Planning and Environmental Consultants

Environmental Impact Assessment Report (EIAR)

Cahermurphy West Wind Farm, Co. Clare

Chapter 6: Biodiversity

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6. BIODIVERSITY

6.1 Introduction

This chapter assesses the likely significant effects (both alone and cumulatively with other projects) that the Proposed Project, as detailed in in Section 1.1.1 of Chapter 1, may have on Biodiversity. This chapter sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified. The residual impacts on biodiversity are then assessed. Particular attention has been paid to species and habitats of ecological importance. These include species and habitats with national and international protection under the Wildlife Acts 1976 (as amended) and/or EU Habitats Directive 92/43/EEC. Impacts on avian receptors are considered in Chapter 7 of this EIAR. The full description of the Proposed Wind Farm 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.
- 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 Valuation 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 projects are fully assessed.
- Proposed mitigation and best practice measures to avoid, reduce or offset 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.

For the purposes of this EIAR:

- Where the 'Proposed Project' is referred to, this relates to all the project components described in detail in Chapter 4 of this EIAR i.e. Proposed Wind Farm and Proposed Grid Connection as detailed below.
- Where 'the Site' is referred to, this relates to the primary study area for the EIAR, as delineated by the EIAR Site Boundary in green as shown on Figure 1-1. Generally, the study area extends beyond the planning application site boundary depending on the requirements of individual assessments. Individual topics for assessment purposes, i.e., each chapter, will indicate the study area used for that topic. The planning application red line boundary occupies a smaller area within the primary EIAR Site Boundary. The EIAR Site Boundary represents the primary area of study and not necessarily areas where proposed works will occur as part of the Proposed Project. The EIAR Site Boundary encompasses an area of approximately 637 hectares (ha). Where the 'Application Site Boundary' is referred to, this refers to the planning application boundaries as shown in Figure 1-4 below and Appendices 4-1 and 4-2, of this EIAR. Two planning application boundaries are included for within the Proposed Project, which denote the 'Proposed Wind Farm' and 'Proposed Grid Connection' as outlined below. Both Application Site Boundaries are shown in Figure 1-4.

- Where the 'Proposed Wind Farm' is referred to, this refers to turbines and associated foundations and hard-standing areas, meteorological mast, site entrance, junction accommodation works, access roads, accommodation works along the turbine delivery route (TDR Works), temporary construction compounds, temporary transition compound, 110kV electrical substation, underground cabling, borrow pits, site drainage, tree felling, biodiversity management and enhancement measures and all ancillary works. The Proposed Wind Farm site (EIAR Site Boundary without corridor that encompasses the Proposed Grid Connection) is shown in Figure 1-2. The Proposed Wind Farm site encompasses an area of approximately 375 hectares (ha). The permanent footprint of the Proposed Wind Farm measures approximately 15.55 ha, which represents approximately 4.1% of the Proposed Wind Farm site.
- Where 'Proposed Grid Connection' is referred to, this refers to the underground 110kV electrical cabling and all associated site development works connecting the Proposed Wind Farm to the existing Moneypoint 110kV electrical substation in the townlands of Carrowdotia South and Carrowdotia North, Co. Clare. The Proposed Grid Connection is shown in Figure 1-3.Where 'the Applicant' is referred to, this refers to Cahermurphy West Designated Activity Company, who are discussed further in Section 1.4 of this EIAR.

Both the EIAR and NIS take into account the combined impacts of these individual elements of the Proposed Project.

For clarity in this EIAR, all elements of the Proposed Project will be assessed cumulatively with other projects to aid the competent authority in carrying out an EIA. The methodology for the identification of projects with the potential for cumulative effects is set out in detail in Chapter 2 of this EIAR.

In addition:

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

6.1.1 Requirements for Ecological Impact Assessment

6.1.2 Review of Relevant Guidance and Sources of Consultation

The assessment methodology is based primarily upon the Transport Infrastructure Ireland (TII) *'s Guidelines for Assessment of Ecological Impacts of National Roads Schemes* (TII, 2009) and the survey methodology is based on the TII Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (TII, 8008). Although these survey methodologies relate to road schemes, these standard guidelines are recognised survey methodologies that ensure best practice regardless of the development type.

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

- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018).

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

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

- Clare County Development Plan 2023-2029.
- Ireland's 4th National Biodiversity Action Plan (2023-2030)
- Regional Spatial and Economic Strategy for the Southern Region.

6.1.3 Statement of Authority

Ecological baseline surveys, including bat surveys, were initially conducted by MKO ecologists between 2018 and 2020. Additional surveys of the site were undertaken in 2024 and 2025 which were led by MKO ecologists; Pádraig Desmond (BSc.), Stephanie Corkery (BSc., MSc.), Deepali Mooloo (BSc., MSc.), which assistance from Katie Leahy (BSc), Bridín Foster (BSc.), Caití Farren (BSc.), Clare Mifsud (BSc., MSc., PhD.) Marie Greaney (BSc., MSc.) and Noel Fahy (BSc.).

Bat surveys were undertaken by specialised MKO bat Ecologists, the details of whom are detailed in **Appendix 6-2**.

Aquatic surveys were undertaken by Triturus Environmental Ltd. ecologists Ross Macklin (BSc., HDip GIS, Dip IPM, MCIEEM, IFM) and Bill Brazier (BSc., MIFM).

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

This EIAR chapter has been prepared by Stephanie Corkery and Pádraig Desmond and reviewed by Caroline Kelly.

Deepali Mooloo

Deepali is an Ecologist at MKO with over two years of experience in ecological consultancy, specialising in terrestrial ecology and conservation. She holds an M.Sc. in Applied Coastal and Marine Management from University College Cork, where she focused on spatial ecology and drone photogrammetry.

Since joining MKO, Deepali has contributed extensively to renewable energy and infrastructure projects, providing comprehensive ecological support from early-stage feasibility through to detailed impact assessment. Her expertise encompasses multidisciplinary ecological walkover surveys, habitat identification and classification in accordance with Fossitt's Guide to Habitats in Ireland, and detailed habitat assessments using the ERICA database. She has undertaken a wide range of specialist field surveys, including marsh fritillary larval web and habitat condition assessments, wintering bird, bat, mammal, and botanical surveys, as well as Annex I habitat condition assessments and surveys for rare and protected plant species. She is experienced in conducting detailed vegetation relevés and ecological constraints mapping.

Deepali has prepared a broad suite of ecological reports, including Appropriate Assessment Screening Reports (AASR), Natura Impact Statements (NIS), Ecological Impact Assessments (EcIA), EIAR Biodiversity Chapters, Feasibility Studies, and Biodiversity Management and Enhancement Plans. She is highly proficient in GIS-based mapping and spatial analysis using QGIS and ArcGIS, supporting detailed habitat and constraints mapping. She also has experience in bat data analysis using Kaleidoscope software.

In 2024, Deepali completed the Marine Mammal Observer Course with the Irish Whale and Dolphin Group (IWDG), further strengthening her multidisciplinary ecological skillset.

Ross Macklin

Ross Macklin BSc (Hons) Applied Ecology HDip GIS Dip IPM MCIEEM IFM is an environmental scientist specialising in freshwater and fisheries ecology. He studied a bachelor's degree in applied Ecology at UCC and later completed a higher diploma in Geographical Information Systems at UCC and a diploma in Integrated Pest Management at UCD. He is currently completing his PhD at UCC in fisheries ecology. Ross has an in-depth knowledge of all freshwater ecosystems and riparian corridors. He has undertaken river habitat, lake habitat, canal habitat and fisheries assessments in professional work for 20 years. His specialist freshwater experience lies in biological and physicochemical water quality analysis, fisheries ecology, riparian habitat assessments, habitat mapping, protected species, mammal surveys, geographical information systems, ecological design and invasive species. Ross has expert experience in identifying and assessing macrophyte plant, aquatic bryophytes, fish and macroinvertebrates from a variety of aquatic habitats. He routinely undertakes fisheries assessments, protected species surveys, invasive species surveys, river hydromorphology surveys, surface water management plans, CEMP, EcIA , EIAR and NIS reporting. He holds full national licences for freshwater pearl mussel (Margaritifera margaritifera), white-clawed crayfish (Austropotamobius pallipes) and amphibians inclusive of an open photography licence for numerous protected species. He has held over 300 section 14 licences for fisheries surveys spanning the breadth of Ireland.

Bill Brazier

Bill Brazier BSc (Hons)Applied Freshwater & Marine Biology, MIFM) is an aquatic, fisheries and mammalian ecologist with over 14 year's professional experience in Ireland. He is a senior ecologist at Triturus Environmental Ltd. and is completing a PhD in fish genetics at UCC. He has extensive experience in a wide range of ecological and environmental projects including EIAR, EcIA and AA/NIS reporting, as well as the areas of renewable energy developments, flood relief schemes, road schemes, invasive species management blueways/greenways, biodiversity projects and non-volant mammal monitoring. He specialises in aquatic ecology and fisheries ecology, inclusive of fisheries assessments, macrophytes, water quality, otter, freshwater pearl mussel, white-clawed crayfish and amphibians, holding full national licences for all of these species. Bill is one of Ireland's most experienced fisheries scientists having held over 250 section 14 authorisation licences for fisheries related work.

Stephanie Corkery

Stephanie is an Ecologist with MKO with over 3 years of experience in professional ecological consultancy. Stephanie holds a BSc. in Ecology and Environmental Biology, an MSc. in Marine Biology, and a HDip in Sustainability in Enterprise, all from University College Cork. Since joining MKO as a graduate in March 2022, Stephanie has worked on a wide variety of projects including wind farms, large scale residential developments, and County Council projects. Stephanie's key strengths include organising and carrying out both terrestrial and marine mammal surveys, as well as general ecological walkover surveys and bat surveys. She is also experienced in GIS, acoustic data analysis for bat species, and in preparing Appropriate Assessment Screening Reports (AASR), Natura Impact Statements (NIS), Ecological Impact Assessments (EcIA), Biodiversity Chapters, and Bat Reports. Stephanie is also a JNCC Certified Marine Mammal Observer and has completed the ACCOBAMS Course for Highly Qualified Marine Mammal Observers (MMO) and Passive Acoustic Monitoring operators (PAM).

Pádraig Desmond

Pádraig is a Project Ecologist with MKO with 6 years post graduate ecological experience, over 5 years of which have been in ecological consultancy. Pádraig holds a BSc (Hons) in Ecology and

Environmental Biology from University College Cork. Pádraig took up his position with MKO in December 2021, prior to which he worked as a Junior Ecologist with Envirico. Through these consultancy roles Pádraig has gained excellent experience in producing ecological reports such as Natura Impact Statements, Ecological Impact Assessments, Biodiversity chapters, Invasive Species Management Plans, and Constraints Reports for a wide range of projects including small private developments to housing developments and renewable energy projects such as solar and wind farms. Prior to the above roles, Pádraig worked as a field ecologist for the Department of Conservation in New Zealand, where he developed a strong field-based skill set.

Pádraig's key strengths and areas of expertise are in terrestrial ecology, including vegetation surveys, habitat identification, invasive species surveys, mammal surveys, and project managing developments requiring Appropriate Assessment and Ecological Impact Assessment.

Caroline Kelly

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

6.2 Methodology

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

6.2.1 Desk Study

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

- Review of NPWS Article 17 maps 2019, 2013 and 2007.
- Review of online web-mappers: National Parks and Wildlife Service (NPWS)[1], EPA maps[2], Water Framework Directive (WFD) and Inland Fisheries Ireland (IFI)[3].
- Inland Fisheries Ireland (IFI) Reports.
- Data on potential occurrence of rare plant and bryophytes – as per NPWS online map viewers; Flora Protection Order 2022 Map Viewer[4].
- Review of the Bat Conservation Ireland (BCI) Private Database.

[1] https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=8f7060450de3485fa1c1085536d477ba *Accessed 20/01/2026*
[2] https://gis.epa.ie/EPAMaps/ *Accessed 20/01/2026*
[3] https://ifigis.maps.arcgis.com/apps/webappviewer/index.html?id=9a31fedb077c4fb29911848842b7ef025 *Accessed 20/01/2026*
[4] https://heritagedata.maps.arcgis.com/apps/webappviewer/index.html?id=a41ef4e10227499d8de17a8abe42bd1e *Accessed 20/01/2026*

- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper[5].
- Review of specially requested records from the NPWS Rare and Protected Species Database for the hectads in which the Proposed Project is located.
- Potential for cumulative effects have been considered in Chapter 2 of this EIAR and Section 6.6 of this Chapter. This was informed by a review of the EIARs/NISs prepared for other plans and projects occurring in the wider area.
- Review of previous planning applications within the Site, as listed in Section 2.7.1 of Chapter 2 (Background to the Proposed Wind Farm) of this EIAR.

6.2.1.1 Designated Sites

6.2.1.1.1 *Identification of the Designated Sites within the Likely Zone of Influence (ZOI) of the Proposed Wind Farm*

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

Special Areas of Conservation (SACs) and Special Protection Areas for Birds (SPAs) are designated under the EU Habitats Directive and EU Birds Directive, respectively and are collectively known as 'European Sites'. The potential for significant effects and/or adverse impacts on the integrity of European Sites is fully assessed in the AA Screening Report and Natura Impact Statement that accompanies this application. As per EPA Guidance 2022, *"a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement"* but should *"incorporate their key findings as available and appropriate"*. Section 6.5.5 of this EIAR provides a summary of the key assessment findings with regard to European Designated Sites.

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

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

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

- All designated sites within the vicinity of the Site (i.e the EIAR Site Boundary) were identified. In addition, the potential for connectivity with European or Nationally designated sites at greater distances from the Proposed Wind Farm was also considered in this initial assessment i.e. father downstream within hydrological catchments.
- 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.
- Where potential pathways for Significant Effect are identified, the site is included within the Likely Zone of Influence (ZoI) and further assessment is required.

[5] https://maps.biodiversityireland.ie/map *Accessed 20/01/2026*

6.2.1.2 NPWS Article 17 Reporting

A review of the Irish Reports for Article 17 of the Habitats Directive (92/42/EEC)[6], including the Heath, Bogs and Mires, Irish Semi-Natural Grassland Survey datasets, National Survey of Native Woodlands and Ancient and Long-Established Woodland datasets, was carried out as part of this assessment.

6.2.2 Scoping and Consultation

MKO undertook a scoping exercise during preparation of this EIAR, as described in Section 2.5 in Chapter 2: Background. A list of the organisations consulted during the scoping process, and notes where scoping responses were received, are detailed in Section 2.6.

Copies of all scoping responses are included in Appendix 2-1 of this EIAR. The recommendations of the consultees have informed the EIAR preparation process and the contents of this chapter. Table 6.1 provides a list of the organisations consulted with regard to biodiversity during the scoping process.

Table 6-1 Organisations consulted with regard to biodiversity.

Consultee	Scoping Response Date	Scoping Response	Addressed in
An Taisce	None received.	No response	N/A
Bat Conservation Ireland	None received	No response	N/A
Clare County Council – Planning Department	None received	No response	N/A
Clare County Council – Environment Department	08/04/2024	Referred scoping request to Clare County Council – Planning Department	N/A
Department of Agriculture, Food and the Marine	08/05/2024	Where felling of forestry is required, a felling licence will be required.	The tree felling activities required as part of the Proposed Project will be the subject of a Felling Licence application to the Forest Service, in accordance with the Forestry Act 2014, the Forestry Regulations 2017 (SI 191/2017) and as per the Forest Service's policy on granting felling licenses for wind farm developments. The policy requires that a copy of the planning permission for the wind farm be submitted with the felling licence applications; therefore,

[6] https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17 *Accessed 30/09/2025*

Consultee	Scoping Response Date	Scoping Response	Addressed in
			the felling licenses cannot be applied for until such time as planning permission is obtained for the Proposed Project.
Department of Communications, Climate Action and the Environment	None received	No response	N/A
Department of Housing, Local Government and Heritage	17/05/2024	Regards Ecology, the Department made reference to the following: › Bird surveys of all species, and should consider potential collision risk, habitat loss, barrier effect and displacement. › Consideration of hen harrier › Consideration of Freshwater pearl mussel › Consideration of Bat species › Water quality › Natura 2000 network › Peatland habitats › Marsh fritillary surveys › Preservation of hedgerows and scrub › Invasive species › Desk studies using the appropriate online resources › Lesser horseshoe bat at Moneypoint › Cumulative and in-combination, as well as ex-situ, effects. › Recommends a habitat management plan	Each point is considered within the application, either within this Biodiversity chapter or it's appendices or within the NIS. Point relating to birds are addressed in Chapter 7.
Inland Fisheries Ireland	05/04/2024	Acknowledgement email only	N/A
Irish Peatland Conservation Council	No response	No response	N/A

Consultee	Scoping Response Date	Scoping Response	Addressed in
Irish Wildlife Trust	No response	No response	N/A
The Heritage Council	No response	No response	N/A

6.2.3 Field Surveys

A comprehensive survey of the biodiversity within the Site was undertaken to inform this Biodiversity Chapter of the EIAR. The following sections fully describe the ecological surveys that have been undertaken and provide details of the methodologies and guidance followed. Surveys were carried out on the Site on multiple dates between May 2019 and May 2020 for a previous application. Additional updated surveys were undertaken in 2024, 2025 and 2026 in support of the current application and are summarised in Table 6-2 below.

Table 6-2: Ecology surveys informing this EIAR

Survey Type	Dates	Appendix
Multi-disciplinary walkover (incl. habitats)	• 16th July 2024 • 17th July 2024 • 18th July 2024	N/A
Multi-disciplinary walkover – Hen harrier enhancement lands	• 14th January 2026 • 15th January 2026	N/A
Detailed Botanical Surveys – Irish Vegetation Classification (IVC)	• 16th July 2024 • 17th July 2024	Botanical Report, **Appendix 6-1**
Badger/Mammal survey and camera trap set up	• 11th April 2024 • 12th April 2024	N/A
Marsh fritillary habitat appraisal	• 16th July 2024 • 17th July 2024 • 18th July 2024	N/A
Bat Surveys	• Spring, Summer and Autumn 2023, 2024 and 2025 Inclusive of transect, static and roost inspection surveys	Bat Survey Report, **Appendix 6-2**
Aquatic surveys (including otter)	• July 2024 and August 2025	Aquatics Report, **Appendix 6-3**
Grid Connection FWPM Habitat appraisal	• 10th December 2025	N/A
Multi-disciplinary walkover - Grid connection and TDR	• 9th October 2024 • 13th February 2025	N/A

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

Multidisciplinary walkover surveys were undertaken within the Site. The majority of surveys were undertaken within the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith *et al.*, 2011), but where those were outside the optimal survey season, no significant limitations were encountered as all habitat were identifiable. A comprehensive walkover of the entire Site was completed with incidental records also incorporated from other dedicated species/habitat specific surveys.

The walkover surveys were designed to detect the presence, or likely presence, of a range of protected species. The survey included a search for mammal signs (bats, badger, red squirrel etc.) and areas of suitable habitat to support these species, potential features likely to be of significance to bats and additional habitat features for the full range of other protected species that are likely to occur in the vicinity of the Proposed Project (e.g. otter etc.).

The multi-disciplinary walkover surveys comprehensively covered the entire study area and based on the survey findings, further detailed targeted surveys were carried out for features and locations of ecological significance. Other targeted surveys undertaken within the Site are described in the following subsections.

6.2.3.2 Invasive species survey

During the multidisciplinary walkover surveys, a search for non-native invasive species was undertaken. The survey focused on the identification of invasive species listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) and the First Schedule of the European Union (Invasive Alien Species) Regulations 2024 (S.I. No 374 of 2024). Where recorded, the extent and location of infestations was recorded, along with photographs and are detailed **Appendix 6-4**.

6.2.3.3 Dedicated Habitat and Vegetation Composition Surveys

All habitats recorded on site and described in this Biodiversity 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.

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

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

- Commission of the European Communities (2013) *Interpretation manual of European Union habitats*. Eur 28. European Commission DG Environment.
- NPWS (2025). The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS report. Edited by: Domhnall Finch, Aoife Delaney, Fionnuala O'Neill and Deirdre Lynn
- Martin, J.R., O'Neill, F.H. & Daly, O.H. (2018), *The monitoring and assessment of three EU Habitats Directive Annex I grassland habitats*. Irish Wildlife Manuals, No. 102. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.
- O'Neill, F.H., Martin, J.R., Devaney, F.M. & Perrin, P.M. (2013), *The Irish semi-natural grasslands survey 2007-2012*. Irish Wildlife Manuals, No. 78. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.

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

6.2.3.3.1 *Vegetation composition assessment*

Detailed habitat classification and assessment was undertaken by MKO at targeted locations within the Proposed Wind Farm site, with relevés undertaken within representative habitats at each turbine base and associated proposed wind farm infrastructure, see **Appendix 6-1** for all relevé data. The extent of each habitat on site was mapped using the ARC GIS field maps app. A representative photograph was

also taken for each of the habitats recorded on site, including all relevés. The locations of all relevés are shown in **Appendix 6-1**.

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

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

The Engine for Relevés to Irish Communities Assignment (ERICA)[7] is a web application for assigning vegetation data to communities defined by the Irish Vegetation Classification (IVC). Data can be uploaded, checked for errors and analysed and the results can then be downloaded. ERICA works with both quantitative vegetation cover data (such as are recorded in relevés and other types of botanical recording plots) and presence/absence data, such as species lists. ERICA covers grasslands, woodland, duneland, heaths, bogs, fens, mires, freshwater, saline waters, rocky habitats, scrub, strandline, saltmarsh and weed communities (Perrin, 2018). The data collected from the botanical assessments was uploaded to ERICA, analysed and the results data downloaded.

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

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

Plot Type	Definition
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, in particular having the potential to correspond to those listed in Annex I of the EU Habitats Directive, where present were identified and were classified as key ecological receptors (KERs), if potential for effects on such habitats as result of the Proposed Project existed.

6.2.3.4 Terrestrial Fauna Surveys

The results of the desk study, scoping replies, incidental records of protected species during ecological survey work and multidisciplinary walkover surveys were used to inform the scope of targeted ecological surveys required. Dedicated surveys for protected fauna were undertaken, the detail of which is described below. During the multidisciplinary walkover surveys, where observed, incidental records of birds and invertebrates including butterflies, dragonflies, etc. were recorded.

[7] *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: 10.10.2020*

6.2.3.4.1 Badger Survey

The badger survey was conducted adhering to best practice guidance *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Roads Schemes* (TII, 2008) and *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes* (TII, 2005). Badgers occur within a wide variety of habitat types in both lowland and upland regions. Setts are often located within woodland and woodland edge, hedgerow and scrub habitats, especially where these occur adjacent to good foraging habitat such as grazed grasslands. Over half of badger setts in Ireland are found along hedgerows (TII, 2005).

The survey was conducted to determine the presence and location of badger setts and signs within the Site. The badger survey involved a search for all potential Badger signs as per TII (2005) (latrines, badger paths and setts) and Scottish Natural Heritage (SNH) (2003):

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

Setts, if recorded, were classified using the conventions set out in TII (2005). Classification of setts as per the *Best Practice Badger Survey Guidance Note* provided by SNH (2003) is provided in Table 6-4 below.

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

Sett Type	Description
Main	Several holes with large spoil heaps and obvious paths emanating from and between sett entrances.
Annexe	Normally less than 150m from main sett, comprising several holes. May not be in use all the time, even if main sett is very active.
Subsidiary	Usually at least 50m from main sett with no obvious paths connecting to other setts. May only be used intermittently.
Outlier	Little spoil outside holes. No obvious paths connecting to other setts and only used sporadically. May be used by Foxes and rabbits.

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

6.2.3.4.2 Otter Survey

As part of the multidisciplinary walkover survey, a search for indications of otter was carried out within the Site, including the proposed hen harrier enhancement lands (HHELs) and along the proposed TDR. This search was conducted in order to determine the presence or absence of otter within the Site.

This involved a search for all potential indications of otter, as per TII (2006) (spraint, tracks, couches, holts). The otter survey was conducted as per TII (2008) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes). Following the results of the multidisciplinary surveys, no requirement for further, more detailed surveys for otter was identified.

