

6. BIODIVERSITY

6.1 Introduction

This chapter assesses the likely significant effects (both alone and cumulatively with other plans and projects) that the proposed development may have on Biodiversity, Flora and Fauna and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified. The residual impacts on biodiversity are then assessed. Particular attention has been paid to species and habitats of ecological importance. These include species and habitats with national and international protection under the Wildlife Acts 1976-2021 as amended, EU Habitats Directive 92/43/EEC. Impacts on avian receptors are considered in Chapter 7 of this EIAR. The full description of the proposed development is provided in Chapter 4 of this EIAR.

The chapter is structured as follows

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

The following defined terms are utilised in this chapter:

- For the purposes of this EIAR, the development and its component parts which is the subject of a proposed application for planning permission is referred to as the ‘Proposed Development’.
- For the purpose of this EIAR chapter, the term ‘EIAR Site Boundary’/ ‘Site Boundary’ refers to the site boundary as shown in Figure 6-1.
- The term ‘development footprint’ is used to describe the lands that will be subject to the proposed infrastructure and associated construction works.
- “Key Ecological Receptor” (KER) is defined as a species or habitat occurring within the zone of influence of the development upon which likely significant effects are anticipated.
- “Zones of Influence” (ZOI) for individual ecological receptors refers to the zone within which potential effects are anticipated. ZOIs differ depending on the sensitivities of particular habitats and species and were assigned in accordance with best available guidance and through adoption of a precautionary approach.



Map Legend

- EIAR Site Boundary

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Site Location Map	
Proposed Glenard Windfarm	
Client: PE	Created by: JH
Project No: 190114	Drawing No: Fig 6-1
Scale: 1:75000	Date: 02.06.2021

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Requirements for Ecological Impact Assessment

National Legislation

The Wildlife Act, 1976–2021 as amended, is the principal piece of legislation governing protection of wildlife in Ireland. The Wildlife Act provides strict protection for species of conservation value. The Wildlife Act conserves wildlife (including game) and protects certain wild creatures and flora. These species are therefore considered in this report as ecological receptors.

Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) are heritage sites that are designated for the protection of flora, fauna, habitats and geological sites. Only NHAs are designated under the Wildlife (Amendment) Act 2017. These sites do not form part of the Natura 2000 network of European sites and the AA process, or screening for same, does not apply to NHAs or pNHAs. Proposed Natural Heritage Areas (pNHAs) were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated¹ However, these sites are considered to be of significance for wildlife and habitats as they may form statutory designated sites in the future (NPWS, 2020).

The Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) lists the species, hybrids and/or subspecies of flora protected under Section 21 of the Wildlife Acts. It provides protection to a wide variety of protected plant species in Ireland including vascular plants, mosses, liverworts, lichens and stoneworts. It is illegal to cut, pick, collect, uproot or damage, injure or destroy species listed or their flowers, fruits, seeds or spores or wilfully damage, alter, destroy or interfere with their habitat (unless under licence).

National Policy

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

- “Incorporate into legislation the requirement for consideration of impacts on biodiversity to ensure that conservation and sustainable use of biodiversity are taken into account in all relevant plans and programmes and relevant new legislation;
- Public and Private Sector relevant policies will use best practice in SEA, AA and other assessment tools to ensure proper consideration of biodiversity in policies and plans;
- All Public Authorities and private sector bodies move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure;
- Strengthen ecological expertise in local authorities and relevant Government Departments and agencies;
- Local Authorities will review and update their Biodiversity and Heritage Action Plans;
- Local Authorities will review and update their Development Plans and policies to include policies and objectives for the protection and restoration of biodiversity;
- Develop Green Infrastructure at local, regional and national levels and promote the use of nature based solutions for the delivery of a coherent and integrated network;

¹ <https://www.npws.ie/protected-sites/nha> (accessed 19 November 2020).

- Continue to produce guidance on the protection of biodiversity in designated areas, marine and the wider countryside for Local Authorities and relevant sectors;
- Integrate Natura 2000 and Biodiversity financial expenditure tracking into Government Programmes internal paying agency management procedures including linkage to the Prioritised Action Framework and this NBAP;
- Develop a Natural Capital Asset Register and national natural capital accounts by 2020, and integrate these accounts into economic policy and decision-making;
- Initiate natural capital accounting through sectoral and small scale pilot studies, including the integration of environmental and economic statistics using the framework of the UN System of Experimental-Ecosystem Accounting (SEEA);
- Establish a national Business and Biodiversity Platform under the CBD's Global Business Partnership;
- Ensure Origin Green produces tangible benefits for biodiversity with increased emphasis on conservation and restoration of biodiversity;
- Implement actions from Ireland's Biodiversity Climate Change Sectoral Adaptation Plan;
- Identify and take measures to minimise the impact of incentives and subsidies on biodiversity loss, and develop positive incentive measures, where necessary, to assist the conservation of biodiversity;
- Establish and implement mechanisms for the payments of ecosystem services including carbon stocks, to generate increased revenue for biodiversity conservation and restoration;
- Develop and implement a National Biodiversity Finance Plan to set out in detail how the actions and targets of this NBAP will be delivered from 2017 and beyond; and
- Monitor the implementation of the Plan”

In addition, the National Biodiversity Data Centre (2021) Pollinator-friendly management of Wind Farms identifies an evidence-based action plan for wind farm operators that can help pollinators by employing changes to existing management strategies.

Such policies have informed the evaluation of ecological features recorded within the study area and the ecological assessment process. Pollinator friendly measures have been incorporated into the proposed development and these are detailed within the Biodiversity Mitigation and Enhancement Plan (BMEP) (see Appendix 6.4).

European Legislation

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

Annex I of the Habitats Directive lists habitat types whose conservation requires the designation of Special Areas of Conservation (SAC). Priority habitats, such as Turloughs, which are in danger of disappearing within the EU territory are also listed in Annex I. Annex II of the Directive lists animal and plant species (e.g. marsh fritillary, Atlantic salmon, and Killarney fern) whose conservation also requires the designation of SAC. Annex IV lists animal and plant species in need of strict protection such as lesser horseshoe bat and otter, and Annex V lists animal and plant species whose taking in the wild and exploitation may be subject to management measures. In Ireland, species listed under Annex V include Irish hare, common frog and pine marten. Species can be listed in more than one Annex, as is the case with otter and lesser horseshoe bat which are listed on both Annex II and Annex IV.

The disturbance of species under Article 12 of the Habitats Directive (and in particular avoidance of deliberate disturbance of Annex IV species, particularly during the period of breeding, rearing, hibernation and migration and avoidance of deterioration or destruction of breeding sites or resting places) has been specifically assessed in this EIAR.

Council Directive 2009/147/EC on the conservation of wild birds (the “**Birds Directive**”) instructs Member States to take measures to maintain populations of all bird species naturally occurring in the wild state in the EU (Article 2). According to Recital 1 of the Birds Directive, Council Directive 79/409/EEC on the conservation of wild birds was substantially amended several times and in the interests of clarity and rationality, the Birds Directive codifies Council Directive 79/409/EEC. Such measures may include the maintenance and/or re-establishment of habitats in order to sustain these bird populations (Article 3). A subset of bird species has been identified in the Directive and are listed in Annex I as requiring special conservation measures in relation to their habitats. These species have been listed on account of inter alia: their risk of extinction; vulnerability to specific changes in their habitat; and/or due to their relatively small population size or restricted distribution. Special Protection Areas (SPAs) are to be identified and classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

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

6.3 Relevant Guidance

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

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

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater and Coastal (CIEEM, 2018).
- SNH (2019) ‘*Bats and onshore wind turbines: survey, Assessment and mitigation*’
- NatureScot (2021). Bats and onshore wind turbines: survey, Assessment and mitigation. Version: August 2021 (updated with minor revisions).
- Draft Revised guidelines on the information to be contained in Environmental Impact Statements (EPA, 2017).
- Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment. Department of the Environment, Community and Local Government DoEHLG (2013).
- Guidelines for assessment of Ecological Impacts of National Road Schemes, (NRA, 2009).
- Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA, 2009).
- Environmental Assessment and Construction Guidelines (NRA, 2006).
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (Environmental Protection Agency (EPA), 2003).

- Guidelines on the information to be contained in Environmental Impact Statements (EPA, 2002).
- European Commission Guidance on the preparation of the Environmental Impact Assessment Report (2017)
- European Commission Guidance document on wind energy developments and EU nature legislation (2020)
- Environmental Protection Agency (EPA) ‘*Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*’ (August 2017)

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

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

- The International Convention on Wetlands of International Importance especially Waterfowl Habitat (Concluded at Ramsar, Iran on 2 February 1971)
- S.I. No. 272 of 2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009 and S.I. No. 722 of 2003 European Communities (Water Policy) Regulations 2003 which give further effect to EU Water Framework Directive (2000/60/EC).

The following legislation applies with respect to non-native species:

- Regulation 49 and 50 of European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011).

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

- County Donegal Development Plan 2018-2024
- National Biodiversity Action Plan 2017-2021

6.3.1 Statement of Authority

This report has been prepared by David McNicholas (BSc., MSc., MCIEEM) and Patrick Ellison (BSc., MSc. ACIEEM). David McNicholas has over 9 years’ professional ecological consultancy experience and is a full member of the Chartered Institute of Ecology and Environmental Management. Patrick Ellison is an experienced ecologist with over 5 years’ professional experience. Field assessments were conducted by David McNicholas (BSc., MSc. MCIEEM), James Owens (BSc., MSc.), Julie O’Sullivan (B.Sc, M.Sc), Colin Murphy (B.Sc., M.Sc.), Aoife Joyce (BSc., MSc.), Luke Dodebier (BSc.), Claire Stephens (BSc.), Olivia O’ Gorman (BSc., MSc, MCIEEM) and Patrick Ellison (BSc., MSc. ACIEEM) between June 2017 and June 2021.

This report has been reviewed by John Hynes. (BSc., MSc., MCIEEM) John has over 10 years’ experience in ecological management and assessment.

6.4 Methodology

Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to and at the time of the project proceeding. Ecological baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

The following sections outline the methodologies utilised to establish the baseline ecological condition of the proposed development site.

6.4.1 Desk Study

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

- Review of online web-mappers: National Parks and Wildlife Service (NPWS), EPA (Envision), Water Framework Directive (WFD), Geological Survey of Ireland (GSI) & Inland Fisheries Ireland (IFI).
- Review of the Bat Conservation Ireland (BCI) Private Database.
- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper.
- Data on potential occurrence of protected bryophytes – as per NPWS online map viewer; Flora Protection Order Map Viewer – Bryophytes².
- Inland Fisheries Ireland (IFI) Reports.
- Records from the National Parks and Wildlife Services (‘NPWS’) WS web-mapper and review of specially requested records from the NPWS Rare and Protected Species Database for the hectad in which the Proposed Development is located.
- Review of NPWS Article 17 Metadata and GIS Database Files (2019).

6.4.2 Scoping and Consultation

MKO undertook a scoping exercise during preparation of this EIAR, as described in Chapter 2, Section 2.6 of this EIAR.

Copies of all scoping responses are included in Appendix 2.1 of this EIAR. The recommendations of the consultees have informed the EIAR preparation process and the contents of this chapter. Table 2.4 in Chapter 2 of this EIAR describes where the comments raised in the scoping responses received have been addressed in this assessment. Table 6-1 provides a list of the organisations consulted with regard to biodiversity during the scoping process. Their comments were fully considered in the preparation of this chapter.

Table 6-1 Organisations consulted with regard to biodiversity

Consultee	Response Yes/No	Response
An Taisce	No response received to date	Receipt of scoping document confirmed
Bat Conservation Ireland	No response received to date	-

² NPWS, 2020, Online map viewer; Flora Protection Order Map Viewer – Bryophytes. Online, Available at: <http://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e>, Accessed: 30/01/2022.

BirdWatch Ireland	Response received 16/08/2019	Receipt of scoping document confirmed
Department of Culture, Heritage and the Gaeltacht	Response received 15/01/2020 DAU response received 16/08/2019	<p>In order to assess impacts on biodiversity, fauna, flora and habitats an ecological survey should be carried out.</p> <p>In order to assess impacts it may be necessary to obtain hydrological and/or geological data.</p> <p>Hedgerows should be maintained where possible as they form wildlife corridors and provide areas for birds to nest in; hedgerow trees may provide roosting places for bats.</p> <p>Wetlands are important areas for biodiversity and ground and surface water quality should be protected during construction and operation of the proposed development.</p> <p>Flood plains, if present, should be identified in the EIAR and left undeveloped to allow for the protection of these valuable habitats and provide areas for flood water retention (green infrastructure).</p> <p>It is noted that bat roosts may be present in trees, buildings and bridges.</p> <p>The EIAR should also address the issue of invasive alien plant and animal species such as Japanese Knotweed or piri piri burr, and detail the methods required to ensure they are not accidentally introduced or spread during survey and or construction.</p> <p>Survey methodologies should follow best practice and if necessary be modified to reflect the Irish situation.</p> <p>The impact of the proposed development on the flora/fauna and habitats present should be assessed.</p> <p>Construction Management Plans should contain sufficient detail to avoid any post construction doubt with regard to the implementation of mitigation measures, timings and roles and responsibilities for same.</p> <p>In order to carry out the Appropriate Assessment screening, and/or prepare a Natura Impact Statement (NIS), information about the relevant European sites including their conservation objectives will need to be collected.</p> <p><u>DAU</u></p> <p>In the event of observations, you will receive a co-ordinated heritage-related response by email from</p>

		Development Applications Unit (DAU) on behalf of the Department.
Inland Fisheries Ireland	Response received 22/08/2019	The proposed site is located within two salmonid bearing catchments
Irish Peatland Conservation Council	No response received to date	-
Irish Wildlife Trust	No response received to date	-
Heritage Officer- Donegal County Council	No response received to date	-
The Heritage Council	No response received to date	-

6.4.3 Field Surveys

A comprehensive survey of the biodiversity of the entire EIAR Site Boundary was undertaken on various dates throughout 2017, 2019, 2020 and 2021. The following sections fully describe the ecological surveys that have been undertaken and provide details of the methodologies, dates of survey and guidance followed.

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

Multidisciplinary walkover surveys were undertaken within the site of the proposed development on the following dates (green indicates bat surveys were also conducted on these dates);

- > 13.06.2017
- > 14.05.2019
- > 28.05.2019
- > 27.06.2019
- > 08.07.2019
- > 14.08.2019
- > 15.08.2019
- > 04.09.2019
- > 17.09.2019
- > 02.12.2019
- > 16.04.2020
- > 28.04.2020
- > 17.06.2020
- > 02.07.2020
- > 18.08.2020
- > 01.09.2020
- > 02.06.2021
- > 03.06.2021
- > 30.11.2021
- > 01.12.2021

All surveys of vegetation were completed within the optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith *et al.*, 2011). A comprehensive walkover of the entire EIAR primary study area was completed. Surveys undertaken outside of this period were not used to evaluate habitats.

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

The multi-disciplinary walkover surveys comprehensively covered the entire 'EIAR Site Boundary'/'Site Boundary' for features and locations of ecological significance. Based on the multi-disciplinary walkover survey findings, further detailed targeted surveys were carried out during follow-up species specific survey visits. These are described in detail below. These surveys were carried out in accordance with NRA *Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes* (NRA, 2009).

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

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

6.4.3.2 Dedicated Habitat and Vegetation Composition Surveys

All habitats recorded on site and described in this EIAR chapter have been classified in accordance with Fossitt (2000). In addition, peatland habitats outside of the proposed infrastructure footprint but within the EIAR Site Boundary are described in detail in this chapter. Full details of all the botanical surveys and results are provided in Appendix 6.1 and an assessment of the potential for the EIAR Site Boundary to support Annex I habitats is also provided in this Appendix.

Botanical surveys of the EIAR Site Boundary were also undertaken throughout multidisciplinary walkover surveys carried out in 2017, 2019, 2020 and 2021. These surveys provided an understanding of the baseline and informed further survey work following finalisation of the proposed infrastructure layout. The habitat assessment surveys described in this report have been undertaken in accordance with the following guidelines and interpretation documents:

- Perrin, P.M, Martin, J.R., Barron, J.R., Roche & O'Hanrahan, B. (2014) *Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland*. Version 2.0. Irish Wildlife Manuals, No. 79. National Parks and Wildlife Service.
- Commission of the European Communities (2013) *Interpretation manual of European Union habitats*. Eur 27. European Commission DG Environment.
- Foss, P.J. & Crushell, P. 2008, *Guidelines for a National Fen Survey of Ireland, Survey Manual*. Report for the National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Ireland.
- NPWS (2013) *The Status of EU Protected Habitats and Species in Ireland. Habitat Assessments Volume 2*. Version 1.1. Unpublished Report, National Parks and Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- NPWS (2019). *The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments*. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill.
- Martin, J.R., O'Neill, F.H. & Daly, O.H. (2018), *The monitoring and assessment of three EU Habitats Directive Annex I grassland habitats*. Irish Wildlife Manuals, No.

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

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

6.4.3.2.1 Vegetation composition assessment

Detailed habitat classification and assessment was undertaken by MKO at targeted locations within the development footprint, with relevés undertaken in 2019, 2020 and 2021 within representative habitats at each turbine base, borrow pits and substation. The extent of each habitat on site was mapped using aerial photography, hand held GPS and smartphone technology. A representative photograph was also taken for each of the habitats recorded on site, including all relevés. The location of all quadrats is shown in Figure 6-2.

