition of the dry meadows and grassy verges (GS2) habitat included dandelion, creeping buttercup, clover, ragwort (*Jacobaea vulgaris*), red fescue (*Festuca rubra* agg.) and perennial rye grass. A portion of the turbine oversail area overlaps part of a short and immature mixed broadleaf and conifer treeline (WL2). This treeline has been planted atop the earth bank island present at the junction 22 exit from the M7. The trees within the treeline are not considered to have any potential roosting suitability for bats.



Plate 6-27 Dry Meadows and Grassy verges (GS2) habitat with the land take and mixed conifer and broadleaf treeline in the oversail area.



Plate 6-28 M7 junction merging with the N62 classified as Buildings and artificial surfaces (BL3) and adjacent dry meadows and grassy verges (GS2) within turbine delivery route accommodation area.

No other areas of accommodation works are proposed for the Haul Route. Habitats adjacent to junction 22 and the N62 leading towards the Site entrance consist of habitats common and widespread within the surrounding area such as buildings and artificial surfaces (BL3), hedgerow (WL1), improved agricultural grassland (GA2) and dry meadows and grassy verges (GS2). To facilitate the delivery of turbines into the Site, a temporary abnormal load entrance and access track is required. This temporary entrance is located to the west of the permanent proposed Site entrance and is located within improved agricultural grassland (GA1) and fractured immature hedgerow (WL1).

6.6.2.7 Habitats along the Proposed Grid Connection

It is proposed to construct a 110kV onsite electrical substation in the townland of Clonmore which will be connected by means of an underground grid connection cable route and 2 no. lattice tower end masts to the existing 110kV Ikerrin to Thurles overhead line located in the townlands of Strogue, Co. Tipperary. The proposed underground electrical cabling route is approximately 2km long and runs through a mix of local road (L7039 for 870m) and other habitats. Please see Appendix 4-5 section and plan detail.

Habitats present at and surrounding the Proposed Grid Connection footprint include the following:

- Improved agricultural grassland (GA1)
- Buildings and artificial surfaces (BL3)
- Treelines (WL2)
- Hedgerows (WL1)
- Wet grassland (GS4)
- Amenity grassland (GA2)
- Dry meadows and grassy verges (GS2)

The proposed 110kV substation and its associated temporary construction compound are located within an area of Agricultural grassland (GA1) adjacent to local road L-70391 within the east of the Site. The proposed underground grid connection cable route continues east from the substation through the Agricultural grassland (GA1) habitat before exiting on to the L7039 local road classified as Buildings and artificial Surfaces (BL3), where it turn south and runs along the road, crossing the R433 and L7038 for a total of 870m. Habitats adjacent to these roads include Amenity grassland (GA2), Buildings and artificial surfaces, Hedgerow (WL1) and Treeline (WL2).

The proposed underground grid connection cable route crosses the Clonmore (Stream) classified as a depositing/ lowland river (FW2), (Plate 6-29; Plate 6-30). This watercourse crossing is referred to as grid route watercourse crossing no. 1 (WC1). At WC1 located in the L7039 road, it is proposed to cross the Clonmore watercourse via the Directional Drilling (DD) method. This method comprises this drilling under obstacles such as bridges, culverts, railways, water courses, etc. to install cable ducts under the obstacle. The road at this river crossing is lined by a managed hedgerow with species including hawthorn (*Crataegus monogyna*) and blackthorn (*Prunus spinosa*) and scattered trees including alder (*Alnus glutinosa*), hawthorn (*Crataegus monogyna*), and ash (*Fraxinus excelsior*). Full details of WC1 directional drilling can be found in section 4.9.8.6.1 of Chapter 4 'Description'.

From the L7038, the proposed underground grid connection cable route enters agricultural grassland (GA1), running parallel to the L7038 for approx 175m before turning in a northeastern direction. The underground grid connection cable route crosses a tributary of the Clonmore (Stream), the Strogue Stream, which is classified as a Depositing/ lowland River (FW2) and is located within an agricultural grassland and bordered by a treeline (WL2) that consists of hawthorn (*Crataegus monogyna*) and blackthorn (*Prunus spinosa*) and scattered trees including ash (*Fraxinus excelsior*) (Plate 6-31). This new proposed crossing is referred to as watercourse crossing no. 2 (WC2). At WC2, it is proposed to construct a clear-span watercourse crossing.

The underground grid connection cable route continues to run through agricultural grassland (GA1) and several treelines and field drains before terminating at proposed end masts approx. 2km from the

110kV substation. The end masts will be located on either side of a Treeline delineating two improved agricultural grasslands and a portion of this treeline will need to be removed to facilitate a cable track to connect to the second end mast.

The proposed end masts are also to be located in an area of agricultural grassland (GA1). This grassland is bordered by hedgerow (WL1) to the east and west, drainage ditches (FW4) to the north, east, and south, and treelines (WL2), to the northeast and south.

The species found in this grassland consisted of perennial rye grass (*Lolium perenne*), dandelion (*Taraxacum officinale agg.*), daisy (*Bellis perennis*), yorkshire fog (*Holcus lanatus*), white clover (*Trifolium repens*), broad leaved doc (*Rumex obtusifolius*), and ribwort plantain (*Plantago lanceolata*).

The species found within the treelines bordering this grassland are hawthorn (*Crataegus monogyna*), ash (*Fraxinus excelsior*), elder (*Sambucus nigra*), blackthorn (*Prunus spinosa*), and holly (*Ilex aquifolium*).

The hedgerow at the borders of the grassland was mainly made up of blackthorn (*Prunus spinosa*) and bramble (*Rubus fruticosus*).



Plate 6-29 Route for grid connection underground cabling on road crossing at Clonmore river bridge located at the south east of the Site.



Plate 6-30 Bridge at Clonmore river where grid connection will pass underneath (HDD) within the road, southeast of the Site.



Plate 6-31 View of the proposed clearspan bridge location with an existing tunnel within the railway located at the southeast of the Site near where the proposed grid connection underground cabling access road will pass by.



Plate 6-32 Drainage ditch (FW4) and treeline (WL2) located between fields for the proposed end masts.

6.6.2.7.1 Watercourse crossings

The 2 water crossings identified along the underground grid connection cable route during the walkover survey have been assigned reference numbers: WC1 and WC2 as in Table 6-13 below. Locations of water crossings are shown on Figure 6-1. All crossings are EPA-mapped rivers. Description and pictures of the 2 water crossings can be seen in section 6.6.1.10 above. In addition to the two rivers there are a number of open farm drains that will need to be crossed.

Table 6-13 Watercourse crossings

Crossing ID	Location (Irish Grid Ref.)	Culvert type	Crossing option	Channel Works	EPA watercourse reference
WC 1	S 14639 74022	Stone Arch	Directional Drilling	None. No instream works required.	Clonmore (Stream) [Suir]
WC2	S 14972 73791	N/A	Construction of new clearspan watercourse crossing adjacent to existing railway crossing	None. No instream works required.	Strogue

6.6.2.8 Protected Flora

Wood bitter vetch (*Vicia orobus*) listed under the Flora (protection) Order (S.I. No. 235 of 2022) was identified approximately 60m east of proposed Turbine 1 hardstand infrastructure. This record location has been included in the Confidential Appendix 6-5. No infrastructure is proposed for the area in which wood bitter-vetch was identified. No other botanical species listed under the Flora (protection) Order (S.I. No. 235 of 2022), listed in the EU Habitats Directive (92/43/EEC), or listed in the Irish Red Data Books were recorded on the site. All other species recorded are common in the Irish landscape. No rare and protected plant species recorded in the desk study, including those obtained from NPWS data request (see Section 6.5.1.6), were recorded within the Site.

6.6.2.9 Invasive species

During field 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. No Third Schedule invasive species were recorded within the Site or within turbine delivery accommodation works areas.

6.6.3 Fauna in the Existing Environment

The following subsections provide a breakdown of the species recorded during the Site visits and assessments. A map showing locations of evidence of fauna observed is in Figure 6-7.

6.6.3.1 Badger

During the ecological surveys undertaken of the Site, a number of both active and inactive badger setts were found within the Site. No active setts were recorded within 150m of Turbine bases or the borrow pit where breaking or blasting may occur. One of the active setts is located approximately 36m from a section of Proposed Wind Farm road at the north of the Site. This sett is within 50m of proposed construction. Trail camera footage from 13th of April 2023 to 27th of April 2023 showed evidence of badger activity in the vicinity of all active setts.

Two inactive badger setts were located within close proximity to proposed new Wind Farm road infrastructure. The first of these is located approximately 5 metres from a section of proposed access track leading north to Turbine 5. The second inactive badger sett is located approximately 20m south of the proposed access track heading to Turbine 6. A third inactive badger sett was identified approximately 77m south east of the Turbine 5 hardstand and outside of the Bat Buffer of Turbine 5 (Please see description of Bat Buffer in section 6.1.3 of Appendix 6-2). None of these setts showed activity of use by badger from Trail camera footage from 13th of April 2023 to 27th of April 2023 but the inactive sett 20m south of the proposed access track heading to Turbine 6 did show use by Pine Marten as described in Section 6.6.2.4. While these two inactive setts did not show evidence of activity it is possible that they could become active as Badger activity was recorded within the Site with badgers being likely to move around and potentially utilise inactive setts.

The locations of the badger setts are provided in Confidential Appendix 6-5⁹.

6.6.3.2 Otter (*Lutra lutra*)

An Otter was sighted on the 21/09/2022, in the Eastwood River, southeast of Turbine 6 and northeast of Turbine 7. The otter was seen commuting south along the Eastwood riverbank. The Aquatic Baseline Report states that despite some good suitability at numerous survey locations, otter signs were only recorded within the Site on the Shanakill River and the River Suir. Otter signs include a small number of regular spraint sites and old spraint sites as well as prints. No breeding (holt) or couch (resting) places were identified within or 150 downstream of the Site. Watercourses were assessed as providing potentially suitable commuting and foraging habitat for the species and otter may occur within the Site, at least on occasion.

⁹ Following standard best practice, the location of breeding or resting places of protected species should be provided as a confidential appendix for review by the competent authority and not made available to the public in order to avoid potential for persecution.

6.6.3.3 Red Squirrel (*Sciurus vulgaris*)

Red squirrel was identified commuting within the Site. Trail camera footage from the 13th of April 2023 to 27th of April 2023 showed evidence of red squirrel activity north of turbine 6 within the broadleaved and conifer wooded areas of the site. Further red squirrel commuting activity was noted west of Turbine 6.

6.6.3.4 Pine Marten (*Martes martes*)

Trail camera footage from the 13th of April 2023 to 27th of April 2023 showed evidence of Pine Marten entering and exiting an unoccupied badger sett approx. 20m from a proposed access road near Turbine 6. While no other evidence of usage was recorded, a precautionary approach is adopted, and it is assumed the sett may be a resting place for Pine Marten.

6.6.3.5 Bats

Bat walkover surveys which were carried out throughout 2023 in accordance with NatureScot (2021) guidance, form the core dataset for the assessment of effects on bats at the Proposed Project site. Bat surveys included bat habitat suitability appraisal survey, roost survey, manual transect surveys and ground-level static surveys. Bat Survey results are presented below and in Appendix 6-2.

6.6.3.5.1 Bat Habitat Suitability Appraisal Survey

Proposed Wind Farm

With regard to foraging and commuting bats, exposed areas of grassland and farmland (tilled and arable) habitats outlined above, as well as *spoil and bare ground* and *recolonising bare ground*, were considered *Low* suitability, i.e. habitat that could be used by small numbers of commuting bats such as gappy hedgerow or unvegetated stream but isolated (Collins, 2016). Areas of *scrub*, *conifer plantation* and *drainage ditches* 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, 2016). Due to their varying levels of maturity and connectivity, *treelines and hedgerows* were assessed as having *Moderate* to *High* potential. While mature *mixed broadleaf woodland* and *depositing lowland rivers* 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 commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. (Collins, 2016).

Trees present on site comprise a mixture of mature and immature conifer and broadleaved species. With regards to roosting bats, a number of mature broadleaf trees were identified within the bat felling buffers which present *Negligible* to *High* roosting potential. In relation to bat felling buffers, a minimum 50m buffer between turbine blade tip and nearest woodland (or other key habitat features) used by bats (e.g., hedgerows, treelines etc.) is recommended at all wind turbines (NatureScot, 2021). Further detail on bat felling buffers are outlined in in Section 6.1.3 of Appendix 2.

The trees assessed were characterised by extensive ivy cover as well as presence of branch damage and cuts providing potential roosting features suitable for opportunistic and regular roosting. Trees with potential for roosting bats are outlined in further detail below and in Section 4.3.2 of Appendix 2. Additionally, four structures and their associated outbuildings (*buildings and artificial surfaces*) are also assessed below for roosting potential. All other habitats present were assigned a *Negligible* value for roosting bats.

The Eastwood River will require crossing by a new proposed wind farm road. It is proposed to construct a new clear span watercourse crossing on the Eastwood River to facilitate access to T6. It is

also required to pass IPP cables under an existing concrete culvert on the River Suir to the east of T8. No alterations will occur as this crossing will be undertaken via directional drilling. These crossings were assessed on 11th May 2023 for their suitability to support roosting bats (

Table 6-14).

Table 6-14 Proposed Watercourse Crossings for the Proposed Wind Farm

Watercourse Crossing Reference No.	Location (Irish Grid Ref.)	Watercourse Bridge Type	Extent of Works Proposed	Bat Roosting Habitat Suitability
WCA	S 12796 74256	N/A	Construction of new clearspan watercourse crossing	N/A
WCB	S 13798 74308	Existing Concrete culvert crossing	Directional Drilling	Negligible

Proposed Grid Connection

With regard to commuting and foraging bats, features along the underground cabling route 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, 2016).

With regard to roosting bats, habitat features along the underground cabling route, including grassland habitats, 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, 2016).

There are a total of two identified watercourse crossings along the underground cabling route, both of which are EPA/OSI mapped crossings. The crossings were assessed on 11th May 2023 for their suitability to support roosting bats. Only one location has existing crossing infrastructure i.e. WC1 (Table 6-15). The other crossing presents no roosting suitability and will include the construction of a new clearspan bridge.

The underground cabling route will run through a mix of local road (L7039) and new access track across agricultural land. Other than the feature presented in Table 6-15 below, no potential roost features were identified along the underground cabling route. There will be some requirement to remove trees to facilitate the underground grid cabling. However, any trees removed as part of the construction works will be replanted elsewhere within the Site.

Table 6-15 Proposed Grid Connection Watercourse Crossings

Watercourse Crossing Reference No.	Location (Irish Grid Ref.)	Watercourse Bridge Type	Extent of Works Proposed	Bat Roosting Habitat Suitability
WC1	S 14639 74022	Stone Arch	Directional Drilling	Low – high water levels

Turbine Delivery Accommodation Works

With regard to commuting and foraging bats, these works area have been assessed as having *Low-Moderate* suitability. With regard to roosting bats, the habitat features at the works areas, including hedgerows, buildings and artificial surfaces and grassland habitats were assessed as having *Negligible-Low* suitability.

6.6.3.5.2 Roost surveys

Daytime Roost Inspections

Following the search for roosts, four structures and their associated outbuildings containing potential suitable bat roost features were identified within the Site.

The structures were subject to interior (where accessible) and exterior inspections to search for evidence of bats. Details of the inspection surveys are presented below. All identified structures will be retained and avoided as part of the Proposed Project. Details of the inspection surveys are presented in Section 4.3.2 of the Bat Report (Appendix 6-2).