In addition, targeted otter surveys were carried out by Triturus Environmental Ltd. within and downstream of the Site (see Section 2.8 of the Aquatic Baseline Report, **Appendix 6-3**)

6.2.3.4.3 Marsh Fritillary Surveys

As part of the multidisciplinary surveys, a search for potential suitable habitat for marsh fritillary butterfly was carried out as per TII (2008). This included a search for devil's- bit scabious (*Succisa pratensis*) which is the food plant for the larval stage of this species.

6.2.3.4.4 Bat Surveys

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

Survey design and effort in 2025 and 2026 was created in accordance with the best practice guidelines available, '*Bat Surveys: Good Practice Guidelines'* prepared by the Bat Conservation Trust (Collins 2023). Surveys were undertaken in strict accordance with those prescribed in NatureScot (2021) '*Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*'. This is in line with standard best practice industry guidelines.

6.2.3.5 Aquatic surveys

Dedicated aquatic baseline surveys were undertaken by Triturus Environmental Ltd. and are detailed in the aquatic baseline report in **Appendix 6-3**. The baseline assessment focused on aquatic ecology including fisheries and biological water quality, as well as protected aquatic species and habitats in the vicinity of the Proposed Project within the following sub-catchments:

- Annageeragh_SC_010,
- KiltumperStream_SC_010,
- Doonbeg_SC_010,
- Wood_SC_010
- Cloon [Clare]_SC_010

Undertaken on a catchment-wide scale, the baseline surveys focused on the detection of freshwater habitats and species of high conservation value. These included surveys for white-clawed crayfish (*Austropotamobius pallipes*), macro-invertebrates (biological water quality) and fish species, inclusive of supporting nursery and spawning habitat. The surveys also documented macrophyte and aquatic bryophyte communities including Annex I habitat associations in the vicinity of the Proposed Project. This holistic approach informed the overall aquatic ecological evaluation of each survey site in context of the Proposed Wind Farm and ensured that any habitats and species of high conservation value would be detected. Full details of the methodology followed for the aquatic surveys as well as details of the locations of survey sites is provided in the Aquatic Baseline Report (**Appendix 6-3**).

6.2.4 Methodology for Assessment of Impacts and Effects

6.2.4.1 Identification of Target Receptors and Key Ecological Receptors

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

6.2.4.2 Valuing Ecological Receptors

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

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

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

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

6.2.4.3 Characterisation of Impacts and Effects

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

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

6.2.4.4 Determining the Significance of Effects

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

For the purpose of 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.

6.2.4.5 Incorporation of Mitigation

Constraint studies, as described in Section 3.2.6 and 3.2.7 of Chapter 3 of this EIAR, have been carried out to ensure that turbines and all ancillary infrastructure are located in the most appropriate areas of the site. Section 6.6 of this Biodiversity chapter assesses the potential effects of the Proposed Project to ensure that all effects on sensitive ecological receptors are adequately addressed. Where significant effects on sensitive ecological receptors are predicted, mitigation is incorporated into the project design or layout to address such effects. The implemented mitigation measures avoid or reduce potential significant residual effects, post mitigation.

6.2.5 Limitations

The information provided in this document accurately and comprehensively describes the baseline ecological environment; provides an accurate prediction of the likely ecological effects of the Proposed Project; prescribes mitigation as necessary; and describes the residual ecological impacts. The specialist

studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines. No significant limitations in the scope, scale or context of the assessment have been identified.

6.3 Desk Study

The following sections describe the results of a survey of published material that was consulted as part of the desk study for the purposes of the ecological assessment. It provides a baseline of the ecology known to occur in the existing environment. Material reviewed includes the Site Synopses for designated sites within the zone of influence, as compiled by the National Parks and Wildlife Service (NPWS) of the Department of Culture, Heritage and the Gaeltacht, and plant distribution atlases and other research publications.

6.3.1 Hydrology

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

- Regional and Local Hydrology and Hydrogeology – Section 9.3.3
- Surface water quality – Section 9.3.7
- Water Framework Directive Water Body Status – Section 9.3.11
- Surface Water Body Status – Section 9.3.13
- Groundwater Body Status – Section 9.312

6.3.2 Designated Sites

A map of all the European Sites within the vicinity of the Site is provided in Figure 6-1, with all Nationally designated sites shown in Figure 6-2.

Table 6-5 provides details of all relevant Nationally designated sites initially considered to potentially be within the ZoI of the Proposed Project. All European designated sites are fully described and assessed in the Natura Impact Statement submitted with the EIAR. In summary, five European sites were identified to be within the ZoI of the Proposed Project, namely:

- Lower River Shannon SAC [002165],
- Carrowmore Dunes SAC [002250],
- Carrowmore Point to Spanish Point and Islands SAC [001021],
- River Shannon and River Fergus Estuaries SPA [004077], and
- Mid-Clare Coast SPA [004182].

The following National Sites were identified as being within the likely ZoI of the Proposed Project, as assessed in Table 6-5:

- Cragnashingaun Bogs NHA [002400]
- St. Senan's Lough pNHA [001025]
- Carrowmore Point to Spanish Point and Islands [001021]
- White Strand / Carrowmore Marsh [001007]
- Poulnasherry Bay pNHA [000065]

Map Legend

- EIAR Site Boundary
- Special Area of Conservation (SAC)
- Special Protected Area (SPA)
- WFD Hydrological Catchments
- WFD River Waterbodies

Drawing Title
European Designated sites within the likely zone of Influence

Project Title
Cahermurphy West Wind Farm

Drawn By	Checked by
AMc	PD
Project No.	Drawing No.
230843	Figure 6-1
Scale	Date
1:150,000	16.01.2026

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Map Legend

EIAR Site Boundary

National Heritage Areas (NHAs)

Proposed National Heritage Areas (pNHAs)

WFD Hydrological Catchments

WFD River Waterbodies

Drawing Title

Nationally Designated sites within the likely zone of Influence

Project Title

Cahermurphy West Wind farm

Drawn By	Checked by
AMc	PD
Project No.	Drawing No.
230843	Figure 6-2
Scale	Date
1:150,000	16.01.2026

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Table 6-5 Designated Sites within the Likely Zone of Impact

Designated Site	Features of Interest	Likely Zone of Impact Determination
Natural Heritage Area (NHA)		
Cragnashingaun Bogs NHA **Distance from wind farm site:** Slight overlap (with HHELs) **Distance from grid connection Route:** 2.21 km **Hydrological distance:** 5.8 km upstream	› Peatlands	There is a slight overlap between this National Site and the Proposed Project. One section of the proposed hen harrier enhancement lands is located directly adjacent, to this National Site, with slight overlaps. Therefore, taking a precautionary approach, there is potential for significant direct effects on this National Site, as a result of habitat loss/degradation during the proposed hen harrier enhancement works associated with the Proposed Wind Farm. **Therefore, this site is within the likely Zone of Influence and further consideration is required.**
Lough Namina Bog NHA **Distance from wind farm:** 7.36 km **Distance from grid connection Route:** 7.58 km **Hydrological distance:** No direct connectivity	› Peatlands	The Proposed Project is located entirely outside of these NHAs and therefore, no potential for direct effect exists. The potential for indirect effects was also considered. These National sites are either located upstream of the Proposed Project or within separate hydrological sub-catchments. Given the lack of direct hydrological connectivity and the terrestrial nature of these NHAs, no pathway for significant effect on these NHAs was identified. There is no potential for significant effects and these NHAs are **not** located within the Likely Zone of Influence.
Lough Acrow Bogs NHA **Distance from wind farm:** 8.01 km **Distance from grid connection Route:** 8.01 km **Hydrological distance:** No direct connectivity	› Peatlands	
Slievecallan Mountain Bog NHA **Distance from wind farm:** 8.15 km **Distance from grid connection Route:** 9.96 km **Hydrological distance:** No direct connectivity	› Peatlands	
Proposed Natural Heritage Area (pNHA)		

Designated Site	Features of Interest	Likely Zone of Impact Determination
St. Senan's Lough pNHA [001025] **Distance from wind farm:** 14.09 km **Distance from grid connection Route:** 0.135m **Hydrological distance:** 145m downstream	› Acidic Lake › Marsh › Cutaway Bog	The Site is located entirely outside of this pNHA and therefore, no potential for direct effect exists. The potential for indirect effects was also considered. Given the short direct hydrological distance of approx. 145m between the Proposed Grid Connection and this pNHA, there is potential for significant indirect effects on this National Site, as a result of deterioration of water quality arising from the runoff or percolation of pollutants into surface and ground water systems, during the construction of the Proposed Grid Connection. **Therefore, this site is within the likely Zone of Influence and further consideration is required.** As the Proposed Grid Connection will be permanent, there is no potential for effects as a result of decommissioning.
Clonderalaw Bay pNHA [000027] **Distance from wind farm:** 13.42 km **Distance from grid connection Route:** 3.00 km **Hydrological distance:** No direct connectivity	No NPWS Site Synopsis available for this pNHA. Overlaps with aquatic habitats designated for Lower River Shannon SAC and River Shannon and River Fergus SPA: › Estuary › Mudflats and Sandflats › Potential Atlantic Salt Meadows › Wetlands	The Proposed Project is located entirely outside of this pNHA and therefore, no potential for direct effect exists. The potential for indirect effects was also considered. Whilst the southern section of the Proposed Grid Connection is located in the same hydrological sub-catchment as this pNHA, no direct connectivity exists between these sites. No other pathway for effect is relevant, given the aquatic nature of the pNHA. There is no potential for significant effects and this pNHA is **not** located within the Likely Zone of Influence.
Carrowmore Point to Spanish Point and Islands [001021] **Distance from wind farm:** 6.22 km **Distance from grid connection Route:** 8.14 km **Hydrological distance:** 8.15 km downstream	No NPWS Site Synopsis available for this pNHA Overlaps with Carrowmore Point to Spanish Point and Islands SAC, designated for: › Coastal lagoons › Reefs › Perennial vegetation of stony banks › Petrifying springs with tufa formation	The Site is located entirely outside of this pNHA and therefore, no potential for direct effect exists. The potential for indirect effects was also considered. The northern section of the Site is drained to the west via the Lissyneillan stream, which directly discharges into this pNHA downstream. There is, therefore, potential for indirect significant effects on this National Site, as a result of deterioration of water quality arising from the runoff or percolation of pollutants into surface and ground water systems, during the construction, operational and

Designated Site	Features of Interest	Likely Zone of Impact Determination
		decommissioning phases of the Proposed Wind Farm. **Therefore, this site is within the likely Zone of Influence and further consideration is required.**
White Strand / Carrowmore Marsh [001007] **Distance from wind farm:** 7.34 km **Distance from grid connection Route:** 7.03 km **Hydrological distance:** 14.12 km downstream	No NPWS Site Synopsis available for this pNHA Partially overlaps with Carrowmore Dunes SAC and Mid-Clare Coast SPA, designated for: › Reefs › Dune habitats › Wetlands	The Proposed Project is located entirely outside of this pNHA and therefore, no potential for direct effect exists. The potential for indirect effects was also considered. The southern section of the Proposed Wind farm site and a section of the Proposed Grid Connection route have direct downstream connectivity to this pNHA, via tributaries of the Creegh River. There is, therefore, potential for indirect significant effects on this National Site, as a result of deterioration of water quality arising from the runoff or percolation of pollutants into surface and ground water systems, during the construction and operational phase of the Proposed Wind Farm. **Therefore, this site is within the likely Zone of Influence and further consideration is required.**
Poulnasherry Bay pNHA [000065] **Distance from wind farm:** 15.26 km **Distance from grid connection Route:** 8.44 km **Hydrological distance:** 11.53 km downstream	No NPWS Site Synopsis available for this pNHA. Overlaps with aquatic habitats designated for Lower River Shannon SAC and River Shannon and River Fergus SPA: › Estuary › Large Shallow Inlets and Bays › Reefs › Mudflats and Sandflats › Potential Atlantic Salt Meadows/Mediterranean Salt Meadows › Wetlands	The Proposed Project is located entirely outside of this pNHA and therefore, no potential for direct effect exists. The potential for indirect effects was also considered. A section of the Proposed Grid Connection route has direct downstream connectivity to this pNHA, via the Moyasta River. There is, therefore, potential for indirect significant effects on this National Site, as a result of deterioration of water quality arising from the runoff or percolation of pollutants into surface and ground water systems, during the construction and operational phase of the Proposed Wind Farm. **Therefore, this site is within the likely Zone of Influence and further consideration is required.**
Derrygeeha Lough pNHA [000050] **Distance from wind farm:** 12.53 km	› Freshwater Lake › Caddisfly (*Cyrnus insolutus*) › Cutover blanket bog › Otter (*Lutra lutra*)	The Proposed Project is located entirely outside of this pNHA and therefore, no potential for direct effect exists. The potential for indirect effects was also considered. Whilst the southern section of

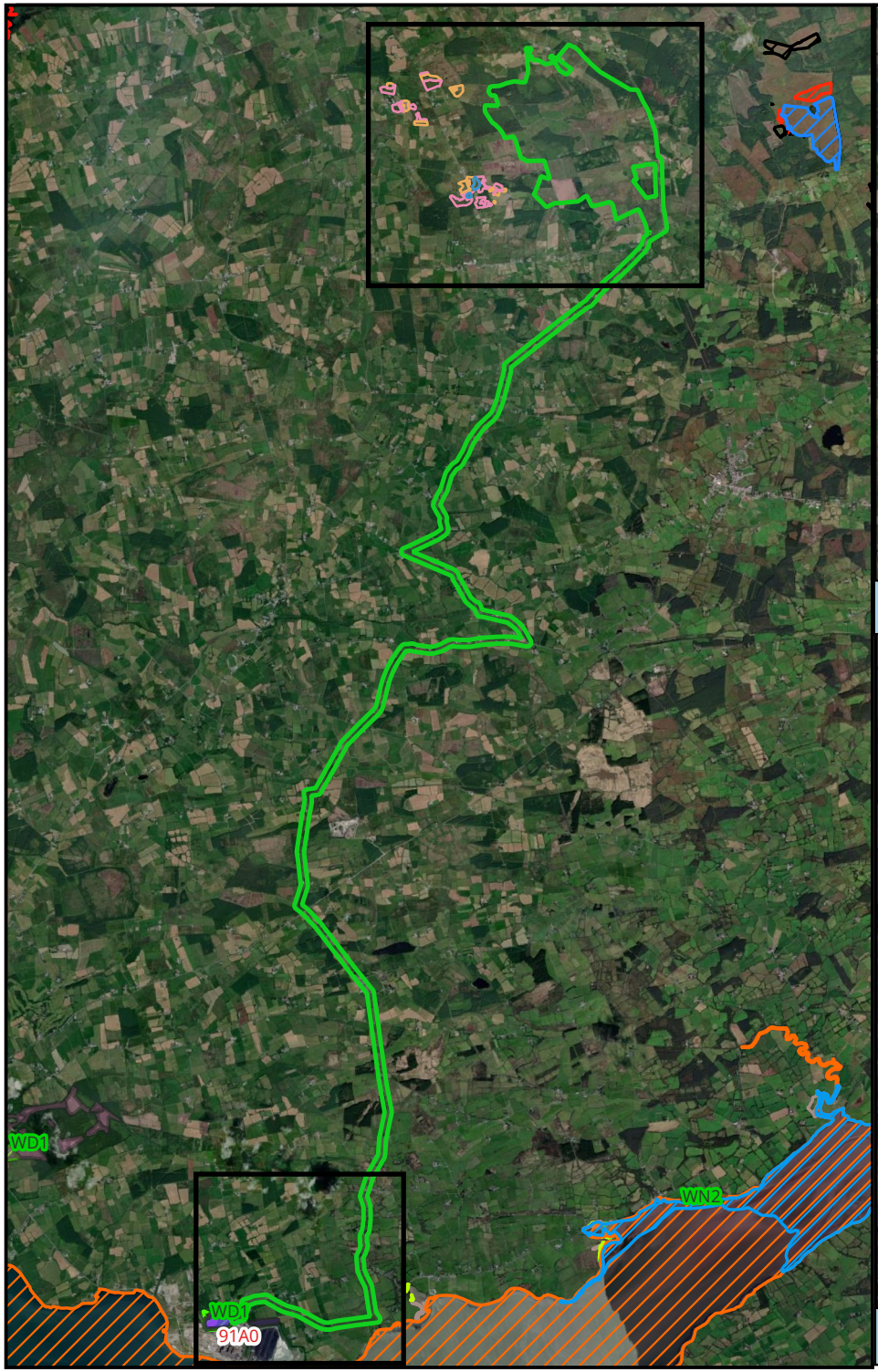
Designated Site	Features of Interest	Likely Zone of Impact Determination
Distance from grid connection Route: 8.67 km **Hydrological distance:** No direct connectivity		the Proposed Grid Connection is located in the same hydrological sub-catchment as this pNHA, no direct connectivity exists between these sites. No other pathway for effect is relevant, given the aquatic nature of the pNHA, due to the distance from the Site. There is no potential for significant effects and this pNHA is **not** located within the Likely Zone of Influence.
Tullaher Lough and Bog pNHA [000070] **Distance from wind farm:** 13.18 km **Distance from grid connection Route:** 9.11 km **Hydrological distance:** No direct connectivity	No NPWS Site Synopsis available for this pNHA Overlaps with Tullaher Lough and Bog SAC, designated for: › Peatlands	The Proposed Project is located entirely outside of this pNHA and therefore, no potential for direct effect exists. The potential for indirect effects was also considered. Whilst a section of the Proposed Grid Connection is located in the same hydrological sub-catchment as this pNHA, no direct connectivity exists between these sites. This pNHA is also entirely terrestrial. There is no potential for significant effects and this pNHA is **not** located within the Likely Zone of Influence.
Cloonsnaghta Lough pNHA [001004] **Distance from wind farm:** 14.16 km **Distance from grid connection Route:** 13.12 km **Hydrological distance:** No direct connectivity	› Lake habitat. › Blanket Bog. › Wet Grassland. › Willow and Gorse Scrub. › Arctic Char (*Salvelinus alpinus*)	The Proposed Project is located entirely outside of this pNHA and therefore, no potential for direct effect exists. The potential for indirect effects was also considered. There is no hydrological connectivity between the Proposed Project and this pNHA, which are located in separate hydrological sub-catchments. No other pathway for effect is relevant, given the aquatic nature of the pNHA. There is no potential for significant effects and this pNHA is **not** located within the Likely Zone of Influence.
Farrihy Lough pNHA [000200] **Distance from wind farm:** 15.93 km **Distance from grid connection Route:** 13.12 km **Hydrological distance:** No direct connectivity	› Reed beds › Wet grassland › Waterbirds	The Proposed Project is located entirely outside of this pNHA and therefore, no potential for direct effect exists. The potential for indirect effects was also considered. Whilst a section of the Proposed Grid Connection is located in the same hydrological sub-catchment as this pNHA, no direct connectivity exists between these sites. No other pathway for effect is relevant, given the aquatic nature of the pNHA. There is no potential for significant effects and this pNHA is **not** located within the Likely Zone of Influence.

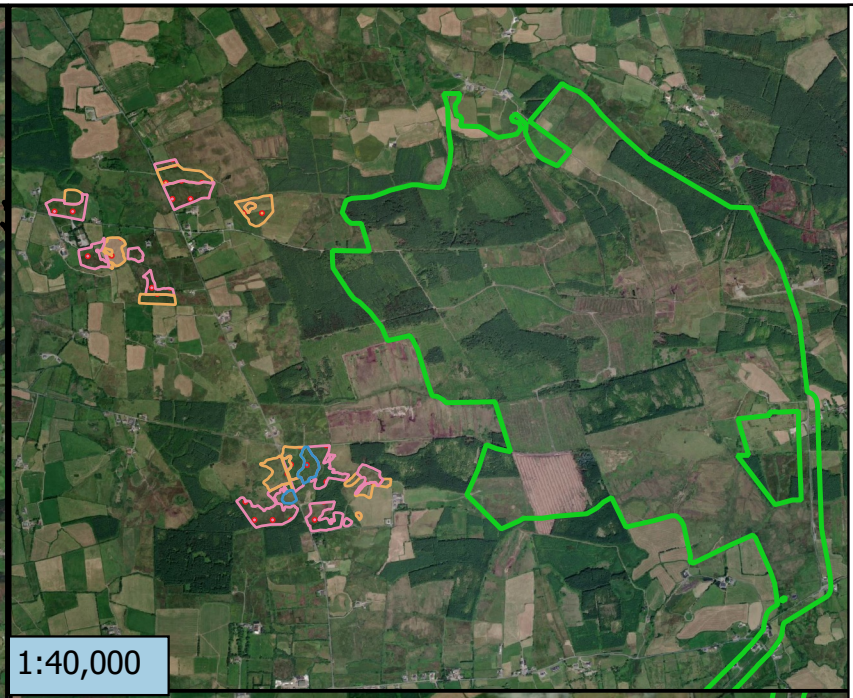
Designated Site	Features of Interest	Likely Zone of Impact Determination
Gortglass Lough pNHA [001015] **Distance from wind farm:** 13.58 km **Distance from grid connection Route:** 13.84 km **Hydrological distance:** No direct connectivity	› Acid Lake habitat. › Acid grassland. › Cutaway Blanket Bog. › Alder (*Alnus* spp.) and Birch (*Betula* spp.) › Arctic Char (*Salvelinus alpinus*)	The Proposed Project is located entirely outside of this pNHA and therefore, no potential for direct effect exists. The potential for indirect effects was also considered. There is no hydrological connectivity between the Proposed Project and this pNHA, which are located in separate hydrological sub-catchments. No other pathway for effect is relevant, given the aquatic nature of the pNHA. There is no potential for significant effects and this pNHA is **not** located within the Likely Zone of Influence.

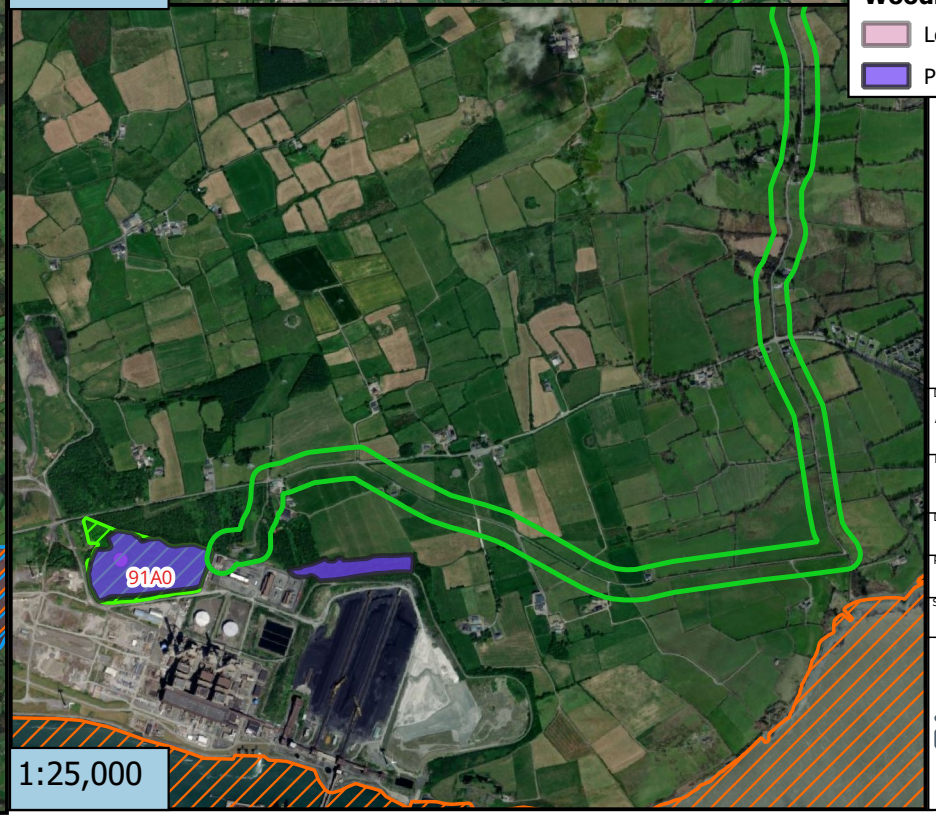
6.3.3 NPWS Article 17 Reporting

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 was carried out as part of this assessment (reviewed 14/01/2026).