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)³ is a web application for assigning vegetation data to communities defined by the Irish Vegetation Classification (IVC). Data can be uploaded, checked for errors and analysed and the results can then be downloaded. ERICA works with both quantitative vegetation cover data (such as are recorded in relevés and other types of botanical recording plots) and presence/absence data, such as species lists. ERICA covers grasslands, woodland, duneland, heaths, bogs, fens, mires, freshwater, saline waters, rocky habitats, scrub, strandline, saltmarsh and weed communities (Perrin, 2019).

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

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

³ Perrin, 2019, ERICA – Engine for Relevés to Irish Communities Assignment V5.0 User's Manual, Online, Available at: https://biodiversityireland.shinapps.io/vegetation-classification/w_9cd4889a/manual.pdf, Accessed: 10.11.2020



- ### Map Legend
- EIAR Site Boundary
 - Quadrat Locations
 - Proposed Turbine Layout
 - Proposed Met Mast
 - Proposed Construction Compounds
 - Proposed 110kV Substation Compounds
 - Proposed Borrow Pit
 - Peat and Spoil Respository Area
 - Turbine Delivery Route Accommodation Works
 - Proposed 110kV Underground Grid Connection Route
 - Proposed Amenity Walkway
 - Existing Roads Upgrade Proposed
 - Existing Forestry Roads & Tracks
 - Proposed New Site Roads

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Quadrat Locations

Glenard Windfarm

Drawn By: PE	Checked By: JH
Project No: 190114	Drawing No: Fig 6-2
Scale: 1:35000	Date: 22.11.2021

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Table 6-2 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 and in particular having the potential to correspond to those listed in Annex I of the EU Habitats Directive 92/43/EEC were identified and classified as Key Ecological Receptors (KERs).

6.4.3.3 Fauna Surveys

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

6.4.3.3.1 Badger Survey

Dedicated badger surveys were conducted on the 13th June 2017, 14th August 2019, 15th August 2019, 02nd December 2019, 02nd July 2020 and 03rd June 2021. In addition, records of any badger activity within the study area were also recorded during other faunal and habitat surveys of the site. The badger surveys covered the entire development footprint and surrounding boundary hedgerows/treelines. The site was systematically searched for signs of badger, incidental setts, prints, latrines, foraging signs or sightings. If encountered, setts were classified as per the convention set out in NRA (2009) (i.e. main, annexe, subsidiary, outlier). The badger survey was not constrained by vegetation given the nature of the habitats within the site and the timing of the surveys (NRA 2006a).

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

6.4.3.3.2 Otter Survey

Following a review of the initial site walkover ecological surveys for constraints identification and the results of the multi-disciplinary walkover survey; areas identified as providing potential habitat for otter were subject to specialist targeted survey. The otter survey of watercourses was conducted on the 13th June 2017, 14th August 2019, 15th August 2019, 02nd December 2019, 02nd July 2020 and 03rd June 2021. Additional otter surveys were undertaken during a fisheries assessment of the watercourses both within and downstream of the study area between the 19th and 21st August 2019.

⁴ CIEEM, 2013, *Technical Guidance Series – Competencies for Species Survey*, Online, Available at: <https://cieem.net/resource/competencies-for-species-survey-css/> Accessed: 20.06.2019

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

6.4.3.3.3 Bats

A detailed bat survey report is provided in Appendix 6.2 of this EIAR. This document provides a detailed description of all survey methodologies as undertaken at the site during the period 2019-2021. Full details of the survey times and dates and the methodologies followed are provided in the Bat Report, included as Appendix 6.2, along with details of all the surveyors.

Habitat suitability for bats was assessed according to Collins (2016), which provides a grading protocol for roosting habitats and for commuting and foraging areas. All further bat activity and roost surveys were undertaken in strict accordance with those prescribed in SNH (2019) ‘*Bats and onshore wind turbines: survey, Assessment and mitigation*’. This is in line with standard best practice industry guidelines.

6.4.3.3.4 Marsh fritillary surveys

Following the identification of suitable habitat for marsh fritillary within the site during habitat surveys, targeted surveys for the species were undertaken on 14th June and 22nd September 2017. The survey methodology followed that described in the NRA (2009) best practice guidance document. This involved walked surveys to identify suitable areas of marsh fritillary habitat within or adjacent to the development footprint. Where suitable habitat did occur, detailed surveys to locate larval webs were undertaken. In addition, habitat suitability assessments were undertaken within areas of suitable habitat for the species following those developed by the NBDC⁵.

6.4.3.3.5 Aquatic surveys

Kick sampling was carried out at watercourses both within and downstream of the proposed works site in order to inform baseline conditions. These were carried out on the 14th August 2019, 15th December 2020 and 1st December 2021. Representative locations along watercourses that drain the site were chosen for the assessment. The locations of each watercourse surveyed are provided in Figure 6-3.

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

Aquatic plant species protected under Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) were searched for during all aquatic surveys.

⁵ NBDC, 2020, *Habitat Condition Assessment for Marsh Fritillary*, Online, Available at: <http://www.biodiversityireland.ie/wordpress/wp-content/uploads/Marsh-Fritillary-Habitat-Condition-Form.pdf>, Accessed, 20 October 2020

⁶ Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C., & MacGarthaigh, M. (2005). *Water quality in Ireland*. Environmental Protection Agency, Co. Wexford, Ireland.



Map Legend

- EIA/ Site Boundary
- Kick sample locations
- Proposed Turbine Layout
- Proposed Met Mast
- Proposed Construction Compounds
- Proposed 110kV Substation Compounds
- Proposed Borrow Pit
- Peat and Spoil Repository Area
- Turbine Delivery Route Accommodation Works
- Proposed 110kV Underground Grid Connection Route
- Proposed Amenity Walkway
- Existing Roads Upgrade Proposed
- Existing Forestry Roads & Tracks
- Proposed New Site Roads



Kick Sample Locations

Proposed Glenard Windfarm

CB	PE
190114	Fig 6-3
Scale: 1:35000	Date: 22.11.2021

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6.4.3.3.6 Invasive species survey

During the multi-disciplinary walkover surveys, a search for non-native invasive species was undertaken. The survey focused on the identification of invasive species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (As Amended) (S.I. 477 of 2015).

6.4.4 Methodology for Assessment of Impacts and Effects

6.4.4.1 Identification of Target Receptors and Key Ecological Receptors

The methodology for assessment followed a precautionary screening approach with regard to the identification of Key Ecological Receptors (KERs). Following a comprehensive desk study, site visits were undertaken on the dates listed in Section 6.4.3.1 and “Target receptors” likely to occur in the zone of influence of the development were identified. The target receptors included habitats and species that were protected under the following legislation:

- Annexes of the EU Habitats Directive
- Qualifying Interests (QI) of Special Areas of Conservation (SAC) within the likely zone of impact.
- Species protected under the Wildlife Acts 1976-2019
- Species protected under the Flora Protection Order 2015

6.4.4.2 Determining Importance of 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 ‘Guidelines for Assessment of Ecological Impacts of National Roads Schemes’ (NRA, 2009). These guidelines set out the context for the determination of value on a geographic basis with a hierarchy assigned in relation to the importance of any particular receptor. The guidelines provide a basis for determination of whether any particular receptor is of importance on the following scales:

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

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

Any ecological receptors that are determined to be of National or International, County or Local importance (Higher Value) following the criteria set out in NRA (2009) are considered to be Key Ecological Receptors (KERs) for the purposes of ecological impact assessment if there is a pathway for

effects thereon. Any receptors that are determined to be of Local Importance (Lower Value) are not considered to be Key Ecological Receptors.

6.4.4.3 Characterisation of Impacts and Effects

The proposed development 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). These guidelines are the industry standard for the completion of Ecological Impact Assessment in the UK and Ireland. This chapter has also been prepared in accordance with the corresponding EPA guidance (EPA 2017). 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 development results in a positive or negative effect on the ecological receptor.
- **Extent.** Description of the spatial area over which the effect has the potential to occur.
- **Magnitude** Refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.
- **Duration** is defined in relation to ecological characteristics (such as the lifecycle of a species) as well as human timeframes. For example, five years, which might seem short-term in the human context or that of other long-lived species, would span at least five generations of some invertebrate species.
- **Frequency and Timing.** This relates to the number of times that an impact occurs and its frequency. A small-scale impact can have a significant effect if it is repeated on numerous occasions over a long period.
- **Reversibility.** This is a consideration of whether an effect is reversible within a ‘reasonable’ timescale. What is considered to be a reasonable timescale can vary between receptors and is justified where appropriate in the impact assessment section of this report.

6.4.4.4 Determining the Significance of Effects

The ecological significance of the effects of the proposed development 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 (EclA), ‘significant effect’ is an effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local (CIEEM, 2018).

When determining significance, consideration is given to whether:

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

The EPA draft Guidelines on information to be included in Environmental Impact Assessment Reports (EPA, 2017) and the *Guidelines for assessment of Ecological Impacts of National Road Schemes*, (NRA, 2009) were also considered when determining significance and the assessment is in accordance with those guidelines.

The terminology used in the determination of significance follows the suggested language set out in the Draft EPA Guidelines (2017) as shown in Table 6-3 below.

Table 6-3 Criteria for determining significance of effect, based on (EPA, 2017) guidelines

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

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

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

Integrity

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

Conservation status

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

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

- Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

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

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

The conservation of a species is favourable when:

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

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

6.4.4.5 Incorporation of Mitigation

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

6.4.4.6 Limitations

The information provided in this assessment accurately and comprehensively describes the baseline ecological environment following surveys on numerous dates during all seasons and over 3 years; it provides an accurate prediction of the likely ecological effects of the proposed development alone and together with potential cumulative effects; prescribes best practice and mitigation as necessary; and, describes the residual ecological impacts.

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

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

6.5 Establishing the Ecological Baseline

6.5.1 Desk Study Results

The following sections describe the results of a survey of published material that was consulted as part of the desk study for the purposes of the ecological assessment. It provides a baseline for the ecology of

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

6.5.1.1 Designated Sites

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

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

Special Areas of Conservation (SACs) and Special Protection Areas for Birds (SPAs) are designated under the EU Habitats Directive and EU Birds Directive, respectively and are collectively known as ‘European Sites’. The potential for significant effects and/or adverse impacts on the integrity of European Sites is fully assessed in the AA Screening Report and Natura Impact Statement that accompanies this application. As per EPA draft Guidance 2017, “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 6.7.2 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 EcIA.

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 EcIA.

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

- Initially the most up to date GIS spatial datasets for European and Nationally designated sites and water catchments were downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) on the 30/01/2022. The datasets were utilised to identify Designated Sites which could feasibly be affected by the proposed development.
- All designated sites within a distance of 15km surrounding the development site were identified. In addition, the potential for connectivity with European or Nationally designated sites at distances of greater than 15km from the proposed development was also considered in this initial assessment.
- A map of all the European Sites within 15km is provided in Figure 6-4
- Table 6-5 provides details of all relevant Nationally designated sites as identified in the preceding steps and assesses which are within the likely Zone of Impact. All relevant European Designated Sites are fully described and assessed in the Screening for Appropriate Assessment and Natura Impact Statement reports submitted as part of this planning application.
- The designation features of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of preparing this report 30/01/2022

Where potential pathways for Significant Effect are identified, the site is included within the Likely Zone of Impact and further assessment is required.



Map Legend

- EIAR Site Boundary
- Natural Heritage Areas (NHA)
- Proposed Natural Heritage Areas (pNHA)
- 15km Buffer
- Hydrological Catchments (WFD)
- River Waterbodies (WFD)

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 Ireland/Government of Ireland



Site in Relation to Nationally Designated Sites

Glenard Windfarm	
Project No:	190114
Scale:	1:170000
Drawn by:	JH
Checked by:	JH
Project Title:	Fig 6-5
Date:	25.11.2021

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Table 6-4 Designated sites in the Zone of Influence

Designated Site	Distance from EIAR Site Boundary (km)	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)		
Lough Swilly SAC [002287]	Distance: 2.5km Hydrological distance: ~5km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site.</p> <p>The site of the proposed development is hydrologically connected to the SAC via tributaries of the Crana River (within the north of the site) and the Mill [Donegal] River (within the south of the site). At its closest, the SAC is located approximately 5km downstream of the EIAR boundary.</p> <p>The SAC is considered to be within the Likely Zone of Impact and further assessment is required with regard to the above listed QIs of the SAC.</p>
Magheradrumman Bog SAC [000168]	Distance: 3.2km	<p>There will be no direct effects as the proposed development is located entirely outside the designated site.</p> <p>No pathway for indirect effects on the terrestrial QIs for which the SAC has been designated exists.</p> <p>The SAC and the proposed development are located within different hydrological catchments and there is no connectivity between the development and the SAC. Therefore no potential for indirect effects on the SAC exists.</p> <p>No pathway for effect was identified and the site is not within the Likely Zone of Impact</p>
North Inishowen Coast SAC [000212]	Distance: 11.2km	<p>There will be no direct effects as the proposed development is located entirely outside the designated site.</p> <p>The proposed delivery route crosses tributaries of the Glennagannon River (namely the East Crockback stream) which enters the SAC 13km (hydrological distance) from the north of the proposed site. There is however no connectivity between the Proposed Development and this SAC as they are located within separate surface water catchments.</p> <p>The SAC is considered to be within the Likely Zone of Impact and further assessment is required with regard to the above listed QIs of the SAC.</p>
Special Protection Area (SPA)		

Designated Site	Distance from EIAR Site Boundary (km)	Likely Zone of Impact Determination
Lough Swilly SPA [004075]	Distance: 3.3km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site.</p> <p>The site of the proposed development is hydrologically connected to Lough Swilly via tributaries of the Crana River (within the north of the site) and the Mill [Donegal] River (within the south of the site). Taking a highly precautionary approach, there is therefore potential for significant effect on the aquatic dependant SCI Wetland and Waterbirds [A999] as a result of the proposed development due to tidal movements in the Lough Swilly estuary.</p> <p>The following SCI species were recorded within the EIAR Site Boundary during the dedicated bird surveys (see Chapter 7 of the accompanying EIAR); therefore further assessment is needed:</p> <ul style="list-style-type: none"> > Grey Heron > Mallard > Whooper Swan > Greylag Goose > Black-headed Gull > Common Gull <p>The SPA is considered to be <i>within</i> the Likely Zone of Impact and further assessment is required with regard to the above listed SCIs of the SPA.</p>
Lough Foyle SPA [004087]	Distance: 5km Hydrological distance: ~7km	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>The proposed delivery route crosses a small watercourse, the Cabry 40, which enters Lough Foyle SPA within approximately 7km (hydrological distance) from the south of the proposed site. Therefore, further impact assessment is required with regard to:</p> <ul style="list-style-type: none"> > Wetland and Waterbirds [A999] <p>The following SCI species were recorded on the proposed development site during the dedicated bird surveys (see Chapter 7 of the accompanying EIAR), therefore further assessment is required:</p> <ul style="list-style-type: none"> > Whooper Swan > Greylag Goose > Mallard > Golden Plover > Black-headed Gull > Common Gull > Herring Gull <p>The SPA is considered to be <i>within</i> the Likely Zone of Impact and further assessment is required with regard to the above listed SCIs of the SPA.</p>

Designated Site	Distance from EIAR Site Boundary (km)	Likely Zone of Impact Determination
<p>Lough Foyle SPA [UK9020031]</p>	<p>Distance: 7km</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Hydrological connectivity has been identified between the proposed development and the SPA via the Cabry River. Therefore, further impact assessment is required with regard to:</p> <ul style="list-style-type: none"> ➤ Wetland and Waterbirds [A999] <p>The following SCI species were recorded on the proposed development site during the dedicated bird surveys (see Chapter 7 of the accompanying EIAR), therefore further assessment is required:</p> <ul style="list-style-type: none"> ➤ Golden Plover ➤ Whooper Swan ➤ Mallard <p>The SPA is considered to be <i>within</i> the Likely Zone of Impact and further assessment is required with regard to the above listed SCIs of the SPA.</p>
<p>Trawbreaga Bay SPA [004034]</p>	<p>Distance: 11.2km</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>The proposed delivery route crosses tributaries of the Glennagannon River (namely the East Crockback stream) which enters the SPA 13 km (hydrological distance) from the north of the proposed site. Therefore, further impact assessment is required on a precautionary basis with regard to:</p> <ul style="list-style-type: none"> ➤ Wetland and Waterbirds [A999] <p>None of the listed SCI bird species were recorded during the dedicated bird surveys of the proposed development site (see Chapter 7 of the accompanying EIAR).</p> <p>This site is considered to be <i>within</i> the Likely Zone of Impact and further assessment is required with regard to the above listed SCIs of the SPA.</p>
<p>Natural Heritage Areas (NHA)</p>		
<p>Camowen River Bog NHA [002405]</p>	<p>Immediately adjacent</p>	<p>The NHA occurs on peatland habitat on the southern side of the road proposed for the delivery route, i.e. along the L1731. There are local road widening works proposed along a section of this road; however these works will not occur within the boundary of the NHA. Therefore, there is no potential for direct effects.</p>