Structures

Table 6-16 Potential Roost Feature (PRF) Inspection Survey Results

Structure	PRF Suitability	Survey Results
Stone Shed and Hay Storage Shed	Stone Shed - <i>Low</i> Hay Storage Shed - <i>Negligible</i>	No evidence of bats. Stone shed in a state of disrepair however some potential for small numbers of bats to roost under Ivy. Hay shed had a lack of suitable roosting features.
Hay barn and Cow Shed	<i>Low</i>	No evidence of bats. Significant light penetration throughout the structure and open to the elements at three sides. Gaps and cracks in the concrete blocks throughout structure and could be used opportunistically by individual bats.
Derelict Farm Shed	<i>Low</i>	No evidence of bats. Small number of cracks suitable for opportunistic use by individual crevice-dwelling species
Dairy Farm and associated Buildings	<i>Low - Moderate</i>	No evidence of bats. Could be used opportunistically by small numbers of bats

Tree Inspections

A small number of Trees contained *Moderate* roosting potential, i.e. a tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (Collins, 2016). Two trees were assessed as containing High roosting potential, i.e. a tree with one or more potential roost sites that's are suitable for use by larger numbers of bats on a more regular bases due to their size, shelter, protection, conditions and surrounding habitat.

The majority of trees assessed were classified as having *Low* roosting potential i.e. a tree of sufficient size and age to contain potential roost features but with none seen from the ground or with features seen with only very limited roosting potential (Collins, 2016).

Conifer plantation to the southwest of the Site do not provide potential roosting habitat of significance for bats and as such were assessed as having *Negligible* roosting potential i.e. negligible habitat features to be used by roosting bats, due to their size and lack of suitable PRFs.

Overall, the Site contains a number of mature trees, hedgerows and treelines. All trees assessed are outlined in

Table 6-17, and in Table 4-7, Figure 4-1 and shown in Plates 4-11 to 4-30 of Appendix 6-2. A summary of trees/tree groups of note within a 100m radius (likely requiring removal) of the proposed turbine locations, their general location, PRFs and their respective suitability for bat roosting, are outlined in

Table 6-17 below. Several trees proposed for removal provide potential suitable habitat for roosting bats. However, no evidence of roosting bats was identified during the ground level inspections.

Table 6-17 Summary of Trees/Tree Groups Inspected within the Site

Nearest Turbine	Inspection Date	PRF	Trees/Hedgerows to be removed/retained. North, South, East or West of Turbine	Bat Suitability
T01	10th May 2022	N/A	Trees to be retained on east, no other treelines to be felled.	<ul style="list-style-type: none"> Negligible
T02	10th May & 28th September 2023	Canker holes, Missing limbs, small rot hole, broken branches	Bat buffer felling: <ul style="list-style-type: none"> S 13215 76200 (east) Partial tree removal: <ul style="list-style-type: none"> S 13159 76123 (south) 	<ul style="list-style-type: none"> East Treeline - Negligible to High South Treeline - Negligible & Low
T03	10th May 2023	N/A	No felling: Trees to be retained on east	<ul style="list-style-type: none"> East Treeline - Negligible
T04	10th May & 28th September 2023	Lifting bark, mature ivy, knotholes, rot holes, lifting bark, butt rot or transverse snaps that could be used by bats.	Bat buffer felling: <ul style="list-style-type: none"> S 13166 75026 (south) S 13101 75134 (west) Trees for retention: <ul style="list-style-type: none"> S 13150 75260 (north) outside felling buffer S 13246 75119 (east) within felling buffer 	<ul style="list-style-type: none"> North - Moderate East - Negligible South - Negligible, Low & one Moderate West - Negligible
T05	10th May 2023	Mature ivy, knotholes, rot holes, lifting bark, missing branches	Bat buffer felling: <ul style="list-style-type: none"> S 13295 74598 (south) S 13295 74564 (southern field) Trees for retention: <ul style="list-style-type: none"> S 13185 74634 (west) 	<ul style="list-style-type: none"> East Treeline - Negligible South Treeline - Negligible, Low & one Moderate
T06	10th May 2023	Ivy cover, twisted branches, small knot holes	Bat buffer felling: <ul style="list-style-type: none"> S 12596 74266 (Felling linear woodland north, east, south and west) 	<ul style="list-style-type: none"> Extensive mature broadleaf trees within bat felling buffer, conifer plantation to the north - Negligible to Low suitability.
T07	10th May & 28th September 2023	N/A	Bat buffer felling: <ul style="list-style-type: none"> S 12656 73968 (north) S 12672 73892 (south) 	<ul style="list-style-type: none"> North - Negligible South - Negligible (sparse linear vegetation)
T08	10th May & 28th September 2023	N/A	Bat buffer felling: <ul style="list-style-type: none"> S 13571 74189 (east) S 13491 74235 hedgerow (north) Trees for retention: <ul style="list-style-type: none"> S 13507 74098 (south) outside buffer 	<ul style="list-style-type: none"> North and East Hedgerow - Negligible Southern Treeline - Negligible

T09	10th May & 28th September 2023	N/A	Bat buffer felling: <ul style="list-style-type: none"> S 13063 73644 (north-south) S 13057 73688 (east-west) 	<ul style="list-style-type: none"> North Treeline and Hedgerow – Negligible
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Emergence Surveys

An emergence survey was carried out on 3rd August 2023 by four surveyors. The derelict stone shed and hay barn, and derelict farm including associated buildings were surveyed. No bats were observed emerging from the structures; however, bats were observed commuting and foraging in the wider area. Two common pipistrelles were noted commuting over the structure and a small number of bats were observed repeatedly foraging along nearby linear features including broadleaf trees.

An emergence survey was also carried out on 28th September 2023 along a mature treeline present in the vicinity of proposed T02. No bats were observed emerging from the trees during the surveys and overall, activity was very low. Table 6-18 summarises the findings of the bat activity surveys carried out on the structures.

Table 6-18 Emergence Survey Results 2023

Structure	PRF Suitability	IG Ref	Survey Type	Date Surveyed	Survey Results
Hay Barn and cow shed	<i>Low and Negligible</i>	S 12975 75626	Dusk Emergence Summer 2023	3rd August 2023	No bats emerging. Small number of bats foraging at nearby watercourse.
Derelict farm shed structure	<i>Low</i>	S 12832 75659	Dusk Emergence Summer 2023	3rd August 2023	One soprano pipistrelle recorded commuting & two bats recorded foraging nearby for a short period.
Dairy Farm and associated Buildings	<i>Moderate, Low and Negligible</i>	S 12717 76702	Dusk Emergence Summer 2023	3rd August 2023	No bats emerging, two to three bats feeding in the sheds close to sunset, recorded at 17 and 22 minutes past sunset, potential roosting nearby.
Treeline at T02	<i>Negligible, Low and Moderate</i>	S 12826 74445	Dusk Emergence Summer 2023	28th September 2023	No bats emerging, one pipistrelle bats recorded commuting to T2 and foraging in the vicinity. Recorded 41 minutes after sunset.

6.6.3.5.3 Manual Transects

Manual transects were undertaken in Spring, Summer and Autumn 2023. Bat activity was recorded in all seasons. A total of 869 bat passes were recorded, including emergence surveys. In general, soprano pipistrelle (n=625) was recorded most frequently, followed the common pipistrelle (n=208). Leisler's bat (n=35) and *Myotis spp.* (n=1) were less frequent (See Plate 4-31 of Appendix 6-2).

Species composition and activity levels varied between surveys. Transect survey results were calculated as bat passes per km surveyed (to account for differences in survey effort). Plate 4-32 of Appendix 6-2 presents the results for individual species per survey period. Figures 4-2 – 4-4 of Appendix 6-2 present the spatial distribution of bat activity across surveys. Bat activity was concentrated along treelines, and hedgerows, and linear (road/track) habitats. Soprano pipistrelle occurred the most often in Summer and Autumn 2023. Common pipistrelle occurred more frequently in Spring 2023.

6.6.3.5.4 Ground-level Static Surveys

NatureScot (2021) requires static detector surveys at turbine bases and the results of those surveys are provided below. The location of all static detectors is provided in Table 3-3 of Appendix 6-2 of this EIAR.

Leisler's bat typically recorded *Low* Median Activity Levels in spring, summer and autumn. However, D06 recorded *High* Median Activity. *Moderate* Maximum Activity levels was recorded in spring at D03, D04, D05 and D07 and *High* Maximum Activity was recorded at D02, D06 and D09. *Moderate* or *High* Maximum Activity was generally recorded at most the detector locations for Leisler's bat in spring and summer. In autumn, *Low* Maximum Activity was generally recorded at most detectors i.e. D01, D03, D06, D07 and D09. *Moderate* Maximum Activity was recorded at D02, D04, D05, and D08 in Autumn.

Overall, common pipistrelle Median Bat Activity was generally *Low* in all seasons. However, D06 recorded *High* Median Activity in spring. *High* Maximum Activity was recorded in D02, D05, D06 and D08 in spring, and D04 and D05 in summer. *Moderate* Maximum Activity was recorded in spring at D07, in summer at D03, D06, D07 and D08 and in autumn at D02 and D04. Median Activity peaked in Spring at D06.

Soprano pipistrelle Median and Maximum Bat Activity was generally *Low* across all three seasons. Maximum Activity peaked in summer at D05. *Moderate* Maximum Bat Activity was recorded in spring at D08 only, summer at D02, D04 and D08, and autumn D02. Median Activity peaked at *Moderate* at D08 in autumn.

Myotis spp. recorded relatively *Low* activity in comparison to other species, on a site-specific level. Typical Median and Maximum Activity recorded in all three seasons was *Low*. *Moderate* Maximum Activity was recorded in spring at D02, D03, D04, and D07. *High* Maximum Activity was recorded at D05, and D06 in spring.

Brown long-eared bat activity was generally *Low* throughout the Site across all seasons. *Moderate* Max Activity levels for this species were recorded at D02 autumn.

Nathusius' pipistrelle activity was not recorded in 2023.

Detailed results for each species can be found in the Bat Report, provided in Appendix 6-2.

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. Bats as an Ecological Receptors have been assigned **Local Importance (Higher value)** on the basis that the habitats within the Site are utilized by a regularly occurring bat population of Local Importance.

No roosting bats were identified during the surveys and no roosting site of National Importance (i.e. site greater than 100 individuals) was recorded within the Site. It is suspected that some PRFs within the Site may provide potential roosting habitat for small numbers of roosting bats. The Site was not found to host a roosting site of ecological significance.

6.6.3.6 Reptiles and Amphibians

Common frog (*Rana temporaria*) was noted at various locations in the surrounding wet grasslands at Turbine 6 during the walkover survey on the 13th of April 2023 and again on the 27th of April 2023. Frog spawn was also noted in these surrounding wet grasslands near flooded entrances to the field and flooded tractor tracks throughout the grasslands during the walkover survey on the 27th of April 2023. These records are shown on Figure 6-7. There were no other species of amphibian or reptile recorded within the Site.

6.6.3.7 Fisheries and Aquatic Fauna

The watercourses that flow through the Site, and downstream watercourses, were subject to biological evaluation and assessment through kick sampling, fish stock assessment (electro-fishing) and white-clawed crayfish surveys on the 28th and 29th of September 2022. Full details of the results of these surveys are provided in Appendix 6-3.

The survey included a general habitat assessment and biological water quality assessment at watercourses within or downstream of the Site. The water quality, as per Q-value (Quality Rating System)¹⁰, is fully described in Appendix 6-3. All sampled sites failed to meet the target good status ($\geq Q4$) requirements of the Water Framework Directive. The biological water quality of the survey area was generally poor - moderate with the majority of watercourses significantly impacted via siltation and or historical modifications (hydromorphology).

The aquatic baseline report summarises the results as follows:

*None of the 13 no. aquatic survey sites in the vicinity of the proposed Borrisbeg wind farm project were evaluated as of greater than **local importance (higher value)** in terms of their aquatic ecology. Poor hydromorphology due to drainage pressures (deepening and straightening) had impacted the flow profiles and exacerbated sedimentation. These pressures evidently reduced the fisheries value of the riverine sites and also created conditions inimical to support Annex I floating river vegetation that was not recorded during the surveys. Apart from two sites on the Farranacahill Stream and unnamed tributary (see below) that achieved **local importance (lower value)**, the remaining 11 survey sites were evaluated as **local importance (higher value)** in terms of their aquatic ecology. Primarily this evaluation was due to the presence of salmonids (n=9 sites), lamprey (*Lampetra* sp.) (n=8 sites) and or otter (n=4 sites). Sites B5 on the River Suir and D1 on the Clonmore Stream also supported other aquatic species of high conservation value, such as Red-listed European eel.*

No rare or protected macro-invertebrate species (according to national red lists) were recorded in the biological water quality samples taken from n=13 riverine sites in September 2022.

No freshwater pearl mussel eDNA was detected in the River Suir (sites B3 & B5) or Eastwood River (C4) samples collected in September 2022 (0 positive qPCR replicates out of 12, respectively). Suitability was poor or absent throughout the survey sites (heavy siltation, enrichment, historical modifications, compaction of substrata etc.) and these results were in keeping with the known distribution of this species within the wider Suir catchment, i.e. the only extant population is located on the Clodiagh River (Ross, 2006).


Similarly, no white-clawed crayfish eDNA was detected within the survey area, supporting the absence of available records within much of the Suir_010 river sub-catchment.

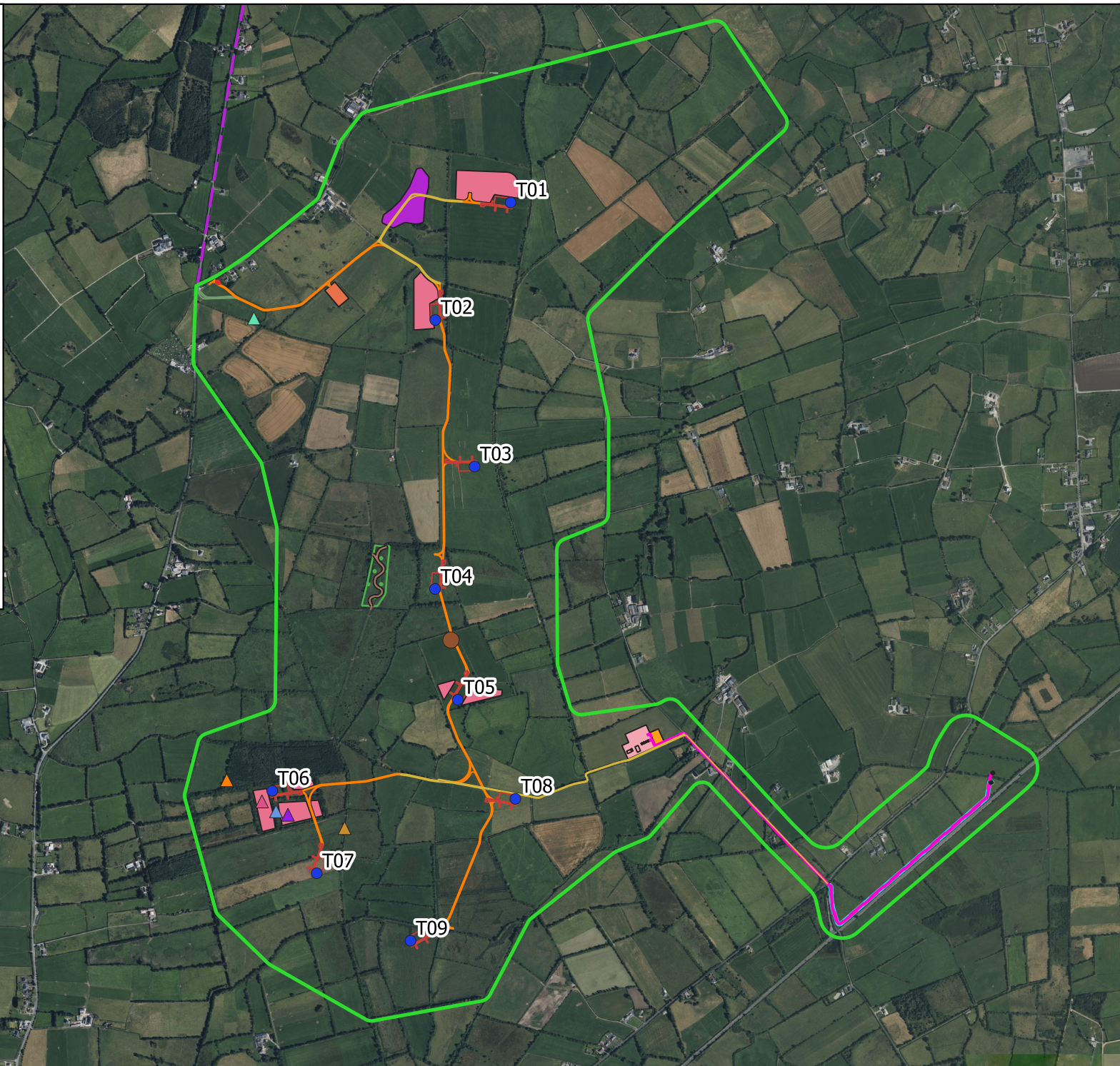
6.6.3.8 Other species







The trail camera footage from the 13th of April 2023 to 27th of April 2023 showed evidence of fox (*Vulpes vulpes*) and mouse species present within the Site. Fox scat was recorded frequently during the walkover surveys and a fox was seen commuting through agricultural grassland south of turbine 6 during the initial badger sett survey on the 13th of April 2023.