In a search of the NPWS Article 17 datasets, minor overlap was found between the southernmost portion of the proposed grid connection route and Old Oak Woodlands [91A0] Annex I habitat adjacent to Moneypoint Power Station. Additionally, the southernmost point of the Proposed Grid Connection route lies approximately 400m from known mapped areas of the Annex I habitats Estuaries [1130], and 550m from Atlantic Salt Meadows [1330] and Mediterranean Salt Meadows [1410]. The grid connection in this area will be laid in-road, therefore these habitats will not be impacted by the proposed works. The location of these habitats and further surrounding habitats is shown in Figure 6-3.







Map Legend

EIAR Site Boundary

Article 17 Habitats

- Active Blanket Bog Poly
- Dry Heath Poly
- Estuaries
- Mediterranean Salt Meadows
- Tidal Mudflats and Sandflats
- Transition Mires Poly
- Wet Heath Poly

Semi Natural Grasslands

- Improved agrticultural grassland
- Dry calcareous and neutral grassland
- Wet Grassland

Woodland Inventory

- Long Established Woodland
- Provisional Ancient Woodland

Drawing Title: Article 17 habitats in proximity to the Site

Project Title: Cahermurphy West Wind Farm

Drawn By	Checked by
AMc	PD
Project No.	Drawing No.
230843	Figure 6-3
Scale	Date
1:100,000	31.10.2025

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6.3.4 New Flora Atlas

A search was made in the New Atlas of the British & Irish Flora (Preston et al., 2002) to investigate whether any rare or unusual plant species listed on Annex II of the Habitats Directive, Ireland Red List No. 10 Vascular Plants (Wyse Jackson *et al.*, 2016) or protected under the Flora (Protection) Order, 2022 had been recorded in the relevant 10km squares in which the Proposed Project site is situated (R05, R06, and R07), during the 1987-1999 atlas survey. The search concluded that no species listed on the Red Data List or Flora (Protection) Order had been recorded in hectads R05, R06, and R07.

6.3.4.1 Bryophytes

A search of the NPWS online data map for bryophytes (accessed 05/06/2025) was also undertaken, with no protected bryophytes recorded within or adjacent to the Site.

6.3.5 NPWS Records

A data request was sent to the NPWS on the 22/01/2025 for records of any rare or protected species of flora or fauna within the 10 km grid squares R05, R06, and R07. A follow-up request was sent on the 17/02/2025. A response was received on the 17/08/2025 from the NPWS, the result so of which are provided in Table 6-6. Note, while the data received and listed below include bird species, these are considered in Chapter 7.

Table 6-6 Records for rare and protected species within hectads R05, R06, and R07.

Common Name	Scientific Name	Status
Greenland White Fronted Goose	*Anser albifrons*	BD Annex I, II, III
Peregrine falcon	*Falco Peregrinus*	BD Annex I
Hen harrier	*Circus cyaneus*	BD Annex I
Freshwater Pearl Mussel	*Margaritifera margaritifera*	HD Annex II, V

Annex II, Annex IV, Annex V – of EU Habitats Directive or EU Birds Directive].

6.3.6 Biodiversity Ireland Database

The National Biodiversity Data Centre database was accessed on 30/09/2025 and the following information was obtained.

Table 6-5 lists all records of the protected faunal species (excluding birds) recorded within the hectads pertaining to the EIAR Site Boundary (R05, R06, and R07). The database was also searched for records of Third Schedule and First Schedule non-native invasive species within this hectad. Table 6-6 lists the non-native invasive species recorded within the hectad.

Table 6-5 NBDC records for protected fauna records within hectads R05, R06, and R07 (excl. birds).

Common Name	Scientific Name	Status	Hectad
Common Frog	*Rana temporaria*	HD Annex V, WA	R05, R06, R07
Smooth Newt	*Lissotriton vulgaris*	WA	R07
Daubenton's bat	*Myotis daubentonii*	HD Annex IV, WA	R05, R06
Lesser Noctule	*Nyctalus leisleri*	HD Annex IV, WA	R05, R06, R07
Common Pipistrelle	*Pipistrelle (Pipistrellus sensu stricto)*	HD Annex IV, WA	R05
Soprano Pipistrelle	*Pipistrellus pygmaeus*	HD Annex IV, WA	R05, R06, R07
Pipistrelle	*Pipistrellus pipistrellus sensu lato*	HD Annex IV, WA	R07
Nathusius's Pipistrelle	*Pipistrellus nathusii*	HD Annex IV, WA	R05

Common Name	Scientific Name	Status	Hectad
Brown Long-eared Bat	*Plecotus auritus*	HD Annex IV, WA	R05
Lesser Horseshoe Bat	*Rhinolophus hipposideros*	HD Annex II, IV, WA	R05
Natterer's Bat	*Myotis nattereri*	Annex IV, WA	R05
European Otter	*Lutra lutra*	HD Annex II, IV, WA	R05, R06, R07
Pine Marten	*Martes martes*	HD Annex V, WA	R05, R06, R07
Eurasian Badger	*Meles meles*	WA	R05, R06, R07
Fallow Deer	*Dama dama*	WA	R06
Eurasian Red Squirrel	*Sciurus vulgaris*	WA	R06
Irish Hare	*Lepus timidus*	WA	R06
West European Hedgehog	*Erinaceus europaeus*	WA	R05, R06, R07
Marsh Fritillary	*Euphydryas aurinia*	HD Annex II	R05
Bottle-nosed dolphin	*Tursiops truncates*	HD Annex II, IV, WA	R05, R07
Common dolphin	*Delphinus delphis*	HD Annex IV, WA	R05, R07
Grey Seal	*Halichoerus grypus*	HD Annex II, IV, WA	R05, R07
Common porpoise	*Phocoena phocoena*	HD Annex II, IV, WA	R05, R07
Curvier's beaked Whale	*Ziphius cavirostris*	HD Annex IV, WA	R07
Long-finned Pilot Whale	*Globicephala melas*	HD Annex IV, WA	R07
Minke Whale	*Balaenoptera acutorostrata*	HD Annex IV, WA	R07
Sowerby's Beaked Whale	*Mesoplodon bidens*	HD Annex IV, WA	R07
Striped Dolphin	*Stenella coeruleoalba*	HD Annex IV, WA	R07
Narrow-mouthed Whorl Snail	*Vertigo (Vertilla) angustior*	HD Annex II, WA	R07
Leathery Turtle	*Dermochelys coriacea*	HD Annex II, WA	R07
Loggerhead Turtle	*Caretta caretta*	HD Annex II, WA	R07

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

Table 6-7 NBDC records for Third and First Schedule Invasive species within hectads R05, R06, and R07.

Common Name	Scientific Name	Hectad
Japanese knotweed	*Reynoutria japonica*	R05, R06, R07
Rhododendron	*Rhododendron ponticum*	R05, R07
Spanish Bluebell	*Hyacinthoides hispanica*	R07
American mink	*Mustela vison*	R06
Fallow Deer	*Dama dama*	R05

6.3.6.1 Bat Records

The National Bat Database of Ireland was searched for records of bat activity and roosts within a 10 km radius of the Proposed Wind Farm (last search 17th December 2025). Hectad R06, R07, R16, and R17 lie within 10 km of the Proposed Wind Farm. Six of Ireland's nine resident bat species were recorded within 10 km of the Proposed Wind Farm. The results of the database search are provided in Table 6-8.

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

Table 6-8 NBDC Bat Records within 10 km of the Site.

Hectads	Species	Database	Designation
R06, R07, R16, R17	Common pipistrelle (*Pipistrellus pipistrellus*)	National Bat Database of Ireland	HD Annex IV, WA
R06, R16, R17	Soprano pipistrelle (*Pipistrellus pygmaeus*)	National Bat Database of Ireland	HD Annex IV, WA
R06, R16,	Daubenton's bat *(Myotis daubentonii)*	National Bat Database of Ireland	HD Annex IV, WA

Hectads	Species	Database	Designation
R17	Natterer's bat *(Myotis nattereri)*	National Bat Database of Ireland	HD Annex IV, WA
R16, R17	Brown long-eared bat (*Plecotus auritus*)	National Bat Database of Ireland	HD Annex IV, WA
R06, R16, R17	Leisler's bat (*Nyctalus leisleri*)	National Bat Database of Ireland	HD Annex IV, WA

6.3.7 Freshwater pearl mussel (FWPM)

The Proposed Project is located within the Annageeragh_SC_010, KiltumperStream_SC_010, Doonbeg_SC_010, Wood_SC_010 and Cloon [Clare]_SC_010 hydrological sub-catchments. Historical records of FWPM are known within the Doonbeg, Annageeragh and Creegh rivers, which are hydrologically connected to the Proposed Wind Farm site or the Proposed Grid Connection route. Therefore, a desk study on the occurrences for FWPM was undertaken on the 29/10/2025, the results of which, are detailed below.

6.3.7.1 Clare County Council

Freshwater pearl mussel surveys were undertaken on behalf of Clare County Council by EirEco Environmental Consultants in the Doonbeg, Creegh and Annageeragh rivers in 2016, approximately 3.5 km, 2.1 km, and 3.4 km downstream of the Site, respectively. The Annageeragh and Creegh are both located downstream of the Proposed Wind Farm site, while the Proposed Grid Connection route crosses both the Creegh and Doonbeg. The Proposed Grid Connection Route crosses the Doonbeg, while the Proposed Wind Farm has downstream connectivity to both the Annageeragh and Creegh rivers. The HHELs have downstream connectivity to the Annageeragh River.

The report 'Freshwater Pearl Mussel Survey of the Doonbeg, Annageeragh and Creegh Rivers, Co. Clare'[8] outlines the results of the surveys and was consulted during this desk study. The results are summarised below.

Doonbeg

Stage 1 and 2 Surveys for FWPM were undertaken in the Doonbeg catchment including parts of the Greygrove River, Ballyduneen River and Doonbeg River in May 2016. Approximately 5.5 kilometres of channel within the Doonbeg catchment was surveyed from a point upstream of Greygrove Bridge to Derrycrossaun Bridge looking at 10 different sections. A total of 1,851 live mussels and 93 dead shells were found in the stretches of river surveyed. Two mussels were recorded on the Greygrove River at a station approximately 1km downstream of Greygrove Bridge and a further single live mussel and dead shell were recorded at a station near Knockalough. A total of 4 live mussels were recorded a further 1km downstream at the Ballyduneen Bridge on the N68, with a further 1,844 live mussels recorded between this point and Derrycrossaun Bridge.

Creegh

A single adult mussel was recorded on the Creegh River, upstream of Coomacreehaun Bridge, during surveys undertaken in 2016. The report states that, although the Creegh was a good freshwater pearl mussel river in the past, the species can be considered effectively extinct in the Creegh catchment. The Creegh was also found to contain high levels of filamentous green algal growth and fine silt and detritus

[8] https://www.clarecoco.ie/services/planning/publications/heritageconservation/doonbeg-pearl-mussel-survey-report-2016-24581.pdf *Accessed 29/10/2025*

in more slow flowing reaches, at levels that exceed freshwater pearl mussel regulation thresholds (S.I. 296 of 2009).

Annageeragh

5 no. adult mussels were recorded on the Annageeragh during the survey undertaken in 2016, including 2 large adult mussels located upstream of Annageeragh Bridge and 3 large adults located upstream of the disused railbridge downstream of Lisseyneillan Bridge. No mussels were recorded in the reaches upstream of Lisseyneillan Bridge, downstream of Knockahila Bridge or upstream of Knockahila Bridge. The report stated that although the Annageeragh has very low numbers of mussels it does have some suitable substrate. Much of the river has been modified by drainage and engineering works both historically and in recent years. The lower reaches, including just upstream of Annageeragh Bridge and downstream of Lissyneillan Bridge have a greater proportion of suitable substrate for mussels compared to reaches further upstream. These reaches have also been most affected by historical drainage and engineering works and the survey found that these reaches had high levels of filamentous green algal growth and fine silt and detritus at levels that exceed freshwater pearl mussel regulation thresholds (S.I. 296 of 2009). Populations of FWPM within this catchment are considered to be functionally extinct.

6.3.7.2 Previous Reports

The EIAR for the previously submitted wind farm application at the Proposed Wind Farm site was also reviewed as part of this desk study. Dedicated FWPM surveys were undertaken to inform this application in 2019, which are provided below.

Assessments of the watercourses within the development site for suitability for freshwater pearl mussel (Margaritifera margaritifera) were undertaken on the 11th October 2019. The watercourses within the development boundary were generally small, <1m in width and none were suitable to support freshwater pearl mussel.

Dedicated assessments were also undertaken outside the proposed development site at each of the streams that flow off the site in both the Annageeragh and Creegh catchments. These assessments were undertaken to determine whether there was any suitable habitat or potential for populations to be present in close proximity downstream of the proposed development site.

Site 1 was at E107533 N171081 on the Knocknahila Beg Stream in the Annageeragh catchment. This was located approximately 1.2km from the wind farm development. Whilst this stream was larger than the streams that were recorded on the site, it was still very unstable and indicative of an upland watercourse with variable water levels. There was evidence of cattle access at the survey point. It provided poor quality habitat for freshwater pearl mussel and none were recorded during the dedicated survey undertaken. This location is shown in Plate 6-1.

Plate 6-1 Knocknahila Beg Stream at sampling point

Site 2 was at E106433 N169847 on the Lissyneillan Stream. The sampling point was at a bridge on the local road approximately 1km to the west of the development site. This was a small stream/drain that had a flow but was very overgrown with brambles and trees and was shallow. It provided no suitable habitat for freshwater pearl mussel. This location is shown in Plate 6-2.

Plate 6-2 Lissyneillan Stream at sampling point

Site 3 was at E107011 N168578 on the Knocknahila More Stream approximately 300 metres to the west of the proposed development site. This was a small stream of approximately 2m in width and 15cm in depth during the survey. The channel was very steep and fast flowing at the sample point. It was a very steep upland stream and did not provide suitable habitat for freshwater pearl mussel. This location is shown in Plate 6-3.

Plate 6-3 Knocknahila More Stream at sampling point

Site 4 was at E107232 N167903 on the Clooneenagh stream approximately 600m to the west of the wind farm development site. This was a small, steep and fast flowing stream of approximately 2m in width. The stream was heavily overgrown with bramble and gorse. Though it did have a substrate of cobbles and gravels, the streambed was that of an unstable upland stream that does not provide suitable habitat for freshwater pearl mussel at this location. This location is shown in Plate 6-4.

Plate 6-4 Clooneenagh Stream at sampling point

6.3.8 Conclusions of the Desk Study

The desk study revealed that the site of the Proposed Wind Farm is located within an area that is dominated by upland forestry and peatland habitats. The Proposed Wind Farm site, specifically the HHELs, are partially located within one NHA, Cragnashingaun Bogs NHA. Additionally, the Proposed Project has downstream hydrological connectivity to several pNHAs. These National Sites have been considered within the likely Zone of Influence and for which further consideration is therefore required, and include the following:

- Cragnashingaun Bogs NHA
- St. Senan's Lough pNHA [001025]
- Carrowmore Point to Spanish Point and Islands [001021]
- White Strand/Carrowmore Marsh [001007]
- Poulnasherry Bay pNHA [000065]

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

- Lower River Shannon SAC [002165],
- Carrowmore Dunes SAC [002250],
- Carrowmore Point to Spanish Point and Islands SAC [001021],
- River Shannon and River Fergus Estuaries SPA [004077], and
- Mid-Clare Coast SPA [004182].

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

The Proposed Wind Farm is located within two freshwater pearl mussel catchments, the Annageeragh catchment and the Creegh catchment. However, the desk study revealed that freshwater pearl mussel can be considered effectively extinct in the Creegh river and that very few adult pearl mussels were recorded in the Annageeragh. Furthermore, the Annageeragh has been modified by drainage and engineering works both historically and in recent years and had high levels of filamentous green algal growth and fine silt and detritus at levels that exceed freshwater pearl mussel regulation thresholds (S.I. 296 of 2009). The Proposed Grid Connection route is located within the Doonbeg catchment, within which populations of FWPM are known downstream.

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

6.4 Baseline Ecological Survey Results

6.4.1 Description of Habitats and Flora

Detailed botanical data from relevés recorded at the Proposed Wind Farm site are provided in **Appendix 6-1** of this EIAR. A habitat map of the Site is provided in Figure 6-4. A map showing the development footprint overlaying the Habitat Map is shown in Figure 6-5.

A total of 22 habitats were recorded within the Site, which are listed in Table 6-9 below.

Table 6-9 List of habitats recorded within the Site

Habitat Name	Fossitt Code
Conifer plantation	WD4
Recently felled woodland	WS5
Wet heath (peatland mosaic)	HH3
Cutover bog (peatland mosaic)	PB4
Lowland blanket bog (peatland mosaic)	PB3
Wet grassland	GS4
Scrub	WS1
Mixed broadleaved woodland	WD1
Spoil and bare ground	ED2
Recolonising bare ground	ED3
Eroding/upland rivers	FW1
Drainage ditches	FW4i
Buildings and artificial surfaces	BL3
Dry meadows and grassy verges	GS2
Hedgerows	WL1
Treelines	WL2
Stonewalls and other stonework	BL1
Mixed broadleaved/conifer woodland	WD2
Improved agricultural grassland	GA1
Earth banks	BL2
Dense bracken	HD1
Acid oligotrophic lake	FL2
Wet willow alder ash woodland	WN6

The habitats recorded during the site visit are described in the sections below.

6.4.1.1 Habitats within the Proposed Wind Farm Site

6.4.1.1.1 *Conifer plantation (WD4) & Recently felled woodland (WS5)*

The Proposed Wind Farm site is dominated by conifer forestry. This includes Conifer plantation (WD4) of various ages, including clear-felled areas, semi-mature and mature stands, and immature pre-thicket areas of both first and second rotation. Sitka spruce (*Picea sitchensis*) is the dominant species, with lodgepole pine (*Pinus contorta*) and larch (*Larix* sp.) also present in smaller quantities at a number of locations. Stands of mature conifer trees are interspersed with immature stands, typically comprised of Sitka spruce. At some locations small areas of willow (*Salix* spp.) Scrub (WS5) and birch (*Betula* sp.) woodland are present as small pockets within the Conifer plantation (WD4). These areas were not of sufficient size to warrant individual mapping within the provided habitat map, as per Smith et al. (2011) guidance (requires minimum size of 400m^2). Where forestry has been recently felled, these areas were best classified as Recently felled woodland (WS5).

The ground layer of the majority of mature Conifer plantation (WD4) in the Proposed Wind Farm site is typically species poor, with vegetation comprising predominantly of bryophytes such as *Thuidium tamariscinum* and *Kinbergia praelonga*. Other occasional species include honeysuckle (*Lonicera periclymenum*) and bracken (*Peridium aquilinum*). Much of the Conifer plantation (WD4) within the Site has been planted on peatland and therefore the field layer of immature plantation comprises peatland species including ling heather (*Calluna vulgaris*), purple moor grass (*Molinia caerulea*) and bilberry (*Vaccinium myrtillus*) as well as other species including Yorkshire fog (*Holcus lanatus*), sweet vernal grass (*Anthoxanthum odoratum*), common bent (*Agrostis capillaris*), soft rush (*Juncus effusus*) and tormentil (*Potentilla erecta*).

Vegetation of clear-felled areas typically comprised of rosebay willowherb (*Chamaenerion angustifolium*), Yorkshire fog, soft rush (*Juncus effusus*), cross-leaved heath (*Erica tetralix*), common sorrel (*Rumex acetosa*) and foxglove (*Digitalis purpurea*).

Much of the Proposed Wind Farm infrastructure is located within Conifer plantation (WD4) or Recently felled woodland (WS5) habitat including Turbines 1, 3, 4, 6, and 7, new access roads, and one of the proposed borrow pits, as shown in Figure 6-5.

Examples of Conifer plantation (WD4) throughout the site are provided in Plate 6-5, Plate 6-6, Plate 6-7 and Plate 6-8.

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

Plate 6-5 Example of mature confider plantation (WD4) within the Proposed Wind Farm site.

Plate 6-6 Example of second rotation Conifer plantation (WD4) within the Proposed Wind Farm site.

Plate 6-7 Example of Conifer plantation (WD4) adjacent to Wet grassland (GS4)/ Wet heath (HH3) habitat.

Plate 6-8 Example of Conifer plantation (WD4) and Recently felled woodland (WS5) within the Proposed Wind Farm site.

6.4.1.1.2 Peatland Habitats

In areas where Conifer plantation (WD4) is not the dominant habitat type there are several areas of peatland habitat located within the Proposed Wind Farm site. These areas have been extensively altered by drainage and/or peat cutting. The peatlands primarily occur as a mosaic of degraded Wet heath (HH3), Lowland blanket bog (PB3) and Cutover bog (PB4) and often grade into Wet grassland (GS4), which dominates the surrounding agricultural lands. The development has been specifically designed to avoid these peatland habitat mosaics, given the ecological value of such habitats. However, there are some locations where the infrastructure unavoidably intersects with peatland habitats, which are described below.

T5 is located in an area of Cutover bog (PB4) which has regenerated into a mosaic of Wet heath (HH3) and Lowland blanket bog (PB3), which also presented as Wet grassland (GS4) in sections (Plate 6-9 and Plate 6-10). Species composition here was dominated by hare's tail cottongrass (*Eriophorum vaginatum*), ling heather (Calluna vulgaris), deergrass (*Tricophrum germanicum),* bell heather (*Erica cinerea*), bog myrtle (*Myrica gale*), *Sphagnum capillifolium,* and purple mooregrass (*Molinia caerulea*). Other species recorded include black bog rush (Schoenus nigricans), cross-leaved heath (*Erica tetralix*), heath rush (*Juncus squarrosus*), tormentil, *Sphagnum capillifolium, Sphagnum papillosum* and *Sphagnum subnitens, Racomitrium languinosum* and *Cladonia sp.*

Two 2m x 2m relevés were taken at the location of T5 and the results are included in the detailed botanical assessment report in **Appendix 6-1** to this chapter.

Given the high biodiversity value of these habitat mosaics, albeit degraded due to historical turbary and grazing, they conform to the following Annex I habitats of the EU Habitats Directive, due to the presence of multiple indicator species for each:

- Northern Atlantic wet heaths with *Erica tetralix* [4010]
- Blanket bogs [7130]

Whilst these habitats are degraded, they are nonetheless of high biodiversity value and as such, have been assessed as County Importance.

Large areas of Wet heath (HH3) are also present to the north and south of T5. These are heavily grazed and trampled in places and interspersed with areas of rush-dominated Wet grassland (GS4) to the north of T5 and Cutover bog (PB4) with very small areas of Lowland blanket bog (PB3) to the south. These areas will not be impacted by the proposed infrastructure.

In addition to the above, there are peatland habitats within the Site that have been completely avoided by the Proposed Wind Farm. Cutover bog (PB4) and heath mosaics were recorded at various locations throughout the Proposed Wind Farm site with small areas of Lowland blanket bog (PB3) located within these mosaics (Plate 6-11).

Plate 6-9 Regenerated Cutover bog (PB4) located at T5, which now presents as a mosaic of Lowland blanket bog (PB3) and Wet heath (HH3) mosaic.

Plate 6-10 Example of degraded Wet heath (HH3) habitat to the north of T5, outside of the construction footprint.

Plate 6-11 Example of Lowland blanket bog (PB3) which occurs as small pockets in a mosaic with Cutover bog (PB4) and Wet heath (HH3) (outside development footprint)

6.4.1.1.3 Wet grassland (GS4)

Wet grassland (GS4) is common throughout the Proposed Wind Farm site where heath and forestry habitat do not dominate. This habitat was recorded within the footprint of Turbines 2 (Plate 6-12), 5, 6 and 8 (Plate 6-13), the proposed substation (Plate 6-14), the southern proposed borrow pit and met mast, and some sections of new access roads. Wet grassland (GS4) within the Proposed Wind Farm is dominated by soft rush, Yorkshire fog and common bent grass (*Agrostis capillaris*). Other species present in this habitat include sweet vernal grass, common sorrel, broad-leaved dock (*Rumex obtusifolius*), creeping buttercup, marsh thistle (*Cirsium palustre*) and tormentil. The Wet grassland (GS4) habitat within the site is subject to low intensity grazing by cattle and sheep.