Designated Site	Distance from EIAR Site Boundary (km)	Likely Zone of Impact Determination
		<p>No direct or indirect hydrological connectivity has been identified between the proposed development site and the NHA, and all river flow is away from the NHA. No pathway for indirect effects on the terrestrial habitats for which the NHA has been designated exists.</p> <p>This NHA is therefore not within the Likely Zone of Impact.</p>
Illies Hill Bog NHA [001127]	181 metres	<p>At its closest the EIAR study area boundary is located over 181 metres from the NHA and no part of the proposed development site is located inside the NHA. Therefore, there is no potential for direct effects. No direct or indirect hydrological connectivity exists between the proposed development site and the NHA. No pathway for indirect effects on the terrestrial habitats for which the NHA has been designated exists. This NHA is therefore not within the Likely Zone of Impact.</p>
Slieve Snaght Bogs NHA [002322]	2.7km	<p>The EIAR boundary is located entirely outside of the NHA; therefore, there is no potential for direct effects. No pathway for indirect effects on the terrestrial habitats for which the NHA has been designated exists.</p> <p>No direct or indirect hydrological connectivity exists between the proposed development site and the NHA. This NHA is therefore not within the Likely Zone of Impact and further assessment is not required.</p>
Umrycam Bog NHA [002406]	4.6km	<p>No pathway for direct or indirect effects on the terrestrial habitats for which the NHA has been designated exists.</p> <p>No direct or indirect hydrological connectivity exists between the site and this NHA. This NHA is therefore not within the Likely Zone of Impact and further assessment is not required.</p>
Proposed Natural Heritage Areas (pNHA)		
Lough Swilly Including Big Isle, Blanket Nook & Inch Lake pNHA [00016]	2.5km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site.</p> <p>The site of the proposed development is hydrologically connected to the pNHA via tributaries of the Crana River (within the north of the site) and the Mill [Donegal] River (within the south of the site). At its closest, the pNHA is located approximately 5km downstream of the proposed development.</p>

Designated Site	Distance from EIAR Site Boundary (km)	Likely Zone of Impact Determination
		The pNHA is considered to be <i>within</i> the Likely Zone of Impact and further assessment is required.
Old Rectory, Fahan pNHA [002056]	4.04km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site. No pathway for indirect effects on the terrestrial features for which the pNHA has been designated exists.</p> <p>This pNHA is therefore <i>not within</i> the Likely Zone of Impact and further assessment is not required.</p>
Magheradrumman pNHA [000168]	4.1km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site. No pathway for indirect effects on the terrestrial habitats for which the pNHA has been designated exists.</p> <p>This pNHA is in a separate hydrological catchment to the proposed development. No hydrological connectivity to the proposed development site exists.</p> <p>This pNHA is therefore <i>not within</i> the Likely Zone of Impact and further assessment is not required.</p>
Carndonagh Wood pNHA [001098]	8.0km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site. No pathway for indirect effects on the terrestrial habitats for which the pNHA has been designated exists.</p> <p>This pNHA is in a separate hydrological catchment as the proposed development. No hydrological connectivity to the proposed development site exists.</p> <p>This pNHA is therefore <i>not within</i> the Likely Zone of Impact and further assessment is not required..</p>
Lough Fad West pNHA [001161]	8.8km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site. No pathway for indirect effects on the terrestrial habitats for which the pNHA has been designated exists.</p> <p>This pNHA is in a separate hydrological catchment as the proposed development. No hydrological connectivity to the proposed development site exists.</p> <p>This pNHA is therefore <i>not within</i> the Likely Zone of Impact and further assessment is not required.</p>
Bulbin Mountain pNHA [000120]	9.18km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site. No pathway for indirect effects</p>

Designated Site	Distance from EIAR Site Boundary (km)	Likely Zone of Impact Determination
		<p>on the terrestrial habitats for which the pNHA has been designated exists.</p> <p>No hydrological connectivity to the proposed development site exists.</p> <p>This pNHA is therefore <i>not within</i> the Likely Zone of Impact and further assessment is not required.</p>
North Inishowen Coast pNHA [002012]	11.2km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site. No pathway for indirect effects on the terrestrial habitats for which the pNHA has been designated exists.</p> <p>This pNHA is in a separate hydrological catchment as the proposed development. No hydrological connectivity to the proposed development site exists.</p> <p>This pNHA is therefore <i>not within</i> the Likely Zone of Impact and further assessment is not required.</p>
Port Lough pNHA	12.8km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site. No pathway for indirect effects on the terrestrial habitats for which the pNHA has been designated exists.</p> <p>This pNHA is in a separate hydrological catchment as the proposed development. No hydrological connectivity to the proposed development site exists.</p> <p>This pNHA is therefore <i>not within</i> the Likely Zone of Impact and further assessment is not required.</p>
Ballymastocker Dunes pNHA	13.8km	<p>There is no potential for direct effects as the proposed development is located entirely outside of this designated site. No pathway for indirect effects on the terrestrial habitats for which the pNHA has been designated exists.</p> <p>This pNHA is in a separate hydrological catchment as the proposed development. No hydrological connectivity to the proposed development site exists.</p> <p>This pNHA is therefore <i>not within</i> the Likely Zone of Impact and further assessment is not required.</p>

Potential for effects on European sites is summarised in this report and is fully addressed in the Natura Impact Statement submitted as part of the statutory consent process.

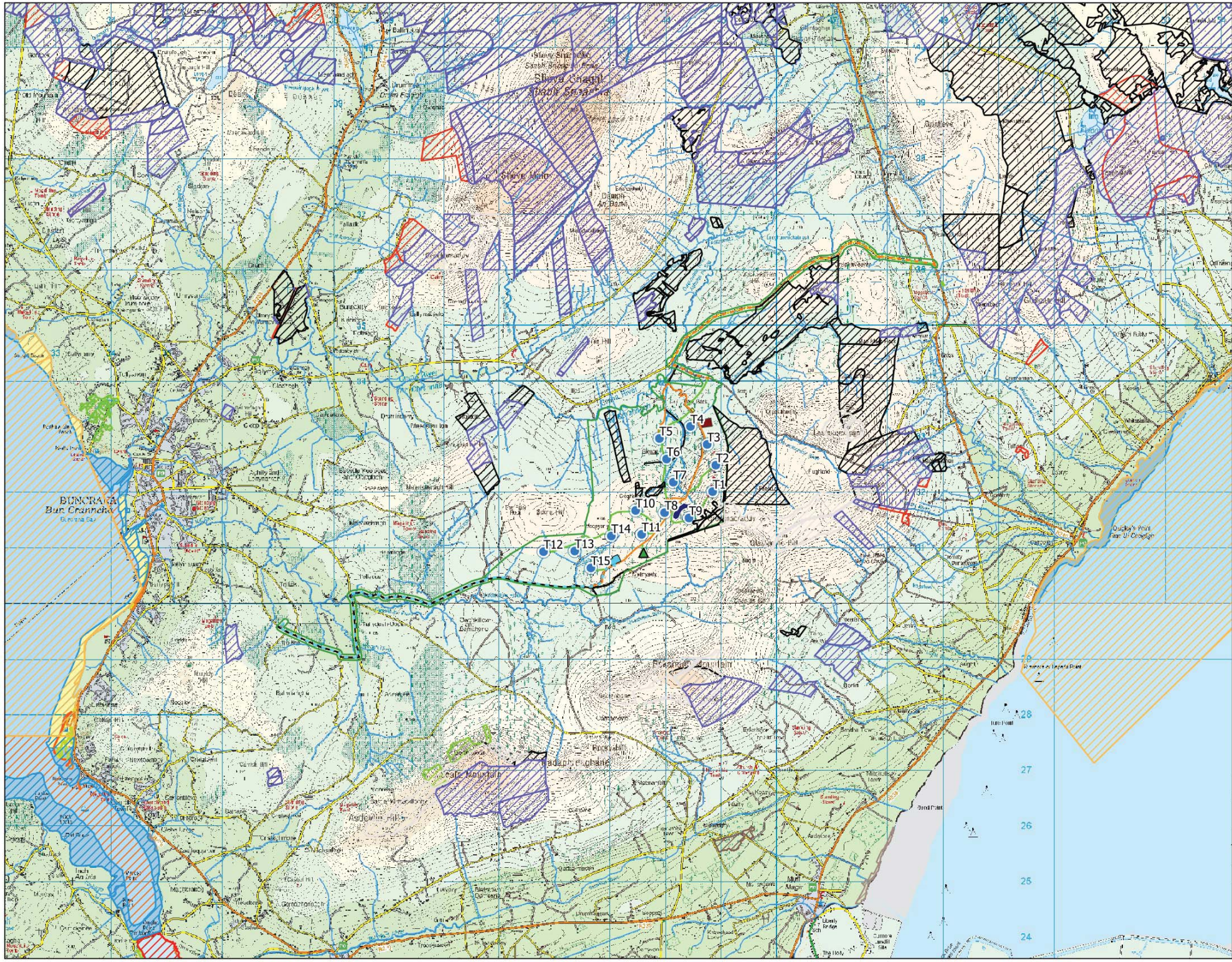
6.5.12 NPWS Article 17 Reporting

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

A search of the NPWS Article 17 datasets⁷ (2019) was undertaken to identify Article 17 habitats within or adjacent to the site boundary, as shown in Figure 6.6. Blanket bog [7130] was mapped within and adjacent to the EIAR boundary. Alphine and Sub Alphine Heath [4060] was recorded outside the southeast of the EIAR boundary and immediately adjacent to the EIAR boundary. Wet heath [4010] was mapped 2.3km to the east of the site boundary at its closest point. Nardus rich upland grassland was recorded 2.7km south of the site boundary.

Two site access tracks, one between Turbines T1 and T9, and a short section of the access road leading from T10 to T14 cross narrow sections of blanket bog as mapped on the Article 17 EU Habitats Directive Annex I habitats dataset, see Figure 6-6.

⁷ Including bog 2012 and 2019 datasets, Online, Available at: <https://www.npws.ie/publications/article-17-reports>



Map Legend

- EIAR Site Boundary
- Proposed Turbine Layout
- Donegal Article 17 Habitats 2020**
- Active Blanket Bog
- Dry Heath
- Nardus Rich Upland Grassland
- Wet Heath
- Proposed Borrow Pit
- Proposed New Site Roads
- Existing Roads Upgrade
- Peat and Spoil Repository Area
- Proposed Substation
- ▲ Proposed Met Mast

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Article 17 Habitats Records

Proposed Glenard Windfarm

Drawn By: PE	Checked By: JH
Project No: 190114	Drawing No: Fig 6-6
Scale: 1:60000	Date: 22.11.2021

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6.5.1.3 Vascular plants

A search was made in the New Atlas of the British and Irish Flora (Preston *et al*, 2002) to investigate whether any rare or unusual plant species listed under Annex I of the EU Habitats Directive, The Irish Red Data Book, 1, Vascular Plants (Curtis, 1988) or the Flora (Protection) Order (1999, as amended 2015) had been recorded in the relevant 10km squares in which the study site is situated (C43). Species of conservation concern are given in Table 6-.

Table 6-5 Species listed designated under the Flora Protection Order or the Irish Red Data Book within Hectad C43

Common Name	Scientific Name	Hectad	Status
Small white orchid	<i>Pseudorchis albida</i>	C43	FPO, Vulnerable
Large flowered hemp nettle	<i>Galeopsis speciosa</i>	C43	NT
Yellow bartisa	<i>Parentucellia viscosa</i>	C43	FPO, NT
Intermediate wintergreen	<i>Pyrola media</i>	C43	NT
Kerry lily	<i>Simethis planifolia</i>	C43	FPO, NT

6.5.1.4 Bryophytes

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

6.5.1.5 National Biodiversity Data Centre (NBDC) Records

A search of the National Biodiversity Data Centre (NBDC) records for the relevant hectad, C43., provided records on a number of fauna species of conservation concern, excluding marine species. These are provided in Table 6-6. NBDC records for protected bird species are presented in Table 6-7.

Table 6-6 NBDC Records for Species of Conservation Interest in hectad C43

Common name	Scientific name	Designation	Hectad
European Otter	<i>Lutra lutra</i>	HD Annex II, IV, WA	C43
Common Frog	<i>Rana temporaria</i>	HD Annex V, WA	C43
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	HD Annex IV, WA	C43
Pine Marten	<i>Martes martes</i>	HD Annex V, WA	C43
Eurasian Badger	<i>Meles meles</i>	WA	C43
Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	WA	C43
West European Hedgehog	<i>Erinaceus europaeus</i>	WA	C43

Annex II, Annex IV, Annex V – Of EU Habitats Directive, WA - Wildlife Acts – Irish Wildlife Acts (1976, 2017), LC – Least concern, NT – Near threatened, VU - Vulnerable.

6.5.1.6 NPWS Data

National Parks and Wildlife Service (NPWS) online records were searched to see if any rare or protected species of flora or fauna have been recorded from hectad C43. An information request was also sent to the NPWS requesting records from the Rare and Protected Species Database. Table 6-8 lists rare and protected species records obtained from NPWS, as received on the 11th of November 2021 as well as those recorded available through the online NPWS map viewer.

Table 6-7 National Parks and Wildlife Service Records

Common name	Scientific name	Designation	Hectad
Allseed	<i>Radiola linoides</i>	N/A	C34
Alpine bistort	<i>Persicaria vivipara</i>	Threatened species: Data Deficient	C34
Alpine saw-wort	<i>Saussurea alpina</i>	Threatened Species: Vulnerable	C34
Blunt-leaved Earwort	<i>Diplophyllum obtusifolium</i>	Threatened Species: Near threatened	C43
Globeflower	<i>Trollius europaeus</i>	Threatened Species: Endangered	C22, C43
Heath cudweed	<i>Gnaphalium sylvaticum</i>	Threatened Species: Vulnerable	C22, C34, C42, C44
Holly-fern	<i>Polystichum lonchitis</i>	Threatened Species: Vulnerable	C34
Intermediate Wintergreen	<i>Pyrola media</i>	Threatened Species: Vulnerable	C22, C23, C33, C34
Large-flowered Hemp-nettle	<i>Galeopsis speciosa</i>	N/A	C33
Northern Dead-nettle	<i>Lamium confertum</i>	N/A	C32
Oysterplant	<i>Mertensia maritima</i>	Threatened Species: Vulnerable	C34, C54
Reindeer lichen	<i>Cladonia ciliata var. ciliata</i>	N?a	C43, C44
Reindeer lichen	<i>Cladonia ciliata var. tenuis</i>	N/A	C23, C54
Reindeer moss	<i>Cladonia portentosa</i>	Protected Species: Habitats Directive Annex V	C23, C31, C33, C42, C43, C44, C54
Rigid bog-moss	<i>Sphagnum teres</i>	Threatened Species: Near threatened	C54
Scots Lovage	<i>Ligusticum scoticum</i>	Threatened Species: Vulnerable	C34

Common name	Scientific name	Designation	Hectad
Shepherd's-needle	<i>Scandix pecten-veneris</i>	Threatened Species: Regionally Extinct	C34
Small Cudweed	<i>Filago minima</i>	Threatened Species: Vulnerable	C32
Small-white Orchid	<i>Pseudorchis albida</i>	Threatened Species: Endangered	C22, C33
<i>Sphagnum imbricatum</i>	<i>Sphagnum imbricatum</i>	N/A	C54
Warne's Thread-moss	<i>Bryum warneum</i>	FPO 2015 Schedule B (Mosses); Threatened Species: Endangered	C32
Common frog	<i>Rana temporaria</i>	HD Annex V, WA	C22, C31, C32, C33, C34, C42, C43, C44, C54
Common lizard	<i>Zootoca vivipara</i>	WA	C34
Common seal	<i>Phoca vitulina</i>	Annex V, WA	C22, C33
Eurasian badger	<i>Meles meles</i>	WA	C22, C31, C32, C33, C34, C43, C44, C52, C53, C54
Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	WA	C41
European Otter	<i>Lutra lutra</i>	Annex II, IV, WA	C22, C23, C31, C32, C33, C34, C41, C43, C44, C53, C54
Grey seal	<i>Halichoerus grypus</i>	WA	C32
Irish Hare	<i>Lepus timidus subsp. Hibernicus</i>	Annex V, WA	C22, C23, C31, C32, C33, C34, C41, C43, C44, C53, C54
Irish stoat	<i>Mustela erminea subsp. hibernica</i>	WA	C22, C34, C41, C44, C53
Pine marten	<i>Martes martes</i>	WA, Annex V	C22, C43
Red deer	<i>Cervus elaphus</i>	WA	C22, C23, C34, C43, C54
European hedgehog	<i>Erinaceus europaeus</i>	WA	C22, C31, C32, C41, C44, C54

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

6.5.1.7 Bat Records

The National Bat Database of Ireland holds records of bat observations received and maintained by BCI. These records include results of national monitoring schemes, roost records as well as ad-hoc observations. A search of the National Bat Database of Ireland was last carried out on the 10th June 2021 and examined bat presence and roost records within a 10 km radius of a central point in the EIAR boundary (IG E108565 N168915) (BCI 2012, Hundt 2012, SNH 2019). Available bat records were provided by Bat Conservation Ireland on 21/06/2021. Results from the National Biodiversity Data Centre were also reviewed for bat species present within the relevant 10km grid squares of the Proposed Development.

At least four of Ireland’s nine resident bat species were recorded within 10 km of the proposed works including soprano pipistrelle, *Pipistrelle* sp., Leisler’s bat, and Daubenton’s bat. The NBDC records returned are provided in Table 6-8. The bat survey report (Appendix 6.3 of this EIAR) should be referred to for full desk study results for bats.