No significant areas of suitable habitat for other taxa including invertebrates or amphibians, species listed in Annex II or IV of the EU Habitats Directive, or other species of conservation concern was identified within the Site.

¹⁰ Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C., & MacGarthaigh, M. (2005). Water quality in Ireland. Environmental Protection Agency, Co. Wexford, Ireland.

-  Proposed Turbines
-  Proposed Met Mast
-  Proposed Haul Route
-  Proposed Grid Connection Cable Route
-  Existing Roads
-  Proposed New Roads
-  Proposed Turbine Hardstands
-  Proposed New Road for Underground Cable
-  Proposed End Masts
-  Proposed Permanent 110kV Substation
-  Proposed Temporary Security Cabins
-  Proposed Temporary Borrow Pit
-  Proposed Spoil Management Areas
-  Temporary Substation Construction Compound
-  Temporary Wind Farm Construction Compound
-  River Enhancement Stream Concept
-  River Enhancement 5m Riparian Buffer
-  River Enhancement 1.8ha Natural Woodland
-  EIAR Study Boundary



- ### Map Legend
- Mammal and flora signs 24.11.23
-  Adult Common Frog
 -  Frogspawn
 -  Otter Sighting
 -  Snuffle Holes
 -  Tadpoles
 -  Squirrel Feeding Signs


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Drawing Title	
Faunal Signs	
Project Title	
Borrisbeg Renewable Energy Development	
Drawn By	Checked By
AvdGM	JH
Project No.	Drawing No.
220310	Figure 6-7
Scale	Date
1:22,500	12.12.2023



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Importance of Ecological Receptors

Table 6-16 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 6.7 of this report and mitigation/ measures will be incorporated into the Proposed Project where required, to avoid potential significant impacts on the features.

Table 6-19 Ecological Receptors identified during the assessment

Ecological feature or species	Reason for inclusion as a KER	KER
Designated sites	<p>Nationally Designated Sites</p> <p>The following Nationally designated sites have been assessed as being within the Likely Zone of Impact:</p> <ul style="list-style-type: none"> > Ormond's Mill, Loughmoe, Templemore pNHA [002066] > Aghsmear House pNHA [002060] > St. Anne's, (Sean Ross Abbey), Roscrea pNHA [000656] > Cabragh Wetlands pNHA [001934] > St. Joseph's, Mountheaton pNHA [002063] > Drumakeenan National School pNHA [002064] > Miltown, Shinrone pNHA [002065] <p>These sites are assigned National importance. These sites are included as KERs as there is potential for indirect effects on them.</p>	Yes
	<p>European Designated Sites</p> <p>The following Special Area of Conservation is identified in the AA Screening as being within the Likely Zone of Impact and is assessed fully in the NIS that accompanies this application:</p> <ul style="list-style-type: none"> > Lower River Suir SAC [002137] <p>This site is assigned International importance and included as a KER as there is potential for indirect effects on this SAC.</p>	Yes
Aquatic habitats and related species	<p>Depositing/ lowland rivers (FW2)</p> <p>A number of natural watercourses are located within the Site. These watercourses include:</p> <ul style="list-style-type: none"> > Shanakill River > Suir River, > Eastwood River, > Farranacahill River, > Clonmore River and its tributaries (Lahagh 16 River and Strogue River), > Unnamed River (Seg Code: 16_2934) <p>These Rivers and Streams have been assigned Local importance (Higher Value) as they connect to downstream waterbodies. The rivers within the Site drain into the River Suir which also flows through the Site and provides a conduit to the downstream SAC Lower River Suir SAC which is of international importance.</p>	Yes

Ecological feature or species	Reason for inclusion as a KER	KER
	<p>Non-calcareous springs (FP2)</p> <p>A non-calcareous spring located within the north western section of the Site has been assigned Local importance (Higher Value) as it flows into downstream waterbodies, including the Farranacahill and Eastwood, in the local area. This spring also provides a conduit to downstream SACs/SPAs of international importance.</p>	Yes
	<p>Drainage ditches (FW4)</p> <p>Drainage ditches are found throughout the Site along field boundaries and within areas of broadleaved woodland. They are highly modified and species poor where they occur but do provide some connectivity with natural watercourses within the site. As such they are assessed as being local importance (lower value) and are considered further as a KER due to potential for conductivity with higher value watercourses.</p>	Yes
	<p>Aquatic and Fisheries Species</p> <p>The aquatic species that are associated with the rivers that are located within and surrounding the site are assigned Local Importance (Higher Value) in that they have a high biodiversity value in the local context. The downstream watercourses and fauna within them have been assigned as of Local Importance (Higher Value) due to the known populations of salmon, trout, eel and lamprey species along with otter. There is potential for indirect effect on these species as a result of impacts on water quality. These species include salmon, trout, lamprey species, European eel, aquatic invertebrates and other aquatic species. Fish and other aquatic species are therefore included as a KER for further assessment.</p>	Yes
Conifer plantation (WD4)	Some of the Proposed Wind Farm infrastructure is located within Conifer Plantation (WD4). This is a highly modified habitat with a low biodiversity value. This is classified as Local Importance (Lower Value). For these reasons, this habitat has not been identified as a KER.	No
Spoil and bare ground (ED2) Recolonising bare ground (ED3)	These habitats are common and widespread in the wider area. The habitat has been assessed as of Local Importance (lower value) as it is largely associated with artificial site access tracks and is of low biodiversity value. For this reason, it has not been identified for further assessment and is not a KER.	No
Buildings and Artificial Surfaces (BL3)	This habitat is found in the form of residential dwellings within the Site as well as roads and farm sheds and other buildings and has been assessed as being of Local Importance (lower value) as it highly artificial in nature, common throughout the wider landscape and offers limited value to biodiversity. This habitat is not considered to be a KER and is not considered further in this assessment.	No
Improved Agricultural grassland (GA1)	Improved agricultural grassland (GA1) has been assessed as of local importance (lower value) as it is generally of low biodiversity value primarily due to intensive management. The loss of this habitat is not	No

Ecological feature or species	Reason for inclusion as a KER	KER
	considered significant. It is therefore not considered further in this assessment.	
Arable Crops (BC1) Tilled Land (BC3)	Arable Crops (BC1) and Tilled Land (BC3) has been assessed as of local importance (lower value) as these habitats are generally of low biodiversity value primarily due to intensive management. The loss of these habitats is not considered significant. It is therefore not considered further in this assessment.	No
Dry meadows and grassy verges (GS2)	This habitat is found along the verges of existing roads and tracks within the Site and at the temporary turbine delivery accommodating works areas at junction 22. This habitat is dominated by common grass species and occurs in isolated, fragmented areas. It is of some low biodiversity value and is assessed as being of local importance (lower value). The loss of this habitat is not considered significant at any geographic scale.	No
Wet Grassland (GS4)	This habitat is found within the Site, in particular surrounding Turbine 6. This habitat within the site is not considered to correspond to any Annex I grassland or other Annex I habitat. Furthermore, the abundance of wet grassland habitat throughout the wider landscape this habitat is assessed as being of local importance (lower value). The loss of this habitat is not considered significant at any geographic scale.	No
Amenity Grassland (GA2)	This habitat is found associated with residential dwellings within the Site and has been assessed as being of Local Importance (lower value) as it is species poor, common throughout the wider landscape and offers limited value to biodiversity. This habitat is not considered to be a KER and is not considered further in this assessment.	No
Broadleaved woodland (WD1)	This habitat occurs within the site predominantly in the vicinity of Turbine 6 as linear sections of woodland. This habitat also occurs in the form of broadleaved plantations north of Turbine 6. Approximately 0.78 hectares of Mixed Broadleaved woodland (WD1) is proposed to be cleared to accommodate construction of infrastructure. This habitat is considered to be of local importance (higher value) and is considered a KER for further assessment.	Yes
Scrub (WS1)	This habitat is of some local importance to local wildlife (NRA, 2009). However, the habitat is common and widespread in the wider area. Where it occurs on the site it is dominated by few species. As such, the habitat has been assessed as of Local Importance (lower value). There will be no significant loss of this habitat at any geographic scale as a result of the Proposed Project. It is therefore not considered further in this assessment.	No
Hedgerow (WL1) Treeline (WL2) Individual trees	Approximately 1.8 linear kilometers (cumulatively) of Hedgerow and Treeline is proposed to be cleared to accommodate construction of infrastructure. These habitats have been assessed as being of Local Importance (Higher Value) due to the commuting and foraging landscape features that hedgerows provide for local species such as bats. The loss of standalone trees within the site has been avoided through the design of the Proposed Project and no significant negative effects to such are anticipated as a result of the Proposed Project.	Yes

Ecological feature or species	Reason for inclusion as a KER	KER
Wood Bitter-vetch	Wood bitter vetch (<i>Vicia orobus</i>) listed under the Flora (protection) Order (S.I. No. 235 of 2022) was identified approximately 60m east of proposed Turbine 1 hardstand infrastructure. No infrastructure is proposed for the area in which wood bitter-vetch was identified. This instance of Wood bitter-vetch is considered to be of National importance due to it being listed under the Flora (protection) Order (S.I. No. 235 of 2022). It is therefore included as a KER for further assessment.	Yes
Badger	Badger as an ecological receptor has been assigned Local Importance (Higher value). A potential for direct impacts on badger was identified due to the presence of an active badger sett located 36m from wind farm infrastructure and three inactive badger setts in the vicinity of Proposed Wind Farm infrastructure. It is therefore included as a KER for further assessment.	Yes
Otter	An Otter was sighted on the 21/09/2022, in the Eastwood River, southeast of Turbine 6 and northeast of Turbine 7 and within the Site. The otter was seen commuting south along the Eastwood riverbank. In addition to these sightings, the Aquatic Baseline Report states that despite some good suitability at numerous survey locations, otter signs were only recorded within the Site on the Shanakill River and the River Suir. Otter signs include a small number of regular spraint sites and old spraint sites as well as prints. No breeding (holt) or couch (resting) places were identified within or downstream of the Site. Watercourses were assessed as providing potentially suitable commuting and foraging habitat for the species and otter may occur within the Site, at least on occasion. Otter has been assessed as of Local Importance (Higher value). No evidence of a more ecologically important population was recorded during any of the site surveys undertaken. The Proposed Project has the potential to result in indirect effects on the receptor (as a result of deterioration in habitat associated with indirect water pollution or disturbance during construction/ decommissioning) and it is therefore included as a KER and requires further assessment.	Yes
Red squirrel	<p>Although evidence of red squirrel was recorded within the Site north of Turbine 6, no evidence of populations of squirrel being significant at more than a local level was recorded. Based on the low number of squirrel records for the site, squirrel has been assessed as of Local Importance (Higher value).</p> <p>The Proposed Project footprint has the potential to result in direct and indirect effects on this receptor. However, given the extent of suitable habitat in the area for the species, the small footprint of the proposed infrastructure and the fact that the Proposed Project will not result in any fragmentation of red squirrel habitat, red squirrel has not been included as a KER.</p>	No
Pine marten	Pine marten as an ecological receptor has been assigned Local Importance (Higher value). A potential for direct impacts on Pine marten was identified due to the observed usage of an unoccupied badger sett in the vicinity of a proposed internal road leading to Turbine 6. It is therefore included as a KER for further assessment.	Yes
Bats	The habitats within and surrounding the Site are likely to be utilised by a bat population of Local Importance (higher value). All bat species in Ireland are protected under both national legislation – (Wildlife Act,	Yes

Ecological feature or species	Reason for inclusion as a KER	KER
	1976, as amended) and European legislation – (Habitats Directive (92/43/EEC). Bats are likely to forage and commute within the vicinity of the Proposed Project. No bat roosts were identified within the development footprint. The Proposed Project has the potential to result in direct and indirect effects on the receptor. Therefore, bats are included as a KER for further assessment.	
Reptiles and Amphibians	The Proposed Project will not result in a significant loss of suitable habitat for reptiles and amphibians as suitable alternative habitat exists for amphibians within the wider site. Frogs were recorded within the site. No evidence of populations of amphibians being significant at more than a local level was recorded, therefore, amphibians have been assessed as of Local Importance (higher value). A potential for significant impact via direct mortality during construction was identified.	Yes
Additional protected fauna (e.g. Irish hare, fox etc).	The recorded evidence suggests that the Site is not utilised by populations of higher than local significance and no potential for significant effects have been identified at the population level. Due to the small footprint and nature of the Proposed Project, they are unlikely to be significantly affected by the Proposed Project. For this reason, other faunal species are not considered further in this EIAR. Significant effects are not anticipated.	No

6.7

Ecological Impact Assessment

6.7.1

Do-Nothing Effect

If the Proposed Project were not to proceed, the majority of the lands within the Site would continue to be managed according to current practices which consist predominantly of agricultural practices and some areas of commercial forestry. Forestry would continue to involve the harvesting of timber as it matures, followed by the coniferous forestry replanting. The other habitats identified within the Site including broadleaved woodland, will likely remain in a similar condition. Changes in farming practices overtime may change the improved agricultural grassland which dominates the site to other habitats which fulfil an agricultural role including Arable land (BC1). The general biodiversity at the Site, as described in this chapter, would likely remain similar to its current state as activity levels and land use would not change significantly.

If the Proposed Project were not to proceed, the opportunity to capture part of Tipperary's valuable renewable energy resource would be lost, as would the opportunity to contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions.

If the Proposed Project were not to proceed, the opportunity to restore a segment of the Eastwood River by improving channel stability, instream habitat and establishing a natural wooded riparian buffer would be lost. Please see Appendix 6-4 Biodiversity Management and Enhancement Plan (BMEP) for details.

6.7.2

Likely Effects During Construction Phase

6.7.2.1

Effects on Habitats During Construction

Table 6-20 below provides details of the extent of the recorded habitats on the site, the extent of the habitat that will be lost to facilitate the Proposed Project (including bat buffers) and the percentage of the total area of that habitat in the Site that it represents.