Given the low floral diversity and thus, its low biodiversity value, the majority of Wet grassland (GS4) has been assessed as Local Importance (lower value) only. The Proposed Wind Farm has been designed to utilise this habitat where possible, to reduce loss of higher value habitats within the Site.

The majority of T2 is located within rush dominated Wet grassland (GS4) which is of low ecological value. However, a small section of the turbine handstand has overlap with an area of Wet grassland (GS4) which supported higher diversity, including orchids (*Orchis* spp.), Jointed rush (*Juncus articulatus),* purple moor grass and sedge species (*Carex* spp.). Given the higher biodiversity value of this Wet grassland (GS4) area, it conforms to the following Annex I habitats of the EU Habitats Directive, due to the presence of multiple indicator species:

- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]

As such, this habitat has assessed as County Importance.

Relevés (2m x 2m) were taken at areas of Wet grassland (GS4) within the construction footprint, which are described in the detailed botanical assessment report included as **Appendix 6-1** to this chapter.

Plate 6-12 Rush dominated Wet grassland (GS4) habitat recorded within the footprint of T2

Plate 6-13 Wet grassland (GS4) recorded within the footprint of T8.

Plate 6-14 Rush and grass dominated Wet grassland (GS4) habitat recorded at the proposed substation location.

6.4.1.1.4 Scrub (WS1)

Scrub (WS1) was present at various locations throughout the Proposed Wind Farm site, recorded delineating Conifer plantation (WD4), existing forestry tracks (Plate 6-15), and as a mosaic with recently felled woodlands (WS5) (conifer). This was generally recorded in small areas of old clear-fell and was in pockets that were too small to be accurately mapped. This habitat type was largely dominated by bramble (*Rubus fruticosus* agg.), with frequent to occasional rowan (*Sorbus aucuparia*) goat willow (*Salix capra*), rosebay willowherb and foxglove (*Digitalis purpurea*).

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

Plate 6-15 Example of bramble scrub recorded adjacent to unused forestry track and Conifer plantation (WD4).

6.4.1.1.5 Mixed Broadleaved Woodland (WD1)

Small areas of Scrub (WS1) within the site, particularly adjacent to Wet grasslands (GS4) and Conifer plantation (WD4), have matured into willow and birch Mixed broadleaved woodland (WD1) (Plate 6-16). Additionally, a small area of Mixed broadleaved woodland (WD1) was recorded on the northwestern boundary of the Proposed Wind Farm site along the edges of existing forestry track (Plate 6-17). The woodland is dominated by sycamore (*Acer pseudoplatanus*) and beech (*Fagus sylvatica*) with occasional larch (*Larix* sp.). Understorey species include hard fern (*Blechnum spicant*) and bracken. The woodland lies outside the infrastructure footprint.

Mixed broadleaved woodland (WD1) presented with relatively high biodiversity value and such woodland typically provides suitable habitat for diverse ground flora. Therefore, Mixed broadleaved woodland (WD1) has been assessed as Local Importance (higher value).

Plate 6-16 Established willow and birch woodland adjacent to Conifer plantation (WD4) within the Proposed Wind Farm site.

Plate 6-17 Mixed broadleaved woodland (WD1) with beech and sycamore within the Proposed Wind Farm site.

6.4.1.1.6 Spoil and Bare Ground (ED2)

The Proposed Wind Farm site is accessed by a network of existing forestry tracks categorised as Spoil and bare ground (ED2) (Plate 6-18). Upgrading of the existing tracks is proposed across the site as shown in Figure 4.1 of the EIAR. Forestry track verges consist of Dry meadows and grassy verges (GS2) habitat, Wet grassland (GS4) and peatland habitat vegetation. Species recorded mainly comprised of Yorkshire fog, ribwort plantain (*Plantago lanceolata*), red clover (*Trifolium pratense*), selfheal (*Prunella vulgaris*), foxglove, tormentil, soft rush, hard rush (*Juncus inflexus*), ling heather, and purple moor grass.

This habitat has been assessed as Local Importance (*lower value*), given the very low floral diversity it supports.

Plate 6-18 Forestry track classified as Spoil and bare ground (ED2) delineated by grassy verges and Scrub (WS1).

6.4.1.1.7 Recolonising Bare Ground (ED3)

A number of existing forestry and land access tracks have become overgrown with vegetation and are classified as Recolonising bare ground (ED3) (Plate 6-19). Whereas some were drier in nature and supported species including hawkbits (*Leontodon* sp), colt's-foot (*Tussilago farfara)* and ragwort (*Senecio jacobea*), others contained vegetation typical of Wet grassland (GS4) and/or heath including ling heather, purple moor grass, Yorkshire fog (*Holcus lanatus*), soft rush, as well as bryophytes including *Sphagnum* sp. and *Hylcomium splendens*.

This habitat has been assessed as Local Importance (*lower value*), given the very low floral diversity it supports.

Plate 6-19 Forestry track classified as Recolonising bare ground (ED3)

6.4.1.1.8 Eroding/Upland Stream (FW1)

A number of watercourses drain the Proposed Wind Farm site. The northern section of the site is drained by the Lissyneillan Stream. The southern section of the site is drained by the Knocknahila More stream and the Clooneenagh Stream. The majority of the streams were <1m in width, shallow with a cobble, gravel and silt substrate with no instream macrophytes. Flow ranged from stagnant to fast and water clarity was poor. The majority of the streams were bordered by forestry and the banks were heavily vegetated with bramble (*Rubus fruticosus agg.*), soft rush, Yorkshire fog, common bent grass, purple moor grass, nettle (*Urtica dioica*) and wild angelica (*Angelica sylvestris*) (Plate 6-20). The rivers have been subject to detailed assessment downstream of the Proposed Wind Farm site and the results are presented in the Aquatic Report in **Appendix 6-3**.

As watercourses within the Site provide connectivity to areas of higher ecological importance, such as European and National Sites, they are assessed as Local Importance (higher value).

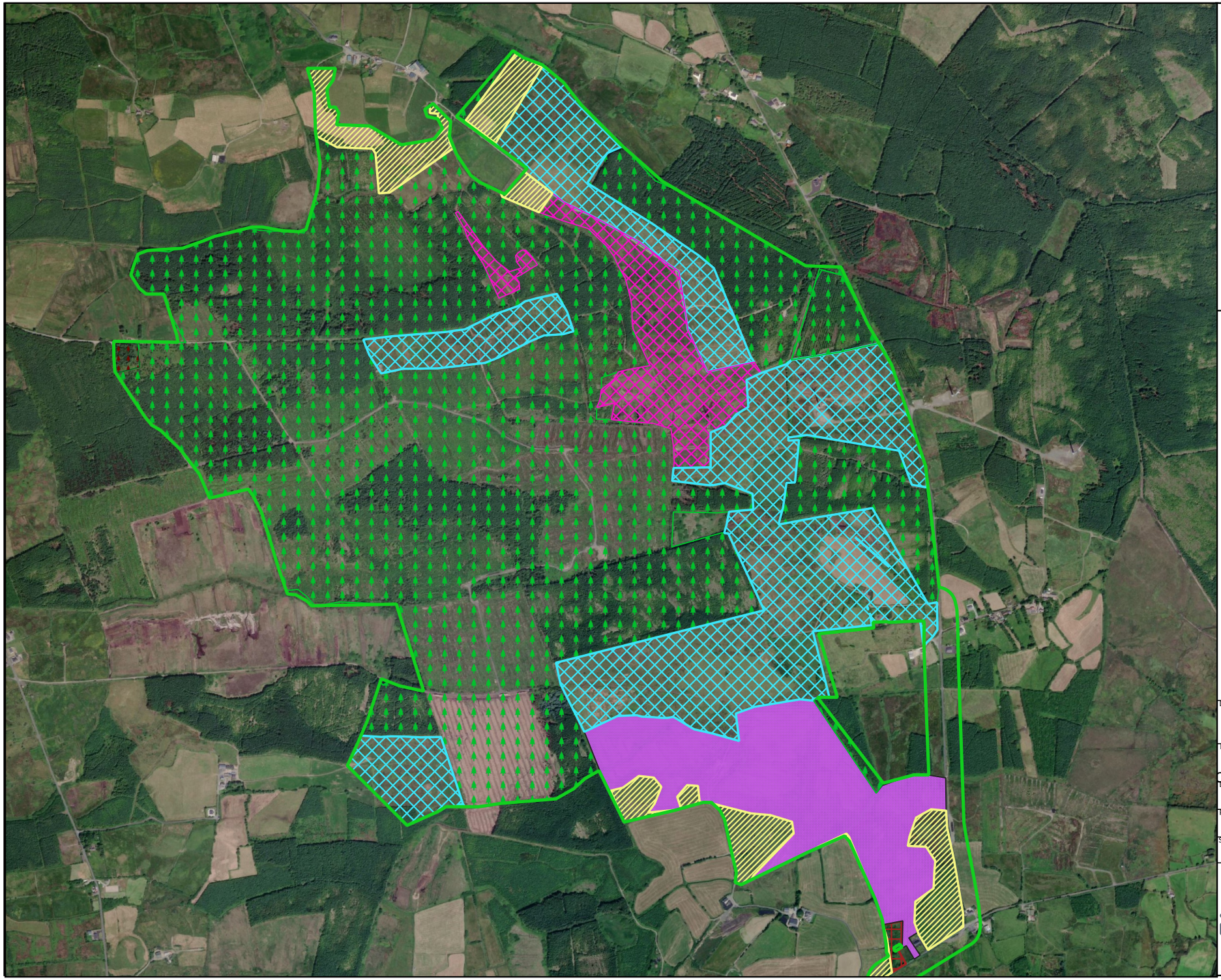
Plate 6-20 Example of a highly vegetated Eroding upland stream (FW1) in the Proposed Wind Farm site (the Knocknahila More), which presented as a small first order stream.

6.4.1.1.9 Drainage ditches (FW4)

A number of Drainage ditches (FW4) are located within the Site. These were predominantly located within Conifer plantation (WD4) and occasionally along roadsides. An example of a typical drainage ditch within the Site is shown in Plate 6-21. All drainage within the Proposed Wind Farm site is presented in Figure 9-3 of Chapter 9 (Hydrology and Hydrogeology).

These drains were typically unvegetated and of low ecological value. Flow rates varied from stagnant to faster flowing forestry drains. Whilst drains within the Proposed Wind Farm site will typcially eventaully discharge into mapped watercourses downstream, they are nonetheless assessed as Local Importance (lower value) as they are highly modified habitats with limited potnetial to support protected fauna.

Plate 6-21 Typical example of a Drainage Ditch (FW4) recorded in association with Conifer plantation (WD4).



Drawing Title
Habitat Map of the Proposed Wind Farm

Project Title
Cahermurphy West Wind Farm

Drawn By	Checked by
AMc	PD
Project No.	Drawing No.
230843	Figure 6-4
Scale	Date
1:15,000	18.02.2026

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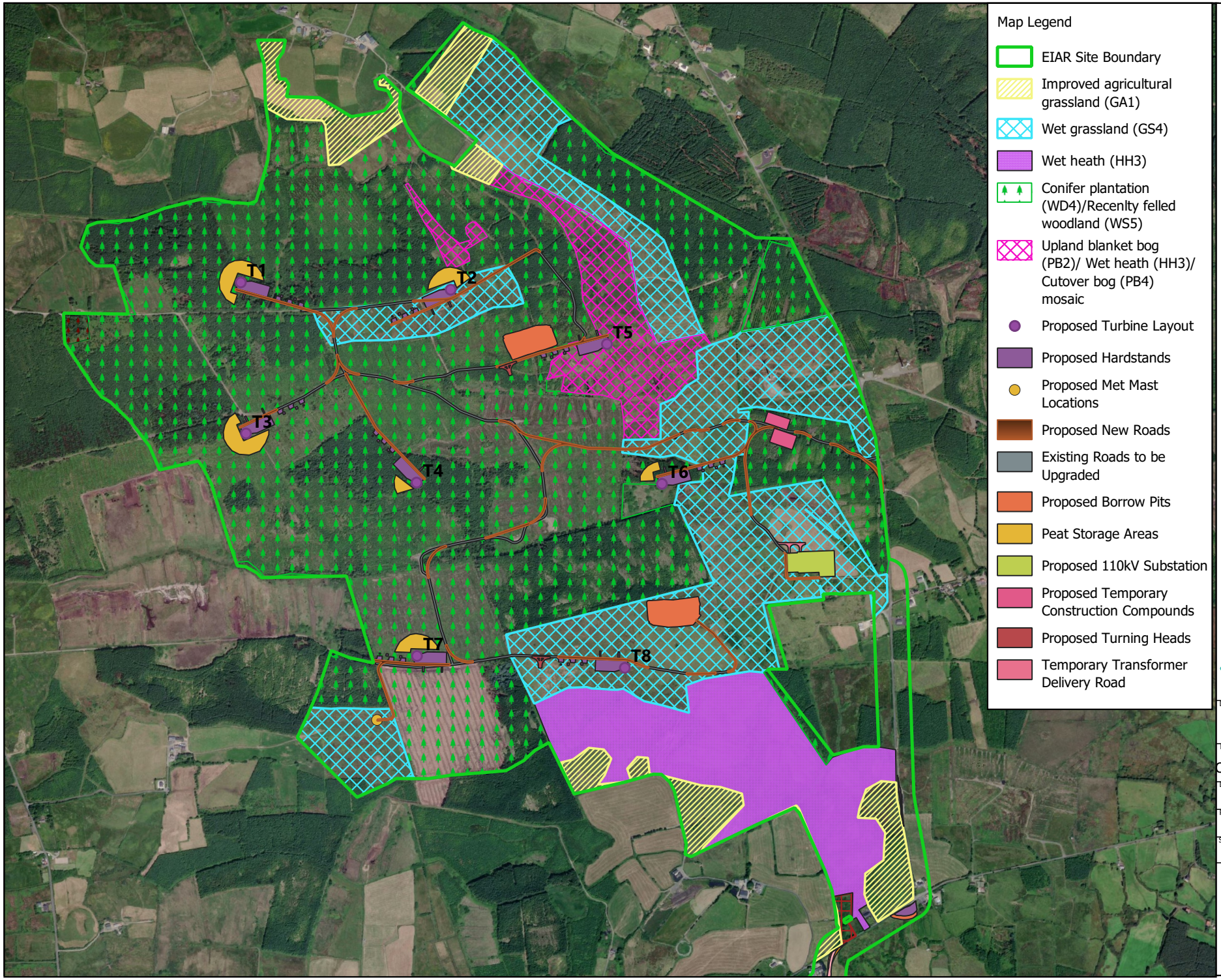

Map Legend

- EIAR Site Boundary
- Improved agricultural grassland (GA1)
- Wet grassland (GS4)
- Wet heath (HH3)
- Conifer plantation (WD4)/Recenlty felled woodland (WS5)
- Upland blanket bog (PB2)/ Wet heath (HH3)/ Cutover bog (PB4) mosaic
- Proposed Turbine Layout
- Proposed Hardstands
- Proposed Met Mast Locations
- Proposed New Roads
- Existing Roads to be Upgraded
- Proposed Borrow Pits
- Peat Storage Areas
- Proposed 110kV Substation
- Proposed Temporary Construction Compounds
- Proposed Turning Heads
- Temporary Transformer Delivery Road

Drawing Title
Habitat Map with Layout overlain

Project Title
Cahermurphy West Wind Farm

Drawn By	Checked by
DM	PD
Project No.	Drawing No.
230843	Figure 6-5
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Website:www.mkoireland.ie

6.4.1.2 Habitats along the Grid Connection Route Options

The Proposed Grid Connection route will exit the wind farm site to the east, the majority of which will be laid within existing road infrastructure, until it reaches Moneypoint on the River Shannon estuary.

The majority of the Proposed Grid Connection route will predominantly follow roads classified as Buildings and artificial surfaces (BL3) (Plate 6-22), with small sections (northern most extent within the Proposed Wind Farm site and southern most extent within Moneypoint Power station lands) within roads of Spoil and bare ground (ED2) (Plate 6-23).

These habitats have been assessed as Local Importance (*lower value*), given the very low floral diversity which they support.

Habitats recorded adjacent to the Proposed Grid Connection route included typical verge habitats such as Dry meadows and grassy verges (GS2), Hedgerows (WL1), Treelines (WL2), Conifer plantation (WD4), Stonewalls and other stonework (BL1), Mixed broadleaved/conifer woodland (WD2), and Buildings and artificial surfaces (BL3). Watercourse crossings along the route, which were bridges, were comprised of Buildings and artificial surfaces (BL3) and Stonewalls and other stonework (BL1), such as that in Plate 6-25.

The Proposed Grid Connection route will cross 24 no. mapped watercourses, which were small Lowland depositing streams (FW2) (Plate 6-24) or Upland eroding rivers (FW1) (Plate 6-25). Smaller watercourses were typically bordered by highly vegetated banks, comprised of scrub and treeline species such as bramble, willow, alder and conifers (Plate 6-26 and Plate 6-27). As watercourses along the Proposed Grid Connection route provide connectivity to areas of higher ecological importance, such as European and National Sites, they are assessed as Local Importance (higher value).

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

Plate 6-22 Existing roadway corridor to the east of the Proposed Wind Farm site classified as Buildings and Artificial surfaces (BL3) with Grassy verges (GS2) and Hedgerows (WL1).

Plate 6-23 Example of access track of Spoil and bare ground (ED2) within which small section of the grid route will be lain.

Plate 6-24 Lowland depositing stream along the grid route

Plate 6-25 Faster flowing upland eroding stream recorded along the grid route

Plate 6-26 Small first order stream highly vegetated by adjacent forestry

Plate 6-27 Completely vegetated watercourse, dominated by bramble Scrub (WS1).

Three small sections of the Proposed Grid Connection route will leave public road infrastructure and will traverse third party agricultural grasslands. This is primarily to facilitate Horizontal Directional Drilling (HDD) launch and receptors compounds. Where the grid exits road infrastructure, existing field entrances are utilised where possible.

The off-road sections of the Proposed Grid Connection and proposed HDD launch and receptors compounds are located within highly modified habitat of low ecological value. These included areas of Improved agricultural grassland (GA1) (Plate 6-28), Dry meadows and grassy verges (GS2) (pate 6-29), and Recolonising bare ground (ED3) (Pate 6-30). Given the highly modified nature and low species diversity associated with such habitats, these habitats have been assessed as Local Importance (lower value).

Plate 6-28 Example Improved agricultural grassland (GA1) where proposed HDD compounds will be located

Plate 6-29 Example Dry meadow and grass verge (GS2) where proposed HDD compounds will be located

Plate 6-30 Example of recolonising bare ground (ED3) where proposed HDD compounds will be located

6.4.1.3 Habitats along the Turbine Delivery Route

Works such as road widening are sometimes required along proposed turbine delivery routes to accommodate the large turbine components and associated vehicles seeking to access wind farm sites. The proposed turbine delivery route for the Proposed Wind Farm has been the subject of a route assessment to determine if any works are required along its length. A description of the TDR is summarised below.

The proposed turbine delivery route (TDR) for the Proposed Wind Farm is predominantly located within existing public road infrastructure. The route will will run from Foynes Port to the Proposed Wind Farm site entrance off the L-6254. The majority of the TDR is comprised of existing regional roads, classified as Buildings and artificial surfaces (BL3), which are bordered by a combination of both Hedgerows (WL1) and Treelines (WL2) (Plate 6-31), Improved agricultural grasslands (GA1), Wet grassland (GS4) (Plate 6-32), and Conifer plantation (WD4), in addition to Buildings and artificial surfaces (BL3), Earth banks (BL2), and Dry meadows and grassy verges (GS2).

To facilitate the TDR, there will be requirement for accommodation works at six locations, as shown in Figures 15-a to 15-f of Chapter 15, requiring minor temporary vegetation clearance. These temporary minor losses include small sections of Hedgerows (WL1), Wet grassland (GS4) and Earth banks (BL2). As these works are temporary (outside of one TDR accommodation track in the townland of Cahermurpy), all vegetation removal will be reinstated post construction.

Plate 6-31 Hedgerow (WL1) and Treeline (WL2) recorded along the proposed TDR.

Plate 6-32 Example of Wet grassland (GS4) where accommodation works are required.

6.4.1.4 Habitats within the Proposed Hen Harrier Enhancement lands (HHEL)

As part of the Proposed Wind Farm, a total of 123.7 ha of enhancement lands to the east, northeast of the wind farm site is being proposed for the benefit of hen harrier, a Key Ornithological Receptor (KOR) of Chapter 7. It is proposed to enhance habitats such as heath/bog, forestry, scrub and grassland through the retention and reinstatement of beneficial landscape features (e.g. scrub and hedgerows), through rush management, and through the management of grazing timing and intensity.

The current land use of the HHELs is commercial forestry and agriculture, dominated by Conifer plantation (WD4) and mosaics of Improved agricultural grassland (GA1), and Wet grassland (GS4). Representative photos of these habitats are provided in Plate 6-33, Plate 6-34). Conifer plantation (WD4) was dominated by Sitka spruce (*Picea sitchensis*), and lodgepole pine (*Pinus contorta*) with small sections dominated by Japanese larch (*Larix kaempferi*).

The grassland mosaic recorded was dominated by species such as rushes (*Juncus* spp.), meadow-grasses (*Poa* spp.), Yorkshire fog (*Holcus lanatus*) and creeping buttercup (*Ranunculus repens*). Additional

flora recorded in these grassland areas included thistles (*Cirsium arvense* and *Cirsium vulgare*), bramble (*Rubus fruticosus* agg.), broad-leaved dock (*Rumex obtusifolius*), dandelion (*Taraxacum vulgaria*), jointed rush (*Juncus articulatus*), sheep's sorrel (*Rumex acetosella*), autumn hawkbit (*Leontodon autumnalis*), fescues (*Festuca* spp.) and clovers (*Trifolium* spp.).

Given the modified nature and low biodiversity value of these habitats, they have been assigned Local Importance (lower value) only.

The eastern portion of the proposed enhancement area was dominated by a mosaic of Lowland blanket bog (PB3) and Wet Heath (HH3) habitats (Plate 6-35). Key species included ling heather (*Calluna vulgaris*), cross-leaved heath (*Erica tetralix*), purple moor grass (*Molinia caerulea*), tormentil (*Potentilla erecta*), devil's-bit scabious (*Succisa pratensis*), deergrass (*Trichophorum germanicum*), jointed rush (*Juncus articulatus*), and various sedge species (*Carex* spp.) and bryophytes such as *Dicranum scoparium, Polytrichum* sp., *Sphagnum rubellum*, *Sphagnum papillosum*.

Other notable habitats included areas of Dense Bracken (HD1), with existing farm tracks, categorized as Spoil and Bare Ground (ED2) and Recolonizing Bare Ground (ED3), also observed. Several Drainage ditches (FW4) were recorded within the Wet grassland (GS4) habitats, often bordered by willows (*Salix* spp.) and alder (*Alnus glutinosa*). A large area of Scrub (WS1) habitat was recorded beside an existing road which included species such as gorse (*Ulex europaeus*), goat willow (*Salix caprea*), various rushes (*Juncus* spp.), bramble (*Rubus fruticosus* agg.), and willowherb (*Chamaenerion angustifolium*) (Plate 6-36). Stone walls and other stonework (BL1) consisting of derelict houses was recorded within the eastern proposed enhancement area. Eroding/upland rivers (FW1) was recorded along the western border of the western proposed enhancement area (Plate 6-37).

An Acid oligotrophic lake (FL2) was also recorded within the HHELs, with Reed and large sedge swamp (FS1) also recorded on its fringes, with willows, bulrush (*Typha latifolia*) and common reed (*Phragmites australis*) present (Plate 6-38).

The habitats in the eastern section of the HHELs, although modified, presented with a high degree of naturalness and supported high floral diversity, and therefore, have been assessed as Local Importance (higher value).

Plate 6-33 Conifer plantation (WD4) recorded within the HHELs.