Table 6-8 National Bat Database of Ireland: Records within 10km

Grid Square	Species	Record Count	Latest Record	Dataset
C43	Soprano pipistrelle	1	24/09/2009	National Bat Database of Ireland
C42	Daubenton’s bat	4	23/09/2009	National Bat Database of Ireland
C42	<i>Pipistrelle</i> sp.	1	27/09/2009	National Bat Database of Ireland
C42	Soprano pipistrelle	2	23/09/2009	National Bat Database of Ireland
C33	Daubenton’s bat	5	09/08/2014	National Bat Database of Ireland
C33	Lesser Noctule	1	24/09/2009	National Bat Database of Ireland
C33	<i>Pipistrelle</i> sp.	1	10/10/2011	National Bat Database of Ireland
C33	Soprano pipistrelle	3	10/10/2011	National Bat Database of Ireland
C32	Daubenton’s bat	4	26/08/2014	National Bat Database of Ireland
C32	Leislers bat	2	30/06/2011	National Bat Database of Ireland
C32	<i>Pipistrelle</i> sp.	1	27/09/2009	National Bat Database of Ireland
C32	Soprano pipistrelle	2	27/09/2009	National Bat Database of Ireland

6.5.1.8 Marsh fritillary (*Euphydryas aurinia*)

No records of marsh fritillary have been recorded within the EIAR study area boundary. The closest NBDC records for marsh fritillary were located 3.7km to the northwest of the EIAR boundary in the townland of Druminderry.

6.5.1.9 Inland Fisheries Ireland (IFI) Data

The IFI online database was reviewed for fish species records within the catchments downstream of the EIAR study area boundary. The Glenard wind farm development encompasses numerous small streams and rivers in north Donegal, including the Crana River, Glasagh River, Owenkillew River, Stranaclea River and Mill River. The closest waterbodies with IFI data is the Swilly Estuary and the Burnfoot River.

A range of fish species including Atlantic salmon (*Salmo salar*), brown trout (*Salmo trutta*) and European eel were returned. Table 6-9 provides a summary of the available online data⁸.

Table 6-9: Fish data available from IFI National Research Survey Programme

Waterbody Name & Site Code	Species	Species Richness	Draft Fish Ecological Status
----------------------------	---------	------------------	------------------------------

⁸ IFI National Research Survey Programme, Online, Available at: <https://ifigis.maps.arcgis.com/apps/webappviewer/index.html?id=9a31fedb077c4fb2991184842b7ef025>

Swilly Estuary Site code: NW_220_0100	Bib; Bull huss; Cod, Common seasnail, Common sole, Corkwing wrasse, Dab, Dragonet sp, European eel, Fifteen-spined stickleback, Five-bearded rockling, Flounder, Lesser sandeel, Lesser spotted dogfish, Long-spined sea scorpion, Painted goby, Plaice, Pogge, Pollack, Poor cod, Rock gob, Sand goby, Sand smelt; Sand sole, Shanny; Short-spined sea scorpion, Sprat, Thornback ray, Three-bearded rockling, Three-spined stickleback, Two-spotted goby, Whiting.	32	Good
Burnfoot River Site code: 39B020600A	Brown trout, European eel, Lamprey sp, Salmon, Three-spined stickleback.	5	Good

6.5.1.10 Invasive Species

The NBDC database also contains records of invasive species identified within the relevant hectad. Records of invasive species for hectad C43 are provided in Table 6-10.

Table 6-10: NBDC records for Invasive Species

Common Name	Scientific Name
American mink	<i>Mustela vison</i>

6.5.1.11 Local Hydrology and Hydrogeology

The following description has been summarised from Chapter 9 ‘Water’ of the EIAR and provides a baseline of the local watercourses within and downstream of the site of the proposed project.

‘The majority of the Proposed development site is situated on the north-western facing slopes of Crocknacraaddy Hill, where the highest point is at 360m OD which is just outside the south-eastern corner of the wind farm site. This section of the site (northern section) slopes in a north-westerly direction towards the Crana River which is at an elevation of approximately 120m OD at the north-western boundary of the wind farm site’.

‘The southern half of the wind farm site is situated on the southwestern facing slopes of Crocknacraaddy Hill and the southern slopes of Sorne Hill (elevation ~260m OD). Sorne Hill slopes steadily down towards the Owenkillew River (180m OD) which is located less than 0.5km to the south of the EIAR site boundary.

‘Regionally the proposed wind farm site including the grid connection are located in the Lough Swilly surface water catchment (IE39_02) within Hydrometric Area 21 of the North Western International River Basin District (NWIRBD). Lough Swilly is located between 9 and 13km downstream of the wind farm site. TDR works, which includes the 2 no. link roads at the L1731, are located in the Culdaff – Clonmany – Donagh coastal regional catchment. This regional catchment is also located within the NWIRBD.

A regional hydrology map is shown as Figure 9.2 within Chapter 9 of this EIAR.

On a more local scale, the northern half (~61% of the EIAR study area) of the wind farm site (including 9 no. of the proposed 15 no. turbines) is located in the Crana River surface water catchment (Crana_SC_10). The southern half (~36% of the EIAR study area) of the wind farm site (including 6 no. of the proposed 15 no. turbines, substation and the grid connection cable) is located in the Mill River surface water catchment (Burnfoot_SC_10). Both the Crana River and the Mill River drain to Lough Swilly.

The Crana River flows in a westerly direction along the north-western boundary of the wind farm site and flows into Lough Swilly approximately 13km further downstream. The majority of the watercourses emerging from the northern section of the wind farm site (the main one being the Glenard River (Crana_020)) flow directly into the Crana River along the northern boundary of the wind farm site. The remaining watercourses on the north of the wind farm site flow into the Camowen River which is a tributary of the Crana River.

The southern half of the wind farm site (including the grid connection) initially drains into the nearby Owenkillew River (Mill (Donegal) 010) which is a sub-catchment of the Mill River (Burnfoot_SC_10). The Mill River discharges into Lough Swilly approximately 9km downstream of the wind farm site and approximately 6km downstream of the grid connection at the Trillick substation location. The western end of the grid connection including the Trillick substation drains to the Maragh River which is a sub-basin of the Owenkillew River.

Proposed development within the Culdaff – Clonmany – Donagh coastal regional catchment (~1.5% of the EIAR study area) is limited to the 2 no. link roads TDR works and minor widening works. Within this regional catchment TDR works are located in the Donagh River sub-basin - Donagh_010 (which flows in a northerly direction into Trawbreaga Bay, which is approximately 15km downstream of the TDR works) and in the Cabry River sub-basin (Cabry_010) (~0.36% of the EIAR study area) which flows into Lough Foyle approximately 8km downstream of the TDR works area.

Refer to Table 9-5 below for a summary of hydrology with regard the Proposed Development site infrastructure.

A local hydrology map is shown as Figure 9-3. Chapter 9 of this EIAR.

6.5.1.12 Water Quality

River Basin Management Plans (RBMPs) have been published for all River Basin Districts in Ireland in accordance with the requirements of the Water Framework Directive. The online EPA Envision map viewer provides access to water quality information at individual waterbody status for all the River Basin Districts in Ireland. The EPA Envision map viewer was consulted, most recently, on 30th January 2022 regarding the water quality status of the rivers which run within and directly adjacent to the Study Area. The WFD River Waterbody Status 2013 – 2018 for the watercourses which flow through the site have been assessed in Table 6-11.

Table 6-11: Watercourses on site with relevant water quality statuses

Name	Location	Q-Value	Status	Risk
River Mill	Flows in a westerly direction through the southern end of the site boundary	4-5	High	Not at Risk
Crana River	The Crana River flows westerly along the northern boundary of the wind farm site and flows into Lough Swilly approximately 13km further downstream. All watercourses emerging from the northern half of the proposed development site flow directly into the Crana River along the northern boundary of the wind farm site.	3/0	Poor	At Risk

6.5.2 Conclusions of the Desk Study

The desktop study has provided information about the existing environment in hectad C43, within which the proposed development is located. The mammal species recorded within the relevant hectad have widespread range and distributions in Ireland and are likely to be recorded frequently throughout Ireland (Marnell et al, 2009⁹). Bat records within 10km of the proposed development site revealed that the wider area has been studied for bats. This suggests that the area offers potential for foraging and commuting bat species.

As part of the desk study, a small area of Habitats Directive Annex I habitats ‘Blanket bog’ and Wet heath were mapped within the site boundary. A number of watercourses that drain the study area, lead to downstream National and EU Designated Sites.

The EU designated sites are further considered in the Natura Impact Statement prepared for the proposed development.

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

6.6 Description of the Existing Environment

6.6.1 Description of Habitats

The habitat classifications and codes correspond to those described in ‘*A Guide to Habitats in Ireland*’ (Fossitt 2000). Peatland and grassland habitats have also been categorised to plant communities from the National Survey of Upland Habitats (Perrin et al. 2014) and the Irish Vegetation Classification. Detailed botanical data from relevés recorded in peatland and grassland habitats are provided in Appendix 6.1 of this report. A habitat map of the site is provided in Figures 6-7a to 6-7d. This also shows the smaller areas of peatland habitat within the site.


The habitats within the EIAR study area boundary are dominated by Conifer plantation (WD4) with small areas of Wet heath (HH3), Cutover bog (PB4), Wet grassland (GS4), Eroding/ upland rivers (FW1) and Scrub (WS1). The following sections describe the various habitats within the site in more detail.

⁹Marnell, F., Kingston, N. & Looney, D. (2009) Ireland Red List No. 3: Terrestrial Mammals, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.



- ### Map Legend
- EIAR Site Boundary
 - Proposed Turbine Layout
 - ▲ Proposed Met Mast
 - Proposed Construction Compounds
 - Proposed 110kV Substation Compounds
 - Peat and Spoil Respository Area
 - Turbine Delivery Route Accommodation Works
 - Proposed 110kV Underground Grid Connection Route
 - Turbine Delivery Route
 - Existing Roads Upgrade
 - Proposed
 - Existing Forestry Roads & Tracks
 - Proposed New Site Roads

- ### Habitat Map Legend
- BL3 Buildings and artificial surfaces
 - ED2 Spoil and bare ground
 - GA1 Improved agricultural grassland
 - GA2 Amenity grassland (improved)
 - GS4 Wet grassland
 - PB2 Upland blanket bog
 - PB4 Cutover bog
 - WD1 (Mixed) broadleaved woodland
 - WD4 Conifer plantation
 - WS1 Scrub
 - WS2 Immature woodland
 - FW1 Eroding/upland rivers
 - PB2/H13 Upland Blanket Bog/Wet Heath Mosaic
 - PB2/H13/PB4/PF2 Upland Blanket Bog/Wet Heath/Cutover Bog/Poor Fen and flush Mosaic
 - PB4/PB2 Upland Blanket Bog/Cutover Bog Mosaic


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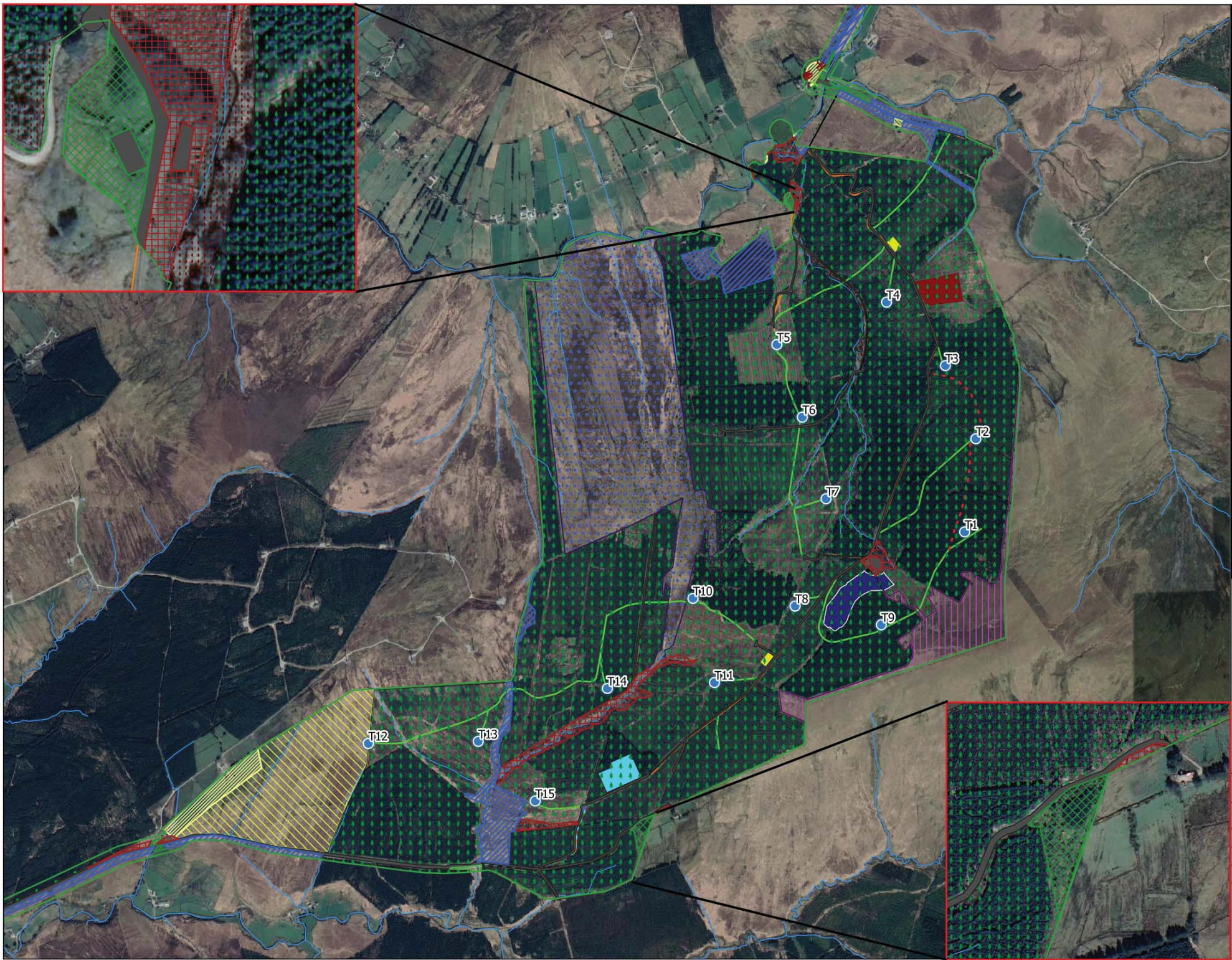
Habitat Map

Project Title

Glendard Windfarm

Drawn By: CB	Checked By: PE
Project No: 190114	Drawing No: Fkj 6-7a
Scale: 1:35000	Date: 07.12.2021


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- ### Map Legend
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 - WD4 Conifer plantation
 - WS1 Scrub
 - WS2 Immature woodland
 - FW1 Eroding/upland rivers
 - PB2/H13 Upland Blanket Bog/Wet Heath Mosaic
 - PB2/H13/PB4/PF2 Upland Blanket Bog/Wet Heath/Cutover Bog/Poor Fen and flush Mosaic
 - PB4/PB2 Upland Blanket Bog/Cutover Bog Mosaic


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Habitat Map - Main Site

Glenard Windfarm

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Scale: 1:17000	Date: 07.12.2021


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- Map Legend**
- EIA/AR Site Boundary
 - Proposed Turbine Layout
 - ▲ Proposed Met Mast
 - Proposed Construction Compounds
 - Proposed 110kV Substation Compounds
 - Peat and Spoil Respository Area
 - Turbine Delivery Route Accommodation Works
 - Proposed 110kV Underground Grid Connection Route
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- Habitat Map Legend**
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 - PB4/PB2 Upland Blanket Bog/Cutover Bog Mosaic



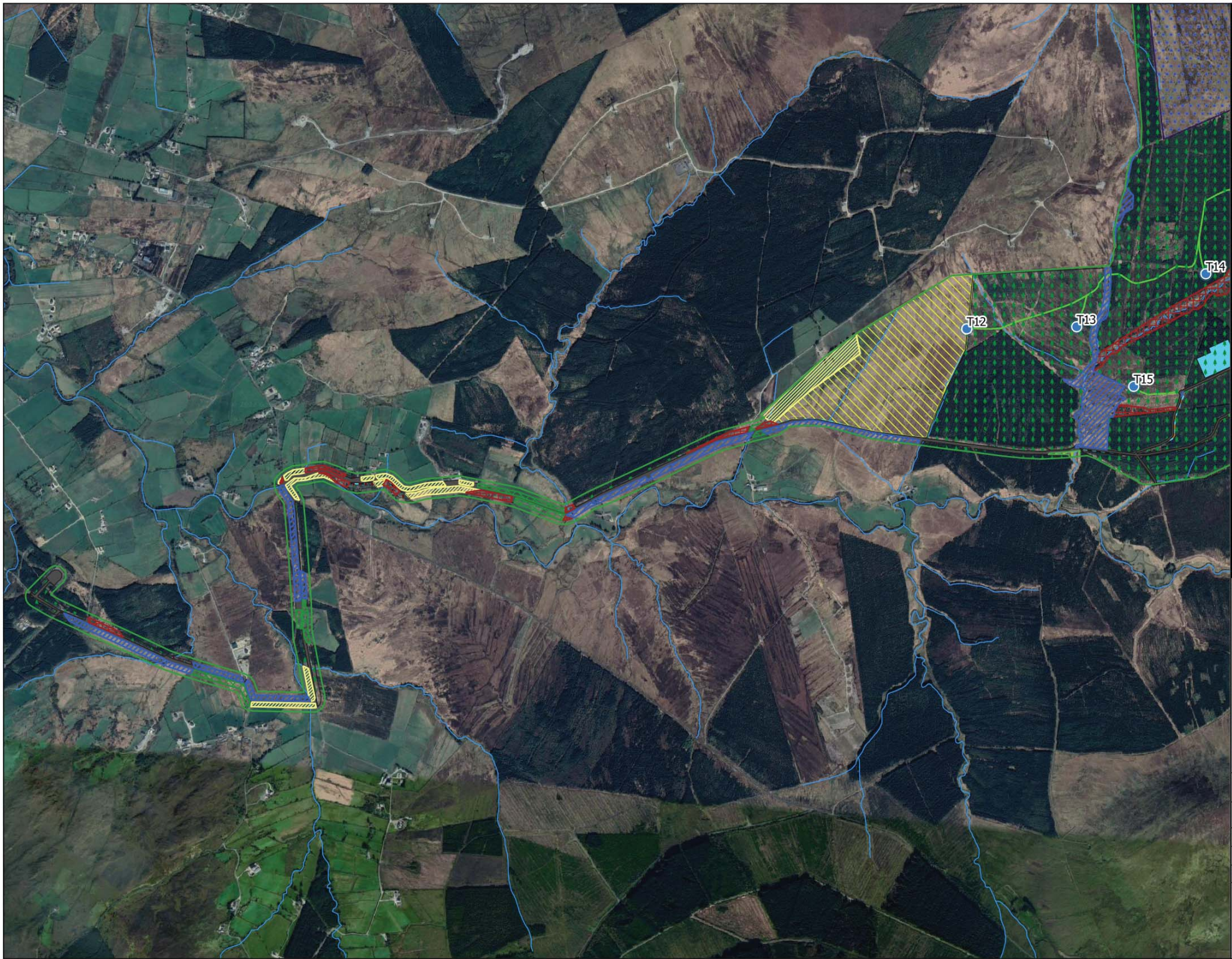
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**Turbine Delivery Route
Habitat Map**