Table 6-20 Extent of habitat lost to the Proposed Project and the percentage of the total area of that habitat within the Site

Habitat	Total Area (Ha) /Length (Km) within the Site	Area (ha)/length (km) to be lost to development footprint	% of total to be lost	KER (Yes/No)
Mixed Broadleaved woodland (WD1)	8.68ha	0.78ha	9	Yes
Depositing/ Lowland Rivers (FW2)	Approximately 13.4km	0	0	Yes
Drainage Ditches (FW4)	Drainage ditches are located along most field boundaries, within forestry boundaries and along some access roads as well as being linked to hedgerows and treelines throughout the Site and as such not all instances of Drainage Ditch habitat could be mapped. As such the total drainage ditch length within the site is Not Known. There will be no significant loss of drainage ditch habitat as a result of the culverting works of small sections of drainage ditch (FW4) habitat associated with the Proposed Project.			Yes

Hedgerow (WL1)	32.6 linear Kilometres	0.945 linear Kilometres	2.9	Yes
Treeline (WL2)	24.4 linear Kilometres	0.860 linear Kilometres	3.5	Yes

The Proposed Project will result in the loss of areas of habitat that are of Local Importance (Lower Value) and are not identified as KERs. This mainly involves the loss of coniferous plantation forestry (WD4), wet grassland (GS4) and improved agricultural grassland (GA1) which has been assessed as of low ecological value. Other habitats assessed as of local importance (lower value) include; Scrub (WS1), grassy verges (GS2), Recolonising bare ground (ED3) and Spoil and bare ground (ED2). Any direct or indirect impacts on these habitats are not significant.

The effects on habitats that are identified as KERs are described in the below tables.

6.7.2.1.1 Assessment of Potential Effects on Rivers and Streams and Sensitive Aquatic Faunal Species

Table 6-21 Potential for impact on rivers, streams and Sensitive Aquatic Species

Description of Effect	<p>This section assesses the potential for likely significant effects on aquatic receptors including aquatic habitats (i.e. watercourses), salmonids, lamprey, coarse fish, European eel, aquatic invertebrates and other aquatic species identified during the desk study and field surveys and which are likely to occur downstream of the Proposed Project.</p> <p>The footprint of the Proposed Project has been specifically designed to avoid significant impacts on watercourses. This was initially achieved by way of a constraints mapping exercise. The key mitigation measure during the construction phase is the avoidance of sensitive aquatic areas where possible, by application of suitable buffer zones (i.e. 50m buffer from streams and rivers). Proposed Infrastructure which is within a 50m distance from the hydrologically very sensitive rivers and streams onsite must be considered throughout the construction and mitigation processes so that treatment of surface runoff is effective before it reaches local watercourses.</p> <p>All of the key development components of the Proposed Wind Farm are located significantly away from the delineated 50m watercourse buffer zones with the following exceptions. 1 no. new watercourse crossing location within the Site has been specifically chosen to facilitate the use of a clear span bridge structure (see the site layout drawings in Appendix 4.1 of this EIAR), thereby ensuring that no instream works are necessary in this location and minimising potential for impact on the receiving environment. In addition, Horizontal Directional Drilling (HDD) will be required at an existing watercourse crossing in the south of the Site leading to the proposed substation. The locations of the water crossing structures are shown on Figure 6-6. As part of the Proposed Project, it is proposed to restore an approximately 240m long segment of the Eastwood River within the Site. Through the restoration process the watercourse segment will be further meandered resulting in a final length of approximately 300m for the restoration segment. Works associated with the river restoration have the potential to cause downstream deterioration of water quality in the absence of mitigation. Full details of the river restoration can be seen in Appendix 6-4 of this EIAR.</p> <p>The Proposed Grid Connection also crosses 2 no. watercourses. One of these crossings will require the construction of a new clear span bridge structure while the other will utilise HDD on an existing bridge. As no instream works are proposed to natural watercourses, there will be no direct effects on these habitats or the species that are associated with them.</p> <p>There will be no net loss of fisheries habitat or potential for the Proposed Project (Proposed Wind Farm and Proposed Grid Connection) to result in any barriers to the movement of aquatic species post completion of construction. The Proposed Project will</p>
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	<p>result in a gain in the region of 60m of watercourse. The river restoration; as well as increasing the length of the Eastwood River within the Site, will increase the habitat quality and diversity from what is at present a heavily silted, deepened and straightened channel. However, while the majority of the construction of the restored channel will be done in the dry, during the construction of the river restoration there will be a temporary short term barrier to movement for aquatic species within the segment of the Eastwood River undergoing restoration.</p> <p>There is potential for the construction activity to result in the run-off of silt, nutrients and other pollutants such as hydrocarbons and cementitious material into these watercourses. This represents a potential indirect effect on the identified aquatic receptors in the form of habitat degradation through water pollution.</p> <p>These potential effects on water quality are fully described and assessed in Chapter 9 'Hydrology and Hydrogeology' of this EIAR and are described here in relation specifically to ecology.</p>
<p>Characterisation of unmitigated effect</p>	<p>In the absence of mitigation, the indirect effect of water pollution on aquatic receptors during construction has the potential to be an indirect, negative, significant, temporary, likely effect on surface water quality in downstream surface water receptors on watercourses which act as a conduit to downstream habitats.</p> <p>The indirect effect of the temporary creation of barriers to movement for aquatic fauna within the Eastwood River during the construction of the river restoration has the potential to be an indirect, negative, non-significant, temporary, effect on aquatic fauna within the Eastwood River. This is not considered to be significant due to the short time period barriers will be in place for and that the majority of the construction work will be done in the dry limiting the need for barriers to movement until the majority of the channel has been constructed.</p> <p>The Proposed Project will result in a net gain in the region of 60m of watercourse within the Site during the construction of the river restoration area. This is characterised as a long term slight positive effect on aquatic fauna and lowland depositing rivers (FW2) at a local level.</p>
<p>Mitigation</p>	<p>As detailed in Chapter 4 section 4-6, the Construction Environment Management Plan (CEMP) Appendix 4-3, and Chapter 9 Hydrology and Hydrogeology, the drainage design for the Proposed Project details of how surface water quality will be protected during the construction phase. This provides specific mitigation for the proposed works including mitigation by avoidance, mitigation by design, mitigation against release of suspended solids, hydrocarbons, cementitious materials, prevention of contamination from wastewater disposal, and clear-felling mitigations. In addition, Section 9.5.2.8 of Chapter 9 describes the mitigation in relation to morphological changes to surface watercourses & drainage patterns for the Proposed Project and Section 9.5.2.15 of Chapter 9 describes the mitigation in relation to the potential water quality and morphological/hydrological effects associated with river channel restoration.</p> <p>In relation to new watercourse crossings, Inland Fisheries Ireland (IFI) will be consulted a minimum of four weeks in advance of watercourse crossing works. The Inland Fisheries Ireland (2016): <i>Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters</i>, and the Scottish Natural Heritage (SNH) <i>Good Practice During Wind Farm Construction</i> (SNH, 2019, 4th Edition) will also be adhered to. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI).</p> <p>Within the Proposed Wind Farm there is 1 new proposed clear span bridge water crossing as well as Directional Drilling to be carried out for an existing water crossing under the River Suir east of T8 and west of the proposed substation.</p>

	<p>There are also a total of 2 no. watercourse crossings along the Proposed Grid Connection. No in-stream works are required at any of these crossings, however due to the proximity of the streams to the construction work at the crossing locations, there is a potential for surface water quality impacts during directional drilling and construction of a clear span bridge. Mitigation measures are outlined in relation to these works in Section 9.5.2.13 of Chapter 9. A suite of measures are in place to avoid any adverse effects on watercourses. These measures are described in full in Chapter 9 ‘Water’ of the EIAR.</p> <p>In addition to the above, in order to improve the water quality within the Site, a section of the Eastwood River has been selected for enhancement. As outlined in Section 6.4.3 the proposal for the enhancement of the section of the Eastwood River has been discussed with IFI who welcomed the proposal. Full details on the proposed river enhancement can be found in Appendix 6-4. This river enhancement will result in a net gain in the region of 60m of watercourse within the Site with increased habitat diversity and is expected to provide a long term slight positive effect on the Eastwood River and the aquatic fauna and flora within.</p>
<p>Residual Effect following Mitigation</p>	<p>Following the implementation of the mitigation measures as described above, there will be no significant residual effect on aquatic habitats or species as a result of the Proposed Project. The Proposed Project will not cause any waterbodies to deteriorate, irrespective of their current condition, and will not in any way prevent any waterbodies from meeting the biological and chemical characteristics for good ecological status.</p> <p>The river restoration as detailed above and in Appendix 6-4 is expected to create a slight long-term positive effect in water quality and river morphology within this segment of the Eastwood River and provide enhanced habitat for a variety of aquatic species. In addition to this Section 6.7.2.1.2 of this report describes the planting of 1.8ha of native woodland species which has been designed to integrate with the proposed river restoration and create suitable riparian habitat along this segment of the Eastwood River.</p>

6.7.2.1.2 Assessment of Potential Effects on (Mixed) Broadleaved Woodland (WD1)

Table 6-22 Loss of woodland habitats

Description of Effect	The construction of the Proposed Wind Farm and associated infrastructure will result in the direct loss of approximately 0.78ha of (mixed) broadleaved woodland (WD1) as a result of the proposed Turbine 6 and associated bat buffer as per NatureScot guidelines. This 0.78ha of mixed broadleaved woodland (WD1) consists of both thin strips of woodland and ash forestry plantation.
Characterisation of unmitigated effect	The loss of 0.78ha of (mixed) broadleaved woodland (WD1) will result in a permanent and irreversible impact on a habitat of Local importance (higher value). The magnitude of this impact is judged to be Moderate in the absence of mitigation as the habitats affected consist of thin strips of linear woodland surrounding fields and a small area of ash plantation.
Assessment of Significance prior to mitigation	The loss of the above-described woodland habitat has been assessed as a permanent moderate negative effect on a receptor of Local importance (higher value), in the absence of mitigation.
Mitigation/ Biodiversity Management and Enhancement	<p>The lost broadleaved woodland (WD1) is in the form of thin strips of woodland and areas of plantation ash is not considered significant. However, in order to provide onsite biodiversity enhancement, it is proposed to plant by hand, approximately 1.8 hectares of native tree species within the Site along a segment of the Eastwood River that has been designated for river restoration work. Please see Appendix 6-4 Biodiversity Management and Enhancement Plan for full details.</p> <p>The planting of 1.8ha of native tree species will result in an increase of approx. 1.02ha of woodland within the Site. While this habitat will develop into a habitat of minimum local importance (higher value) it has the potential to form a habitat of greater significance.</p>
Residual Effect following Mitigation	Following the implementation of the mitigation measures as described above and in Appendix 6-4, there will be no negative long term significant residual effect on (mixed) broadleaved woodland (WD1) within the Proposed Project. The planting of 1.8ha of native tree species in conjunction with river restoration works is considered to be a long-term positive effect on woodland habitat within the Site.

6.7.2.1.3 Assessment of Potential Effects on Hedgerows and Treelines

Table 6-23 Hedgerow and Treeline impact assessment

Description of Effect	To facilitate the construction new access roads within the Site and bat buffers around turbines there will be a loss of approximately 1.8km of linear habitat consisted of approx. 0.945km of Hedgerow (WL1) and 0.86km of Treeline (WL2). The areas where this will occur are shown in Figure 1-1 of the BMEP (Appendix 6-4).
Characterisation of unmitigated effect	The permanent loss of approximately 1.8km of hedgerow and treeline would constitute a permanent moderate negative effect on the linear habitat within the site.
Assessment of Significance prior to mitigation	The loss of the above-described linear habitat has been assessed as a permanent moderate loss of linear habitat of Local Importance (<i>Higher value</i>) in the absence of mitigation.
Mitigation	In order to compensate for the loss of linear vegetation, approximately 5.17 linear kilometres of new replacement treeline/ hedgerow planting and existing hedgerow/ treeline bolstering will be carried out throughout the Site. This will result in a net gain in this habitat within the site. Tree/shrub species planted in these locations will be of a similar

	composition to those occurring onsite, will be native and of local provenance. Further details with regard to species, planting location, and management is contained within Appendix 6-4.
Residual Effect following Mitigation	Following implementation of mitigation, no potential for significant effect exists at any geographic scale. The planting of additional hedgerow/ treeline will serve to enhance the linear habitats within the site due to increased species diversity compared to that to be lost, will benefit wildlife and due to the increase of 3.37 linear kilometres over that to be lost, will result in a net gain in this habitat within the site.

6.7.2.1.4 Assessment of Potential Effects on Wood Bitter-vetch

Table 6-24 Wood bitter-vetch Impact assessment

Description of Effect	Wood bitter vetch (<i>Vicia orobus</i>) listed under the Flora (protection) Order (S.I. No. 235 of 2022) was identified approximately 60m east of proposed Turbine 1 hardstand infrastructure growing in a hedgerow. There is no suitable habitat for Wood bitter-vetch between the Turbine Infrastructure and the Treeline in which it was recorded and no infrastructure is proposed for the area in which wood bitter-vetch was identified. However, taking a precautionary approach the potential for loss of Wood Bitter-vetch during the construction phase of the Proposed Project is considered.
Characterisation of unmitigated effect	The potential for permanent loss of wood bitter-vetch, which was identified approximately 60m east of proposed Turbine 1 hardstand infrastructure, through accidental disturbance of supporting habitat would constitute a permanent significant negative effect on the species.
Assessment of Significance prior to mitigation	The loss of the above-described wood bitter-vetch within the site has been assessed as a permanent significant loss of the FPO species of National importance in the absence of mitigation.
Mitigation	Prior to the commencement of construction works the following measures will be undertaken for the avoidance of wood bitter-vetch: <ul style="list-style-type: none"> ➤ An Ecologist will fence off a 10m buffer of the Treeline habitat east of Turbine 1 where the wood-bitter vetch was recorded to ensure that no works happen within 10m of the Treeline where the species was recorded growing. ➤ No machinery or site works will be allowed within this 10m buffer of recorded plants/ hedgerow habitat. ➤ Follow up surveys of the buffer area will be conducted post erection of the fence and during the construction phase to ensure that wood bitter-vetch distribution has not been impacted on. ➤ After completion of the construction phase of the Proposed Project, fencing will be removed.
Residual Effect following Mitigation	Following implementation of mitigation, no potential for significant effect exists at any geographic scale.

6.7.2.2 Effects on Protected Fauna During Construction

The Proposed Project has the potential to result in habitat loss and disturbance impacts on faunal species that were recorded on the site but were not included as KERs, see Table 6-19. Given the extensive area of habitat that will remain undisturbed throughout the site and the avoidance of the most significant areas of faunal habitat (much of the mixed broadleaved woodland and watercourses), no significant effects on non-KER faunal biodiversity are anticipated as a result of the Proposed Project. Therefore, these species were excluded from further assessment. The following species are assessed below:

- > Otter
- > Badger
- > Pine Marten
- > Bats
- > Amphibians

No instream works are required for any of the proposed new water-crossing structures required for the Proposed Wind Farm or for the cabling route along the Proposed Grid Connection. 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 6.7.2.1.1 above and is not repeated below.