Plate 6-34 Example of mosaic of Improved agricultural grassland (GA1) and Wet grassland (GS4) within the HHELs.

Plate 6-35 Example of mosaic of Lowland blanket bog (PB2) and Wet heath (HH3) habitat within the HHELs.

Plate 6-36 Example of Scrub (WS1) within the HHELs.

Plate 6-37 River located on the western side of the HHELs.

Plate 6-38 Acid oligotrophic lake (FL2) located within the HHELs.

6.4.1.5 Protected Flora

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

6.4.1.6 Invasive Species

During field surveys, a search for Invasive Alien Species (IAS) listed under the 'Third Schedule' of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) and the 'First Schedule' of the European Union (Invasive Alien Species) Regulations 2024 (S.I. 374 of 2024) was conducted. One species - Rhododendron (*Rhododendron ponticum)* - was recorded as small immature stands within the Proposed Wind Farm site, with one infestation recorded within the footprint of T5.

Within the HHELs, Rhododendron (*Rhododendron ponticum)* was recorded on multiple occasions as small immature stands as well as large bushes. This species is listed on the 'First Schedule' of the European Union (Invasive Alien Species) Regulations 2024 (S.I. 374 of 2024) and 'Third Schedule' of Regulations 49 & 50 of the Birds and Natural Habitats Regulations 2011.

Along the Proposed Grid Connection route, two stands of Japanese knotweed (*Reynoutria japonica*) were recorded on existing public road verges.

Full details of all scheduled invasive species recorded during the surveys, with locations, are provided in the Invasive Species Management Plan (ISMP) in **Appendix 6-4**.

6.4.2 Fauna in the Existing Environment

The following subsections provide the results of the faunal surveys undertaken within the Site during the site visits and assessments as outlined in Section 6.2.3 (Field Surveys).

6.4.2.1 Non-volant mammals

Badger

Low levels of badger activity were recorded within the Proposed Wind Farm site, including the HHELs, with indications restricted to worn trails and latrines within forestry and some indications of foraging (snuffle holes). No badger setts were recorded within the site. However, given the nature of the habitats in the Proposed Wind Farm site however, it is likely that this species occurs, at least on occasion, for foraging and commuting purposes. No evidence of badger was recorded along the Proposed Grid Connection route or along the TDR.

Otter

No otter breeding or resting sites were recorded within the Site during the surveys undertaken, including the HHELs and TDR, including those undertaken as part of the aquatic surveys (Section 4.3 of **Appendix 6-3**: Aquatic Report). Several recordings of regular spraint were recorded on watercourses along the Proposed Grid Connection, as detailed in the Aquatic Report, indicating foraging and commuting behaviour of this species. No indications of otter were recorded within the Proposed Wind Farm site but small watercourses may provide potential foraging and commuting habitat for this species, at least on occasion. Due to the forested nature of the site, the fisheries potential of the upper reaches of watercourses within the site is poor and therefore otter are more likely to utilise the lower reaches of the watercourses, downstream of the Site.

6.4.2.2 Bats

A dedicated bat survey and assessment report is provided in **Appendix 6-2** of this EIAR. The following provides a summary of the key findings. Bat surveys were undertaken in 2025 and 2026, in accordance with NatureScot Guidance (NatureScot, 2021) and form the core dataset for the assessment of effects on bats at the Site. Bat surveys included roost survey, manual transect surveys and ground-level static surveys.

Roost Surveys

Three structures were identified within the Proposed Wind Farm as containing features with the potential to support roosting bats. These structures were assessed during daytime surveys undertaken in 2025 in accordance with the grading criteria set out in Collins (2023). Each structure was subject to an external inspection and, where accessible, an internal inspection, to identify potential roosting features and any evidence of bat use. No access issues were encountered during the surveys.

Of the three structures surveyed, two were assessed as having *Low* bat roost potential and one was assessed as having *Moderate* bat roost potential. All three structures will be retained and avoided as part of the Proposed Project. Further details of the structures are provided below and are summarised **Appendix 6-2**.

Manual Transects

Manual transects were undertaken in spring, summer and autumn 2025. Bat activity was recorded on all surveys. A total of 649 bat passes were recorded across all surveys. In general, soprano pipistrelle (n=352)

was recorded most frequently, followed by common pipistrelle (n=270). *Myotis* spp. (n=18), brown long-eared bat (n=6) and Leisler's bat (n=3) were less frequent. Further details are provided in **Appendix 6-2**.

Ground-level Static Surveys

In total, 19,556 bat passes were recorded across all deployments in 2025. In general, soprano pipistrelle (n=9,914) occurred most frequently, followed by common pipistrelle (n=5,468). Instances of Leisler's bat (n=1,853), *Myotis* spp. (n=1,706), brown long-eared bat (n=614) and lesser horseshoe bat (n=1) were recorded less frequently during the 2025 survey period. Further details are provided in **Appendix 6-2**.

Please refer to the Bat Survey Report in **Appendix 6-2** for full details on all bat survey results.

6.4.2.3 Other mammals

Mustelid scats were recorded within forestry close to the location of T1 and within the HHELs. These were likely to be pine marten (*Martes martes*), given their size, shape and location on top of fallen tree trunks. Red squirrel (*Sciurus vulgaris*) feeding signs were present in forestry within the Site, however no dreys were recorded within the Site. No other indications of any protected mammals were recorded during the surveys undertaken.

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

6.4.2.3.1 Reptiles and Amphibians

Common frog (*Rana temporaria*) was recorded at a number of locations throughout the Proposed Wind Farm site in Wet grassland (GS4) and peatland habitats. The species is likely to breed in wet habitats across the Site. Common lizard (*Zootoca vivipara*) and smooth newt (*Lissotriton vulgaris*), while not recorded during the site visits, are likely to occur within the Site, given the suitability of habitats recorded during the surveys undertaken.

6.4.2.3.2 Marsh fritillary

Small, isolated patches of Devil's-Bit Scabious (*Succisa pratensis*), the food plant for the larval stage of marsh fritillary, were identified adjacent to field margins and Conifer plantations (WD4) within the Proposed Wind Farm site, including the HHELs. That said, the extent of this habitat was small, dispersed, and isolated and did not provide significant supporting habitat for Marsh Fritillary. Additional occasional to frequent occurrences of Devil's-Bit Scabious were recorded within the species diverse wet grasslands, to the southeast of Turbine 2 and outside of the construction footprint. No marsh fritillary were recorded during the surveys undertaken and no significant Devils bit scabious was recorded within or in direct proximity to the footprint of the Proposed Project.

6.4.2.3.3 Aquatic receptors

The results of the detailed aquatic surveys are provided in the Aquatic Baseline Report in **Appendix 6-3**.

The majority of the surveyed watercourses in the vicinity of the Proposed Wind Farm site were natural or semi-natural in character with good summer flows and supported species of high conservation value. This included Atlantic salmon and lamprey in addition to European eel, resulting in an evaluation of local importance (higher value). By contrast, many of the watercourses crossed by the Proposed Grid Connection route were smaller in nature, historically modified and of naturally lower aquatic value.

The aquatic report provides a discussion on the findings of the surveys undertaken, and focuses on fisheries, otter, water quality, and floating river vegetation.

The report also notes that, given the higher aquatic habitats recorded on the Creegh, Annageerah, and Doonbeg rivers, these watercourses were assessed as County Importance as they support the Annex I floating river vegetation habitat [3260], eel and salmon, as well as known records of freshwater pearl mussel.

No protected macro-invertebrates, macrophytes or aquatic bryophytes were recorded, and none of the sampling sites achieved greater than Q3-4 (moderate status) biological water quality.

6.4.2.3.4 FWPM habitat appraisals

Fresh water pearl mussel habitat appraisals were undertaken at the 11 no. proposed HDD locations at watercourses along the Proposed Grid Connection route on the 10th of December 2025. This served to determine whether there was any suitable habitat or potential for populations of FWPM to be present at each HDD location, and to inform the impact assessment in this report. It should be noted that all watercourses within the Proposed Wind Farm, including the HHELs, were small first order stream and did not provide potential supporting habitat for FWPM. The HHD locations are presented in Figure 6-6 and each are presented in Plate 6-39 to Plate 6-49.

The majority of watercourses along the Proposed Grid Connection route, and at the proposed HDD locations, were small narrow modified streams with steep banks and high shade and large boulder or cobble substrates and did not present potential significant supporting habitat for FWPM. These

included HDD locations 1, 3, 4, 9, 10, and 11. These were best classified as Upland eroding streams (FW1).

Where larger watercourses were recorded, such as HDD locations 5, 6, and 8, substrate was typically mud, silt, or fine gravels, with high occurrences of macrophytes and slower flows. These were best classified as Lowland depositing streams (FW2) and did not present potential significant supporting habitat for FWPM.

HDD locations 2 (the Creegh) and 7 (the Doonbeg), both Upland eroding streams (FW1), presented as larger watercourses. However, given the presence of sub-optimal substrates of larger cobbles and boulders and high discharge rates, these locations also did not present potential significant supporting habitat for FWPM.

Overall, watercourses at the proposed 11 no. HDD locations along the Proposed Grid Connection route did not provide optimal habitat for FWPM.

Plate 6-39 HDD Location 1

Plate 6-40 HDD Location 2

Plate 6-41 HDD Location 3

Plate 6-42 HDD Location 4

Plate 6-43 HDD Location 5

Plate 6-44 HDD Location 6

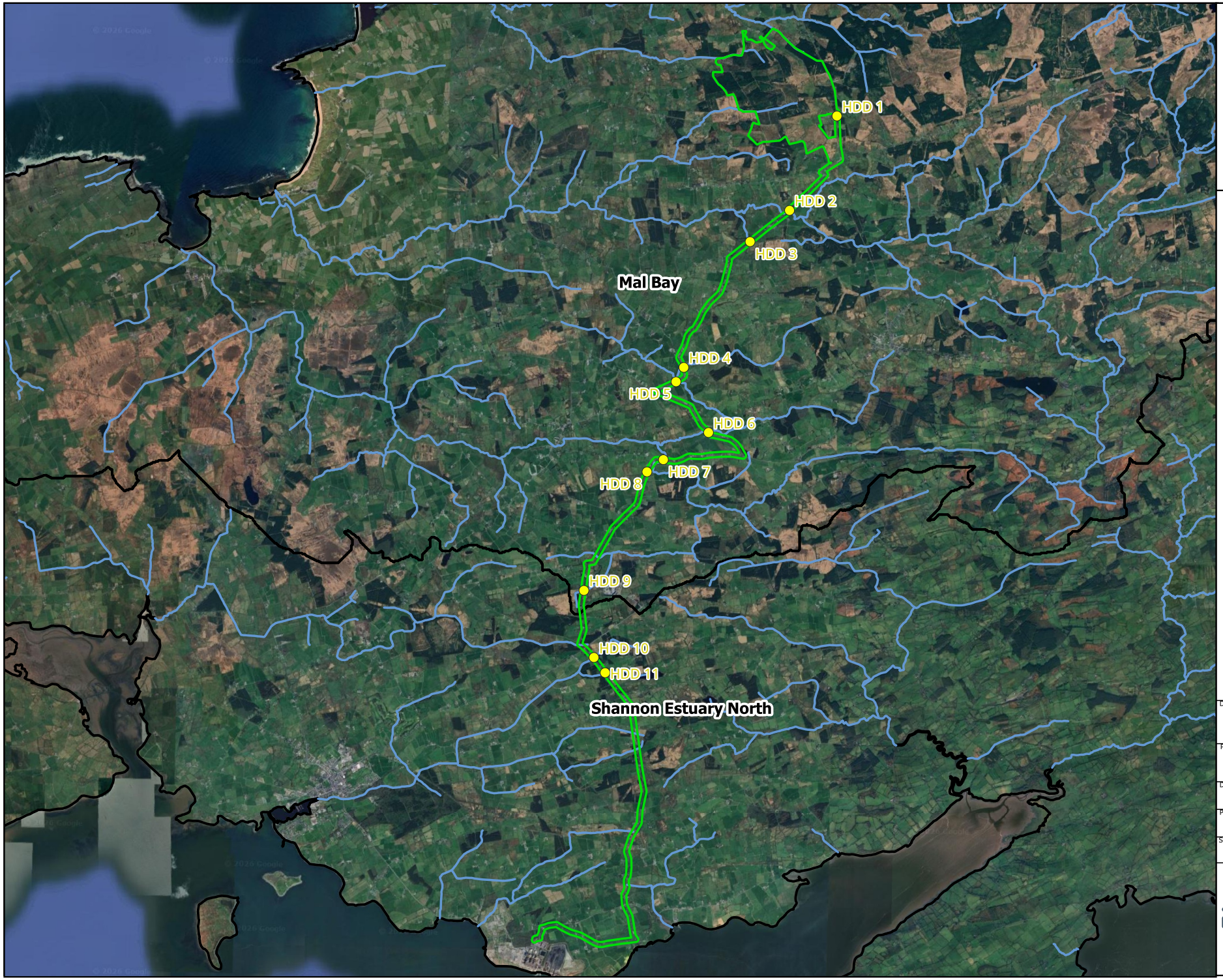
Plate 6-45 HDD Location 7

Plate 6-46 HDD Location 8

Plate 6-47 HDD Location 9

Plate 6-48 HDD Location 10

Plate 6-49 HDD Location 11



Map Legend

- EIAR Site Boundary
- HDD & Watercourse Assessment Locations
- WFD River Waterbodies
- WFD Hydrological Catchments

Drawing Title
FWP Habitat Appraisal Survey Locations

Project Title
Cahermurphy West WF

Drawn By	Checked By
DM	PD
Project No.	Drawing No.
230843	Figure 6-6
Scale	Date
1:100,000	04.03.2026

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6.4.3 Identification of Key Ecological Receptors

Table 6-10 below summarises the ecological evaluation of all receptors as outlined in Section 6.2.4. It provides the rationale for the determination and identifies the habitats and fauna that are considered to be KERs and therefore those receptors that are subject to impact assessment and considered in Section 6.5 of this report. Following impact assessment, mitigation measures are incorporated into the Proposed Project where required, to avoid potential significant impacts on these KERs.

Table 6-10 Importance of Ecological Receptors.

Ecological Receptors and Geographic Importance	KER Y/N	Rationale
Designated Sites		
Nationally Designated Sites › Cragnashingaun Bogs NHA [002400] › St. Senan's Lough pNHA [001025] › Carrowmore Point to Spanish Point and Islands [001021] › White Strand / Carrowmore Marsh [001007] › Poulnasherry Bay pNHA [000065]	***Yes***	These pNHAs have been assigned National Importance as they are sites proposed to be designated as Natural Heritage Areas (NHAs). The Proposed Wind Farm site, specifically the HHELs, has a slight overlap with Cragnashingaun Bogs NHA [002400]. The Site has hydrological connectivity to the remaining listed National sites via mapped watercourses. Following the precautionary principle, a potential pathway for direct and indirect effects on these Nationally Important Sites was identified arising from the construction phase of the Proposed Project. **Therefore, these Nationally important sites are considered a KER.**
European Designated Sites › Lower River Shannon SAC [002165], › Carrowmore Dunes SAC [002250], › Carrowmore Point to Spanish Point and Islands SAC [001021], › River Shannon and River Fergus Estuaries SPA [004077], and › Mid-Clare Coast SPA [004182].	***Yes***	These designated sites have been assigned International Importance as they are sites designated as part of the Natura 2000 Network under the EU Habitats Directive. A potential pathway for likely significant effect on these European Sites, via disturbance, the deterioration of water quality, and impacts from the spread of invasive species during the construction and operational phases of the Proposed Project, was identified. These European Sites have been included as a KER as there is potential for indirect effects via a deterioration in water quality during the construction and operational phases of the Proposed Project. **Therefore, these European Sites are included as KERs.** Note: European Sites within the ZoI are considered in the AAS and NIS that accompanies this planning application.
Habitats		

Ecological Receptors and Geographic Importance	KER Y/N	Rationale
Local Importance (*lower value*) habitats › Buildings and artificial surfaces (BL3) › Recolonising bare ground (ED3) › Conifer plantation (WD4) › Recently felled woodland (WS5) › Rush dominated Wet grassland (GS4) › Spoil and bare ground (ED2) › Scrub (WS1) › Stonewalls and other stonework (BL1) › Dry meadows and grassy verges (GS2)	***No***	These habitats are classified as of Local Importance (lower value). Despite some containing small areas of semi-natural habitat that are of some local importance for wildlife, these are common and widespread in the local and wider landscape. Whilst there will be some loss of some of these habitats to facilitate the Proposed Project, these habitats are **not** included as KERs, given their limited ecological value.
Local Importance (*higher value*) habitats Proposed Wind Farm (including and HHELs) › Mixed broadleaved woodland (WD1) › Hedgerows (WL2) › Lowland blanket bog (PB3) › Wet Heath (HH3) › Acid oligotrophic lake (FL2) › Reed and large sedge swamp (FS1) Proposed Grid Connection › Hedgerows (WL1) › Treelines (WL2) › Mixed broadleaved/conifer woodland (WD2)	***No***	These habitats have been assessed as Local importance *(higher value)* as they are important habitats and are of high biodiversity value, providing supporting habitat for protected flora and fauna. However, there will be no loss of these habitats to facilitate the Proposed Project and therefore, there is no potential for impacts on this habitat. Therefore, these habitats are **not considered as KERs**.
Local Importance (*higher value*) habitats Proposed Turbine delivery route › Hedgerows (WL2)	***Yes***	These habitats have been assessed as Local importance *(higher value)* as they are important habitats and are of high biodiversity value, providing supporting habitat for protected flora and fauna. Whilst there will be the requirement for some temporary loss of hedgerow along the TDR, this will be temporary and is not anticipated to be a significant effect at any geographical scale higher than Local Importance. However, taking a precautionary approach, **this habitat is considered a KER.**
County Importance habitats Peatland habitats, recorded as regenerated mosaics: › Wet heath (HH3) › Lowland blanket bog (PB3) › Cutover bog (PB4) Species rich grassland	***Yes***	Peatlands are recognised as important habitats in the Clare County Biodiversity Action Plan (draft, 2025). Given the high ecological value of peatland, as well as species rich grasslands, habitats, and the fact that they conform to Annex I habitats, despite their degraded nature, they have been assessed as County Importance. The majority of the Proposed Wind Farm will be constructed within low ecological value habitat such as

Ecological Receptors and Geographic Importance	KER Y/N	Rationale
› Wet grassland (GS4)		Conifer plantation (WD4) and Recently felled woodland (WS5). As such, the majority of peatland and species rich grassland habitat will been retained within the Site, but there will be a requirement for some loss of a mosaic of peatland habitats to facilitate the construction of T5 in the north east of the Proposed Wind Farm site, and a minor loss of species rich grassland within the construction footprint of T2. **Therefore, these habitats have been included as a KER.**
Local Importance (*higher value*) to International Importance › Aquatic receptors (surface/ groundwater and associated aquatic faunal species, including, lamprey, white-clawed crayfish, freshwater pearl mussel, European eel, salmonids, coarse fish, and other aquatic species)	***Yes***	Both the Proposed Wind Farm and Grid Connection have downstream connectivity to National Sites and European Sites via several mapped watercourses and therefore, aquatic receptors have been assessed as Local Importance (*higher value*) to International Importance. No instream works are proposed and therefore, there is no potential for direct effects on any aquatic receptor. There is potential for impacts on surface and groundwater systems via the deterioration of water quality arising from runoff during the construction and operation phases of the Proposed Project. The potential for significant effects on aquatic species is restricted to indirect effects on their habitat resulting from a degradation of water quality. **Therefore, Aquatic receptors have been considered as KERs.**
Faunal Species		
Local Importance (*higher value*) to National Importance › Bats	***Yes***	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 Act 1976 (as amended). The following bat species were recorded within the Proposed Wind Farm site: › Common pipistrelle › Soprano pipistrelle › Leisler's bat › *Myotis* spp. › Brown long-eared bat › Nathusius' pipistrelle Bats have been assessed as Ecological Receptors of Local Importance (Higher Value) based on the presence of a regularly occurring bat population recorded within the Proposed Wind Farm, including confirmed roosts and use of the site for foraging and commuting.

Ecological Receptors and Geographic Importance	KER Y/N	Rationale
		Given the nature of the Proposed Project, the potential for significant effects on bats, as a result of both the construction and operational phases of the development, requires consideration. **Therefore, bats are considered a KER.**
Local Importance (*higher value*) › Badger (*Meles meles*)	***Yes***	No evidence of breeding badger was recorded within the Site. However, the habitats within the Site have the potential to support badger populations of Local Importance, and as badger are a mobile species, setts could establish within the site before construction commencing. Therefore, taking a precautionary approach, the Proposed Project has the potential to result in effects on this receptor. **Therefore, badger is considered a KER.**
Local Importance (*higher value*) to International Importance › Otter (*Lutra lutra*)	***Yes***	As downstream connectivity was identified between the Site and the Lower River Shannon SAC, for which otter is a QI, otter has been assessed as of Local Importance (*higher value*) to International Importance. There was no evidence of breeding otter within the Site during the surveys undertaken, but spraint was recorded in watercourses downstream of both the wind farm and grid connection. Therefore, taking a precautionary approach, the Proposed Project has the potential to result in indirect effects on this receptor as a result of deterioration in habitat associated with indirect water pollution or disturbance during construction/ decommissioning). **Therefore, otter is considered a KER.**
Local Importance (*higher value*) › Marsh fritillary (*Euphydryas aurinia*)	***No***	Given only a few incidental recordings of Devils bit scabious were identified adjacent to field margins and Conifer plantations (WD4) within the Proposed Wind Farm site, and outside of the construction footprint, no significant supporting habitat for marsh fritillary was recorded within or adjacent to the Site. Therefore, there is no potential for significant effect on this species associated with the Proposed Project. Therefore, Marsh fritillary is **not** included as a KER.
Local Importance (*higher value*) › Pine marten (*Martes martes*) › Red Squirrel (*Sciurus vulgaris*)	***Yes***	The Proposed Wind Farm site provides suitable foraging and breeding habitat for pine marten and red squirrel. These species as ecological receptors have been assigned Local Importance (Higher value) on the basis that a locally occurring population of Local Importance is likely utilising the site. Given that the species is known to inhabit the area, potential for direct and indirect impacts on these species are considered

Ecological Receptors and Geographic Importance	KER Y/N	Rationale
		further in this assessment and **they have been included as KERs for further assessment**.
Local Importance (*higher value*) › Reptiles and amphibians	***No***	It is considered that the Proposed Project will not result in a significant loss of suitable habitat for amphibians or reptiles. No evidence of populations of amphibians or reptiles being significant at more than a local level was recorded. No likely significant effects on these species are anticipated and therefore further survey/ assessment was not deemed necessary. Based on the few observation of amphibians within the Proposed Wind Farm site (common frog) and the lack of any significant breeding sites for these species, these species are **not** considered to be KERs.
Other fauna - Local Importance (*higher value*)	***No***	No additional species of conservation concern or protected under any Annexes of the EU Habitats Directive were recorded. Although other common species may occur within the Site, at least on occasion, no potential for significant effect has been identified on any other faunal species associated with the Site and are thus **not** included as KERs.

6.5 Ecological Impact Assessment

6.5.1 Do Nothing Scenario

The land that forms the Proposed Wind Farm site is dominated by commercial forestry plantations at various stages in the rotational cycle.

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

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

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

6.5.2 Assessment of Significant Effects During Construction Phase

6.5.2.1 Effects on Habitats During Construction

The development footprint is dominated by habitats considered to be of low ecological value. Approximately 73.5% of the development footprint is located on habitats that are classified as Local importance (lower value). Such habitats include Conifer plantation (WD4), Spoil and bare ground (ED2) and rush dominated or grazed Wet grassland (GS4). These habitats have not been identified as KERs and although there will be loss of these habitats as a result of the Proposed Wind Farm, the loss is not considered to represent a significant effect at any geographic scale.

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

6.5.2.2 Assessment of Potential Effects on Annex I habitats

Table 6-11 Loss of annex I habitats.