Glenard Windfarm

Drawn By: CB	Checked By: PE
Project No: 190114	Drawing No: Fig 6-7c
Scale: 1:14000	Date: 07.12.2021

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- ### Map Legend
- EIAR Site Boundary
 - Proposed Turbine Location
 - ▲ Proposed Met Mast
 - Proposed Construction Compounds
 - Proposed 110kV Substation Compounds
 - Peat and Spoil Respository Area
 - Turbine Delivery Route Accommodation Works
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 - Turbine Delivery Route
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 - Proposed New Site Roads
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 - PB4/PB2 Upland Blanket Bog/Cutover Bog Mosaic


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Habitat Map - Grid Connection Route
Glendard Windfarm
 Drawn By: CB Checked By: PE
 Project No: 190114 Drawing No: Fkj 6-7d
 Scale: 1:17000 Date: 07.12.2021


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6.6.1.1 Conifer plantation (WD4)

Most the site comprises different stages of coniferous plantation forestry including recent clear-fell, second rotation, immature, semi-mature and mature forestry. The species comprise mainly of sitka spruce (*Picea sitchensis*) with some areas also containing lodgepole pine (*Pinus contorta*). Given the nature of such densely planted coniferous plantations, few other woody plant species occur. Turbines T1, T2, T3, T4, T5, T6, T7, T8, T9, T11, T13, T14 and T15, the substation and the two proposed construction compounds all occur entirely within conifer plantation habitat.

A number of small areas within the site have also been planted with alder along the peripheries of the plantation or in small blocks. The forest edges support species including willow (*Salix spp.*), rowan (*Sorbus aucuparia*), ash (*Fraxinus excelsior*), alder (*Alnus glutinosa*) and hawthorn (*Crataegus monogyna*).

In addition to the wind farm roads, approximately 1 kilometre of amenity gravel pathways will be provided as part of the construction of the Proposed development site. The amenity pathways will link into the proposed internal road network. Visitors will access the site via the proposed new site entrance and the northernmost construction car park will be removed for the operational phase of the proposed development. The proposed amenity gravel pathways are located entirely within coniferous plantation forestry (WD4).



Plate 6-1: Example of mature plantation forestry (WD4) occurring within the east of the site.

6.6.1.2 Peatland habitats

Peatlands occurring within the site comprise mainly of Upland blanket bog (PB2) with some small areas of Cutover bog (PB4). Some areas of Upland blanket bog (PB2) are intact, however in many areas the peatland is degraded, for example where these adjoin conifer plantation. Historic and some recent peat extraction has been undertaken in small areas of peatland within the north and south of the EIAR study area. Therefore, those peatland habitats within the site have been assessed as Cutover bog (PB4).

6.6.1.3 Cutover bog (PB4)

Areas of cutover bog comprised of vegetation that included hare's tail cottongrass (*Eriophorum angustifolium*), common cottongrass (*Eriophorum angustifolium*), ling (*Calluna vulgaris*), purple moor-grass (*Molinia caerulea*) and sedges with small amounts of cross-leaved heath (*Erica tetralix*) also present. Other species also recorded include and deergrass (*Trichophorum caespitosum*). Moss species recorded include *Sphagnum capillifolium*, *Rhytidiadelphus loreus* and *Polytrichum commune*.

The most northern area of cutover bog was dominated predominantly by bare peat with other areas of cutover bog beginning to revegetate.



Plate 6-2: Example of revegetating Cutover bog (PB4) located within the southwest of the site

6.6.1.4 Upland Blanket bog (PB2)

Part of turbine no. T12 is located on Upland blanket bog (PB2), with T10 located adjacent to this habitat within an area of forestry. The peat depth at T12 was between 1.1 and 1.9 metres. In addition, the vegetation composition at both T12 and to the west and further to the north of T10 was typical of blanket bog habitat with some signs of historic drainage evident in the wider area. Some signs of grazing (sheep droppings) and historic burning (old dead heather) was evident in some areas. Such activities have resulted in part of this habitat within the site becoming degraded, with a greater abundance of grasses becoming established and heather reducing. In some areas of the site, Sitka spruce has also become established within the blanket bog in the western area of the site as a result of natural seed dispersal from the nearby forestry, see Plate 6-3. In wetter areas, the peatland habitat formed a mosaic with Poor fen and flush (PF2). This habitat is further described below.



Plate 6-3: Blanket bog (PB2) habitat occurring in the north-western part of the site with some signs of grazing and historic burning evident. Sitka spruce has also become established (background) as a result of natural seed dispersal.



Plate 6-4: Blanket bog (PB2) occurring within the south-east of the EIAR study area boundary. Note also the presence of small areas of Poor fen (PF2) that occurs at the headwaters of small watercourses. No infrastructure is located within this area.

6.6.15 Poor fen and flush (PF2)

Poor fen and flush (PF2) habitat was recorded within the Upland blanket bog (PB2) within low lying areas at the headwaters of some small watercourses (see Plate 6-4 above). Poor fen and flush (PF2) generally formed linear features and was characterised by species which were indicative of higher nutrients than the surrounding bog, such as soft rush (*Juncus effusus*), Yorkshire fog (*Holcus lanatus*), wavy hair-grass (*Deschampsia flexuosa*), sweet vernal grass (*Anthoxanthum odoratum*), common cottongrass (*Eriophorum angustifolium*), deergrass (*Trichophorum caespitosum*), *Polytrichum commune* and *Sphagnum palustre*. The presence of *Sphagnum fallax*, *Sphagnum palustre* and *Polytrichum commune* characterise this habitat as poor fen and flush. There is no development proposed within areas of this habitat.

6.6.16 Eroding/Upland River (FW1)

A number of watercourses were identified within the site and correspond to eroding/ upland rivers (FW1). Watercourses were mainly comprised of small streams less than 0.5 metre in width and gradually expanding to 1-2 metre as they leave the site, see Plate 6-5. These small watercourses that drain the proposed development site and grid connection route form part of the Crana River to the north and the Mill [Donegal] River to the south-southwest respectively, see Plates 6-6 and 6-7.



Plate 6-5: Eroding/upland river (FW1) within the study area, a tributary of the Crana River.



Plate 6-6: Eroding/upland river (FW1), the Owenkillew River, a tributary of the Mill (Donegal) River, across which the grid connection route will cross via an existing bridge to the west of the EIAR study area boundary.



Plate 6-7: Eroding/upland river (FW1), the Crana River, located to the north of the EIAR study area boundary.

6.6.1.7 Scrub (WS1)

Small areas of scrub were noted along forestry edges and formed small pockets within areas of wet heath where conifers have not been planted. Species predominantly comprised of gorse (*Ulex europaeus*), willow and bramble (*Rubus fruticosus agg.*), Bilberry (*Vaccinium myrtillus*), bracken and nettle, see Plate 6-8.



Plate 6-8: Example of Scrub (WS1)

6.6.1.8 Immature woodland (WS2)

A small area of immature woodland (WS2), comprising of planted alder (*Alnus glutinosa*). This area is located to the north of the Crana River and will not be affected by the proposed infrastructure.

6.6.1.9 Wet Grassland (GS4)

Small areas of wet grassland were recorded between blocks of plantation forestry or along site tracks and riverbanks. These areas tended to be dominated by the following plant species; creeping buttercup (*Ranunculus repens*), sweet vernal grass (*Anthoxanthum odoratum*), Yorkshire fog (*Holcus lanatus*), tormentil (*Potentilla erecta*), soft rush (*Juncus effusus*) and sharp-flowered rush (*Juncus acutiflorus*), see Plate 6-9.



Plate 6-9 Example of small area of Wet grassland (GS4) occurring within the north of the site near an old farm building

6.6.1.10 Recolonising bare ground (ED3)

A number of areas where ground disturbance has been undertaken in the recent past have begun to recolonise, see Plate 6-10. These areas are small in area and occur as part of a mosaic with other habitat as such, have not been mapped in detail.



Plate 6-10 Example of an area of Recolonising bare ground (ED3) where ground disturbance has been undertaken in the recent past

6.6.111 Buildings and artificial surfaces (BL3)

There is an old derelict dwelling and farm building within the Proposed Development site. These were categorised as Buildings and artificial surfaces (BL3), see Plates 6-11.



Plate 6-11 Old building occurring within the north of the site.

6.6.112 Spoil and bare ground (ED2)

Unbound forestry tracks throughout the site were categorised as Spoil and bare ground (ED2). The access track verges across much of the site comprised of wet grassland adjacent forestry (WD4) habitats (Plate 6-12). Species recorded comprised mainly of sweet vernal grass (*Anthoxanthum odoratum*), daisy (*Bellis perennis*), dandelion (*Taraxacum officinale* agg.), colt's-foot (*Tussilago farfara*), soft rush (*Juncus effusus*), purple moor-grass, *Carex* spp., crested dogs-tail (*Cynosurus cristatus*) and heather (*Calluna vulgaris*). Upgrading of existing forestry tracks is proposed across the site, as shown in Figure 4-1 and Figure 4.7, Chapter 4 of the EIAR.



Plate 6-12 Example of existing unbound forestry tracks categorised as Spoil and bare ground (ED2)

6.6.1.13 Habitats along the delivery route/link roads

As described in Section 4.4.1.1 of the EIAR, to facilitate the delivery of large turbine components and other abnormal loads during the construction of the wind farm, the proposed project includes for the construction of:

- Link road between the R240 in the townland of Carrowmore or Glentogher through Coillte owned land and the L1731 road (see Plate 6-13); and,
- Link road through Coillte-owned land joining two parts of the L1731 road also in the townland of Carrowmore or Glentogher (see Plate 6-14).

The habitat is dominated by immature second rotation forestry with some wet grassland (WD4) and willow dominated scrub (WS1) occurring between the forestry and the existing roads. The roads have been classified as Buildings and artificial surfaces (BL3).

In addition to the proposed link roads, in order to accommodate the delivery of turbine components and other abnormal loads, road widening works will be required along the L1731 in the townland of Illies and along the local access road in the townland of Glenard. Upon completion of the construction phase of the proposed development, the boundary between the local road and the new hardstanding area will be reinstated using stockproof fencing. The habitats recorded within these areas is largely improved agricultural grassland (GA1) or wet grassland (GS4) of low biodiversity value, with a highly cut back hedgerow (WL1) present along the northern side of the existing road here also. The locations of these road widening areas are illustrated on Figure 4-24 and on the site layout drawings in Appendix 4-1 of the EIAR.



Plate 6-13 Example of forestry (WD4) habitat through which the proposed link road between the R240 and the L1731 road will be located. This is in the townland of Carrowmore or Glentogher within the east of the EIA study area boundary.



Plate 6-14 Example of forestry (WD4) habitat where the proposed link road that will join two parts of the L1731 road in the townland of Carrowmore or Glentogher will be located. This is within the east of the EIA study area boundary.

6.6.1.14 Habitats along the Grid Connection Route and Substation

The grid connection cabling route is approximately 8.3 kilometres in length. It is proposed to construct a 110kV electricity substation within the site of the Proposed Development as shown in Figure 4-1. The layout and cross-section of the proposed onsite substation is shown on Figure 4-12. The proposed substation site is located within an area of forestry adjacent to an existing access road.

The underground cabling (UGC) works will consist of the installation of ducts in an excavated trench to accommodate power cables between the proposed 110kV Glenard Wind Farm substation and the existing 110kV Trillick substation.

This underground cable connection will originate at the proposed onsite substation and will run southwest along the existing forestry road before meeting the local public road in the townland of Meenyanly, see Plate 6-15. The habitats adjoining the existing road, which has been assessed as Buildings and artificial surfaces (BL3), are dominated by Wet grassland (WD4), willow and gorse dominated scrub (WS1). A number of flowing watercourses categorised as Depositing/lowland rivers (FW2) which are all tributaries of the Mill [Donegal]_020 River (WFD) pass beneath the existing road along which the underground cable connection route will be located.



Plate 6-15 Local public road in the townland of Meenyanly along which the proposed cable route will be located.

The grid connection cabling route will cross the Meenkeeragh River at the existing road bridge and continue west along the local road through the townlands of Owenkillew and Barnahone, crossing two small streams before turning south at the bridge at Tullydish Upper. The bridge here spans the Owenkillew River. The Owenkillew River is a tributary of the Mill (Donegal) River.



Plate 6-16 Local road through the townlands of Owenkillew and Barnahone



Plate 6-17 Bridge at Tullydish Upper, spanning the Owenkillew River, across which the proposed grid connection route will pass.

The grid connection cabling route will continue south past the Old School House and crossing a flowing stream before turning west along Gransha Road and crossing the Annaslee River before turning northeast into the 110kV Trillick substation, see Plate 6-18, located within the townland of Ballynahone.



Plate 6-18 Access track to the existing Trillick substation and adjoining forestry (WD4).

6.6.1.15 Habitats within the Proposed Borrow Pit

The proposed borrow pit is located within an area of plantation forestry (WD4), similar to that described in Section 6.6.1.1.

6.6.1.16 Habitats within the Peat Repository Area

As described in Section 4.3.4, a peat repository location has been identified within the proposed development boundary and is illustrated in Figure 4-1. The repository area is located approximately 316 metres north of Turbine No. 3. The repository area is located adjacent to an existing road and dominated by second rotation forestry (WD4), see Plate 6-19.



Plate 6-19 Second rotation forestry (WD4) within the Peat and Spoil in Repository Area

6.6.1.17 Habitats at the Proposed Met Mast

The proposed met mast is to be located within plantation forestry (WD4) dominated by Sitka spruce, see Plate 6-20. Some lodgepole pine (*Pinus contorta*) also occurs in the area. The understory vegetation comprises mainly of purple moor-grass (*Molinia caerulea*) and ling (*Calluna vulgaris*) and some bog-myrtle (*Myrica gale*).



Plate 6-20 Plantation forestry (WD4) dominated by Sitka spruce in which the proposed met mast is located.

6.6.1.18 Protected Flora

No botanical species listed under the Flora (protection) Order (1999, as amended 2015), listed in the EU Habitats Directive (92/43/EEC), or listed in the Irish Red Data Books were recorded on 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 NPWS data request (see Table 6-7), were recorded within the study area.

6.6.1.19 Invasive species

During field surveys, a search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) was conducted. No invasive species were recorded within the EIAR boundary, which includes the grid connection route and turbine delivery works area, nor were they recorded along the turbine delivery route.

6.6.2 Fauna in the Existing Environment

Dedicated faunal walkover surveys were undertaken at the site on the following dates:

- > 13.06.2017
- > 14.05.2019
- > 28.05.2019
- > 27.06.2019
- > 08.07.2019
- > 14.08.2019
- > 15.08.2019
- > 04.09.2019
- > 17.09.2019
- > 02.12.2019
- > 16.04.2020
- > 28.04.2020
- > 17.06.2020
- > 02.07.2020
- > 18.08.2020
- > 01.09.2020
- > 30.11.2020
- > 01.12.2020
- > 03.06.2021

In addition to the above targeted surveys, additional faunal signs/sightings were also recorded during other surveys including habitat assessments, bat surveys and bird surveys in 2018 and 2019. The site was also visited on numerous additional occasions during the undertaking of bat surveys throughout 2019 and 2020 (dates in green above).

The walkover survey was designed to detect the presence, or likely presence, of a range of protected species, including birds, bats, otter and badger. Potential suitable habitats were investigated for signs of animal presence. The following subsections provide a breakdown of the species recorded within the proposed development boundary during the site visit and assessment.

6.6.2.1 Badger

Dedicated surveys for this species were undertaken on the above dates between 2017, 2019, 2020 and 2021 in addition to incidental records recorded during other species-specific surveys. During dedicated badger surveys of the site, signs of badger i.e. badger foraging signs, latrines etc. were searched for.