6.7.2.2.1 Assessment of Potential Effects on Otter

Table 6-25 Assessment of Potential Impacts on Otter

Description of Effect	
	<p>As described above in relation to aquatic habitats and species, the Proposed Project has been deliberately designed so that all major infrastructure, i.e., turbine bases and hardstands, avoid significant watercourses.</p> <p>No otter holts were found within the Site.</p> <p>No instream works are required for any of the water crossing works required for the Proposed Wind Farm or along the Proposed Grid Connection.</p> <p>For the Proposed Wind Farm, one new watercourse crossing is required along the internal wind farm access road using a clear span bridge design. A clear span bridge design was chosen to avoid impact on the stream and to ensure no fragmentation of otter habitat. In addition to this, Horizontal Directional Drilling (HDD) will be used at an existing watercourse crossing on the Suir River to facilitate IPP cabling connection to the Proposed Substation.</p> <p>Two water crossings have been proposed for the Proposed Grid Connection in the form of HDD for one and a clear span culvert of the other.</p> <p>The locations of these all above detailed crossings are shown on the layout drawings included in Appendix 4-1 of this EIAR. The construction of new watercourse crossings and carrying out of HDD for the Proposed Wind Farm and Proposed Grid Connection has the potential for indirect effects in the form of disturbance to otter.</p> <p>Potential for effects on Otter has been considered regarding NPWS Threat Response Plan (TRP) which identifies four significant threats facing Otter in an Irish context: Habitat destruction, Water pollution, Disturbance (Recreational sources) and Accidental death/persecution.</p> <p>The construction of the river restoration will involve works interacting with a segment of the Eastwood River. No holts were identified within the section of the Eastwood River to be upgraded or in the vicinity of this section.</p>

<p>Characterisation of unmitigated effect</p>	<p>No otter holts are present within the Site..</p> <p>Evidence of otter in the form of spraint was identified along watercourses which require crossing for the Proposed Wind Farm , but not in the vicinity of Proposed Grid Connection watercourse crossings. There is potential for the construction activity to result in the run-off of silt, nutrients and other pollutants such as hydrocarbons and cementitious material into land drains and minor watercourses. This represents a potential indirect effect on Otter in the form of habitat degradation through water pollution.</p> <p>Given that the majority of the Site is at present in farmland, and all major proposed infrastructure is located over 50 metres from any significant watercourse, any potential disturbance to otter will be a short-term, slight negative effect associated with the installation of the proposed watercourse crossings.</p> <p>In relation to disturbance, Otter are predominantly crepuscular in nature and it is anticipated that construction activity will mostly be confined to daytime hours, thus minimizing potential disturbance related impacts to the species. Channin P (2003) provides a literary review with regard to anthropogenic disturbance and refers to several reports which have found that disturbance is not detrimental to Otters (Jefferies (1987), (Durbin 1993). (Green & Green 1997). The report also describes successful breeding in towns, under ferry terminals and under the jetties of one of Europe’s largest oil and gas terminals at Sullom Voe in North Scotland. Irish Wildlife Manual No 76 (National Otter Survey of Ireland 2010/2012) notes that the occurrence of Otter was unaffected by perceived levels of disturbance at the survey sites. It also notes that there is little published evidence demonstrating any consistent relationship between Otter occurrence and human disturbance (Mason & Macdonald 1986, Delibes et al. 1991; Bailey &Rochford, 2006).</p>
<p>Assessment of Significance prior to mitigation</p>	<p>Significant effects regarding habitat destruction, barrier effect, disturbance and mortality are not anticipated.</p> <p>In the absence of mitigation, the indirect effect of water pollution on otter during construction has the potential to be a short-term reversible impact. The magnitude of any such impact is likely to be at worst moderate, given that the majority of new infrastructure such as turbine bases, substation and construction compounds are located over 50 metres from any significant watercourse.</p>
<p>Mitigation</p>	<p>A drainage maintenance plan for the Proposed Project is provided in Appendix 4-3 CEMP, Chapter 4 and Chapter 9 of this EIAR. This plan provides full details of how water quality will be protected during the construction of the Proposed Project. In addition to this, specific mitigation is provided in relation to water quality in Chapter 9: ‘Hydrology and Hydrogeology’ of this EIAR. These mitigation measures will ensure that there will be no potential indirect effects on otter as a result of a deterioration in water quality.</p> <p>Prior to the commencement of construction works associated with the installation of watercourse crossings, the following measures will be undertaken for the avoidance of disturbance/displacement and direct mortality and to ensure that no otter holts/breeding sites have been established since the original surveys undertaken (TII, 2007):</p> <ul style="list-style-type: none"> ➤ From a precautionary basis, a pre-commencement otter survey will be undertaken in accordance with standard best practice guidance prior to the commencement of site works to ensure that current activity levels are confirmed prior to commencement of works. In the unlikely event that an otter holt is identified within or immediately adjacent to the Proposed Project footprint, consultation will be undertaken with the National Parks and Wildlife Service and a derogation licence applied for. ➤ No works will be undertaken within 150m of any holts at which breeding females or cubs are present. ➤ No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub

	<p>clearance will not take place within 15m of such holts, except under licence (TII, 2006¹¹).</p> <ul style="list-style-type: none"> ➤ All of the above works will be undertaken or supervised by an appropriately qualified ecologist.
Residual Effect following Mitigation	<p>Following the implementation of the mitigation proposed above, there will be no significant residual effect on otter as a result of the Proposed Project at any geographic scale.</p> <p>The river restoration proposed for the Eastwood River section is anticipated to provide enhanced value to biodiversity over its current regime which will result in a positive effect on Otter.</p>

6.7.2.2.2 Assessment of Potential Effects on Badger

Table 6-26 Assessment of Potential Impacts on Badger

Description of Effect	<p>During the ecological surveys undertaken a number of both active and inactive badger setts were found within the Site. No active setts were recorded within 150m of Turbine bases or the borrow pit where breaking or blasting may occur. One of the active setts is located approximately 36m from a section of Proposed Wind Farm road at the north of the Site. This sett is within 50m of proposed construction. On a precautionary basis and as per <i>Guidelines For The Treatment Of Badgers Prior To The Construction Of National Road Schemes</i> (TII 2009) if construction of this section of Proposed Wind Farm road were to occur within the badger breeding season (December-June) there exists the potential for significant effect to badger due to direct mortality and sett loss. Camera footage from 13th of April 2023 to 27th of April 2023 showed evidence of badger activity in the vicinity of all active setts.</p> <p>Two inactive badger setts were located within close proximity to proposed new Wind Farm road infrastructure. The first of these is located approximately 5 metres from a section of proposed access track leading north to Turbine 5. The second inactive badger sett is located approximately 20m south of the proposed access track heading to Turbine 6. A third inactive badger sett was identified approximately 10m east of the Bat Buffer of Turbine 5. None of these setts showed activity of use by badger from Trail camera footage from 13th of April 2023 to 27th of April 2023. While these three inactive setts did not show evidence of activity it is possible that they could become active as Badger activity was recorded within the Site with badgers being likely to move around and potentially utilise inactive setts.</p> <p>Taking a precautionary approach, a potential for significant effect to badger was identified due to direct mortality and sett loss due to the wind farm infrastructure construction.</p>
Characterisation of unmitigated effect	<p>In the absence of mitigation, the construction of the Proposed Wind Farm infrastructure in close proximity to inactive setts may not cause direct destruction of the sett; however, it has potential to cause tunnel collapse as well as disturbance of badgers within the sett if they are to become occupied. Additionally, if construction is to occur within 50m of the active badger sett in the north of the site during the breeding season these risks also apply. The risk of tunnel collapse also carries a risk of mortality to badgers.</p> <p>The risk of tunnel collapse also carries a risk of loss of sett habitat for the local population of badgers.</p>

¹¹ NRA, 2006. *Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes*. Dublin: Transport Infrastructure Ireland. Available at: www.tii.ie/tii-library/environment/construction-guidelines/Guidelines-for-the-Treatment-of-Otters-prior-to-the-Construction-of-National-Road-Schemes.pdf

<p>Assessment of Significance prior to mitigation</p>	<p>In the absence of mitigation, the potential for direct mortality of badgers as a result of potential tunnel collapse due to the construction of wind farm infrastructure is assessed as being a significant effect on the local badger population. The potential for loss of sett habitat as a result of construction work is assessed as a permanent, significant effect on the local badger population.</p>
<p>Mitigation</p>	<p>Prior to the commencement of construction works 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 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"> ➤ 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 ensure that no additional setts in close proximity to proposed infrastructure have been built. In the event that a badger sett is identified within or immediately adjacent to the development footprint, mitigations as per the above referenced TII document will be implemented for the new sett. <p>The active set located approx. 36m from a section of Proposed Wind Farm road infrastructure will be subject to a pre-commencement badger survey. If this sett is found to be active at the time of survey then no works will occur within 50 meters of the sett during the badger breeding season (December to June inclusive) and no blasting or pile driving within 150m of the sett during the badger breeding season (December to June inclusive). In addition an exclusion zone of 50m will be placed around the badger sett during the badger breeding season as outlined above.</p> <p>Temporary exclusions of the inactive setts in close proximity to the proposed road leading to Turbine 5 and in close proximity to the proposed road east of Turbine 6 will be carried out to ensure no badgers are present within the setts during construction of the internal access road network within the Site. The exclusion will be carried out in line with TII guidelines as follows:</p> <ul style="list-style-type: none"> ➤ Local NPWS staff will be informed in advance of the exclusion works. ➤ The exclusion will not take place during badger breeding season (December to June inclusive) ➤ One way exclusion gates will be installed on each sett entrance. ➤ 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. ➤ 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. ➤ If badgers succeed in re-entering during the 21-day period, the exclusion process and 21-day period must start again. ➤ All of the above works will be undertaken or supervised by an appropriately qualified ecologist. ➤ Any temporary exclusion one way gate will be removed following completion of the construction of the Proposed Wind Farm. ➤ Setts will remain in-situ and no direct destruction of the badger sett will occur. <p>In addition to the above, the below mitigations will help to prevent significant effects to badger within the local area.</p> <ul style="list-style-type: none"> ➤ Any works within the badger breeding season (December to June inclusive) will require an exclusion zone of 50m around active badger setts. ➤ During the breeding season, no blasting or pile driving should be within 150m of active badger setts.

Residual Effect following Mitigation	Following the implementation of the mitigation proposed above, there will be no significant residual effect on badger as a result of the Proposed Project at any geographic scale.
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6.7.2.2.3 Assessment of Potential Effects on Pine Marten

Table 6-27 Assessment of Potential Impacts on Pine Marten

Description of Effect	<p>During the ecological surveys undertaken of the Site, Pine Marten was observed at an unoccupied badger sett. Taking a precautionary approach, the unused badger sett may be used as a resting place for Pine Marten. The unoccupied badger sett is located in close proximity to the Proposed Wind Farm road infrastructure near Turbine 6.</p> <p>Taking a precautionary approach, a potential for significant effect to Pine Marten was identified due to direct mortality and sett loss due to the upgrades of the access road.</p>
Characterisation of unmitigated effect	<p>In the absence of mitigation, the upgrade of the access road in close proximity to the unoccupied sett potentially utilised by Pine Marten, while it may not cause direct destruction of the sett, has potential to cause sett collapse as well as disturbance of Pine Marten within the sett. The risk of collapse also carries a risk of mortality to Pine Marten.</p> <p>The risk of collapse also carries a risk of loss of suitable habitat for the local population of Pine Marten.</p>
Assessment of Significance prior to mitigation	In the absence of mitigation, the potential for direct mortality of Pine Marten as a result of potential den collapse due to the construction of the access road is assessed as being a significant effect on the local Pine Marten population. The potential for loss of den habitat as a result of construction work is assessed as a permanent, irreversible, significant effect on the local Pine Marten population.
Mitigation	<p>As described in the above section in relation to badger, the unoccupied sett will be excluded during the construction phase of Proposed Project. This will ensure that any Pine Marten potentially utilising the unoccupied sett are not impacted as a result of the Proposed Project.</p> <p>Additionally, as an enhancement measure, Pine Marten boxes will be installed at suitable locations within the Proposed Wind Farm. This has been further detailed in Appendix 6-4.</p>
Residual Effect following Mitigation	Following the implementation of the mitigation proposed above, there will be no significant residual effect on Pine Marten as a result of the Proposed Project at any geographic scale. With the installation of Pine Marten Boxes within the Site, additional habitat for Pine Marten would be created leaving a positive residual effect on the local population of Pine Marten.

6.7.2.2.4 Assessment of Potential Effects on Bats

Table 6-28 Assessment of Potential Impacts on Bats

<p>Description of Effect</p>	<p>As per NatureScot Guidance, wind farms present four potential risks to bats:</p> <ul style="list-style-type: none"> > Collision mortality, barotrauma and other injuries; (Operational Phase Impact) > Loss or damage to commuting and foraging habitat; > Loss of, or damage to, roosts; > and Displacement of individuals or populations. <p>For each of these four 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 (operational phase impacts relating to collision mortality, barotrauma and other injuries are assessed in Section 6.7.3).</p> <p>Bat surveys undertaken in 2023, in accordance with NatureScot 2021 guidance, form the core dataset for the assessment of effects on bats.</p>
<p>Characterisation of unmitigated effect</p>	<p>Loss or damage to commuting and foraging habitat</p> <p>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 within agricultural grassland surrounded by treelines and hedgerows, with smaller areas of wet grasslands, broadleaf woodland and commercial forestry.</p> <p>The majority of turbines will be located in agricultural grassland resulting in minimal loss of linear habitat features. However, tree felling and linear vegetation removal will be required within and around the Proposed Project infrastructure footprint to allow for the construction of the turbine bases, access roads underground cabling, and the other ancillary infrastructure and also to establish adequate separation between the proposed turbine blades and surrounding vegetation.</p> <p>As described in section 6.7.2.1.3 above, approximately 1.8km of linear vegetation, primarily treeline/hedgerows, will require removal to facilitate the construction of the Proposed Project. As described in Section 6.7.2.1.2 approximately 0.78 hectares of (mixed) broadleaved woodland in the form of thin strips of woodland and areas of plantation ash will be felled to accommodate Turbine 6 and its associated infrastructure. The felling of trees is provided to achieve the required buffer distance for the protection of bats, from the turbine blades to the surrounding vegetation, as recommended by the Natural England (2014) and NatureScot (2021).</p> <p>Along with the removal of linear vegetation and broadleaved woodland, approximately 3.44 hectares of conifer forestry will be permanently felled to accommodate Turbine 9 and its associated infrastructure and the Turbine 6 Bat Buffer. It should be noted that conifer forestry on the Site was originally planted as a commercial crop and will be felled in the future should the Proposed Project proceed or not.</p> <p>To facilitate the transportation of turbine components, minor temporary accommodating works are required which involves the temporary stoning up of the verges and may require minor hedge or tree trimming to transport the turbine components. All works are minor, temporary and contained within the road carriage. Once the abnormal loads have been delivered, these areas will be reseeded. Any areas of tree and hedgerow loss will be assessed by a licenced ecologist prior to removal and any required tree removal will be replaced within the Site with species indigenous to the area.</p> <p>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.</p>

However, any areas of linear vegetation loss or broadleaved woodland loss will be replaced within the site with species indigenous to the area. A replanting plan has been developed to mitigate the loss of bat foraging/commuting habitat associated with the Proposed Project and is presented below and in Section 6.1.5 of Appendix 6-2. The replanting design will ensure habitat connectivity is maintained and enhanced around the Site resulting in an overall net gain of suitable habitat features for bats. It is proposed to plant by hand, approximately 1.8 hectares of natural woodland within the Site along a segment of the Eastwood River. Further details are outlined in Appendix 6-4 Biodiversity Management and Enhancement Plan. An additional 5.17km of linear hedgerow planting is proposed, which will result in a net gain of approximately 3.37km in linear habitat features within the Site. Linear vegetation removal will result in a short-term effect, with connectivity re-established within approximately 2-5 years. No permanent loss of, or damage to, commuting or foraging habitats is anticipated as a result of the Proposed Project or associated infrastructure. The proposed replanting area is shown in Figure 6-1 of Appendix 6-2 and discussed in Appendix 6-4, Biodiversity Management and Enhancement Plan. Following the implementation of the replanting plan within the Proposed Wind Farm, no significant effects in relation to habitat fragmentation or loss of foraging habitat for bats is anticipated.