Description of Effect	**Proposed Wind Farm site** The Proposed Project has been designed to minimise impacts on the receiving environment and maximises the use of existing access roads at the site. Consequently, the Proposed Wind Farm footprint is predominantly located in areas of modified habitats, associated with the existing access road and Conifer plantation (WD4). The Proposed Wind Farm has been designed to avoid the majority of the peatland and species rich grassland habitats within the site. The Proposed Wind Farm development will result in the loss of approximately 0.2 ha of degraded Wet heath (HH3), Lowland blanket bog (PB3) and Cutover bog (PB4) mosaic at the location of T5, approximately 0.04 ha of

	Wet heath (HH3) within the proposed northern borrow pit, and approximately 0.15 ha of species rich grassland within the footprint of T2. These losses will be permanent. The majority of the peatland and species rich grassland habitat within the Proposed Wind Farm site have been avoided and will not be impacted by the Proposed Project. Whilst the Annex I habitats to be lost are degraded, due to existing drainage, grazing, and/or and historical turbary practices, they are nonetheless of high ecological value and have been assessed as County Importance. The overall loss of peatland habitat (0.24 ha) associated with the Proposed Project amounts to less than 0.49% of the overall amount of peatland habitats recorded within the site (49.31 ha). **TDR** There will be no loss of peatland habitats as a result of accommodation works associated with the proposed TDR. **Hen Harrier Enhancement Plan** There will be no loss of Annex I habitats as a result of the proposed Hen Harrier Enhancement Plan. **Proposed Grid Connection route** The Proposed Grid Connection route will be laid primarily within existing road and track infrastructure, with sections of the route and HDD compounds located within private lands of agricultural grassland habitats. Therefore, no impacts on Annex I habitats are anticipated as a result of its construction.
Assessment of Significance prior to mitigation	The permanent loss of 0.24 ha of peatland habitat, which equates to approximately 0.49% of the total area of peatland habitat recorded within the boundary of the Proposed Wind Farm site, is not considered to be a significant effect at any scale greater than the local geographical scale, given their widespread distribution in the surrounding landscape. The permanent loss of 0.15 ha of species rich Wet grassland (GS4) habitat is not considered to be a significant effect at any scale greater than the local geographical scale, given their widespread distribution in the surrounding landscape.
Mitigation	A Hen Harrier Enhancement Plan has been prepared as part of this EIAR and is included as Appendix 7-8. The key target of this plan is the permanent felling of 56.3 ha of forestry and the planned restoration of the underlying peatland. Whilst these enhancement measures will be undertaken outside the Proposed Wind Farm site, but in close proximity in lands to the east of the Site, they will ensure an overall significant increase in peatland habitat in the local environment over time. In addition, it is proposed to manage approximately 67.4 ha of existing farmland into species rich grassland, which will ensure an overall significant increase of this habitat in the local environment over time. Furthermore, as stands of Rhododendron have been recorded within the Proposed Wind Farm site, an Invasive Species Management Plan has been prepared and is included in **Appendix 6-4**. With the successful implementation of the ISMP, pressures on peat habitats within the Site from the threat of invasive species will be removed, preserving the remaining peat habitat within the Site.

Residual Effect following Mitigation	Following the specific design of the Proposed Project footprint and its restriction to habitat predominantly outside peatland areas, as well as the enhancement measures within Hen Harrier Enhancement Plan, there will be no significant effect on peatland habitat in the vicinity of the Proposed Project. Within the Proposed Wind Farm site, the minor loss of degraded peatland habitat (0.49% of the overall peatland habitat recorded), which has been assessed as County Importance, will result in a significant effect, at a local scale only, as it will not significantly impact on this habitat at a County scale. However, with the implementation of the proposed Hen Harrier Enhancement Plan, and the implementation of the proposed Invasive Species Management Plan, there will, overtime, be a significant positive effect on peatland habitat in the vicinity of the Proposed Wind Farm site, as a result of the Proposed Project, as it will result in the restoration of over 56 ha of peatland habitat in the locality.

6.5.2.3 Assessment of Potential Effects on Groundwater, Surface Watercourses and Sensitive Aquatic Faunal Species, excluding Otter

Table 6-12 Potential for Impact on Rivers and Streams, and Sensitive Aquatic Species during Construction.

Description of Effect	Chapter 9 (Hydrology and hydrogeology) of the EIAR assess the potential for significant effects on water quality as a result of the following pathways during construction: › Potential Effects from Clear Felling › Potential Effects from Earthworks (Removal of Vegetation Cover, Excavations and Stock Piling) Resulting in Suspended Solids Entrainment in Surface Waters › Potential Effects on Surface Water Quality from Excavation Dewatering › Potential Release of Hydrocarbons › Potential Effects from Wastewater › Release of Cement-Based Products › Potential Effects due to New Watercourse Crossing Works › Potential Effects on Designated Sites › Potential Effects on Local Groundwater Well Supplies › Potential Effects from Turbine Delivery Route Works › Potential Effects on WFD status › Potential Effects from the Use of Siltbuster › Potential Effects from Earthworks Works and Watercourse Crossings (Along Grid Connection) › Potential Effects on Wetland Hydrology › Potential Effects from the Hen Harrier Enhancement Plan › Surface Effects on Doo Lough Public Water Supply (PWS) › Effects on Downstream Freshwater Pearl Mussel Populations The effects on water quality are fully described in Chapter 9 (Hydrology and Hydrogeology) and are described here in relation specifically to ecology. This section assesses the potential for significant effects on surface/ groundwater and associated aquatic faunal species during construction, including, lamprey, white-clawed crayfish, freshwater pearl mussel, European eel, salmonids, coarse fish, otter, and other aquatic species identified during the desk study and dedicated aquatic surveys and likely to occur within or downstream of the site. **Proposed Wind Farm - Direct impacts** Within the Proposed Wind Farm site, there is the requirement for the creation of 2 no. watercourse crossings and the upgrade of one existing watercourse crossing along proposed

access roads, as well as a number of forestry drains/ditches with connectivity to the watercourses within the site. There will be no instream works as part of the Proposed Project. No sensitive aquatic receptors were recorded within any of the watercourses within the Proposed Wind Farm site during the surveys. Watercourses within the Proposed Wind Farm site were deemed to have low fisheries value. Therefore, there is no potential for significant direct impacts on any sensitive aquatic receptors associated with the Proposed Wind Farm.

Proposed Wind Farm - Indirect impacts (water quality)

A direct surface water pathway exists between the Proposed Wind Farm and downgradient watercourses. Within the Proposed Wind Farm, there are 2 no. mapped watercourses and a number of forestry Drainage ditches (FW4) which flow into these 2 no. watercourses. There is a risk that pollutants and sediment laden surface water run-off could discharge to surrounding ditches and watercourses impacting on sensitive watercourses and aquatic species downstream, including, lamprey, white-clawed crayfish, freshwater pearl mussel, European eel, salmonids, coarse fish, and other aquatic species.

There is also risk that pollutants will seep into groundwater systems, impacting on groundwater quality and associated groundwater dependant receptors.

Potential sources of pollution to surface and ground waters within the Proposed Wind Farm site include:

- Slit laden surface water run-off;
- Release of chemicals, including hydrocarbons, from onsite machinery, concrete and other cement-based products.
- Drainage and seepage of water resulting from infrastructure excavations;
- Stockpiled excavated material providing a point source of exposed sediment;
- Erosion of sediment from emplaced site drainage channels.

Proposed Grid Connection route - Direct impacts (mortality)

The Proposed Grid Connection route crosses 24 no. mapped watercourses, which are detailed in Chapter 9 and in Section 4 of the Aquatic Report in **Appendix 6-3**. These watercourses are hydrologically connected to downstream European and National Sites.

There are no in-stream works proposed to facilitate the Proposed Grid Connection route, with clear span and Horizontal Directional Drilling (HDD) methods to be used to cross these watercourses. Therefore, there is no potential for direct impacts on any sensitive aquatic receptor associated with the Proposed Grid Connection.

Proposed Grid Connection route - Indirect impacts (water quality)

Watercourses were assessed as Local Importance (higher value) or County Importance along the Proposed Grid Connection route and varied between faster flowing Upland eroding streams (FW1) and slower depositing Lowland depositing streams (FW2). Fisheries value varied from low to high between watercourses, as did their potential to support protected aquatic species such as white clawed crayfish, freshwater pearl mussel, otter, and salmonids. Full assessments are provided in **Appendix 6-3**.

There is a risk that pollutants and sediment laden surface water run-off could discharge into the 24 no. watercourses which the grid route will cross, impacting on sensitive watercourses and aquatic species.

There is also risk that pollutants will seep into groundwater systems, impacting on groundwater quality and associated groundwater dependant receptors in the vicinity of the Site, as well as surface water systems.

Assessment of Significance prior to mitigation	In the absence of mitigation, and following the precautionary principle, there is potential for the Proposed Project to result in significant indirect effects on the identified aquatic habitats and species assessed from local importance to International Importance, in the form of pollution to surface and groundwater during the construction phase of the Proposed Project.
Mitigation	**Proposed Wind Farm** Detailed mitigation measures in relation to the protection of surface and ground water during construction are provided in Section 9.5.2 of Chapter 9 (Hydrology and Hydrogeology) and Appendix 4-7 (SWMP). In summary the key mitigation measure during the construction phase is the avoidance of sensitive hydrological features, by application of suitable buffer zones. A self-imposed buffer zone of 50m has been put in place for streams and rivers within the Proposed Wind Farm site. Manmade forestry drains at the site are not considered a hydrological constraint and therefore no buffering of forestry drains has been undertaken. All of the key infrastructure areas are located significantly away from watercourses with the exception of the upgrades to access track water crossings . Detailed control measures in relation to the protection of surface and ground waters during construction are detailed in Section 9.5.2. of Chapter 9 (Hydrology and Hydrogeology). In addition, the Construction Environmental Management Plan (CEMP) that is provided as Appendix 4-5 of the EIAR and the Surface Water Management Plan (Appendix 4-7) provides the details of exactly how the measures will be implemented during construction. A drainage management plan for the Proposed Project is provided in Section 9.4.2 of Chapter 9 (Hydrology and Hydrogeology), as well as in Section 3.2.4 of the CEMP. This plan provides details of how water quality will be protected during the construction of the Proposed Project. The maintenance plan for the on-site construction drainage system will be prepared in advance of commencement of any works with regular inspections of all installed drainage systems undertaken throughout the Site. **Proposed Grid Connection Route** Mitigations around the protection of watercourses from the construction of the Proposed Grid Connection route are provided in Section 9.5.2.14 of Chapter 9. The mitigations include for: › Pre-commencement of works › Underground cabling watercourse crossing works › Fracture Blow-out (Frac-out) Prevention and Contingency Plan for HDD
Residual Effect following Mitigation	Following the implementation of mitigation, there will be no significant effect on aquatic habitats or species, at any geographic scale, as a result of the Proposed Project.

6.5.2.4 Effects on Habitats as a result of the TDR

Table 6-13 Loss of vegetation as a result of the proposed TDR.

Description of Effect	Works such as road widening are sometimes required along proposed turbine transport routes to accommodate the large turbine components and associated vehicles seeking to access wind farm sites. The proposed turbine delivery route for the Proposed Project has been the subject of a route assessment to determine if any works are required along its length. Accommodation works, such as temporary vegetation removal, will be required at various locations on the national and regional road network between Foynes Port and the Proposed Wind Farm site entrance off the L-6254. This will include the removal of hedgerow at 6 separate locations, totalling approximately 240m.

Assessment of Significance prior to mitigation	Whilst there will be losses of hedgerows along the TDR at 6 separate locations, totalling approximately 240m, which have been assessed as Local Importance (higher value), these losses will be temporary as they will be replanted/allowed to grow back after construction. The temporary loss of this vegetation is not considered to be a significant effect at any scale greater than the local geographical scale, given the widespread distribution of the habitats within which cutting back is required, in the surrounding landscape.
Mitigation	To mitigate the losses of the above habitats to facilitate the proposed TDR, the following will be implemented during vegetation removal: › A suitably qualified ecological clerk of works (EcOW) will be appointed and will supervise all vegetation removal. › All vegetation removal will be undertaken in line with the Wildlife Act (1976). › Entire trees will only be removed where absolutely necessary, with pruning to be considered first (i.e. for oversails) › In the event where trees or shrubs are removed, they will be replanted using native species once construction works have been complete.
Residual Effect following Mitigation	Following the mitigation measures above, there will be no significant effect on the Treelines, Hedgerows, or Mixed broadleaved Woodland as a result of the Proposed Project.

6.5.2.5 Impacts on Fauna During Construction

The Proposed Project has the potential to result in habitat loss and disturbance impacts on faunal species included as KERs, see Table 6-10. Therefore, these species were taken forward for further assessment. The following species have been brought forward for further assessment:

- Bats
- Otter
- Badger
- Pine marten
- Red Squirrel

As no instream works are proposed as part of the Proposed Project, the potential for significant effects on sensitive aquatic species, with the of exception of otter, is restricted to indirect effects on their habitat resulting from water pollution. This has been assessed in Table 6-12 in Section 6.5.2.3 above and is not repeated below.

6.5.2.5.1 *Assessment of Potential Effects on Bats during Construction*

The impact assessment in relation to bats has been undertaken in accordance with NatureScot Guidance[9]. As per the NatureScot Guidance, wind farms present four potential risks to bats:

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

[9] *NatureScot published Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation. Version: August 2021 (NatureScot, 2021).*

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. Potential risk of collision, barotrauma and other injuries relate to the operational phase and are presented in Section 6.5.3.2.1.

Table 6-14 Impacts of construction phase on bats

Description of Effect	**Loss or Damage to Commuting and Foraging Habitat** In the absence of appropriate design and mitigation, the loss or degradation of commuting and foraging habitat has the potential to reduce feeding opportunities and/or result in displacement of local bat populations. The Proposed Wind Farm site is predominantly composed of commercial conifer plantation and wet grassland habitats, with smaller areas of wet heath occurring as a mosaic with lowland blanket bog and cutover bog habitats. Baseline habitat appraisal and activity surveys demonstrated that the commercial conifer plantation and wet grassland habitats generally provide *Low* suitability for bat commuting and foraging, reflecting their limited structural complexity and insect productivity. *Moderate* suitability is largely confined to plantation edges and corridors, which provide shelter and navigational structure within the wider forestry landscape. Overall bat activity levels recorded across the site were low and considered representative of a commercial forestry landscape. The Proposed Project will result in the permanent removal of approximately 21 hectares of commercial forestry within the wind farm infrastructure footprint, with an additional 0.79 hectares temporarily felled to facilitate construction compounds and subsequently replanted following completion of the construction phase. A further 56.3 hectares of forestry will be permanently felled as part of the Hen Harrier Enhancement Plan in Appendix 7-8. As the forestry is managed as a commercial crop, this felling would be expected to occur over the plantation lifecycle irrespective of the Proposed Project. TDR accommodation works are minor and confined to areas of *Low* bat habitat suitability, with no high-value commuting or foraging habitats affected. Similarly, the grid connection works will not result in the loss or degradation of bat commuting or foraging habitat.
	Loss of, or Damage to, Roosts The Proposed Wind Farm is located within a landscape that provides limited opportunities for bat roosting, with potential roost features largely confined to a small number of built structures. Commercial conifer trees within the site do not provide suitable roosting habitat due to their species composition, structure and management regime. Three structures within the Proposed Wind Farm were assessed for bat roosting suitability. Two were assessed as offering *Low* roosting potential and one was assessed as offering *Moderate* roosting potential. Emergence surveys confirmed use of all three structures by small numbers of soprano pipistrelle. All structures will be retained and avoided as part of the Proposed Project, and no loss or disturbance of roosts is anticipated. Each broadleaved tree scheduled for felling was systematically were inspected for potential roost features and were assessed as having no (*None*) roosting potential. No loss of tree roosting habitat will occur. A known lesser horseshoe bat roost occurs in the vicinity of the existing Moneypoint substation along the Proposed Grid Connection route. Proposed works in this area are confined to disturbed verge and trackside vegetation within the defined working corridor and are located more than 60m from the known roost, with no works to the buildings or associated woodland. As such, no loss, damage or disturbance of the lesser horseshoe bat roost is anticipated. Along the remainder of the grid connection route, a small number of bridges and culverts were assessed as offering *Low* to *Moderate* roosting potential; however, no evidence of bat

	roosting was recorded, and works will be undertaken using horizontal directional drilling (HDD) with appropriate setbacks and no alteration to these structures. Temporary turbine delivery accommodation works will not affect any roosting features, as no bat roosts or potential roosting features were identified within the works areas. No bat roosts, including the known lesser horseshoe bat roost, will be lost, damaged or disturbed as a result of the Proposed Project, and no significant effects on bat roosting habitat are anticipated.
	Disturbance/Displacement of Individuals or Populations The Proposed Wind Farm is located within a landscape dominated by commercial conifer plantation, wet grassland, wet heath and peatland habitats. These habitats generally provide low suitability for bat roosting, commuting and foraging, and baseline surveys recorded low bat activity levels overall, consistent with a commercial forestry landscape. Confirmed bat roosts within the Proposed Wind Farm will be retained and avoided, and no works are proposed that would result in the loss, damage or disturbance of roosting habitat. Along the Proposed Grid Connection route, a known lesser horseshoe bat roost occurs in the vicinity of the existing Moneypoint substation. Works in this area are confined to disturbed verge and trackside vegetation within the defined working corridor and are located more than 60m from the known roost, with no works to the roost structure or associated broadleaved woodland. Construction activities associated with the Proposed Project, including grid connection works undertaken using horizontal directional drilling (HDD), are localised and temporary in nature and will not result in the fragmentation of bat habitat or a reduction in habitat availability. Given the relatively low baseline activity levels, the avoidance of confirmed roosts, and the spatial separation from the known lesser horseshoe bat roost, no displacement of individual bats or local bat populations is anticipated.
Assessment of Significance prior to mitigation	**Loss or Damage to Commuting and Foraging Habitat** Given that the majority of the development footprint is located within habitats of Low suitability for bat commuting and foraging, that no high-value bat habitats will be lost, and that large areas of the site will remain undisturbed, no significant effects on bat commuting or foraging habitat are predicted as a result of the Proposed Project. Furthermore, within the proposed Hen Harrier Enhancement Lands, the felling of commercial conifer plantation will be followed by habitat enhancement through natural regeneration and targeted management, resulting in increased structural diversity and a more open habitat mosaic. While designed primarily for hen harrier conservation, these measures are expected to provide neutral to minor beneficial effects for bats, through the creation of additional edge habitat, increased insect availability and improved foraging opportunities at a local scale.
	Loss of, or Damage to, Roosts No potential for significant effect with regard to the loss of, or damage to, roosting habitat as a result of the Proposed Project is anticipated. No mitigation is required.
	Disturbance/Displacement of Individuals or Populations No potential for significant effect with regard to the disturbance/displacement of bats as a result of the Proposed Project is anticipated. No mitigation is required.
Mitigation	**Loss or Damage to Commuting and Foraging Habitat**

	No mitigation required. However, taking a precautionary approach, standard best practice measures, as detailed in Section 6 of the Bat Survey Report, will be implemented during construction.
	Loss of, or Damage to, Roosts No mitigation required.
	Disturbance/Displacement of Individuals or Populations No mitigation required. However, taking a precautionary approach, standard best practice measures, as detailed in Section 6 of the Bat Survey Report, will be implemented during construction.
Residual Effect following Mitigation	Taking into consideration the sensitive design of the Proposed Project and the proposed best practice measures, as detailed in Section 6 of the Bat Survey Report, significant residual effects on bats as a result of loss or damage to commuting and foraging habitat, loss of, or damage to, roosts, displacement of individuals or populations, and disturbance, are not anticipated.

6.5.2.5.2 Assessment of Potential Effects on Otter during Construction

Table 6-15 Impacts of the construction phase on otter

Description of Effect	The Proposed Project has been designed to minimise impacts on the receiving environment and maximises the use of existing access roads at the site. Consequently, the Proposed Project footprint is predominantly located in areas of modified habitats, associated with the existing access road and Conifer plantation (WD4). Regards the proposed TDR, no accommodation works are proposed in proximity to any watercourses and therefore, there is no potential for any effect on otter. Proposed Wind Farm site and HHEL No indication of otter was recorded within the Proposed Wind Farm site, including the TDR and HHELs, during any of the surveys undertaken. The watercourses within the Proposed Wind Farm site are typically first order streams and present limited supporting habitat for otter due to low fisheries potential. Whilst there is the requirement for the creation of 2 no. watercourse crossings and the upgrade of one existing watercourse crossing along proposed access roads, as well as a number of forestry drains/ditches with connectivity to the watercourses, these are small streams and only provide marginal commuting habitat for otter and there is no requirement for instream works. **Habitat Loss/Fragmentation** Given the proposed works and the findings of the baseline surveys for otter within the Proposed Wind Farm site, no significant habitat destruction and no loss of breeding or resting habitat for this species is anticipated. **Disturbance, Mortality** In relation to disturbance and direct mortality related impacts, no significant commuting, foraging, or breeding habitat for otter was recorded within the Proposed Wind Farm site. Additionally, otters are predominantly crepuscular in nature, and it is anticipated that construction activity associated with the Proposed Project will be confined to daytime hours, thus minimising potential disturbance related impacts to the species. Any disturbance impacts would be short-term in nature (overall project construction is expected to last 12 months) and not considered to have a significant impact on the local otter population. No further assessment is required. **Habitat Degradation (impacts on water quality)** Taking a precautionary approach, it is assumed that otter may occur within and near the Proposed Wind Farm site on occasion, particularly the lower reaches of the main watercourses downstream. There is potential for construction works to result in the run-off of silt and other pollutants such as hydrocarbons and cementitious material into watercourses downstream of the Proposed Wind Farm site. This represents a potential indirect effect on otter in the form of habitat degradation/loss of prey resource through water pollution. The potential for significant impacts on water quality as a result of the Proposed Project is fully considered above in Table 6-12. Proposed Grid Connection route The Proposed Grid Connection route crosses 24 no. mapped watercourses. Targeted otter surveys were carried at each watercourse crossing, the details of which are provided in the Aquatic Report in **Appendix 6-3**. No indication of breeding otter was recorded at any watercourse crossing location, but spraint was recorded at four locations, on the Creegh River, Lissyneillan River and the

	Annageeragh River, indicating this species was using these watercourses for foraging and commuting. **Habitat Loss** Given the findings of the baseline surveys for otter along the Proposed Grid Connection route, no direct habitat destruction and no loss of potential breeding or resting places for this species are anticipated. No further assessment is required. **Disturbance, Mortality** In relation to disturbance and direct mortality impacts, no breeding habitat for otter was recorded along the Proposed Grid Connection route. Additionally, otters are predominantly crepuscular in nature, and it is anticipated that construction activity associated with the Proposed Project will be confined to daytime hours, thus minimising potential disturbance related impacts to the species. Any disturbance impacts as a result of HDD works would be short-term in nature and not considered to have a significant impact on the local otter population. However, given otter is a mobile species which could establish holts between planning being granted (if approved) and works commencing, taking a precautionary approach, should a breeding site establish within or in close proximity to the Proposed Grid Connection route, there is potential for significant effects on otter, as a result of disturbance/ direct mortality. **Habitat Degradation (impacts on water quality)** As otter are known to be utilising habitats at watercourse crossings along the Proposed Grid Connection route, there is potential for significant effects on this receptor as a result of construction works via the run-off of silt and other pollutants such as hydrocarbons and cementitious material. This represents a potential indirect effect on otter in the form of habitat degradation/loss of prey resource through water pollution. The potential for significant impacts on water quality as a result of the Proposed Project is fully considered above in Table 6-12.
Assessment of Significance prior to mitigation	**Habitat Loss** Significant effects regarding habitat loss are not currently anticipated as a result of the Proposed Project. **Disturbance, Mortality** Significant effects regarding disturbance and/or mortality are not anticipated as a result of the Proposed Project. However, should a breeding site for otter establish within or in close proximity to the construction footprint, there is potential for significant effects on otter, as a result of disturbance/ direct mortality. **Habitat Degradation (impacts on water quality)** Otter are known to occur downstream of the Site, particularly downstream of the Proposed Grid Connection route. As there is a potential for deterioration to water quality, as a result of the construction phase of the Proposed Project, there is a potential for significant effects on otter, assessed as Local Importance (higher value) to International Importance, via deterioration of supporting habitat.