Although signs of badger foraging activity were recorded within or adjacent to the EIAR study area boundary, no badger sett was recorded within the EIAR study area boundary. A single sett (comprising two entrances) was recorded over 600 metres to the south of the EIAR study area boundary, see Plate 6-21. It is considered to be a small main sett due to the amount of spoil outside, as well as the amount of bedding. In addition, a single entrance outlier badger sett was also recorded outside, but adjacent to, the EIAR study area boundary, over 480 metres south of T13, see Plate 6-22. This single entrance sett is located c. 1.6km to the west of the main sett, with foraging signs identified between the two. The location of all badger setts is shown in Figure 6-9, Confidential Appendix 6-5¹⁰ of this EIAR.



Plate 6-21 Badger sett recorded outside the EIAR study area boundary

¹⁰ In order to avoid potential for persecution of this species, the location of breeding or resting places of protected species should be provided as a confidential appendix for review by the competent authority and not made available to the public in order to avoid potential for persecution.



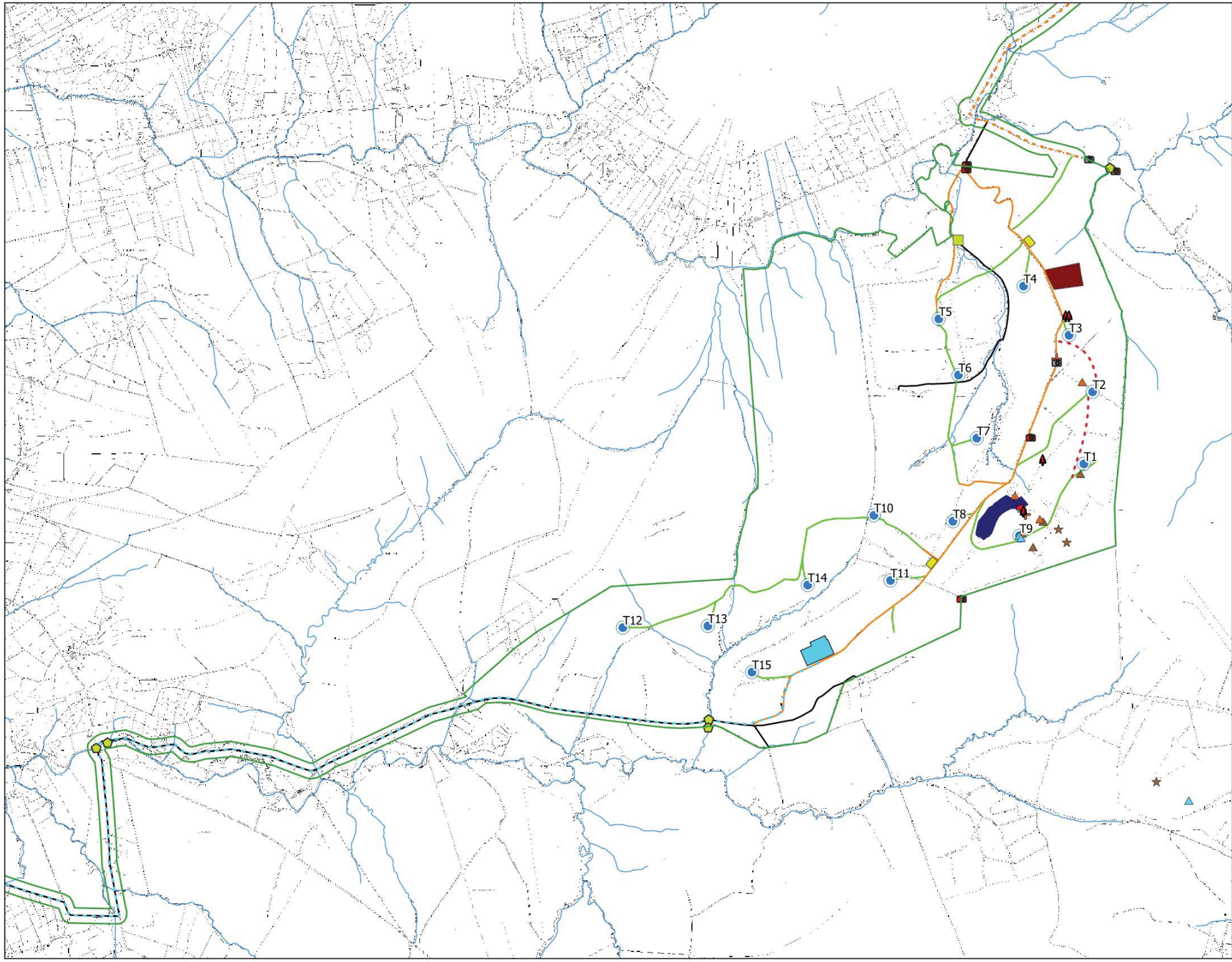
Plate 6-22 Example of outlier badger sett recorded outside, but adjacent to, the EIAR study area boundary

6.6.2.2 Otter

Signs of otter were recorded during the dedicated otter surveys of the watercourses that drain the EIAR study area boundary. Otter spraints were recorded on the Owenkillew River, a tributary of the Mill (Donegal) River, see Plate 6-23, to the southwest of the site, along the grid connection route.

Where the grid connection route spans the Owenkillew River via an existing bridge, this watercourse was also searched for signs of otter both upstream and downstream. Two otter spraints were recorded, one beneath the bridge and one approximately 100m upstream. The Owenkillew River provides suitable habitat for the species and spraints were recorded further upstream as described above. All otter signs recorded are provided in Figure 6-8.

No otter signs were recorded along the smaller watercourses within the site or in close proximity to any of the main windfarm infrastructure i.e. turbines, hardstands, site access roads etc. Watercourses were assessed as providing suitable commuting and foraging habitat for the species and otter may occur within the EIAR site boundary, at least on occasion. Following assessment, 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 proposed development site.



- Map Legend**
- EIA/AR Site Boundary
 - Proposed Turbine Layout
 - Proposed Met Mast
 - Proposed Construction Compounds
 - Proposed 110kV Substation Compounds
 - Peat and Spoil Respository Area
 - Proposed 110kV Underground Grid Connection Route
 - Turbine Delivery Route
 - Existing Roads Upgrade Proposed
 - Existing Forestry Roads & Tracks
 - Proposed New Site Roads
- Master Mammal Records 2020.1**
- SQUIRREL
 - ▲ Possible Old Drey
 - ◆ Spraint
 - Sighting
 - ▲ Stripped Pine Cone
 - DEER
 - ▲ Droppings
 - ★ Track
 - FOX
 - + Scent Marking
 - ▲ Scat
 - Sighting
 - IRISH HARE
 - Sighting
 - PINE MARTEN
 - ▲ Scat
 - OTTER
 - ◆ Spraint
 - ▲ Scat
 - Possible Slide

Ordnance Survey Ireland Licence No. AR 000032000 - Ordnance Survey Ireland/Government of Ireland

Mammal Signs Map

Glendard Windfarm	
Drawn By: CB	Checked By: PE
Project No: 190114	Drawing No: Fig 6-8
Scale: 1:22000	Date: 07.12.2021

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Plate 6-23 Example of otter spraint found along a tributary of the Mill (Donegall) River, beneath a road bridge.

6.6.2.3 Red Squirrel

Dedicated red squirrel (*Sciurus vulgaris*) surveys were undertaken, including walked transects through coniferous plantation forestry (WD4). Feeding signs, see Plate 6-24, were recorded and a number of individuals were also observed. However, no confirmed active dreys were recorded within the proposed development footprint during the surveys, although a possible old disused drey was recorded within the EIAR study area boundary, see Figure 6-8.



Plate 6-24 Red squirrel feeding signs, a stripped pinecone, recorded within coniferous plantation forestry.

6.6.2.4 Bats

Bat surveys undertaken in 2019, 2020, in accordance with Scottish Natural Heritage Guidance (SNH 2019) and subsequently published NatureScot (2021) guidance form the core dataset for the assessment of effects on bats at the proposed development site. Bat surveys included roost survey, manual transect surveys and ground-level static surveys.

Roost surveys

Two derelict buildings, located in the north of the site, were identified in 2019 (IG Ref: E243950 N433653 and E243976 N433654) and surveyed for evidence of roosting bats. The buildings were assessed as providing suitable roosting features and were subject detailed inspections of the exterior to assess for evidence of bat use.

Emergence surveys were carried out in spring, summer and autumn of 2019. In spring, four soprano pipistrelle bats were observed emerging from the two-storey house at dusk. In summer, ten bats were observed emerging from the same building, though not all registered on the Batlogger detectors. The bats were seen light sampling inside the building before emerging, as well as feeding/commuting throughout the building for the duration of the survey. Species observed in summer comprised common and soprano pipistrelle as well as instances of myotis sp. In autumn, three pipistrelle bats were observed emerging from the building, but weather conditions were not ideal for bat activity.

The second structure, located opposite the derelict two-storey building, is a single-storey stone shed with a slate roof and partial underfelt. Potential bat access points were through open doors, windows, gaps in slates and stonework. While no bats were seen emerging from the shed during any of the roost surveys, there was evidence of bat use within the sheds with droppings located on interior walls

The surrounding habitats were assessed as low suitability for roosting bats with large stands of coniferous forestry, clear fell and agricultural grasslands. There was a mixed broadleaved driveway, comprising hawthorn and sycamore, leading to the abandoned structures providing good potential roost features and connectivity for commuting and foraging bats in the area.

Each of the water crossing locations along the underground cable route were assessed by means of a visual inspection survey on 30th June 2021, for their suitability to support roosting bats (Table 4-4). No evidence of bat use, including live or dead specimens, droppings, feeding remains, urine splashes, fur oil staining and noises were identified at any of the water crossings.

Manual transects

2019 manual transects were undertaken in summer and autumn. Bat activity was recorded on all surveys. A total of 474 bat passes were recorded. In general, common pipistrelle (n=294) was recorded most frequently, followed by soprano pipistrelle (n=147), Leisler's bat (n=23), *Pipistrelle* sp. (n=7) and *Myotis* sp. (n=3).

2020 manual transects were undertaken in spring, summer and autumn. Bat activity was recorded on all surveys. A total of 45 bat passes were recorded. In general, Leisler's bat (n=36) was recorded most frequently, followed by, Common pipistrelle (n=6), *Myotis* sp. (n=2) and Brown long-eared bat (n=1). Plate 4-4, Section 4.5.2 'Manual Transects 2019' and Plate 4-5, Section 4.5.3 'Manual Transects 2020' of the standalone 'bat report', provided in Appendix 6.2 of the EIAR, presents results for individual species per survey period

Ground-level Static Surveys

SNH Guidance (2019) requires static detector surveys at turbine bases and the results of those surveys are provided below. The location of all static detectors is provided in Table 3-2 of the Bat report Appendix 6.2 of this EIAR.

Across 2019 and 2020 in total, 18,309 bat passes were recorded across all deployments. In general, common pipistrelle (n=13,190) occurred most frequently, while soprano pipistrelle (n=3,701), Leisler's bat (n=887), *Myotis* sp. (n=284), and brown long-eared bat (n=247) were significantly less.

Over both 2019 and 2020 surveys, the static detectors were placed in different locations to provide a representative cover of the study area.

In 2019 bat activity was dominated by common pipistrelle across all seasons. Activity for soprano pipistrelle, Leisler's bat, *Myotis* sp. and brown long-eared was significantly lower across all seasons when compared to common pipistrelle.

During 2020 bat activity in general was very low across all seasons. During spring brown long eared bat had the highest activity followed by common pipistrelle, soprano pipistrelle, leislars bat and then *Myotis* species having the lowest activity. During summer and autumn leislars bat dominated bat activity, in summer common pipistrelle had the second highest and myotis activity was significantly less. No other bat species were recorded during summer 2020. During autumn common pipistrelle was the second highest recorded species followed by brown long-eared, Soprano pipistrelle and myotis species.

Activity was variable between survey nights. Therefore, bat pass per hour, was used as the most appropriate measure of bat activity. Results for each species can be found in Plate 4-7 of the detailed bat report, provided in Appendix 6.2 of the EIAR.

6.6.2.5 Reptiles and Amphibians

Common frog (*Rana temporaria*) was recorded in the area of suitable habitat, notably on areas of wet peatland, wet grassland and tadpoles within a shallow waterbody at a historic excavation, see Plate 6-25. Common lizard (*Zootoca vivipara*), while not recorded during the site visits, is likely to occur within the study area. Two individual smooth newt (*Lissotriton vulgaris*) were recorded near the Crana River within the north of the EIAR study area boundary. There are no works proposed at the location and therefore no potential for impact as the infrastructure (site track upgrade) is located away from the habitat at this location.

The proposed development will not result in a significant loss of suitable habitat for reptiles and amphibians. It is considered that suitable habitat is extremely widespread in the study area and beyond.



Plate 6-25 Example of shallow area of water, fed by a nearby small stream, containing common frog tadpoles within the site.

6.6.2.6 Fisheries and Aquatic Fauna

The small streams that flows off the site of the Proposed Development, and downstream watercourses, were subject to biological evaluation and assessment through kick sampling. Full details of the results of these surveys are provided in Appendix 6.3. A map of the kick sample locations is provided in Figure 6-3.

The survey included a general habitat assessment and biological water quality assessment at watercourses within or downstream of the EIAR study area boundary. The water quality, as per Q-value (Quality Rating System)¹¹, is fully described in Appendix 6.3. Five of the six sample locations assessed were Q3 ‘Moderately polluted’, and one as Q-3-4 ‘Slightly polluted’.

The upland eroding watercourses within the EIAR study area boundary featured higher gradients and higher flows not conducive to supporting resident salmonids, European eel or lamprey. However, the larger downstream watercourses within the lower catchments are likely to support fish species identified in the desk study, see Section 6.5.1.9.

6.6.2.7 Other species

Irish hare (*Lepus timidus ssp. hibernicus*) was observed on occasion within the site boundary. Mustelid scats were recorded within the forestry and are presumed to be pine marten (*Martes martes*). The scats of fox (*Vulpes vulpes*) were also recorded in a number of areas within the site.

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

¹¹ Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C., & MacGarthaigh, M. (2005). *Water quality in Ireland*. Environmental Protection Agency, Co. Wexford, Ireland.

Incidental records of invertebrates were recorded during the walkover surveys of the site. In addition to the aquatic invertebrates identified during kick samples of the watercourses on site, the following include the species commonly recorded within the study area:

- White ermine moth (*Spilosoma lubricipeda*)
- Fox moth (*Macrothylacia rubi*)
- Drinker moth (*Euthrix potatoria*)
- Common hawker dragonfly (*Aeshna juncea*)
- Common darter damselfly (*Sympetrum striolatum*)
- Peacock butterfly (*Inachis io*)
- Small copper butterfly (*Lycaena phlaeas*)
- Meadow Brown (*Maniola jurtina*)
- Speckled wood butterfly (*Pararge aegeria*)
- Green veined white (*Pieris napi*)
- Small tortoiseshell butterfly (*Aglais urticae*)
- Buff-tailed bumblebee (*Bombus terrestris*)
- Crane fly (*Tipulidae sp*)
- Common pondskater (*Gerris lacustris*)
- Magpie moth (*Abraxas grossulariata*)

6.6.3 Importance of Ecological Receptors

Table 6- lists all identified receptors and assigns them an ecological importance in accordance with the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009). This table also provides the rationale for this determination and identifies the habitats that are Key Ecological Receptors. These ecological receptors are considered in Section 6.7 of this report and mitigation/ measures will be incorporated into the proposed development where required, to avoid potential significant impacts on the features.