Given the extensive area of habitat that will remain undisturbed throughout the Site and the avoidance of the most significant areas of faunal habitat (i.e. the majority of mixed broadleaved woodland, mature treelines and watercourses), no significant effects with regard to loss of commuting and foraging habitat are anticipated. The additional planting outlined above will result in a net gain in linear landscape features, river habitat and woodland available for foraging and commuting bats. This is a positive impact at the local level.

Loss of, or damage to, roosts

The Proposed Project is predominantly located within agricultural grassland surrounded by treelines and hedgerows, with smaller areas of wet grasslands, broadleaf woodland and commercial forestry. The trees in the commercial forestry do not provide potential roosting habitat of significance for bats.

Four structures, and their associated outbuildings, were identified within the Site and were subjected to inspections and dusk activity surveys. While a small number of bats were observed commuting and foraging in the wider area at dusk, no structures were confirmed as roosts. These structures and the surrounding linear habitat features will be impacted by the Proposed Project.

The majority of trees within the Site will be retained as part of the Proposed Project; however, there will be some requirement to remove trees to facilitate the bat felling buffers. Trees within the bat buffers varied in suitability from Negligible to High for roosting bats. A small number of trees identified during the roost surveys as having potential to host roosting bats were located within the bat buffers. No evidence of bat use was identified during daytime inspection of the trees. However, a potential for indirect effects on bats was identified in the form of loss of roosting habitat resources, as well as direct effects such as temporary disturbance and harm or death as a result of the proposed tree felling. On a precautionary basis, as the trees provide some potential roosting habitat, the proposed linear vegetation removal has been designed to retain suitable treelines where possible.

The underground cabling will be following existing roads and agricultural grassland. There will be some requirement to remove trees to facilitate the underground cabling route. However, any trees removed as part of the construction works will be replanted elsewhere within the Site. Further details on replanting are outlined below and in Section 6.1.5 of Appendix 6-2.

Two watercourse crossings are present within the Proposed Wind Farm, only one of which has an existing bridge. This crossing was assessed as having Negligible roosting

	<p>potential. Horizontal Directional Drilling (HDD) is proposed for this watercourse; therefore, there will be no loss of roosting habitat associated with these works. Two watercourse crossings are present along the underground cabling route, only one of which has an existing bridge. This crossing was assessed as having Low roosting potential; however, Horizontal Directional Drilling (HDD) is proposed for this watercourse; therefore, there will be no loss of roosting habitat associated with these works.</p> <p>The Turbine Delivery Route (TDR) accommodation works areas are contained within the existing road infrastructure and traverse small areas of habitats common and widespread within the surrounding area such as improved agricultural grassland, hedgerow and dry meadows and grassy verges. There may be a requirement to complete minor hedge or tree trimming to transport the turbine components. However, no PRFs were identified during the inspection survey. Therefore, no loss of roosting habitat associated with the TDR is anticipated.</p> <p>Displacement of individuals or populations</p> <p>The Proposed Project is predominantly located within an area of agricultural grassland, treelines/hedgerows with smaller areas of wet grassland, private forestry. A number of treelines/hedgerows within the turbine buffers to be removed provide potential roosting and foraging/commuting habitat. Mitigation measures are detailed in below and in Section 6.1 of Appendix 6-2. There will be no net loss of linear landscape features for commuting and foraging bats and there will be no loss of any roosting site of ecological significance. The habitats on the Site will remain suitable for bats and no significant displacement of individuals or populations is anticipated.</p>
<p>Assessment of Significance prior to mitigation</p>	<p>Several trees with roosting potential for bats will be lost due to the construction of the Proposed Project. On a precautionary basis, due to the potential loss of a roost feature and potential mortality to bats a potential for significant effect has been identified in relation to loss of, or damage to, roosts.</p> <p>No other potential for the construction of the Proposed Project to result in Significant effects on the local bat population at any geographic scale.</p>
<p>Mitigation/ Biodiversity Management and Enhancement</p>	<p>Loss or damage to commuting and foraging habitat</p> <p>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. However, the Proposed Project is predominantly located within agricultural grasslands and linear landscape features such as hedgerows, trees and drains which will be largely retained or avoided.</p> <p>Some linear vegetation within the required turbine bat buffers will be removed. A replanting design has been curated to provide alternative commuting corridors within the Site. To comply with NatureScot recommendations in relation to habitat buffering to avoid bat fatalities, a total of 4.22ha of conifer plantation commercial forestry and (mixed) broadleaved woodland comprised of strips of linear woodland and ash plantation, and 1.8km of treeline/hedgerow habitat will be lost as a result of the recommended buffers applied for bats.</p> <p>It is proposed to plant by hand, approximately 1.8 hectares of natural woodland within the Site along a segment of the Eastwood River, as shown in Figure 6-1 of Appendix 6-2. The remaining replanting will be undertaken outside of the hydrological catchment plus 10km from the Site. Further details are outlined in Appendix 6-4 Biodiversity Management and Enhancement Plan.</p> <p>There is an extensive network of existing linear landscape features in the wider area that will be retained, and the loss of hedgerow/trees is not anticipated to have a significant effect on local bat populations. However, it is proposed to plant new linear features and bolster existing habitat features to offset any potential loss in linear habitat features and to provide additional new opportunities for commuting and foraging bats. A total of</p>

5.17km of linear habitat will be added, which will result in a net gain in linear habitat features within the Site.

The locations in which the proposed linear hedgerow planting will take place are illustrated in Figure 6-1 of Appendix 6-2. To ensure connectivity is maintained across the Site, the proposed replanting will be located primarily in the north, eastern and southern section of the Site, enhancing the existing linear features along the watercourse which runs north to south of the Site. Should any alteration of planting locations be required it will be subject to review by the Project Ecologist.

Overall, the proposed replanting will result in a net gain of approximately 3.37km in the linear landscape features within the Site. Planting will be of semi-mature, indigenous species local to the area, to ensure connectivity gains are immediate.

Loss of or Damage to Roosts

A number of mature trees presenting potential roosting features were identified within turbine felling buffers. Areas subject to removal are shown in Figure 6-1 of Appendix 6-2. Bats comprise mobile species that can move regularly between tree roosts. As such, the trees with potential roosting features have been considered as a “roost resource” and compensation will be provided to cover for the loss of the resource. The following procedures are proposed prior to felling trees with PRFs:

- A pre-commencement survey will be carried out by a suitably qualified ecologist on trees with PRFs proposed for felling.
- A bat derogation licence will be obtained from the NPWS for the loss of any confirmed roost resource, prior to felling, and the felling activity will be supervised by a qualified ecologist.
- Tree-felling of mature deciduous trees will be carried out according to the following standard mitigating procedures:
 - Trees with suitable potential roost features proposed for felling will be checked for bats by a suitably qualified arborist at the time of felling.
 - Trees will be nudged two or three times prior to limb removal, with a pause of 30 seconds in between, to allow bats to wake and move.
 - Riggged felling shall be used to lower the limbs and trunk carefully to ground level and cavities searched by a qualified ecologist.
 - Felled trees will be left in-situ for a minimum of 24 hours prior to sawing or mulching, to allow any bats present to escape (National Roads Authority, 2006).
 - Any tree felling will be undertaken outside the bat maternity season (May- August) and the hibernation period (December-February) (Marnell, Kelleher and Mullen, 2022).

Compensation for the loss of trees with alternative potential roosting features will be implemented on a like-for-like basis, through veteranisation of retained trees or the provision of bat boxes:

- A count of all potential roosting features lost will be required to ensure all features are accounted for by compensation measures.
- Veteranisation (i.e. artificially ageing trees by producing non-lethal damage) will be undertaken by professionally trained arborists.
- Bat-boxes produced with woodcrete materials (i.e. Schwegler) will be utilised where veteranisation of existing broadleaves is not possible.

The requirement for a pre-commencement survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice. The function of this survey will be to assess any changes in baseline environment since the time of undertaking the inspections in 2023.

	<p>Displacement of individuals or populations</p> <p>While no significant displacement of individuals or populations is anticipated the following mitigations have been prescribed on a precautionary basis and in line with best practice mitigation.</p> <p><u>Noise Restrictions:</u> 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><u>Lighting Restrictions</u></p> <p>Where lighting is required, directional lighting will be used to prevent overspill on to woodland/forestry edges. Exterior lighting, during construction, shall be designed to minimize light spillage, thus reducing the effect on areas outside the Site, and consequently on bats i.e. Lighting will be directed away from mature trees/treelines around the periphery of the site boundary 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 at night.</p> <p>In addition, the applicant commits to the use of lights during construction in line with the following guidance that is provided in the Dark Sky Ireland Lighting Recommendations:</p> <ul style="list-style-type: none"> ➤ Every light needs to be justifiable, ➤ Limit the use of light to when it is needed, ➤ Direct the light to where it is needed, ➤ Reduce the light intensity to the minimum needed, ➤ Use light spectra adapted to the environment, ➤ When using white light, use sources with a “warm” colour temperature (less than 3000K).
<p>Residual Effect following Mitigation</p>	<p>Post implementation of the above outlined mitigations, there is no potential for the construction of the Proposed Project to result in Significant effects on the local bat population at any geographic scale. There will be no significant effect on the conservation status of any bat species as defined in ‘<i>The Status of Protected Habitats and Species in Ireland</i>’ (NPWS, 2019)</p>

6.7.2.2.5 Assessment of Potential Impact on Amphibians

Table 6-29 Assessment of Potential Impacts on Amphibians

<p>Description of Effect</p>	<p>Due to the presence of suitable alternative habitat for Common Frog within the wider site, no significant impacts via habitat loss are predicted. However, due to the presence of suitable habitat for amphibians within the footprint of Turbine 6 and associated access roads, a potential for direct impact via mortality during construction works was identified.</p>
<p>Characterisation of unmitigated effect</p>	<p>In the absence of mitigation, there is potential for direct mortality to Common Frog in the vicinity of Turbine 6.</p>

<p>Assessment of Significance prior to mitigation</p>	<p>Significant effects as a result of habitat loss are not predicted due to the presence of suitable habitat for amphibians in the wider area.</p> <p>Due to the presence of suitable habitat within the footprint of Turbine 6 (in the form of wet grassland), and records of Common Frog found within this area of the site during the surveys undertaken, there is potential for significant effect to amphibians at a local level via direct mortality as a result of construction works.</p>
<p>Mitigation</p>	<p>A detailed drainage maintenance plan for the Proposed Project is provided in Appendix 4-3 CEMP of this EIAR. This plan provides full details of how water quality will be protected during the construction of the Proposed Project. In addition to this, specific mitigation is provided in relation to water quality in Chapter 9: 'Hydrology and Hydrogeology' of this EIAR. These mitigation measures will ensure that there will be no potential indirect effects on otter as a result of a deterioration in water quality.</p> <p>Prior to the commencement of construction works associated with Turbine 6, the following measures will be undertaken for the avoidance of direct mortality to amphibians:</p> <ul style="list-style-type: none"> ➤ A pre-commencement Common Frog survey will be undertaken in accordance with standard best practice guidance prior to the commencement of works for Turbine 6. Any amphibians found will be translocated to suitable habitat within the Site, outside of construction areas, under licence from the National Parks and Wildlife Service. ➤ All conditions of a derogation licence will be implemented in full. ➤ All of the above works will be undertaken or supervised by an appropriately qualified ecologist.
<p>Residual Effect following Mitigation</p>	<p>Following the implementation of the mitigation proposed above, there will be no significant residual effect on amphibians as a result of the Proposed Project at any geographic scale.</p>

6.7.3 Likely Significant Effects During Operational Phase

6.7.3.1 Effects on Habitats during Operation

The operation of the Proposed Project will not result in any additional land take or loss of habitats and as such there is no potential for any significant effects in this regard. These habitats are not considered to be a KER in the context of the operation of the Proposed Project. However, the Proposed Project has the potential to result in enhancement of the surrounding areas through habitat rehabilitation management (as described in the Biodiversity Management and Enhancement Plan) that will be implemented during the construction phase of the Proposed Project and maintained during the operational phase through operational phase monitoring. Details of the management that will be undertaken are provided in the Biodiversity Management and Enhancement Plan in Appendix 6.4.

There is no potential for significant negative effects on terrestrial fauna such as badger that was identified as a KER during the construction phase of the Proposed Project.

Potential for effects on rivers, streams and sensitive aquatic species remains a KER during operation and is assessed in detail in the following subsection, as are impacts on fauna.

6.7.3.1.1 Effects on Rivers and Streams and Sensitive Aquatic Faunal Species.

Table 6-30 Assessment of Potential Impacts on Rivers, Streams and Sensitive Aquatic Faunal Species

<p>Description of Effect</p>	<p>This section assesses the potential for likely significant effects on aquatic receptors including aquatic habitats (i.e., watercourses), salmonids, lamprey, coarse fish, white-clawed crayfish, European eel, aquatic invertebrates, molluscs and other aquatic species.</p> <p>The increase in the amount of hard standing associated with the proposed infrastructure has the potential to result in faster water runoff from the 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. Additionally, there is the potential for the faster run off of any pollutants that may be associated with vehicular usage on the site.</p> <p>The predicted impacts on water quality are fully described in Chapter 9: ‘Hydrology and Hydrogeology’ of this EIAR and are described here in relation specifically to biodiversity.</p>
<p>Characterisation of unmitigated effect</p>	<p>Impact on water quality during the operational phase of the Proposed Project has been assessed as a Negative, slight, indirect, long term, likely effect on all downstream surface water bodies. The magnitude of this impact is slight because all major infrastructure will be located over 50 metres from any significant watercourse (those mapped by the EPA¹² and downloaded to GIS) and the footprint of the Proposed Project will be minimal when compared to the overall size of the Site.</p>
<p>Assessment of Significance prior to mitigation</p>	<p>Significant effects on water quality are not anticipated at any geographic scale during the operation of the Proposed Project.</p>
<p>Mitigation</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 site has been fully mitigated through appropriate design and mitigation as fully described in Section 4.6 ‘Site Drainage’, and Section 9.5.3 of the EIAR. In Section 9.5.3 of Chapter 9 ‘Hydrology and Hydrogeology’, the assessment concludes that with the implementation of mitigation, ‘<i>No significant effects on downstream flood risk will occur during the operational phase of the Proposed Project</i>’. The detailed mitigation measures are not repeated here to</p>

¹² EPA, 2023, Online Map viewer. Available at: <https://gis.epa.ie/EPAMaps/>

	reduce repetition throughout the document, but are described in Section 9.5.3.1, Chapter 9; the measures used to mitigate the risk of release of hydrocarbons and other pollutants and for sediment control during the construction phase will also be employed as required during the operational phase. Drainage management measures employed during the construction phase will ensure that runoff from the operational phase will be effectively mitigated.
Residual Effect following Mitigation	Proven and effective measures to attenuate runoff and mitigate the risk of flooding will be employed. The residual effect will be a neutral, indirect, long term, likely effect on down gradient streams/ivers.

6.7.3.2 Effects on Fauna during Operation

The operation of the Proposed Project will not result in any additional habitat loss or deterioration, nor will it result in a significant increase in anthropogenic activity due to its location and scale.