Mitigation	**Habitat Loss** A pre-construction survey for otter will be carried out to identify the presence of any new breeding sites. **Disturbance, Mortality** No significant effects are anticipated. However, taking a precautionary approach, and due to the time that can elapse between the original surveys, any future planning consent and construction, a pre-construction otter survey will be carried out by a qualified ecologist to identify the presence of any breeding sites along the Proposed Grid Connection route, that may have been established in the intervening period. Watercourses within the Proposed Wind Farm site and HHELs are small first order streams, and are unlikely to support breeding sites for otter. The requirement for a pre-construction survey is fully in line with industry best practice. Any holts identified within 50m of proposed infrastructure will subsequently be monitored for a minimum period of 2 weeks using remote cameras in order to ascertain use by otter and levels of activity. If an active otter holt is identified and works can be undertaken safely then an exclusion zone will be set up around the holt as follows: › Exclusion zone fencing and appropriate signage will be put in place between working areas and otter holt exclusion zones to ensure that there will be no encroachment of the breeding site exclusion zones by construction activities. If a newly established and active holt was identified within an area where works could not avoid direct impacts on the holt, the holt would likely need to be excluded, with the provision of a derogation licence from NPWS, prior to works commencing. This would involve the erection of one-way fencing, only allowing egress from the holt and will be undertaken in line with current guidelines by an appropriately qualified ecologist in advance of construction works commencing. Currently based on the finding of the surveys and current information regarding the Site, no derogation licence is required for this application, as no breeding sites have been recorded in close proximity to the Site. However, should the pre-commencement surveys identify a new breeding site and exclusion is required, a derogation licence will be in place from the NPWS. **Habitat Degradation (impacts on water quality)** The potential for deterioration of water quality, and degradation of otter habitat, has been considered in Table 6-12 above, which assesses the potential for significant impacts on aquatic receptors, and provides mitigations to prevent any such effects.
Residual Effect following Mitigation	Following the incorporation of the mitigation measures described above, no significant negative effects to otter are anticipated at any geographic scale.

6.5.2.5.3 Assessment of Potential Effects on Badger during Construction

Table 6-16 Impacts of the construction phase on badger

Description of Effect	**Habitat Loss/Fragmentation** Given the nature of the Proposed Project, there will be some minimal loss of suitable badger foraging habitat i.e., Conifer plantation (WD4) associated with the footprint of the Proposed Wind Farm infrastructure and the hen harrier enhancements. However, this habitat loss will not be significant in the context of the widespread alternative foraging habitat available within the site and the wider area surrounding the site. There will be no significant loss/fragmentation of badger habitat as a result of the Proposed Project. **Disturbance/Mortality** No badger setts were identified during the ecological surveys undertaken of the Site, however, signs of badger activity within the site (latrines, snuffle holes, prints) in close proximity to the Proposed Wind Farm infrastructure were identified. Noise and earth works during construction have the potential to disturb badgers occupying setts in close proximity to Proposed Wind Farm infrastructure during construction. Badger tunnel systems can extend some distance from sett entrances (over 20m in some cases[10]) and therefore any excavation by heavy machinery in close proximity to sett entrances risks causing damage to setts and/or direct harm to badgers in the absence of mitigation. In the event that a new badger sett is established within or near the footprint of the Proposed Wind Farm during the interim (i.e. between baseline ecological surveys and commencement of construction), there is potential for disturbance/mortality to badger using the setts as a result of noise and/or tunnel or sett collapse during construction.
Assessment of Significance prior to mitigation	**Habitat Loss/Fragmentation** No significant overall loss or fragmentation of badger foraging habitat is anticipated at any geographic scale. **Disturbance/Mortality** Whilst no badger setts were recorded within the Site, baseline surveys identified that the Proposed Wind Farm site is being utilised by a local badger population. Any potential for physical damage or significant disturbance of occupied setts (if established prior to construction) will be considered significant at the local geographic scale in the absence of mitigation.
Mitigation	**Habitat Loss/Fragmentation** No specific mitigation is required for habitat loss. **Disturbance/Mortality** Due to time that can elapse between the original surveys, any future planning consent and construction, a pre-construction badger survey will be carried out to identify the presence of any setts that may have been established in the intervening period. The requirement for a pre-construction survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice. Any setts identified within 50m of the Proposed Wind Farm infrastructure will subsequently be monitored for a minimum period of 2 weeks using remote cameras in order to ascertain use by badgers and levels of activity. If an active badger sett is identified and works can be undertaken safely (as to avoid sett collapse) then an exclusion zone will be set up around the sett as follows:

[10] *TII (2006) Guidelines for the treatment of badgers prior to the construction of National Road Schemes.*

	› Exclusion zone fencing and appropriate signage will be put in place between working areas and badger sett exclusion zones to ensure that there will be no encroachment of the badger sett exclusion zones by construction activities. If a newly established and active sett was identified within an area where works could not avoid direct impacts on the sett, then the sett would likely need to be excluded prior to works commencing. This would need to be undertaken in line with current guidelines by an appropriately qualified ecologist in advance of construction works commencing and in consultation with NPWS.
Residual Effect following Mitigation	Following the incorporation of the mitigation measures described above, no significant negative effects to badger is anticipated at any geographic scale.

6.5.2.5.4 *Assessment of Potential Effects on Red squirrel/Pine marten during Construction*

Table 6-17 Impacts of the construction phase on Red squirrel/Pine marten

Description of Effect	**Habitat Loss/Fragmentation** Red squirrel and pine marten are known to occur within the Site. Conifer plantation (WD4) within the wind farm site and HHELs provides suitable foraging and breeding habitat for both species. Approximately 233 ha of Conifer plantation (WD4) was recorded within the Site. The Proposed Project will result in the loss of Conifer plantation (WD4), within the Proposed Wind Farm site and the HHELs. This habitat loss will not be significant in the context of the widespread alternative foraging/breeding habitat available within the site and the wider area surrounding the site. There will be no significant fragmentation of red squirrel or pine marten habitat as a result of the Proposed Project. **Disturbance, Mortality** The Proposed Wind Farm site provides suitable foraging and breeding habitat for both species. No breeding sites (e.g. dreys, dens) were identified for either species during the ecological surveys undertaken of the Proposed Wind Farm site, however, there is a potential for breeding sites to be created during the interim between baseline ecological surveying and commencement of construction. Tree felling works associated with the Proposed Wind Farm have the potential to disturb or destroy occupied dreys and or dens during construction. Both species would be a particularly vulnerable to the risk of mortality when young are to be found within breeding sites (spring/summer period). In the event that new breeding sites were established within or near the clear-felling footprint there is potential for disturbance/mortality to red squirrel or pine martin through destruction of breeding sites during construction.
Assessment of Significance prior to mitigation	**Habitat Loss/Fragmentation** No significant overall loss or fragmentation of red squirrel or pine marten habitat is anticipated at any geographic scale. **Disturbance/Mortality** Whilst no breeding sites for these species were recorded within the Proposed Wind Farm site baseline surveys identified that the Proposed Wind Farm site is being utilised by a local red squirrel and pine marten population. Any potential for physical damage or significant

	disturbance of occupied breeding sites (if established prior to construction) for these species has been identified as significant at the local geographic scale in the absence of mitigation.
Mitigation	**Habitat Loss/Fragmentation** No specific mitigation is required for habitat loss. **Disturbance/Mortality** Due to time that can elapse between the original surveys, any future planning consent and construction, a pre-construction survey for pine marten/red squirrel will be carried out to identify the presence of any new breeding sites. These surveys will focus on areas of Conifer plantation (WD4) to be felled and all suitable habitat within 50m of the felling blocks. Any potential breeding sites should be monitored to ascertain if they are active breeding sites. Surveys will be undertaken in line with Nature Scot[11] and TII[12] guidelines. Should active dreys/dens be identified within the blocks to be felled, the following mitigations and best practice procedures will be followed to ensure that no breeding site for either red squirrel or pine marten are impacted: › Felling works to be undertaken in October–January inclusive, this will avoid the main breeding season (February-September) when vulnerable young are most likely to be found within breeding sites for both species. › Any breeding sites identified within the 50m buffer that wouldn't be directly affected by felling works, but are vulnerable to disturbance related impacts, will be clearly marked out with an exclusion zone, and works/access through these areas will be avoided. › Plant machinery will be turned off when not in use. › Operating machinery will be restricted to the Proposed Project works site area (and outside any exclusion zone)
Residual Effect following Mitigation	Following the incorporation of the mitigation and enhancement measures described above, no significant negative effects to pine marten and red squirrel is anticipated at any geographic scale.

[11] https://www.nature.scot/sites/default/files/2018-09/Species%20Planning%20Advice%20-%20red%20squirrel.pdf
[12] *TII guidance (TII, 2008, Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. Dublin: National Roads Authority).*

6.5.3 Assessment of Significant Effects During Operational Phase

6.5.3.1 Effects on Habitats during Operation

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

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

6.5.3.1.1 *Assessment of Potential Effects on Groundwater, Surface Watercourses and Sensitive Aquatic Faunal Species During Operation*

Table 6-18 Assessment of potential impacts on rivers, streams and sensitive aquatic faunal species during operation.

Description of Effect	This section assesses the potential for significant effects on aquatic receptors including aquatic habitats (i.e. watercourses), salmonids, otter, lamprey, coarse fish, white-clawed crayfish, European eel, aquatic invertebrates, molluscs (including Freshwater Pearl Mussel) and other aquatic species during the operation of the Proposed Project. The Proposed Project has been designed to minimise impacts on the receiving environment and maximises the use of existing access roads at the site. Consequently, the Proposed Wind Farm footprint is predominantly located in areas of modified habitats, associated with the existing access road and Conifer plantation (WD4). The relatively small-scale increase in the amount of hard standing associated with the proposed infrastructure has the potential to result in faster water runoff from the Proposed Wind Farm site to the surrounding watercourses. This may have the indirect effect of causing erosion, which could lead to deterioration of surface water and supporting habitat quality as a result of sedimentation. Additionally, there is the potential for the faster run off of any pollutants that may be associated with the operation of the Proposed Project, including hydrocarbons associated with the operational maintenance, potentially impacting on supporting aquatic faunal habitats. The impacts on water quality during operation are fully described in Chapter 9 (Hydrology & Hydrogeology) of this EIAR and are discussed here specifically in relation to biodiversity.
Assessment of Significance prior to mitigation	Given the minor increase in hardstanding as a result of the Proposed Project, significant effects on water quality are not anticipated at any geographic scale during the operation of the Proposed Project. Whilst no significant effects on water quality are anticipated, potential for effects on water quality associated with the operational phase drainage of the Proposed Wind Farm has been fully mitigated through appropriate design and mitigation as fully described in Section 9.5.3 of Chapter 9 (Hydrology & Hydrogeology).
Mitigation	Chapter 9 (Hydrology and hydrogeology) of the EIAR assess the potential for significant effects on water quality as a result of the following pathways during operation: › Potential Effects from the Replacement of Natural Surface with Low Permeability Surfaces › Potential Effects from Runoff › Potential Effects on WFD Status

	The effects on water quality are fully described in Chapter 9 (Hydrology and Hydrogeology) and are described here in relation specifically to ecology. This section assesses the potential for significant effects on surface/ groundwater and associated aquatic faunal species during operation, including, lamprey, white-clawed crayfish, freshwater pearl mussel, European eel, salmonids, coarse fish, otter, and other aquatic species identified during the desk study and dedicated aquatic surveys and likely to occur within or downstream of the site. The operational phase drainage system of the Proposed Project will be installed and constructed in conjunction with the road and hardstanding construction work as described in Section 9.5.3 of Chapter 9 and as shown on the drainage drawings (Appendix 4-7) submitted with this planning application. With regards potential impacts on water quality, and thus aquatic receptors, as a result of the runoff during operations, the mitigations provided in Sections 9.5.2.2 and 9.5.3.1 of Chapter 9 will ensure all surface water runoff from upgraded roads and new road surfaces (including hardstand and turbine base areas) will be captured and treated prior to discharge/release. Settlement ponds, checks dams and buffered outfalls will prevent roads acting as preferential flowpaths by providing attenuation and water quality treatment.
Residual Effect following Mitigation	Following the successful implementation of the mitigation measures outlined above, no potential for significant effect on water quality or aquatic receptors has been identified at any geographic scale, as a result of the operation of Proposed Project.

6.5.3.2 Effects on Fauna during Operation

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

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

Operational lighting will be confined to the site of the proposed substation. Lighting will be minimal and will include a security spotlight on a timer. Given the proposed minimal lighting, no significant disturbance effects as a result of lighting on any faunal species is anticipated.

It should be noted that no significant habitat for salmonids, lamprey, freshwater pearl mussel, European eel, or other aquatic species was recorded within the footprint of the Proposed Project and all new major infrastructure such as turbine bases are located over 50 metres from the watercourses within the Proposed Wind Farm site. The potential for significant effects on aquatic species is restricted to indirect effects on their habitat resulting from water pollution. This has been assessed in Section 6.6.3.1.1 and is not repeated below.

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

6.5.3.2.1 *Assessment of Potential Effects on bats during Operation*

Table 6-19 Impacts of construction phase on bats

Description of Effect	The Proposed Project has been designed to minimise impacts on the receiving environment and maximises the use of existing infrastructure at the Site including internal access tracks. The Proposed Project footprint is dominated by modified habitats associated with the existing infrastructure and conifer plantation. A full impact assessment for bats is provided in the Bat Survey Report in **Appendix 6-2** and is summarised below. As per SNH Guidance, wind farms present four potential risks to bats: › Collision mortality, barotrauma and other injuries; › Loss or damage to commuting and foraging habitat; › Loss of, or damage to, roosts; › Displacement of individuals or populations. No significant effects in relation to 1) Loss or damage to commuting and foraging habitat; 2) Loss of, or damage to, roosts; and 3) Displacement of individuals or populations is anticipated as a result of the operation of the Proposed Project, as per Section 6.5.2.5.1. **Collision mortality, barotrauma, and other injuries** Low-risk species recorded within the Site included *Myotis* species, brown long eared bat, and lesser horseshoe bat. As per SNH guidance. these species are not identified as being particularly vulnerable to collision mortality. Given the low levels of activity recorded, no significant effects are anticipated. The following high-risk species were recorded during the dedicated surveys:

	• Leisler's bat, • Common pipistrelle, • Soprano pipistrelle, Site-level collision risk for high collision risk bat species was assessed as *Low* under typical conditions, increasing to *Medium* during periods of peak activity. Overall bat activity levels were considered representative of the habitat composition at the Proposed Wind Farm, which is dominated by commercial conifer plantation, with widespread areas of wet grassland and smaller areas of wet heath occurring as a mosaic with lowland blanket bog and cutover bog habitats. Both static detector data and manual transect surveys indicated activity levels typical of a commercial forestry landscape, with moderate suitability for commuting and foraging largely limited to conifer plantation corridors.
Assessment of Significance prior to mitigation	A potential for long-term negative effects was identified for bats due to the ***Low*** to ***Medium*** collision risk of high-risk bat species. The potential unmitigated effects on these high-risk species as a result of their potential interaction with wind turbines are considered significant at a local geographic scale only, for both peak and typical activity levels. No significant effects are anticipated at any other geographic scale.
Mitigation	In order to reduce the value of the habitat for high-risk bat species in the areas surrounding the turbines, a felling buffer of at least 50m between the tip of the blade and any trees or other tall vegetation that could provide high quality foraging habitat for bat species will be implemented. Detailed mitigation measures in relation to bats is provided in Section 6 of the Bat Survey Report in **Appendix 6-2** and summarised below. Mitigation measures are proposed together with post-construction monitoring: • Introduce felling buffers around turbines • Implement blade feathering as a standard • Lighting restrictions • Implement curtailment, as required, on proposed turbines if significant bat fatalities encountered recorded. • A minimum of three years operational monitoring, including carcass searches, to assess changes in bat activity patterns post construction and to monitor the implementation of the mitigation strategy. • Adaptive mitigation strategy based on the results of the post-construction monitoring. A bat monitoring and mitigation strategy has been devised in line with Appendix 5 of NatureScot (2021). Should Year 1 post-construction monitoring identify significant bat fatalities, a curtailment protocol will be implemented. This would be tailored to site-specific seasonal and species-specific patterns and may include curtailment based on wind speed thresholds, weather-based triggers, and increased buffer zones as required. Regards low risk bat species, no significant effects during operation are anticipated, but activity levels for these species will continue to be assessed during operational monitoring following the implementation of best practice mitigations provided in Section 6.1 of the Bat Survey Report. Further mitigation will be implemented after Year 1 if deemed necessary.
Residual Effect following Mitigation	Taking into account the overall low bat activity levels within the Site, the sensitive design of the Proposed Project and the implementation of best practice mitigation and adaptive post-construction monitoring measures, no significant residual effects on bats are anticipated with regard to collision mortality, barotrauma and other injuries.

6.5.4 Impacts During Decommissioning

The proposed turbines are expected to have a lifespan of approximately 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 Proposed Project may be decommissioned fully.

Decommissioning of the Proposed Project is discussed in Section 4.6 of Chapter 4 (Description of the Proposed Project) and is fully detailed in the Decommissioning Plan in Appendix 4-6.

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

6.5.5 Impacts on Designated Sites

6.5.5.1 Impacts on European Sites

The Site is located completely outside of the boundary of any European site. Watercourses within the Site have a direct hydrological link to the below listed European Sites, upon which a potential for likely significant effect was identified:

- Lower River Shannon SAC [002165],
- Carrowmore Dunes SAC [002250],
- Carrowmore Point to Spanish Point and Islands SAC [001021],
- River Shannon and River Fergus Estuaries SPA [004077], and
- Mid-Clare Coast SPA [004182].

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

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

The Stage 1 Screening Assessment concluded as follows:

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

- *Lower River Shannon SAC [002165],*
- *Carrowmore Dunes SAC [002250],*
- *Carrowmore Point to Spanish Point and Islands SAC [001021],*
- *River Shannon and River Fergus Estuaries SPA [004077], and*
- *Mid-Clare Coast SPA [004182].*

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

The findings presented in the NIS are that:

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

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

6.5.5.2 Impacts on Nationally Designated Sites

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

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

- Cragnashingaun Bogs NHA [002400]
- St. Senan's Lough pNHA [001025]
- Carrowmore Point to Spanish Point and Islands [001021]
- White Strand / Carrowmore Marsh [001007]
- Poulnasherry Bay pNHA [000065]

With the implementation of the mitigations and best practice procedures for the construction, operational and decommissioning phases of the Proposed Project , as described in Table 6-12 and 6-18, respectively, which aim to negate potential impacts from deterioration of surface water quality, as well as those in Chapter 9 (Hydrology & Hydrogeology) and in the CEMP (Appendix 4-5), no significant impacts on these National Sites are anticipated.

6.6 Cumulative Impact Assessment

The Proposed Project was considered in combination with other plans and projects in the area that could result in cumulative impacts on the Key Ecological Receptors (KERs) identified in Table 6-10 of this report, including European and Nationally Designated Sites. This included a review of online Planning Registers and served to identify past, present and future plans and projects, their activities and their predicted environmental effects. The projects considered are listed in Appendix 2-2 of Chapter 2 (Background to the Proposed Project) of this EIAR.

6.6.1 Assessment of Plans

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

- Clare County Development Plan 2023-2029
- Regional Spatial and Economic Strategy 2020 – 2032
- Ireland's 4th National Biodiversity Action Plan 2023-2030
- Clare County Biodiversity Action Plan 2025 - 2031

The review focused on policies and objectives that relate to 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 6-20.

Table 6-20 Review of Plans and Policies

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
Clare County Development Plan 2023-2029	**CDP 3.3** - It is an objective of the Clare County Council: To require compliance with the objectives and requirements of the Habitats Directive, specifically Article 6(3) and where necessary 6(4), Birds, Water Framework, and all other relevant EU Directives and all relevant transposing national legislation; To require project planning to be fully informed by ecological and environmental constraints at the earliest stage of project development and any necessary assessment to be undertaken, including assessments of disturbance to species, where required together with the preparation of both statutory and non-Statutory Ecological Impact Assessments (EcIA); To protect, manage and enhance ecological connectivity and improve the coherence of the Natura 2000 Network; To require all proposals to ensure there is 'no net loss' of biodiversity within developments. To ensure that European sites and Natural Heritage Areas (designated proposed NHAs) are appropriately protected; To require the preparation and assessment of all plans and projects to have regard to the information, data and requirements of the Appropriate Assessment Natura Impact Report, SEA Environmental Report and Strategic Flood Risk Assessment Report contained in Volume 10 of this Development Plan; and To require compliance with the objectives of the Water Framework Directive and support the implementation of the 3rd Cycle River Basin Management Plan (and any other iteration during the lifetime of the CDP). **CDP 11.26** - It is an objective of Clare County Council: To facilitate the implementation of the River Basin Management Plan 2022-2027 and any subsequent plan for ground, surface, estuarine, coastal and transitional waters in the Plan area as part of the implementation of the EU Water Framework Directive; To protect groundwater and surface water resources in accordance with the statutory requirements and specific measures as set out in the River Basin Management Plan 2022-2027, and any subsequent management plans; To achieve and maintain at least good water quality status for all water bodies except where more stringent obligations are required such as Blue Dot/High Status Objective Water Bodies; To consider development proposals where it can be clearly demonstrated that the development will meet the requirements of the River Basin Management Plan; and,	The Development Plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity, protected species and designated sites. The Proposed Project has been designed in order to avoid likely significant effect on biodiversity. Where the potential for significant effect on biodiversity has been identified, mitigation will be implemented as prescribed within this chapter to ensure that there is no significant impact. Where pathways for effects on Designated Sites have been identified, mitigation shall also be implemented to ensure that there are no significant effects. No potential for negative cumulative impacts when considered in conjunction with the Proposed Project were identified.