Table 6-12 Key Ecological Receptors identified during the assessment

Ecological feature or species	Reason for inclusion as a KER	KER
Designated sites	<p>Nationally Designated Sites</p> <p>Only one Nationally designated site is located downstream of the proposed development and has been identified as being within the likely Zone of Impact:</p> <ul style="list-style-type: none"> ➤ Lough Swilly Including Big Isle, Blanket Nook & Inch Lake pNHA <p>The majority of this pNHA has also been designated as part of Lough Swilly SAC; potential impacts on the SAC are fully considered within the accompanying NIS. This is further described in Section 6.7.2 of this Chapter.</p>	Yes
	<p>European Designated Sites</p> <p>The following Special Areas of Conservation are identified in the AA Screening as being within the Likely Zone of Impact and are assessed fully in the NIS that accompanies this application:</p> <ul style="list-style-type: none"> ➤ Lough Swilly SAC ➤ North Inishowen Coast SAC ➤ Lough Swilly SPA ➤ Lough Foyle SPA [UK9020031] ➤ Trawbreaga Bay SPA 	Yes

Ecological feature or species	Reason for inclusion as a KER	KER
	<p>These sites are assigned International importance and included as a KER as there is potential for indirect effects on them via water pollution.</p> <p>Note: SPAs within the Likely Zone of Impact are considered in Chapter 7, Ornithology and in the NIS.</p>	
Aquatic habitats and related species	<p>Eroding/upland rivers (FW1)</p> <p>A number of natural watercourses and large rivers are located within the site boundary. These watercourses include:</p> <ul style="list-style-type: none"> ➤ The Crana River to the north, and ➤ The Mill [Donegal] River to the south-southwest. <p>These Rivers and Streams have been assigned Local importance (Higher Value) as they are of high biodiversity value and connect to downstream waterbodies in the local area. They also provide a conduit to downstream SACs/SPAs of international importance.</p>	Yes
	<p>Aquatic and Fisheries Species</p> <p>The aquatic species that are associated with the rivers that are located within and surrounding the site are assigned Local Importance (Higher Value) in that they have a high biodiversity value in the local context. The downstream watercourses and fauna within them have been assigned as of Local Importance (Higher Value) due to the known populations of salmon, trout and lamprey species along with otter. There is potential for indirect effect on these features as a result of impacts on water quality. These species include salmonid, trout, lamprey species, European eel, aquatic invertebrates and other aquatic species. Fish and other aquatic species are therefore included as a KER for further assessment along with Upland eroding rivers.</p>	Yes
Conifer plantation (WD4)	<p>The majority of the proposed windfarm infrastructure is located within Conifer Plantation (WD4). This is a highly modified habitat with a low biodiversity value. This is classified as Local Importance (Lower Value). For these reasons, this habitat has not been identified as a KER.</p>	No
Peatlands and associated habitats	<p>Upland Blanket Bog (PB2)</p> <p>This habitat is assigned County Importance as, although the habitat occurring within the site has been degraded as a result of forestry and turbary activities, the areas of upland blanket bog conform to EU Habitats Directive Annex I habitat Blanket Bog [7130] and is of high biodiversity. Poor fen and flush (PF2) is also considered in this assessment as it forms an intimate mosaic with the habitat locally in places. The footprint of the proposed development has the potential to result in direct and indirect effects on the receptors and they are included as a KER for further assessment.</p>	Yes
	<p>Cutover bog (PB4)</p> <p>This habitat is assigned County Importance as the habitat that occurs within the site has been degraded as a result of historic turbary activities. The areas of Cutover bog (PB4) conform to EU Habitats Directive Annex I habitat Blanket Bog [7130] and is of high biodiversity in a local context. The footprint of the proposed development has the potential to result in</p>	Yes

Ecological feature or species	Reason for inclusion as a KER	KER
	direct and indirect effects on the receptors and they are included as a KER for further assessment.	
Spoil and bare ground (ED2)	The habitat is common and widespread in the wider area. The habitat has been assessed as of Local Importance (lower value) as it is largely associated with artificial site access tracks and is of low biodiversity value. For this reason, it has not been identified for further assessment and is not a KER.	No
Wet grassland (GS4)	Wet grassland (GS4) has been assessed as of local importance (lower value) as it is generally of low biodiversity value primarily due to fragmentation, abandonment and scrub encroachment associated with the surrounding afforestation of the landscape. However, the habitat is of some local importance to local wildlife (NRA, 2009). As such, the habitat has been assessed as of Local Importance (lower value). There will be no significant loss of this habitat at any geographic scale as a result of the proposed development. It is therefore not considered further in this assessment.	No
Scrub (WD1)	This habitat is of some local importance to local wildlife (NRA, 2009). However, the habitat is common and widespread in the wider area. As such, the habitat has been assessed as of Local Importance (lower value). There will be no significant loss of this habitat at any geographic scale as a result of the proposed development. It is therefore not considered further in this assessment.	No
Hedgerow (WL1)	Hedgerow (WL1) habitat was present to the north-east of the development site in association with the existing access road here. Approximately 85 linear meters of this hedge is proposed to be cleared to accommodate road widening works proposed here. Despite the heavily managed nature of the hedgerow and its low species diversity this has been assessed as being of Local Importance (Higher Value) due to the commuting and foraging landscape features that hedgerows provide for local species such as bats.	Yes
Badger	Badger as an ecological receptor has been assigned Local Importance (Higher value) on the basis that the habitats within and adjacent to the study area are likely to be utilised by a locally occurring badger population of Local Importance. Direct impacts on badger are not anticipated. There will be no loss of resting or breeding places associated with the development. The main badger sett identified during field visits was recorded over 600 metres outside of the south of the EIAR study area boundary. The single outlier badger sett was located outside, but adjacent to, the EIAR study area boundary approx.. 480 metres south of T13. The proposed development has therefore no potential for significant effect on badger at any geographic scale and it is therefore not included as a KER for further assessment.	No
Otter	Otter spraints were recorded on tributaries of the Mill (Donegal River, along the grid connection route corridor. Based on the absence of otter records within the site i.e. in close proximity to significant infrastructure such as turbine bases, access roads, borrow pits etc, the low number of otter records in the wider study area and the low suitability of the aquatic habitats to support fish species, otter has been assessed as of Local Importance (Higher value). No evidence of a more ecologically important population was recorded during any of the site surveys undertaken. The proposed development has the potential to result in indirect effects on the receptor (as a result of deterioration in habitat associated with indirect water pollution or disturbance during construction/ decommissioning) and it is therefore included as a KER and requires further assessment.	Yes

Ecological feature or species	Reason for inclusion as a KER	KER
Red squirrel	<p>Although evidence of red squirrel was recorded within the study area, no evidence of populations of squirrel being significant at more than a local level was recorded. Based on the low number of squirrel records for the site, squirrel has been assessed as of Local Importance (Higher value).</p> <p>The proposed development footprint has the potential to result in direct and indirect effects on this receptor. However, given the extent of suitable habitat in the area for the species, the small footprint of the proposed infrastructure and the fact that the proposed development will not result in any fragmentation of red squirrel habitat, red squirrel has not been included as a KER.</p>	No
Bats	<p>The habitats within and surrounding the proposed development site are likely to be utilised by a bat population of Local Importance (higher value). All bat species in Ireland are protected under both national legislation – (Wildlife Act, 1976, as amended) and European legislation – (Habitats Directive (92/43/EEC). Bats are likely to forage and commute within the vicinity of the proposed development. No bat roosts were identified within the development footprint. The proposed development has the potential to result in direct and indirect effects on the receptor. Therefore, bats are included as a KER for further assessment.</p>	Yes
Reptiles and Amphibians	<p>The proposed development will not result in a significant loss of suitable habitat for reptiles and amphibians. No evidence of populations of amphibians 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 low number of amphibian records for the site and the highly afforested nature of the study area, amphibians have been assessed as of Local Importance (lower value).</p>	No
Additional protected fauna (e.g. Irish hare, pine marten, fox etc).	<p>The recorded evidence suggests that the study area is not utilised by populations of higher than local significance and no potential for significant effects have been identified at the population level. Due to the small footprint and nature of the proposed development, they are unlikely to be significantly affected by the proposed development. For this reason, other faunal species are not considered further in this EIAR. Significant effects are not anticipated.</p>	No

6.7 Ecological Impact Assessment

6.7.1 Do-Nothing Effect

If the proposed development were not to proceed, the majority of the lands within the site would continue to be managed as commercial forestry. This would continue to involve the harvesting of timber as it matures, followed by the coniferous forestry replanting. The other habitats identified within the EIAR study area, including peatlands and associated habitats, would likely remain in a similar condition. In some drier areas of the peatland habitat, scrub is likely to develop and in time, this may undergo succession to small areas of woodland. The general biodiversity on the site, as described in this chapter, would likely remain similar to its current state as activity levels and land use would not change significantly.

6.7.2 Likely Significant Effects During Construction Phase

6.7.2.1 Effects on Habitats During Construction

Table 6-13 below provides details of the extent of the recorded habitats on the site, the extent of the habitat that will be lost to facilitate the proposed development and the percentage of the total area of that habitat in the EIAR study area that it represents.

Table 6-13 Extent of habitat lost to the proposed development and the percentage of the total area of that habitat on site

Habitat	Total Area (Ha) /Length (Km) in the site	Area (ha)/length (km) to be lost to development footprint	% of total to be lost	KER?
Conifer plantation (WD4)	622.34ha	24.7ha	24.7ha	No
Buildings and Artificial Surfaces (BL3)	26.2ha	N/A (some existing roads to be upgraded; no buildings to be lost)	0	No
Spoil and bare ground (ED2)	N/A (comprised areas of unbound forestry tracks and road verges)	Unbound forestry tracks to be upgraded	-	No
Improved agricultural grassland (GA1)	10.23ha	0.15ha	1.4%	No
Amenity grassland (GA2)	0.13ha	0	0	No
Wet grassland (GS4)	6.01ha	0.05ha	0.8%	No
Upland blanket bog (PB2)/ Wet heath (HH3) mosaic	19.44ha	0.02ha	0.1%	Yes
Upland blanket bog (PB2)/ Cutover bog (PB4) mosaic	42.02ha	0.06ha	0.14%	Yes
Upland blanket bog (PB2)/ Wet Heath (HH3)/ Cutover bog (PB4) mosaic	105.8ha	0.07ha	0.06%	Yes

Cutover bog (PB4)	49.3ha	0.1	0.2%	Yes
(Mixed) Broadleaf woodland (WD1)	4ha	0	0	No
Scrub (WS1)	14ha	0.06	0.4%	No
Immature woodland (WS2)	1.25ha	0	0	No
Eroding/ upland rivers (FW1)	Not known	0	0	Yes
Hedgerow (WL1)	100 linear metres	75 linear metres	75%	Yes
Total				

The proposed development will result in the loss of areas of habitat that are of Local Importance (Lower Value) and are not identified as KERs. This mainly involves the loss of coniferous plantation forestry (WD4) and has been assessed as of low ecological value. Other habitats assessed as of local importance (lower value) include; Wet grassland (GS4), Buildings and artificial surfaces (BL3), Recolonising bare ground (ED3) and Spoil and bare ground (ED2). Any direct or indirect impacts on these habitats are not significant.

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

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

Table 6-14 Potential for impact on rivers, streams and Sensitive Aquatic Species

Description of Effect	<p>This section assesses the potential for likely significant effects on aquatic receptors including aquatic habitats (i.e. watercourses), salmonids, lamprey, coarse fish, European eel, aquatic invertebrates, molluscs and other aquatic species identified during the desk study and field surveys and which are likely to occur downstream of the Proposed Development.</p> <p>The footprint of the proposed development has been specifically designed to avoid the large watercourses within the study area, see Sections 3.5, Chapter 3 of this EIAR. This was undertaken as part of a constraints mapping exercise. The location of new watercourse crossings has been specifically chosen to facilitate the use of precast concrete bottomless box culverts, see the site layout drawings in Appendix 4.1 of this EIAR, thereby ensuring that no instream works are necessary in these locations and minimising potential for impact on the receiving environment. However, the proposed internal road network, proposed turbine delivery route and grid connection route also cross a number of watercourses. Where possible, site access tracks will utilise existing bridges with no instream works proposed (see Appendix 4.1); however replacement of bridge decks at a single bridge (Bridge 4 as shown in Appendix 4.1) will be required in order to accommodate the grid connection cable (although no removal of the external bridge structure or masonry will be required). In-channel works will be required here; however a temporary dry working area for the works will be created within the river channel to ensure the stream will continue to flow on the other side of the channel to the works, and the river flow will be reinstated following completion of the works. Therefore there is no potential for the proposed development to result in any barrier to the movement of aquatic species.</p> <p>There is potential for the construction activity within the main wind farm to result in the run off of silt, nutrients and other pollutants such as hydrocarbons and cementitious material into these watercourses. This could result from the culverting of drainage ditches, minor movement of peat (associated with T12 and where access roads are constructed on bog) or the use of concrete and other construction materials. The</p>
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	<p>proposed development will cross a number of small drainage ditches, which are not themselves ecologically sensitive but do provide connectivity to the larger watercourses that surround the site.</p> <p>The construction phase of the proposed watercourse crossings represents a potential indirect effect on the identified aquatic receptors in the form of habitat degradation through water pollution.</p> <p>These effects on water quality are fully described in Chapter 9 ‘Water’ of this EIAR and are described here in relation specifically to ecology.</p>
<p>Characterisation of unmitigated effect</p>	<p>In the absence of mitigation, the indirect effect of water pollution on aquatic receptors during construction has the potential be a short-term, moderate, reversible impact on watercourses which act as a conduit to downstream habitats. The magnitude of any such impact is likely to be at worst moderate, given that all major infrastructure such as turbine bases, site compound etc. are located over 50 metres from any significant watercourse.</p>
<p>Assessment of Significance prior to mitigation</p>	<p>In the absence of mitigation and following the precautionary principle, there is potential for the proposed development to result in significant indirect effects on the identified aquatic habitats and species at a local geographic scale in the form of pollution during the construction phase of the proposed development.</p>
<p>Mitigation</p>	<p>A detailed Surface Water Management Plan for the proposed development is provided as Appendix 4.4 of this EIAR. This plan provides details of how surface water quality will be protected during the construction of the proposed development. In addition to this, specific mitigation is provided in relation to water quality in Chapter 9: ‘Hydrology and Hydrogeology’ of this EIAR. In addition, the Construction Environmental Management Plan (CEMP) that is provided as Appendix 4.3 of the EIAR, provides the details of exactly how the measures will be implemented during construction.</p> <p>In relation to new watercourse crossings, Inland Fisheries Ireland (IFI) will be consulted a minimum of four weeks in advance of the installation of pre-cast concrete bottomless box culverts. The Inland Fisheries Ireland (2016): <i>Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters</i>, and the Scottish Natural Heritage (SNH) <i>Good Practice During Wind Farm Construction</i> (SNH, 2019, 4th Edition) will also be adhered to. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI).</p> <p>Section 4.9.4 of this EIAR provides the methodology proposed for new watercourse crossings. Section 10 of the ‘Glenard Wind Farm 110kV Grid Connection - Construction Methodology’ Report (TLI Group) (Appendix 4.5 of this EIAR) provides specific methodology for the replacement of the deck of Bridge 4, for which temporary dams will be used during construction to divert and contain the flow from the works area. In addition, Section 9.5.2.8, Chapter 9 of the EIAR ‘Hydrology and Hydrogeology’ fully details the proposed mitigation measures to protect water quality for proposed works to bridges and new watercourse crossings, and Section 3.2 of the Construction Environmental Management Plan (CEMP) that is provided as Appendix 4.3 of the EIAR provides the details of how the relevant mitigation measures to ensure the protection of water quality will be implemented during construction.</p>
<p>Residual Effect following Mitigation</p>	<p>Following the implementation of the mitigation measures as described above, there will be no significant residual effect on aquatic habitats or species as a result of the proposed development. The proposed development will not cause any waterbodies to deteriorate, irrespective of their current condition, and will not in any way prevent any waterbodies from meeting the biological and chemical characteristics for good ecological status.</p>

6.7.2.1.2 Assessment of Potential Effects on Peatlands and Associated Habitats

Table 6-2 Loss of peatlands and associated habitats

<p>Description of Effect</p>	<p>The construction of the proposed windfarm and associated infrastructure will result in the direct loss of approximately 0.25 hectares of Upland blanket bog (PB2) and Cutover bog (PB4) as a result of the proposed Turbine no. T12 (degraded bog), Turbine no. T10, sections of the new site access track between T10 and T14 (the area of blanket bog in this area of the site also forms an intimate mosaic with small areas of Poor fen (PF2)) a narrow strip of cutover bog between T13 and T14, and a small area of degraded bog at the site of the new access road between T1 and T9. The remaining area of peatland habitats within the EIAR study area boundary have been entirely avoided in the design of the project with no potential for any effect thereon.</p> <p>There is the potential to result in indirect effects on the habitat immediately adjoining the footprint through drainage. Such indirect impacts are further considered in the below paragraphs.</p>
<p>Characterisation of unmitigated effect</p>	<p>The loss of Upland blanket bog (PB2) associated with the construction of Turbine no. T12, T10 and the associated site access roads for these turbines as well as the access road between T1 and T9, and cutover bog (PB4) associated with the access road between T13 and T14 will result in a permanent and irreversible impact on this habitat of County Importance. The magnitude of this impact is judged to be slight in the absence of mitigation as it only affects a very small percentage of the overall habitat type within the EIAR study area.</p>
<p>Assessment of Significance prior to mitigation</p>	<p>The loss or degradation of Upland blanket bog (PB2) and Cutover Bog (PB4) habitats has been assessed as a permanent slight negative effect on a very small area of a receptor of County importance, in the absence of mitigation. The impact is restricted to a small percentage of the overall habitat within the site. In addition, the proposed infrastructure layout has been designed to deliberately avoid the other areas of Upland blanket bog (PB2) and Cutover bog (PB4) within the site boundary.</p>
<p>Mitigation</p>	<p>The proposed development has been deliberately designed to minimise loss of Upland blanket bog (PB2) and Cutover bog (PB4). Where direct impacts on peatland habitat will occur, as a result of the construction of Turbines T12, and to a lesser extent T10 and the associated access roads to these turbines and between T1 and T9 and T13 and T14, mitigation measures as described below will be implemented to minimise the works area within the construction corridor. This will avoid any loss of peatland habitat outside the proposed development footprint. As described in Section 4.3.2.1.2 of the EIAR, floating roads over peat are proposed for areas where the peat stability assessment indicates that this construction method is suitable. Floating roads minimise impact on the peat, particularly peat hydrology, as there is no excavation required and no subsequent peat arisings are generated. Where the underlying peat has insufficient bearing capacity or due to topographic restrictions, an excavated type access road may be more suitable. The construction types as they are proposed are shown in Figure 1-1 of Fehily Timoney & Company's (FT) Peat & Spoil Management Plan. This document is included as Appendix 4-2 to Chapter 4 of this EIAR. In the areas where proposed new roads cross areas of blanket bog, excavated roads are proposed due to peat stability recorded in these locations.</p> <p>Where excavation is required, at turbine T12 and T10 hardstands, and associated access roads here and as well as the access road between T1 and T9, all turves and sub-peat arising from the initial construction phase will be used in habitat restoration adjacent to the proposed development infrastructure. During the construction of infrastructure within peatland habitat at the three locations listed above, site specific drainage approaches have been incorporated into the proposed development to avoid localised desiccation and erosion of peat. This is fully described in the accompanying Biodiversity Management and Enhancement Plan (BMEP), provided in Appendix 6.4 of the EIAR.</p>