It should be noted that although most surveyed watercourses were found to support salmonid populations, lamprey species and/ or otter; no significant habitat for salmonids, lamprey, European eel, aquatic invertebrates or other aquatic species was recorded within the footprint of the Proposed Project. As outlined in Appendix 6-3, none of the sample sites achieved target good status ($\geq Q4$) and historical drainage pressures (hydromorphology) and siltation have significantly reduced the quality of aquatic habitats on most watercourses in the vicinity of the Proposed Project. All major infrastructure such as turbine bases are located over 50 metres from the watercourses within the Site. The potential for significant effects on the above aquatic species is restricted to indirect effects on their habitat resulting from water pollution. This has been assessed in Section 6.7.3.1.1 and is not repeated below.

The implementation of the Biodiversity Management and Enhancement Plan (BMEP) will ensure that any broadleaved woodland, treeline and hedgerow habitat that is lost to facilitate the Proposed Project infrastructure will be replaced within the Site. The BMEP will incorporate measures to create a river restoration area and associated area of woodland planting at a section of the Eastwood River within the west of the Site, west of Turbine 4. This will result in the establishment of habitats of higher value for local faunal species during the operational period. This river restoration area and associated woodland planting area will provide a greater biodiversity benefit than the existing habitats to be lost for the proposed development infrastructure. As such the operation of the Proposed Project will not result in a significant impact at any geographic scale. Such measures will have positive effects on the non-volant terrestrial fauna and aquatic fauna species at the site of the Proposed Project, as well as for birds and invertebrates. There is no potential for significant negative effects on non-volant terrestrial fauna including otter that was identified as a KER during the operational phase of the Proposed Project.

Total coverage of broadleaf woodland within the Site is currently 8.68ha. Taking into account the 0.78ha loss of this habitat and the planting of 1.8ha of woodland during the construction phase the total coverage of broadleaf woodland within the site will increase to 9.7ha. The positive effect as a result of the proposed River Restoration and 1.8ha of woodland replanting is assessed as a **Slight Longterm Positive effect** at a local level on aquatic fauna, birds, bats, amphibians, non-volant mammals and invertebrates as these measures will create and increase suitable habitat for foraging, commuting and nesting for a wide range of fauna including those listed above.

The replanting of 5.17km of linear vegetation within the site will have a **Slight Longterm Positive effect** at a local level on invertebrates, non-volant mammals, bats and birds who are likely to utilise the linear vegetation habitat for commuting, foraging and nesting.

As part of the mitigations outlined in Chapter 7 ‘Ornithology’ the grass growing season will be extended in areas within the Site. This will result in a **Slight Longterm Positive effect** at a local level on small mammals and pollinators within the Site. Further detail can also be seen in Appendix 6-4 ‘Biodiversity Management and Enhancement Plan’.

Potential for significant effects on bat species resulting from the operation of the Proposed Project were identified and therefore, these are identified as KERs during the operational phase.

6.7.3.2.1 Assessment of Potential Effects on Bats during operation

Table 6-31 Assessment of Potential Impacts on Bats

<p>Description of Effect</p>	<p>There is no potential for loss or fragmentation of foraging or roosting habitat for bat species during the operational phase of the Proposed Project as there will be no additional loss of any habitats following construction.</p> <p>The bat survey report that is provided in Appendix 6.2 found bat species composition and abundance to be typical of the geographic location and nature of the site, and that the site is utilised by a regularly occurring bat population of Local Importance.</p> <p>The operational phase of the Proposed Project poses a potential risk to bats in the form of collision mortality, barotrauma and other injuries cause by bats coming into contact or close proximity to operational turbines. Any increase in artificial lighting at night associated with the Proposed Project would have the potential to result in displacement effects on bats.</p>
<p>Characterisation of unmitigated effect</p>	<p>Collision Risk</p> <p>The following high-risk species were recorded during the dedicated surveys:</p> <ul style="list-style-type: none"> > Leisler’s bat, > Common pipistrelle > Soprano pipistrelle <p>The Overall Risk Assessment for high collision risk species is provided in the sections below. Overall Risk was determined, in accordance with Table 3b of NatureScot 2021 guidance (Appendix 3 of Appendix 6-2), by a cross-tablature of the site risk level (i.e. Medium). The assessment was carried out for both median and maximum activity categories in order to provide insight into typical bat activity (i.e. median values) and activity peaks (i.e. maximum values). NatureScot recommends that the most appropriate activity level (i.e. median or maximum) be utilised to determine the overall risk assessment for a species.</p> <p>There is Moderate collision risk level assigned to the local population of Leisler’s Bat in Spring and Summer, and a Low collision risk level assigned to the local population in Autumn.</p> <p>There is Low collision risk level assigned to the local population of Common pipistrelle across all three seasons.</p> <p>There is Low collision risk level assigned to the local population of Soprano pipistrelle across all three seasons.</p> <p>Site-level collision risk for high collision risk bat species was typically Low. Overall bat activity levels were typical of the nature of the Site, which is predominantly agricultural grasslands, treelines and hedgerows with relatively low levels of bat activity recorded during the static detector surveys as well as the walked transects undertaken.</p> <p>As per NatureScot guidance there is no requirement to complete an Overall Risk Assessment for low-risk species. During the extensive suite of surveys undertaken the following low risk species were recorded:</p> <ul style="list-style-type: none"> > <i>Myotis spp.</i> > Brown long-eared bat

	<p>Overall activity levels were low for the above species; therefore, no significant collision related effects are anticipated.</p>
<p>Assessment of Significance prior to mitigation</p>	<p>Death may occur through collision with turbine blades or as a result of barotrauma. Fatalities may negatively affect local bat populations. Significant effects are not anticipated at the county or national scale.</p> <p>To date, no studies have conclusively linked pre-construction activity surveys to post-construction fatality rates (Hein et.al., 2013). However, there is a strong positive correlation between post-construction activity and fatality at wind farms (Kunz et al. 2007, Baerwald and Barclay 2009, Amorim et al. 2012, Korner-Nievergelt et al. 2013).</p> <p>The magnitude of this effect, in respect of local bat populations, in the absence of mitigation is Significant at the local scale.</p>
<p>Mitigation</p>	<p>Bat Felling Buffers</p> <p>In accordance with NatureScot Guidance, a minimum 50m buffer to all habitat features used by bats (e.g., hedgerows, treelines etc.) will be applied to the siting of all wind turbines (See example provided in Plate 6-1 below). It is noted that Eurobats No. 6 guidance and NIEA recommends increased buffers of 100m and 200m around woodland/forestry areas, however, there is no scientific evidence to support these increased buffer distances in the UK. Details of this mitigation and how it is calculated is provided in Section 6.1.3 of the ‘Bat Report’ (Appendix 6.2).</p> <p>Lighting Restrictions</p> <p>Where lighting is required, directional lighting will be used to prevent overspill on to woodland/forestry edges. Exterior lighting, during construction and post construction, shall be designed to minimize light spillage, thus reducing the effect on areas outside the Site, and consequently on bats i.e. Lighting will be directed away from mature trees/treelines around the periphery of the site boundary 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 at night.</p> <p>In addition, the applicant commits to the use of lights during construction, operation and decommissioning (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"> ➤ Every light needs to be justifiable, ➤ Limit the use of light to when it is needed, ➤ Direct the light to where it is needed, ➤ Reduce the light intensity to the minimum needed, ➤ Use light spectra adapted to the environment, ➤ When using white light, use sources with a “warm” colour temperature (less than 3000K). <p>With regard to the potential for lighting to increase collision risk, it is noted that there will be limited illumination of the turbines in the form of aviation lighting. Post construction monitoring will be carried out (as outlined below) to assess any potential changes in bat activity patterns and collision risk. Significant effects as a result of aviation lighting are not anticipated; however, if in the course of this monitoring, any potential for significant effects on bats is identified, the site-specific mitigation measures will be reviewed and any changes necessary will be implemented to avoid any such impacts.</p>

	<p>Blade Feathering</p> <p>NIEA Guidelines also recommend that, in addition to buffers applied to habitat features, all wind turbines are subject to ‘feathering’ of turbine blades when wind speeds are below the cut-in speed of the proposed turbine. This means that the turbine blades are pitched at 90 degrees or parallel to the wind to reduce their rotation speed to below two revolutions per minute while idling. This measure has been shown to significantly reduce bat fatalities (by up to 50%) in some studies (NIEA, 2021).</p> <p>In accordance with NIEA Guidelines, blade feathering will be implemented as a standard across all proposed turbines when wind speeds are below the cut-in speed of the turbine.</p> <p>Post construction monitoring</p> <p>It is noted in the NatureScot (2021) guidelines that bat activity on windfarm sites is highly liable to change following construction of a wind farm, due to the changes in habitat that occur to facilitate construction. Therefore, continued monitoring of operational wind farms for up to three years’ post construction is recommended in NIEA and NatureScot (both 2021) guidelines and will be undertaken at this site, to verify the predicted post construction effects on the local bat populations.</p> <p>Full details of the proposed operational bat monitoring programme for the Proposed Project are provided in Section 6.2 of the Bat Report (Appendix 6.2) and include measurement of bat activity using static detectors at turbine bases, walked survey transects and corpse searching to record any bat fatalities resulting from collision. Monitoring of weather parameters known to influence collision risk including wind speed, temperature and precipitation will be undertaken in parallel with this. At a minimum, monitoring will be conducted for 3 years post construction. The monitoring will also include carcass searches to monitor and record bat fatalities, which shall be conducted at each turbine in accordance with NatureScot Guidance.</p> <p>The results of post construction monitoring shall be utilised to assess changes in bat activity patterns post construction and to monitor the implementation of the mitigation strategy. At the end of each year, the efficacy of the mitigation programme will be reviewed, and any identified efficiencies incorporated into the programme. This approach allows for an evidence-based review of the potential for bat fatalities at the site, post construction, to ensure that the necessary measures, based on a new baseline post-construction, are implemented for the protection of bat species locally.</p> <p>In addition, post construction monitoring of any bat boxes installed with the Site will be carried out in accordance with Appendix 6-2 and Appendix 6-4.</p>
<p>Residual Effect following Mitigation</p>	<p>Taking into consideration the sensitive design of the project and the proposed best practice and adaptive mitigation measures, there is no potential for significant effects on bat populations as a result of the Proposed Project.</p>

Likely Significant Effects During Decommissioning phase

The accompanying planning application seeks a ten-year planning permission and 30-year operational life from the date of commissioning of the Proposed Wind Farm. Decommissioning of the Proposed Wind Farm is described within the Decommissioning Plan (Appendix 4-4) and Chapter 4 of this EIAR. The Decommissioning Plan will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will be agreed with the competent authority at that time.

There will be no additional habitat loss associated with the decommissioning of the Proposed Project and therefore there will be no significant effects in this regard.

The proposed wind turbines are expected to have a lifespan of approximately 30-35 years. Following the end of their useful life, the equipment may be replaced with a new technology, subject to planning permission being obtained, or the Wind Farm may be decommissioned fully.

Upon decommissioning of the Proposed Wind Farm, the wind turbines and the meteorological mast would be disassembled. All above ground turbine and mast components would be separated and removed off-site for recycling. Turbine and mast foundations would remain underground and would be covered with earth and allowed to revegetate. Leaving the foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in significant temporary environment nuisances such as noise, dust and/or vibration. Site roadways will be used during the operational phase by farm machinery and will provide a useful means of extracting the commercial forestry crop which exists on at the Site and therefore will be retained post decommissioning to facilitate these activities.

The underground electrical cabling connecting the turbines to the on-site substation will be removed from the cable ducts. The cabling will be pulled from the cable ducts using a mechanical winch which will extract the cable and re-roll it on to a cable drum. This will be undertaken at the original cable jointing pits which will be excavated using a mechanical excavator and will be fully re-instated once the cables are removed. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance. The cable materials will be transferred to a suitable recycling or recovery facility.

The Grid Connection infrastructure will remain in place as it will be part of the Electricity Grid under the ownership and control of the ESBN/ EirGrid.

The potential for effects during the decommissioning phase of the Proposed Wind Farm has been fully assessed in the EIAR.

As noted in the Scottish Natural Heritage report (SNH) *Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms* (SNH, 2013) reinstatement proposals for a wind farm are made approximately 30 years in advance, so within the lifespan of the Proposed Wind Farm, technological advances and preferred approaches to reinstatement are likely to change. According to the SNH guidance, it is therefore:

“best practice not to limit options too far in advance of actual decommissioning but to maintain informed flexibility until close to the end-of-life of the wind farm”.

The impacts on biodiversity will also be similar in nature to those experienced during construction but on a far lesser scale and magnitude. There will be no additional or ancillary impacts associated with the decommissioning phase.

The same mitigation to prevent significant impacts on water quality and associated aquatic fauna and other terrestrial fauna during construction will be applicable to the decommissioning phase. The Decommissioning Plan provides details of the methodologies that will be adopted, throughout decommissioning, the environmental controls that will be implemented, the Emergency Response Procedure to be adopted, methods for reviewing compliance and an indicative programme of decommissioning works. The CEMP (Appendix 4-3) for the Proposed Project also provides details of the mitigation and best practice that will be employed to avoid any potential for significant residual effects on biodiversity during decommissioning of the Proposed Project. In addition, the measures incorporated into the construction phase, in Section 6.7.2.1 of this EIAR chapter, including specific mitigation provided in relation to water quality in Chapter 9: Hydrology and Hydrogeology, will be implemented during decommissioning. 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.

6.7.5 Effects on Designated Sites

None of the elements of the Proposed Project are located within the boundaries of any Nationally or European designated sites. There will be no direct effects on any designated site as a result of the construction, operation and decommissioning of the Proposed Project.

6.7.5.1 Impacts on Nationally Designated Sites

As identified in Table 6-4, the following Nationally Designated Sites were identified as being within the Zone of Likely Impact:

- Cabragh Wetlands pNHA [001934]

6.7.5.1.1 Hydrological (surface water) Impacts

Potential hydrological connectivity has been identified from the Site to Cabragh Wetlands pNHA [001934]. No potential for residual adverse impacts on water quality have been identified following implementation of mitigation measures in relation to potential effects on rivers/streams and sensitive aquatic faunal species, as described above in Section 6.7.2 and therefore no significant effects on this pNHA are anticipated.

No hydrological connectivity has been identified to any other NHAs/pNHAs; given the distance from the Site and relatively low impact of the works, and therefore, no impacts are anticipated.

6.7.5.2 Impacts on European Sites

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

As per the aforementioned 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 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. It may also utilise data that is also included in the Appropriate Assessment documentation”. This section provides a summary of the key assessment findings with regard to Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). Please see the accompanying Natura Impact Statement for further details.

The Screening for Appropriate 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 sites:

- Lower River Suir SAC [002137]

As a result, an Appropriate Assessment is required, and a Natura Impact Statement has been prepared in respect of the Proposed Project in order to assess whether the Proposed Project will adversely impact the integrity of these European Sites’.

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.

6.8

Cumulative and in combination Effects

The Proposed Project was considered cumulatively and in combination with other proposed, consented or operational projects and/or plans, in the surrounding area that could result in cumulative impacts on the Key Ecological Receptors (KERs) identified in Section 6.6.4 of this report, including European sites 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 Appendix 2-2 of this EIAR. The full list of projects has been considered and relevant ones from this list are discussed in this section. The cumulative assessment methodology is discussed in section 2.8, Chapter 2 of this EIAR.

6.8.1

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
- > National Biodiversity Action Plan 2017-2021
- > Draft 4th National Biodiversity Action Plan 2023-2027
- > Eastern and Midlands Regional Assembly: Regional Spatial & Economic Strategy 2019-2031 (RSES)

The review focused on policies and objectives that relate to nationally designated sites for nature conservation, biodiversity and protected species. Policies and objectives relating to the conservation of peatlands and sustainable land use were also reviewed, particularly where the policies relate to the preservation of surface water quality. An overview of the search results with regard to plans is provided in Table 6-32.