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	To work with and support LAWPRO and support improvements/recommendations within Priority Areas for Action, Blue Dot/High Status Objective catchments and any additional areas identified within subsequent River Basin Management Plans. **CDP 13.1**- It is an objective of the Clare County Council: To require proposals for development which may impact on a European site to undertake and submit a Natura Impact Statement and Environmental Impact Assessment Report should it be deemed necessary as part of any planning application in accordance with the requirements of the Habitats and EIA Directives. **CDP 15.1** - It is an objective of Clare County Council: To ensure that features of importance to local biodiversity are retained as part of developments and projects being undertaken in the County. **CDP 15.12** - It is an objective of Clare County Council: To protect and promote the sustainable management of the natural heritage, flora and fauna of the County both within protected areas and in the general landscape through the promotion of biodiversity, the conservation of natural habitats, the enhancement of new and existing habitats, and through the integration of Green Infrastructure (GI), Blue Infrastructure and ecosystem services including landscape, heritage, biodiversity and management of invasive and alien species into the Development Plan; To promote the conservation of biodiversity through the protection of sites of biodiversity importance and wildlife corridors, both within and between the designated sites and the wider Plan area; To ensure there is no net loss of potential Lesser Horseshoe Bat feeding habitats, treelines and hedgerows within 2.5km of known roosts; To implement and monitor the actions as set out in the Clare County Biodiversity Plan; and To promote biodiversity net gain in any new plans/projects/policies to promote development that leaves biodiversity in a better state than before. **CDP 15.13** - It is an objective of Clare County Council: To encourage and, where appropriate, enhance the provision of biodiversity features in urban areas through the preparation of local areas plans/settlement plans, green infrastructure strategies, ecosystem services, and through the development management process. **CDP 15.14** - It is an objective of Clare County Council:	

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	To ensure that development proposals support and enhance the connectivity and integrity of habitats in the Plan area by incorporating natural features into the design of development proposals. **CDP 15.15** - It is an objective of Clare County Council: To support the implementation of positive conservation management on lands which are owned or managed by Clare County Council. To protect and where possible enhance the biodiversity value of land owned and managed by Clare County Council; To support national policy to create new woodlands on public land and participate in the Creation of Woodlands on Public Lands Scheme and any subsequent schemes subject to the appropriate ecological assessments; To create new native woodlands on public lands which will be carried out in accordance with proper planning and sustainable development in order to ensure important habitats such as Wetlands (which are key carbon sequestration locations) are not lost due to their development; and To support the use of natural approaches to flood management and control on lands owned or managed by or on behalf of Clare County Council subject to the appropriate ecological assessments. **CDP 15.19** – It is an objective of the Clare County Council: To protect individual or groups of trees within the Plan area which are important for environmental, recreational, historical, biodiversity and/or aesthetic reasons or by reason of contribution to sense of place, including groups of trees which correspond with protected habitats, or which support protected species, under the Habitats Directive; To protect woodlands and hedgerows from damage and/or degradation and to prevent disruption of the connectivity of woodlands and hedgerows of the County;	

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
Regional Spatial and Economic Strategy 2020 – 2032	<u>Growth Ambition 2: Environment – Natural Region</u> **RPO 5.4** - Encourage the prioritisation of Site-Specific Conservation Objectives (SSCO) for all sites of Conservation Value, designated in EU Directive (i.e. SACs, SPAs) to integrate with the development objectives of this Strategy. **RPO 5.5** - Ensure efficient and sustainable use of all our natural resources, including inland waterways, peatlands, and forests in a manner which ensures a healthy society a clean environment and there is no net contribution to biodiversity loss arising from development supported in this strategy. Conserve and protect designated areas and natural heritage area. Conserve and protect European sites and their integrity. **RPO 5.6** - Develop awareness and create a greater appreciation of the benefits of our natural heritage, including on the health, wealth and well-being of the region's ecosystem services. **RPO 5.7** - Ensure that all plans, projects and activities requiring consent arising from the RSES are subject to the relevant environmental assessment requirements including SEA, EIA and AA as appropriate.	The strategy was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity, protected species and designated sites. The Proposed Project has been designed in order to avoid likely significant effect on biodiversity and designated sites. Where pathways for effects on Designated Sites have been identified, mitigation shall be implemented to ensure that there are no significant effects. No potential for negative cumulative impacts when considered in conjunction with the Proposed Project were identified.
Ireland's 4th National Biodiversity Action Plan 2023-2030	› **Objective 1: Adopt a Whole-of Government, Whole of-Society Approach to Biodiversity.** Proposed actions include capacity and resource reviews across Government; determining responsibilities for the expanding biodiversity agenda providing support for communities, citizen scientists and business; and mechanisms for the governance and review of this National Biodiversity Action Plan. › **Objective 2: Meet Urgent Conservation and Restoration Needs.** Supporting actions will build on existing conservation measures. Efforts to tackle Invasive Alien Species will be elevated. The protected area network will be expanded to include the Marine Protected Areas. The ambition of the EU Biodiversity Strategy will be considered as part of an evolving work programme across Government. › **Objective 3: Secure Nature's Contribution to People.** Actions highlight the relationship between nature and people in Ireland. These include recognising the tangible and intangible values of biodiversity, promoting nature's importance to our culture and heritage and recognising how biodiversity supports our society and our economy. › **Objective 4: Enhance the Evidence Base for Action on Biodiversity.** This objective focuses on biodiversity research needs, as well as the development and strengthening of long-term monitoring programmes that will underpin and strengthen future decision-making. Action will also focus on collaboration to advance ecosystem accounting that will contribute towards natural capital accounts.	The action plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to biodiversity, protected species and designated sites. The Proposed Project has been designed in order to avoid likely significant effect on biodiversity. Where the potential for adverse effect on biodiversity has been identified, mitigation will be implemented as prescribed within this chapter to ensure that there is no significant impact. Where pathways for effects on Designated

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	Objective 5: Strengthen Ireland's Contribution to International Biodiversity Initiatives. Collaboration with other countries and across the island of Ireland will play a key role in the realisation of this Objective. Ireland will strengthen its contribution to international biodiversity initiatives and international governance processes, such as the United Nations Convention on Biological Diversity.	Sites have been identified, mitigation shall also be implemented to ensure that there are no significant effects. No potential for negative cumulative impacts when considered in conjunction with the Proposed Project were identified.
Clare County Biodiversity Action Plan 2025-2031	The plan has been drafted with a focus on five key pillars, each with a particular objective, which are highlighted below. **Pillar 1:** Developing and Researching the County's Ecological Network **Objective:** Support and strengthen our database to conserve, manage and enhance biodiversity within the county through data collection, mapping and research. **Pillar 2:** Integrating Biodiversity into Our Work Practices **Objective:** Promote and integrate biodiversity conservation into decision-making processes and operations through policy, best practice and procedures. **Pillar 3:** Restoring, Enhancing and Conserving our Biodiversity Assets **Objective:** Deliver actions which aim to conserve, restore and enhance biodiversity and to reverse biodiversity loss at a county-wide level by 2031. **Pillar 4**: Raising Biodiversity Awareness and Education for Present and Future Generations **Objective:** Raise awareness and appreciation of biodiversity within the county through education, training and outreach initiatives. **Pillar 5:** Building Collaborative Partnerships for Nature **Objective:** Enhance collaboration among all people adopting a whole-of-society approach to protect, conserve and enhance biodiversity within the county.	The Proposed Project will not result in significant effects on habitats and features of ecological importance. The Proposed Project will not impact on connectivity within the wider area and there is no potential for significant effects on water quality. There will be no significant effects on biodiversity as a result of the Proposed Project.

6.6.2 Assessment of Projects

As described in Section 2.9 of the EIAR, relevant projects have been assessed cumulatively with the Proposed Project and include planning applications in the vicinity of the site, within the likely zone of influence of all habitats and species considered in this report and include other wind energy applications within the wider area. These have not been repeated here to reduce the duplication of information within this EIAR. However, they have been fully considered in the assessment with further detail provided below. In addition, Section 6.6.6 concludes on their potential for impact on biodiversity.

Table 6-21 provides the cumulative study areas for individual EIAR topics that are also relevant in relation to ecological receptors i.e., hydrological connectivity is important for assessing potential for effects on designated sites. Potential for cumulative effects in relation to birds is assessed separately within Chapter 7 (Birds) of this EIAR.

Table 6-21 Cumulative Study Areas in relation to ecological receptors (birds are assessed separately within Chapter 7 of this EIAR)

Individual Topic	Maximum Extent	Justification
Biodiversity (including Bats)	10 km from the Proposed Wind Farm site 250m from Proposed Grid Connection Route. Consideration for the Biodiversity cumulative extent is also given to the Birds and Water Cumulative geographical boundaries.	Using the precautionary approach and given the nature and scale of the Proposed Project, the geographical boundary for terrestrial ecological aspects, i.e. habitats and species, is 10km for cumulative assessment for the Proposed Wind Farm, and 250 m from the Proposed Grid Connection route. In particular, this approach aligns with Nature Scot (2021) guidance: Bats and Onshore Wind Turbines.
Water	**Proposed Wind Farm:** Annageeragh_SC_010 and KiltumperStream_SC_010 sub-catchment for large infrastructural developments such as wind farms, energy and public transport developments. River Sub Basins for all smaller proposed, permitted or existing plans or projects (i.e. private and commercial type developments). **Proposed Grid Connection Route:** Within a 250m buffer zone of the Proposed Grid Connection Route.	Regional surface water catchments are used for cumulative impact assessment with regard large infrastructural developments such as wind farms, energy and public transport developments. The potential for cumulative effects for these developments likely exists on a regional catchment scale (i.e. significant works likely existing in several sub-basins). Therefore, other wind-farm developments are considered within the Annageeragh and Kiltumper Stream sub-catchments for cumulative effects. River Sub Basins are used for smaller developments (i.e. private & commercial type developments). These developments are not likely to present a significant cumulative impact risk on a regional catchment scale as any effects would likely be imperceptible as a result of the setback distances and localised nature of the associated works. Given the nature and scale of the proposed works and the lack of hydrological cumulative impact potential beyond the river sub basin scale, the Water cumulative study area is defined by river sub

		basins in which the Proposed Wind Farm is located. Due to the narrow nature of the Proposed Grid Connection route trench (~0.6m wide), a 250m buffer zone is an appropriate scale when considering potential cumulative effects on the water environment.

6.6.2.1 Other Wind Farm Projects

For the purposes of this cumulative assessment, wind farms within a 10-kilometre radius of the Site were considered in further detail below, in line with NatureScot (2021) guidance. Details of wind farm projects within 10km of the Proposed Project are provided in Appendix 2-2 of this EIAR and are summarised below also in the context of terrestrial ecology. Nine wind farms were identified as being within the cumulative study boundary as outline in Table 6-22 below. Potential for in-combination effects in relation to European sites are fully assessed in Section 8 of the NIS accompanying this application.

Table 6-22 Wind farm projects considered to be within the cumulative study area (Biodiversity) of the Proposed Project

Wind Farm	Planning Status	Number of Turbines	Separation Distance (turbine to turbine)	County
Booltiagh I Wind Farm	Existing	12	c.6.1 km	Co. Clare
Booltiagh Extension	Existing	6	c.6.3 km	Co. Clare
Cahermurphy	Existing	4	0 km	Co. Clare
Crossmore	Existing	7	c.8.4 km	Co. Clare
Kiltumper	Existing	2	c.1.7 km	Co. Clare
Glenmore	Existing	12	c.6.5 km	Co. Clare
Letteragh	Existing	6	c.9.8 km	Co. Clare
Slieve Callan	Existing	29	c.6.4 km	Co. Clare
Slieveacurry	Pre-planning	9	c.9.9 km	Co. Clare

Booltiagh I Wind Farm

Booltiagh I Wind Farm is an existing wind farm consisting of 12 no. turbines and is approx. 6.1 km from the Site. As per the assessment of residual effects from the Proposed Project, as well as those in the EIAR for Bootliagh I Wind Farm, there is no potential for significant effects, following incorporation of mitigation, on downstream watercourses during construction. Additionally, The Booltiagh I Wind Farm has already been constructed and as such there is no potential for cumulative effects with the Proposed Project during construction. No potential for in-combination effects given the projects will not be constructed at the same time. Potential for cumulative effects during operation is limited to impacts on bats. The Proposed Project is not predicted to result in any significant residual effects on bats when considered alone. Collision risk has been assessed as Low under typical activity conditions and Medium at peak activity levels for a small number of species, with adaptive post-construction monitoring proposed to confirm predictions. No loss or damage to bat roosts is anticipated, no high-value commuting or foraging habitat will be affected, and no displacement of individual bats or local bat populations is predicted.

Booltiagh Extension

Booltiagh Extension is an existing wind farm extension consisting of 6 no. turbines and is approx. 6.3 km from the Site. As per the assessment of residual effects from the Proposed Project, as well as those in the EIAR for Bootliagh I Wind Farm, there is no potential for significant effects, following

incorporation of mitigation, on downstream watercourses during construction. Additionally, The Booltiagh I Wind Farm has already been constructed and as such there is no potential for cumulative effects with the Proposed Project during construction. No potential for in-combination effects given the projects will not be constructed at the same time. Potential for cumulative effects during operation is limited to impacts on bats. The Proposed Project is not predicted to result in any significant residual effects on bats when considered alone. Collision risk has been assessed as Low under typical activity conditions and Medium at peak activity levels for a small number of species, with adaptive post-construction monitoring proposed to confirm predictions. No loss or damage to bat roosts is anticipated, no high-value commuting or foraging habitat will be affected, and no displacement of individual bats or local bat populations is predicted.

Cahermurphy

Cahermurphy Wind Farm is an existing wind farm consisting of 4 no. turbines and is within this Site. Site. As per the assessment of residual effects from the Proposed Project, as well as those in the EIAR for Cahermurphy Wind Farm, there is no potential for significant effects, following incorporation of mitigation, on downstream watercourses during construction. Additionally, The Cahermurphy Wind Farm has already been constructed and as such there is no potential for cumulative effects with the Proposed Project during construction. No potential for in-combination effects given the projects will not be constructed at the same time. Potential for cumulative effects during operation is limited to impacts on bats. The Proposed Project is not predicted to result in any significant residual effects on bats when considered alone. Collision risk has been assessed as Low under typical activity conditions and Medium at peak activity levels for a small number of species, with adaptive post-construction monitoring proposed to confirm predictions. No loss or damage to bat roosts is anticipated, no high-value commuting or foraging habitat will be affected, and no displacement of individual bats or local bat populations is predicted.

Crossmore

Crossmore Wind Farm is an existing wind farm consisting of 7 no. turbines and is approx. 8.4 km from the Site. Site. As per the assessment of residual effects from the Proposed Project, as well as those in the EIAR for Crossmore Wind Farm, there is no potential for significant effects, following incorporation of mitigation, on downstream watercourses during construction. Additionally, The Crossmore Wind Farm has already been constructed and as such there is no potential for cumulative effects with the Proposed Project during construction. No potential for in-combination effects given the projects will not be constructed at the same time. Potential for cumulative effects during operation is limited to impacts on bats. The Proposed Project is not predicted to result in any significant residual effects on bats when considered alone. Collision risk has been assessed as Low under typical activity conditions and Medium at peak activity levels for a small number of species, with adaptive post-construction monitoring proposed to confirm predictions. No loss or damage to bat roosts is anticipated, no high-value commuting or foraging habitat will be affected, and no displacement of individual bats or local bat populations is predicted.

Kiltumper

Kiltumper Wind Farm consists of 2 no. turbines and is 1.7 km from the Site. Site. As per the assessment of residual effects from the Proposed Project, as well as those in the EIAR for Kiltumper Wind Farm, there is no potential for significant effects, following incorporation of mitigation, on downstream watercourses during construction. Additionally, The Kiltumper Wind Farm has already been constructed and as such there is no potential for cumulative effects with the Proposed Project during construction. No potential for in-combination effects given the projects will not be constructed at the same time. Potential for cumulative effects during operation is limited to impacts on bats. The Proposed Project is not predicted to result in any significant residual effects on bats when considered alone. Collision risk has been assessed as Low under typical activity conditions and Medium at peak activity

levels for a small number of species, with adaptive post-construction monitoring proposed to confirm predictions. No loss or damage to bat roosts is anticipated, no high-value commuting or foraging habitat will be affected, and no displacement of individual bats or local bat populations is predicted.

Glenmore

Glenmore Wind Farm consists of 12 no. turbines and is 6.5 km from the Site. Site. As per the assessment of residual effects from the Proposed Project, as well as those in the EIAR for Glenmore Wind Farm, there is no potential for significant effects, following incorporation of mitigation, on downstream watercourses during construction. Additionally, The Glenmore Wind Farm has already been constructed and as such there is no potential for cumulative effects with the Proposed Project during construction. No potential for in-combination effects given the projects will not be constructed at the same time. Potential for cumulative effects during operation is limited to impacts on bats. The Proposed Project is not predicted to result in any significant residual effects on bats when considered alone. Collision risk has been assessed as Low under typical activity conditions and Medium at peak activity levels for a small number of species, with adaptive post-construction monitoring proposed to confirm predictions. No loss or damage to bat roosts is anticipated, no high-value commuting or foraging habitat will be affected, and no displacement of individual bats or local bat populations is predicted.

Letteragh

Letteragh Wind Farm consists of 6 no. turbines and is 9.8 km from the Site. Site. As per the assessment of residual effects from the Proposed Project, as well as those in the EIAR for Letteragh Wind Farm, there is no potential for significant effects, following incorporation of mitigation, on downstream watercourses during construction. Additionally, The Letteragh Wind Farm has already been constructed and as such there is no potential for cumulative effects with the Proposed Project during construction. No potential for in-combination effects given the projects will not be constructed at the same time. Potential for cumulative effects during operation is limited to impacts on bats. The Proposed Project is not predicted to result in any significant residual effects on bats when considered alone. Collision risk has been assessed as Low under typical activity conditions and Medium at peak activity levels for a small number of species, with adaptive post-construction monitoring proposed to confirm predictions. No loss or damage to bat roosts is anticipated, no high-value commuting or foraging habitat will be affected, and no displacement of individual bats or local bat populations is predicted.

Slieve Callan

Sleive Callan Wind Farm consists of 29 no. turbines and is 6.4 km from the Site. Site. As per the assessment of residual effects from the Proposed Project, as well as those in the EIAR for Sleive Callan Wind Farm, there is no potential for significant effects, following incorporation of mitigation, on downstream watercourses during construction. Additionally, The Sleive Callan Wind Farm has already been constructed and as such there is no potential for cumulative effects with the Proposed Project during construction. No potential for in-combination effects given the projects will not be constructed at the same time. Potential for cumulative effects during operation is limited to impacts on bats. The Proposed Project is not predicted to result in any significant residual effects on bats when considered alone. Collision risk has been assessed as Low under typical activity conditions and Medium at peak activity levels for a small number of species, with adaptive post-construction monitoring proposed to confirm predictions. No loss or damage to bat roosts is anticipated, no high-value commuting or foraging habitat will be affected, and no displacement of individual bats or local bat populations is predicted.

Slieveacurry

This project is in the pre-application consultation phase and therefore an EIAR and NIS has not been produced as of yet. This proposed wind farm is located approximately 9.9 km to the Proposed Project.

6.6.2.2 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. Land use in the wider area is dominated by agricultural pasture, commercial forestry and peatland turbary, as well as uncut raised bog habitats. Land use in the wider area will not contribute to significant cumulative effects to biodiversity in-combination with the Proposed Project. Furthermore, it is unlikely that the construction phase of the Proposed Project, which will last 12 months, would overlap with felling operations (forestry rotations typically last 30-50 years).

The Proposed Project is located primarily on Conifer plantation (WD4) and marginal grassland habitats. Annex I peatlands, heath and grasslands within the Site have been avoided where possible and any loss of high value habitat will be offset through the measures described in the Hen Harrier Enhancement Plan in Appendix 7-8. The Proposed Project will not contribute to an overall net loss of high value habitat.

6.6.2.3 Other Projects Within 2km of Proposed Wind Farm

A desk-based planning search was undertaken, as per Chapter 2, to identify permitted developments within 2km vicinity of the Proposed Wind Farm site using the Clare County Council planning portal. The projects within this boundary are described in Chapter 2 and are not repeated in detail here. Projects identified within this area consisted predominantly of the construction of individual private dwellings, extensions to existing dwellings, agricultural shed and minor infrastructure projects.

Given the small scale of the projects identified within 2km of the Proposed Wind Farm, and given the lack of significant residual effects predicted as a result of the Proposed Project, there is no potential for likely significant cumulative effect when considered in-combination with these projects.

6.6.2.4 Other Projects Within 250m of Proposed Grid Connection

A desk-based planning search was undertaken to identify permitted developments within 250m vicinity of the Proposed Grid Connection route using the Clare County Council planning portal. The projects within this boundary are described in Chapter 2 and are not repeated in detail here. Projects identified within this area consisted predominantly of the construction of individual private dwellings, extensions to existing dwellings, agricultural shed and infrastructure projects. The following additional projects were reviewed:

- Permission to construct an additional 280m uncovered running track on to the existing 120m covered running track and to develop a grass training pitch to include flood lights and all associated site works and services (**Planning Reference: 2360324**)
- Permission to erect 5 No dwellings & foul sewer treatment systems & percolation areas, to connect to ancillary services and to develop service road and new site entrance(**Planning Reference: 2360554**)
- Permission to construct spectator toilets, referees room, store and connect to exiting water and sewage system on site and all a ancillary site works (**Planning Reference: 1935**)
- Permission for development within the Moneypoint Generating Station, Carrowdotia North and Carrowdotia South, Kilimer, County Clare (Eircode V15 R963) which is licenced by the Environmental Protection Agency (EPA) under an Industrial Emissions (IE) Licence (Ref P0605-04) and and Upper tier COMAH site and therefore falls under the requirements of the

Control of Major Accident Hazard Regulations (COMAH) Regulations, 2015. The development, which will be located at various locations within the station complex, will consist of land based site Investigation (SI) works comprising of boreholes and trial pits across the site (**Planning Reference: 2332**)

Following an assessment of the projects identified within 250m of the Proposed Grid Connection, and given the lack of significant residual effects predicted as a result of the Proposed Project, there is no potential for likely significant cumulative effect when considered in-combination with these projects. The works along the Proposed Grid Connection are minor and transient, similar to roadworks being completed across the country and have no potential for significant cumulative effects on ecology.

6.6.3 Cumulative Effects with Agriculture

According to Corine land cover mapping (www.epa.ie) (2018) the Water Study Area catchments are largely agricultural catchments.

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

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

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

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

6.6.4 Cumulative Effects with Commercial Forestry

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

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

With regard non-wind farm related forestry activities at the Site and the potential for cumulative impacts, it is proposed that all scheduled tree felling or replanting will be planned around the Proposed Project construction phase in order to prevent hydrological cumulative impacts. No scheduled tree felling will occur in the same local catchment where the Proposed Project construction is taking place.

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

6.6.5 Cumulative Effects with Turbary Peat Cutting Activities

Private peat cutting on turbary plots will likely continue in the vicinity of the Site and in the wider cumulative area. The construction phase of the Proposed Project is likely to interact with these turbary

activities and result in a deterioration of downstream surface water quality through the emissions of elevated concentrations of suspended solids and ammonia.

However, the areas of private peat cutting will be small, significantly limiting the potential for cumulative effects to arise with the Proposed Project. Nevertheless, the mitigation measures detailed for the construction, operational, and decommissioning phases of the Proposed Project will ensure the protection of downstream surface water quality.

For these reasons there will not be a significant cumulative effect associated with turbary activities.

6.6.6 Assessment of Cumulative Effects

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

Following the detailed surveys undertaken and impact assessment provided in Section 6.6 (including mitigation measures), it is concluded that there will be no significant residual habitat loss, disturbance, deterioration of water quality associated with the Proposed Project and therefore it cannot contribute to any cumulative effect when considered in-combination with other plans and projects. The other wind farms in the area were considered (among other projects) but the Proposed Project has been deliberately designed to minimise the effects on biodiversity through the siting of the Proposed Wind Farm on habitats of low ecological value and an emphasis on protection of surface water features (and associated aquatic fauna) during construction of the Proposed Project. The Proposed Project also includes a Biodiversity Management and Enhancement Plan, which further minimises /mitigates any potential for individual or cumulative negative effects on biodiversity and proposes enhancement measures for habitats and species within the EIAR boundary.

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

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

6.7 CONCLUSION

Following consideration of the residual effects (post mitigation) it is concluded that the Proposed Project will not result in any significant effects on any of the identified KERs. No significant residual effects on receptors of International, National, County Importance or Local importance (higher value) were identified.

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

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

EIA CLASSIFICATION SUMMARY

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

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

Topic	Pre-Mitigation Effect	Mitigation Section Reference	Residual Effect	Significance
Construction Phase				
Annex I Habitats	**Direct Habitat Loss**: Potential significant effect at a local scale only.	Section 6.5.2.2	No potential for significant residual effects	Not Significant
Watercourses and Sensitive Aquatic Faunal Species	**Direct effects** No potential for significant direct effects, at any geographical scale **Indirect effects** Potential significant effects from local scale to International Importance.	Section 6.5.2.3	No potential for significant residual effects	Not Significant
Hedgerows	**Direct Loss**: Potential significant effect at a local scale only.	Section 6.5.2.4	No potential for significant residual effects	Not Significant
Bats	No potential for significant effects, at any geographical scale	No mitigation required	No potential for significant residual effects	Not Significant

Otter	**Habitat Loss/Fragmentation** No potential for significant effects, at any geographical scale **Disturbance, Mortality** Potential significant effect at a local scale only. **Habitat Degradation** Potential significant effect at a local scale only.	Section 6.5.2.3	No potential for significant residual effects	Not Significant
Badger	**Habitat Loss/Fragmentation** No potential for significant effects, at any geographical scale **Disturbance/Mortality** Potential significant effect at a local scale only.	Section 6.5.2.5.3	No potential for significant residual effects	Not Significant
Red squirrel & pine marten	**Habitat Loss/Fragmentation** No potential for significant effects, at any geographical scale **Disturbance/Mortality** Potential significant effect at a local scale only.	Section 6.5.2.5.4	No potential for significant residual effects	Not Significant
Operational Phase				
Watercourses and Sensitive Aquatic Faunal Species	**Indirect effects** No potential for significant effects, at any geographical scale	Section 6.5.3.1.1	No potential for significant residual effects	Not Significant

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