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

Table 6-32 Assessment of Plans

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
<p>Tipperary County Development Plan 2022 – 2028</p>	<p>SO-1: To support the just transition to a climate resilient, biodiversity-rich, environmentally-sustainable and climate-neutral economy.</p> <p>Policies</p> <p>11 - 1 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 projects59).</p> <p>11 - 2 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. 11 - 3 Ensure the conservation and protection of existing, and proposed NHAs, and to ensure that Proposed Projects 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>11 - 4 (a) 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) and any review thereof. (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</p>	<p>The Development plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the biodiversity, protected species and designated sites.</p> <p>The Proposed Project is located outside of any Nationally designated sites. All identified pathways for impact to designated sites have been assessed and mitigated where necessary as detailed in Section 6.7.5.</p> <p>No potential for negative cumulative impacts when considered in conjunction with the Proposed Project were identified.</p> <p>No developments or projects identified within the Development Plan were found to occur in the wider area surrounding the Proposed Project.</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
	<p>design process. (c) 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. (d) 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>11 - 5 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. 11 - 6 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). 11 - 7 a) 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) Support an integrated and collaborative approach to catchment management in accordance with the River Basin Management Plan 2018-2021 and any successor. c) 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>11 - 8 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 relation to: sustainable fishing practices that would not affect the ecological site integrity; and invasive species</p> <p>11 - 13 Seek to control the spread of invasive plant and animal species, including consideration of potential pathways for invasive species spread, i.e., watercourses.</p>	

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
	<p>11 - 15 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>11 - D (a) 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) 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>11 - G Apply best practice in sustainable environmental standards in the design and development of collaborative and/or public sector development in Tipperary, including: (a) Ensure that biodiversity issues are considered at the earliest possible stages of plan making; (b) Ensure that plans and strategies comply with nature conservation legislation and policy as required (fulfil SEA and AA requirements); and (c) Carry out ecological impact assessment of plans and strategies as appropriate.</p>	
<p>Draft 4th National Biodiversity Action Plan 2023-2027</p>	<p>Objective 2 - Meet Urgent Conservation and Restoration Needs</p> <p>Outcome 2A: The protection of existing designated areas and species is strengthened and conservation and restoration within the existing protected area network are enhanced 29</p> <p>Outcome 2B: Biodiversity and ecosystem services in the wider countryside are conserved 32 18 27 Navigation</p> <p>Outcome 2C: All freshwater bodies are of at least ‘Good Ecological Status’ as defined under the EU Water Framework Directive 36</p>	<p>There will be no adverse effects on designated sites or biodiversity as a result of the Proposed Project.</p> <p>The Proposed Project will not impact on connectivity within the wider area and will maintain watercourses within and adjacent to the Site in good condition.</p> <p>No Invasive species were present within the Site, and the Proposed Project will not contribute to the spread of invasive species.</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
	<p>Outcome 2D: Genetic diversity of wild and domesticated species is safeguarded 39</p> <p>Outcome 2E: A National Restoration Plan is in place to meet EU Biodiversity Strategy 2030 nature restoration targets 41</p> <p>Outcome 2F: Biodiversity and ecosystem services in the marine environment are conserved and restored 42</p> <p>Outcome 2G: Invasive alien species (IAS) are controlled and managed on an all-island basis to reduce the harmful impact they have on biodiversity and measures are undertaken to tackle the introduction and spread of new IAS to the environment</p>	
<p>National Biodiversity Action Plan 2017-2021</p>	<p>Objective 1 Mainstream biodiversity into decision-making across all sectors</p> <p>Developments in the area of Green Infrastructure are being initiated at the local and regional level. Green Infrastructure is a strategically planned network of natural and semi natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services such as water purification, air quality, space for recreation and climate mitigation and adaptation.</p> <p>Objective 4 - Conserve and restore biodiversity and ecosystem services in the wider countryside</p> <p>Target 6.2 - Sufficiency, coherence, connectivity, and resilience of the protected areas network substantially enhanced by 2020.</p>	<p>The Action plan was comprehensively reviewed, with particular reference to Objectives that relate to the biodiversity, protected species and designated sites.</p> <p>The Proposed Project has been designed in order to avoid any potential fragmentation of habitats or commuting corridors.</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 Potential Impact on European Sites
<p>Eastern and Midlands Regional Assembly: Regional Spatial & Economic Strategy 2019-2031 (RSES)</p>	<p>RPO 7.16: Support the implementation of the Habitats Directives in achieving an improvement in the conservation status of protected species and habitats in the Region and to ensure alignment between the core objectives of the EU Birds and Habitats Directives and local authority development plans.</p> <p>RPO 7.17: Facilitate cross boundary co-ordination between local authorities and the relevant agencies in the Region to provide clear governance arrangements and coordination mechanisms to support the development of ecological networks and enhanced connectivity between protected sites whilst also addressing the need for management of alien invasive species and the conservation of native species.</p> <p>RPO 7.18: Work with local authorities and state agencies to promote the development of all aspects of park management in the Wicklow National Park and the Slieve Bloom Mountains.</p> <p>RPO 7.19: Support the consideration of designating a National Park for the peatlands area in the Midlands.</p> <p>RPO 7.20: Promote the development of improved visitor experiences, nature conservation and sustainable development activities within the Dublin Bay Biosphere in cooperation with the Dublin Bay UNESCO Biosphere Partnership.</p>	<p>The Regional Spatial & Economic Strategy was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the biodiversity, protected species and designated sites.</p> <p>There will be no adverse effects on biodiversity as a result of the Proposed Project, and no cumulative impacts in this regard.</p> <p>The Proposed Project has been designed to avoid any effects on water quality and/or designated sites outside the site.</p> <p>The Proposed Project has been subject to a full environmental assessment i.e. EIA and AA.</p>

6.8.2 Assessment of Projects

As described in Section 2.8 of Chapter 2 of the EIAR, relevant projects have been assessed in-combination with the Proposed Project and include planning applications in the vicinity of the site including other wind energy applications within the appropriate zone of sensitivity. Appendix 2-2 to Chapter 2 of this EIAR provides the full list of projects identified; 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 6.8.3 concludes on their potential for impact on biodiversity. The table below 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 of this EIAR.

Table 6-33: Cumulative Study Areas in relation to ecological receptors (birds are assessed separately within Chapter 7 of this EIAR)

Individual Topic	Maximum Extent	Justification
Biodiversity	Suir Sub Catchment	The Site is located within the Suir_SC_010 Catchment. To capture other projects within the same hydrological sub catchments of the Site.
Biodiversity-Bats	10km	A 10km buffer of the Site is used as is recommended for the desktop study and cumulative assessment by NatureScot Guidelines 2021 (Section 4).
Hydrology and Hydrogeology	Suir Sub Catchment	The Site is located within the Suir_SC_010 Catchment. To capture other projects within the same hydrological sub catchments of the Site.

Other smaller developments within the wider study area have been considered within the identified zone of sensitivity for biodiversity as described in Section 2.8 of this EIAR, have been considered within this cumulative impact assessment. A list of projects considered in the cumulative assessment is contained within Appendix 2.2 of this EIAR; In order to avoid repetition within the EIAR, these have not been repeated below.

6.8.2.1 Other Wind Farm Projects

For the purposes of this cumulative assessment wind farms within 25km of the Site have been considered in further detail below. Wind farms occurring at greater distances were considered, however, given the nature of the KERs identified within the ornithological EIAR survey area (potential for cumulative effects on birds are considered within Chapter 7 of this EIAR) no significant residual effects were identified and further detailed analysis is not provided below.

There are 20 no. wind farm developments operational, consented or proposed, that have been identified due to either an application, a request for pre-application consultation having been lodged or permitted, or proposed wind farm projects identified in the Public Domain within the cumulative study area:

- Pl ref: 5124325 Ballinlough (operational)
- Pl ref: 08510664 Ballinvey (operational)
- Pl ref: 10145, 10129, 10510118 Bruckana (operational)
- Pl ref: 5123496 Carrig (operational)

- > Pl ref: 04511665 Curraghraigue (operational)
- > Pl ref: 1324 (ABP-242710) Glenough (operational)
- > Pl ref: 041195, 1180, 10595 Glenough (operational)
- > Pl ref: 12510368 Gortnahalla (operational)
- > Pl ref: 09801 Gurteen Lower (operational)
- > Pl ref: 12172 Lisdowney (operational)
- > Pl ref: 06510773 (ABP 222142) Lisheen I (operational)
- > Pl ref: 09510100 Lisheen II (operational)
- > Pl ref: 20459, 19597 Lisheen III (operational)
- > Pl ref: 03510957, 12510174 Monanicha Bog (operational)
- > Pl ref: 5123495 Skehanagh (operational)
- > Pl ref: 07510779 Templederry (operational)
- > Pl ref: 14600062 Turraheen Upper (operational)
- > Pl ref: ABP-310171 Upperchurch (permitted)
- > Pl ref: 12510385 Cappa White B (operational)
- > Pl ref: (VC92.315655) Brittas (proposed)

Further details of these projects are provided within Appendix 2-1 to Section 2 of this EIAR.

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 European Sites have been identified for the Proposed Project (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

6.8.2.2 Non-Renewable Energy Developments

Appendix 2-1 of this EIAR lists existing and approved projects as well as planning applications pending a decision within various study areas out to the Suir subcatchment.. This list has not been repeated here to save on duplication of information. There are 15 EIA projects within 25km of the Proposed Project which are listed below:

1. Pl ref: ABP-310171-21. Amendments to the authorised (but not constructed) twenty-two turbine Upperchurch Windfarm, previously authorised under ABP Ref: L22.243040. To include an increase in the size of the authorised wind turbines and amendments to the two authorised met masts. Conditional.
2. Pl ref: 20816. The existing anaerobic digestion facility to be upgraded to include for the acceptance of up to 30,000 tonnes of organic waste materials, a glass line steel storage tank, an office building and ancillary infrastructure. Conditional.
3. Pl ref: 21599. Recommencement of underground mining at the former Galmoy Zinc and Lead Mine incl. the refurbishment of a number of surface structures, two new wells and associated ancillary infrastructure for the supply of supplementary water to GRPWS. Conditional.
4. Pl ref: 20211. The proposed demolition of three existing pig houses and to construct a second stage weaner house, extend a farrowing house, extend a loose sow house, construct a pre-finisher house, construct a slurry reception tank and all associated site works. Conditional.
5. Pl ref: CN90049. Establishment of 206.1 hectares of native woodland on industrial cutaway bog areas that cannot be rewetted to restore active, Raised bogs. Seeding & planting of native trees will stabilise exposed bogs, reduce wind & water erosion, & enhance biodiversity. N/A.
6. Pl ref: 22716. Recommencement of underground mining at the former Galmoy Zinc and Lead Mine incl. the refurbishment of a number of surface structures, two new wells and associated ancillary infrastructure for the supply of supplementary water to GRPWS. Conditional.

7. PI ref: ABP-306204-19. Proposed 110kV Electrical Substation at Mountphilips & underground 110kV electrical cables & associated comms cables, from the proposed substation in Mountphilips, to the consented Upperchurch Windfarm Substation, at Knockcurraghbola Commons, Co. Tipperary. Conditional.
8. PI ref: 2260395. Development of a Bioproduct Campus comprising a Biorefinery, Bioenergy Plant (wood fuelled) Compost Plant and Anaerobic Digestion Plant with associated biogas fuelled electricity generators. Conditional.
9. PI ref: 2360337. Extension of the existing limestone quarry and for continued use of the site entrance, access laneway, lagoons, plant and machinery and ancillary works. The extension area will be 0.869ha in lands directly north of the existing quarry. On Hold.
10. PI ref: 21627. The installation of 31.489 km of 38 KV cable ducting and associated electrical cabling and all other ancillary works including joint bays, culverts, maker posts and all associated development. Conditional.
11. PI ref: PL92.249060. Erection of a 58.11 hectare solar PV farm. Conditional.
12. PI ref: 21929. 2.4 hectare extension to an existing sand and gravel pit; extraction of sand and gravel material; transport of material to the existing pit for processing; Landscaping and restoration; All associated ancillary works; Planning permission for 5 years. Conditional.
13. PI ref: 20550 ABP Ref: 310786. Increase the annual waste intake at an existing biological waste treatment plant from 45,000 tonnes to 80,000 tonnes. Construct two extensions (combined 6,083 sq.m.) to existing processing building to accommodate the increased intake. Conditional.
14. PI ref: 18601296. A biorefinery facility comprising a building with processing areas, plant rooms, stores, personnel and administrative areas; external bunded process and storage areas; vessels and tanks; CHP plant; foul, effluent and water treatment plants and site works. Conditional.
15. PI ref: 21599. Recommencement of underground mining at the former Galmoy Zinc and Lead Mine. Conditional.

Further details of these projects are provided within Appendix 2-1 to Section 2 of this EIAR.

The planning applications have been reviewed based on their type, scale and proximity to the Site. Based on the scale of the works, their proximity to the Proposed Project and the temporal period of likely works, no cumulative effects will occur as a result of the Proposed Project. 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 European Sites have been identified for the Proposed Project (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

6.8.2.3 Existing Habitats and Land Uses

The potential for the Proposed Project to result in a cumulative loss or deterioration of habitats, or impact on the KER species identified, was considered in relation to the existing land uses in the area.

The Proposed Project is located primarily on improved agricultural grassland (GA1), wet grassland (GS4) and conifer plantation (WD4) habitats. The loss of hedgerow, treeline and broadleaved woodland will be mitigated through habitat enhancement and replanting proposed as part of this development.

6.8.3 Assessment of Cumulative Effects

The Proposed Project has been considered cumulatively with other plans and projects as described in Sections 6.8.1 & 6.8.2. Particular focus has been placed on those plans and projects that are in closest proximity to the Proposed Project and those that could be potentially affected via downstream surface water.

Following the detailed surveys undertaken and impact assessment provided in Section 6.7, it is concluded that there will be no significant residual disturbance, deterioration of water quality, faunal habitat loss 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 Project on habitats of low ecological value. Following implementation of prescribed mitigation there will be no significant residual impacts on ecological receptors associated with the Proposed Project and therefore no potential for individual or cumulative negative effects on biodiversity are likely to occur.

No significant residual 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.

Conclusion

The site is located primarily within Improved agricultural grassland (GA1) Wet Grassland (GS4) and coniferous forestry plantation (WD4). Potentially significant effects on the Key Ecological Receptors identified in this report have been avoided through infrastructure siting, project design and mitigated by the implementation of specific mitigation measures as detailed in Section 6.7 of this chapter; including all references made to mitigation specified in Chapters 4 ‘Development Description’, and Chapter 9, ‘Hydrology and Hydrogeology’.

Faunal species records within the Site, during detailed ecological surveys undertaken between 2022 and 2023, were found to be common and widespread in the wider area, and in a national context. Protected species such as bats, badger and amphibians were identified within the Site and prescribed avoidance and mitigation measures have been implemented to ensure that no significant effects will occur. In addition, a number of standard best practice and prescribed mitigation measures have been incorporated into the project for the avoidance of impact on protected species as a result of disturbance/displacement and water quality deterioration. The implementation of these measures in full will ensure compliance with the Wildlife Act.

Taking the above information into consideration and having regard to the precautionary principle, the Proposed Project will not result in a significant residual loss of any habitat of high ecological significance and will not have any significant impacts on the ecology of the wider area.

Provided that the Proposed Project is constructed, operated and decommissioned in accordance with the design, best practice and mitigation that is described within this EIAR, significant effects on biodiversity are not anticipated at any geographic scale.