	<p>Where the development footprint does occur on this habitat, (i.e., at Turbines T12 and T10 and associated access roads, a section of the new site access track between T10 and T14, Access track between T13 and T14, and a small area of degraded bog at the site of the new access road between T1 and T9), the proposed development provides for the replacement of peatland habitat through the restoration of forestry (WD4) back to peatland and the removal of encroaching tree cover to improve an area of existing peatland, both areas located to the north of Turbine no. T10. The restoration areas equate to a total of approximately 5.4ha. The areas are mapped, and the restoration approaches are fully described, in the site-specific Biodiversity Management and Enhancement Plan (BMEP), provided in Appendix 6.4 of the EIAR. The measures specified in the BMEP will ensure that there will be no net loss of peatland habitat associated with the proposed development as well as providing an overall long-term net gain in terms of area (2.7ha restored from forestry + 2.7ha improved peatland habitat).</p> <p>On completion of successful restoration of plantation forestry to peatland habitats, this will result in an additional area of 2.45ha of restored peatland habitat as a result of the proposed development. The mitigation/restoration measures will be monitored by a suitably qualified ecologist appointed by the wind farm operator over the lifetime of the proposed development as part of the BMEP to confirm their effectiveness and to allow for alteration in approaches where necessary.</p>
<p>Residual Effect following Mitigation</p>	<p>There is potential for a significant temporary negative impact on a feature of County Importance. However with successful mitigation i.e. forestry restoration to bog (5ha), there will be no significant residual effect on peatland features of County Importance as a result of the proposed development.</p>

6.7.2.1.3 Assessment of Potential Effects on Hedgerow

Table 6-3 Hedgerow impact assessment

<p>Description of Effect</p>	<p>Road widening works associated with the proposed windfarm at the northern site entrance will result in the direct loss of approximately 75 linear metres of hedgerow habitat.</p>
<p>Characterisation of unmitigated effect</p>	<p>The permanent loss of approximately 75 linear metres of hedgerow trees would constitute a permanent negative effect on the hedgerow habitat within the site, albeit a minimal one within the context of the surrounding landscape given that the hedgerow is species poor and habitat of this nature is widespread and common in the wider area.</p>
<p>Assessment of Significance prior to mitigation</p>	<p>The permanent loss of this section of low hedgerow is not considered to be a significant effect at any greater than the local geographical scale, as this habitat is widespread and common within the local farmland to the west. Removal of the hedge would not cause any significant fragmentation of habitat connectivity within the landscape given that the adjacent Polinamack and Crana Rivers, are both lined with tree cover.</p>
<p>Mitigation</p>	<p>In order to compensate for the loss of linear hedgerow approximately 100 linear metres of new replacement hedgerow planting will be carried out just to the north of where hedgerow will be removed along the turbine delivery route. This will result in a net gain in this habitat within the site. Tree/shrub species planted in these locations will be of a similar composition to those occurring on site, will be native and of local provenance. Rowan (<i>Sorbus aucuparia</i>) and hawthorn will be utilised as these are low-growing and produce flowers and berries that are beneficial for a number of species. Hazel and holly are also proposed.</p>
<p>Residual Effect following Mitigation</p>	<p>Following implementation of mitigation, no potential for significant effect exists at any geographic scale. The planting of additional hedgerow will serve to enhance the hedgerow habitat within the site due to increased species diversity compared to that to</p>

	be lost, will benefit wildlife and due to the increase of 30 linear metres over that to be lost, will result in a net gain in this habitat within the site.
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6.7.2.2 Effects on Protected Fauna During Construction

The proposed development has the potential to result in habitat loss and disturbance impacts on faunal species that were recorded on the site but were not included as KERs, see Table 6-. Given the extensive area of habitat that will remain undisturbed throughout the site and the avoidance of the most significant areas of faunal habitat (peatlands, scrub and watercourses), no significant effects on non-KER faunal biodiversity is anticipated as a result of the proposed development. Therefore, these species were excluded from further assessment.

The potential for significant effects on aquatic species is restricted to indirect effects on their habitat resulting from water pollution. This has been assessed in Section 6.7.3.1.1 above and is not repeated below.

6.7.2.2.1 Assessment of Potential Effects on Otter

Table 6-4 Assessment of Potential Impacts on Otter

Description of Effect	<p>As described above in relation to aquatic habitats and species, the proposed development has been deliberately designed so that all major infrastructure, i.e. turbine bases and hardstands, avoid significant watercourses. Instream works are proposed along the grid connection route at a single location (Bridge 4, see Appendix 4.1 of Chapter 4) where bridge deck replacement works to the bridge are required. There is therefore the potential for direct effect on habitat that is significant for otter.</p> <p>Infrastructure such as the haul roads and site access tracks will require up to 4 new watercourse crossings along the wind farm access roads using culverts and 5 no. potential crossing upgrades will be required as part of the Proposed Development. The locations of these crossings are shown on the layout drawings included in Appendix 4-1 of this EIAR. The construction of new watercourse crossings has the potential for indirect effects in the form of disturbance to otter. Similarly, the construction/ installation of the proposed grid connection route, for which Horizontal Directional Drilling (HDD) is proposed for existing Bridges 1, 2, 3 and 5, will also have the potential for disturbance/displacement due to noise where works to bridges are to take place which has the potential to disturb holts if these occur in close proximity.</p> <p>Potential for effects on Otter has been considered regarding NPWS Threat Response Plan (TRP) which identifies four significant threats facing Otter in an Irish context: Habitat destruction, Water pollution, Disturbance (Recreational sources) and Accidental death/persecution</p>
Characterisation of unmitigated effect	<p>Evidence of otter in the form of spraint was identified at a watercourse crossing on the proposed grid connection route. No holts or resting sites were recorded. There is potential for the construction activity to result in the run-off of silt, nutrients and other pollutants such as hydrocarbons and cementitious material into land drains and minor watercourses. This represents a potential indirect effect on Otter in the form of habitat degradation through water pollution.</p> <p>Given that the majority of the site is at present in active afforestation of different ages and all major proposed infrastructure is located over 50 metres from any significant watercourse, any potential disturbance to otter will be a short-term, slight negative effect associated with the installation of the proposed watercourse crossings.</p> <p>In relation to disturbance, Otter are predominantly crepuscular in nature and it is anticipated that construction activity will mostly be confined to daytime hours, thus minimizing potential disturbance related impacts to the species. Channin P (2003) provides a literary review with regard to anthropogenic disturbance and refers to several reports which have found that disturbance is not detrimental to Otters (Jefferies (1987),</p>

	<p>(Durbin 1993). (Green & Green 1997). The report also describes successful breeding in towns, under ferry terminals and under the jetties of one of Europe’s largest oil and gas terminals at Sullom Voe in North Scotland. Irish Wildlife Manual No 76 (National Otter Survey of Ireland 2010/2012) notes that the occurrence of Otter was unaffected by perceived levels of disturbance at the survey sites. It also notes that there is little published evidence demonstrating any consistent relationship between Otter occurrence and human disturbance (Mason & Macdonald 1986, Delibes et al. 1991; Bailey & Rochford, 2006).</p>
<p>Assessment of Significance prior to mitigation</p>	<p>Significant effects regarding habitat destruction, barrier effect, disturbance and mortality are not anticipated.</p> <p>In the absence of mitigation, the indirect effect of water pollution on otter during construction has the potential to be a short-term reversible impact. The magnitude of any such impact is likely to be at worst moderate, given that the majority of new infrastructure such as turbine bases, substation and construction compounds are located over 50metres from any significant watercourse.</p>
<p>Mitigation</p>	<p>A detailed drainage maintenance plan for the proposed development is provided in Section 4.7 of this ELAR and further details are provided within the Surface Water Management Plan (SWMP) included as Appendix 4.4 of the ELAR. This plan provides full details of how water quality will be protected during the construction of the proposed development. In addition to this, specific mitigation is provided in relation to water quality in Section 9.5, Chapter 9: ‘Hydrology and Hydrogeology’ of this ELAR. In addition, the Construction Environmental Management Plan (CEMP) that is provided as Appendix 4.3 of the ELAR provides the details of exactly how the measures will be implemented during construction. These mitigation measures will ensure that there will be no potential indirect effects on otter as a result of a deterioration in water quality.</p> <p>Prior to the commencement of construction works associated with the installation of watercourse crossings, the following measures will be undertaken for the avoidance of disturbance/displacement and direct mortality and to ensure that no otter holts/breeding sites have been established since the original surveys undertaken (TII, 2007):</p> <ul style="list-style-type: none"> ➤ From a precautionary basis, a pre-commencement otter survey will be undertaken in accordance with standard best practice guidance prior to the commencement of site works to ensure that current activity levels are confirmed prior to commencement of works. In the unlikely event that an otter holt is identified within or immediately adjacent to the proposed development footprint, consultation will be undertaken with the National Parks and Wildlife Service and a derogation licence applied for. ➤ All conditions of a derogation licence will be implemented in full. ➤ No works will be undertaken within 150m of any holts at which breeding females or cubs are present. ➤ No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance will not take place within 15m of such holts, except under licence (TII, 2006¹²). ➤ All of the above works will be undertaken or supervised by an appropriately qualified ecologist.
<p>Residual Effect following Mitigation</p>	<p>Following the implementation of the mitigation proposed above, there will be no significant residual effect on otter as a result of the proposed development at any geographic scale.</p>

¹² NRA, 2006. Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes. Dublin: Transport Infrastructure Ireland. Available at: www.tii.ie/tii-library/environment/construction-guidelines/Guidelines-for-the-Treatment-of-Otters-prior-to-the-Construction-of-National-Road-Schemes.pdf

6.7.2.2.2 Assessment of Potential Effects on Bats

Table 6-5 Assessment of Potential Impacts on Bats

<p>Description of Effect</p>	<p>As per SNH Guidance, wind farms present four potential risks to bats:</p> <ul style="list-style-type: none"> • Collision mortality, barotrauma and other injuries; (Operational Phase Impact) • Loss or damage to commuting and foraging habitat; • Loss of, or damage to, roosts and • Displacement of individuals or populations. <p>For each of these four risks, the detailed knowledge of bat distribution and activity within the study area has been utilised to predict the potential effects of the proposed development on bats.</p> <p>Bat surveys undertaken in 2019, in accordance with Scottish Natural Heritage Guidance (SNH 2019), form the core dataset for the assessment of effects on bats.</p>
<p>Characterisation of unmitigated effect</p>	<p>Loss or damage to commuting and foraging habitat</p> <p>In absence of appropriate design, the loss or degradation of commuting/foraging habitat has potential to reduce feeding opportunities and/or displace bat populations. However, the development is predominantly located within existing conifer plantation forestry and blanket bog habitats, and Linear landscape features such as hedgerows and treelines have been largely avoided. A total of 75m of hedgerow habitat will be lost where new road widening is required. Any areas of hedgerow loss, to accommodate the delivery of turbines, will be replaced within the site with species indigenous to the area. Approximately 270 linear metres of hedgerow planting is proposed, which will result in a net gain in linear habitat features within the site. Hedgerow removal will result in a short term effect, with connectivity re-established within approximately 2-5 years. No permanent loss of, or damage to, commuting or foraging habitats is anticipated as a result of the turbine delivery or cable routes and there will be no net loss of linear landscape features for commuting and foraging bats.</p> <p>The Proposed Development, including the creation of new road infrastructure, amenity walkway and underground cable route will provide a positive change with the creation of additional available areas of linear landscape features that may be utilised by bats for commuting or foraging.</p> <p>Given the extensive area of habitat that will remain undisturbed throughout the site and the avoidance of the most significant areas of faunal habitat (i.e. natural woodlands and watercourses), no significant effects with regard to loss of commuting and foraging habitat are anticipated. The opening up of conifer forestry plantations to facilitate turbine construction will result in a net gain in linear landscape features available for foraging and commuting bats. This is a positive impact at the local level.</p> <p>Loss of, or damage to, roosts</p> <p>The development is predominantly located within an area dominated by commercial coniferous forestry and blanket bog. The trees in the plantation do not provide potential roosting habitat of significance for bats. Two derelict structures were identified within the proposed site boundary and were subjected to dusk activity surveys. While a small number of bats were observed flying in and out of these buildings during the roost surveys only one was identified as an active bat roost. These structures and the surrounding linear habitat features will be retained as part of the Proposed Development; thus, no loss of roosting habitat is anticipated.</p>

	<p>The underground cabling will connect from the Proposed Development site to the existing Trillick substation located in the townland of Ballynahone existing roads and tracks measuring approximately 8.3km. There will be no requirement to fell trees/forestry as part of the underground cable route. Therefore, there will be no loss of tree roosting habitat associated with these works.</p> <p>Horizontal Directional Drilling (HDD) is proposed for Bridges 1, 2, 3 and 5 and no loss of roosting habitat is anticipated. Bridges 4 and 6 will require bridge deck replacement. Although no evidence of bat use was identified within any of the bridges, Bridge 4 contains Potential Roosting Features (PRFs) in the form of gaps present in bridge stone abutments where mortar has become dislodged which could support a bat roost. Bridge 6 was assessed as having Negligible suitability for roosting bats. Therefore, no loss of roosting habitat or disturbance is anticipated.</p> <p>Given the presence of PRFs at Bridge 4, there is potential for temporary disturbance to bats as a results of bridge deck works at Bridge 4, although no evidence of use by bats was recorded during the baseline bat surveys.</p> <p>No potential for significant effect with regard to the loss of, or damage to, roosting habitat as a result of the Proposed Development, haul route or underground cable route, is anticipated.</p> <p>Displacement of individuals or populations</p> <p>The development is predominantly located within conifer plantation with small areas of blanket bog, wet heath and cutover bog. There will be no net loss of linear landscape features for commuting and foraging bats and there will be no loss of any roosting site of ecological significance. The habitats on the site will remain suitable for bats and no significant displacement of individuals or populations is anticipated.</p>
<p>Assessment of Significance prior to mitigation</p>	<p>There is no potential for the construction of the proposed development to result in Significant effects on the local bat population at any geographic scale as no roosts were recorded close to the infrastructure. Habitat loss and temporary disturbance as a result of works to a single bridge deck (Bridge 4) are only likely to result in slight effects on the local population. The bat survey report, which is included in Appendix 6.2 provides further detail and analysis with regard to the effects on bat species.</p>
<p>Mitigation</p>	<p>A preconstruction survey of Bridges number 4 (see Section 6.2.5 of the bat report included as Appendix 6.2) will be carried out on a precautionary basis to ensure that there are no roosting bats present. 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. The function of this survey will be to assess any changes in baseline environment since the time of undertaking the survey in June 2021. In the unlikely event that any bats are found to be roosting in Bridge 4, a bat derogation licence will be obtained, and further mitigation prescribed by a licenced ecologist in order to carry out these works.</p> <p>A minimum of 2 bat boxes will be erected at Bridge 4 to provide new roosting opportunities for bats. (see Section 6.2.5, Appendix 6-2 - bat report).</p> <p>The felling of plantation forestry (WD4) within the site, to facilitate site access roads and turbine locations, will result in the creation of more woodland edge habitat and as such benefit feeding and commuting bat species locally.</p> <p>In addition, the following construction best practice will be employed to minimise general noise and disturbance potential:</p> <ul style="list-style-type: none"> ➤ Plant machinery will be turned off when not in use and all plant and equipment for use will comply with the European Communities (Noise Emission by Equipment For Use Outdoors) Regulations, 2001 (S.I. No.

	<p>632/2001) and Construction Plant and Equipment Permissible Noise Levels Regulations (S.I. No. 359/1996).</p> <ul style="list-style-type: none"> ➤ The proposed lighting around the site during construction shall be designed in accordance with the Institute of Lighting Professionals Guidance Note 08/18 Bats and artificial lighting in the UK and the Dark Sky Ireland Lighting Recommendations (see Section 6.2.2 of the Bat Report, included as Appendix 6-2).
Residual Effect following Mitigation	<p>There is no potential for the construction of the proposed development to result in Significant effects on the local bat population at any geographic scale. There will be no significant effect on the conservation status of any bat species as defined in ‘<i>The Status of Protected Habitats and Species in Ireland</i>’ (NPWS, 2019)</p>

6.7.3 Likely Significant Effects During Operational Phase

6.7.3.1 Effects on Habitats during Operation

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

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

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

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

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

Description of Effect	<p>Note: Whilst this impact assessment is in the habitats section, it also assesses the potential impact on the proposed development on aquatic species including salmonids, lamprey, European eel, aquatic invertebrates and other aquatic species during operation. The proposed development will have no direct impact on the aquatic habitat of these species and there is no potential for disturbance because X fill in brieflyXXX. The only pathway for effect to occur is as a result of water pollution and this is discussed in this section in relation to habitats and species.</p> <p>In this regard, the increased amount of hard standing associated with the windfarm infrastructure has the potential to result in faster run off of water from the site to the surrounding watercourses. This may have the indirect effect of causing erosion, which could lead to deterioration of surface water and supporting habitat quality. Additionally, there is the potential for the faster run off of any pollutants that may be associated with vehicular usage on the site.</p> <p>These impacts on water quality are fully described in Chapter 9: ‘Water’ of this EIAR and are described here in relation specifically to biodiversity.</p>
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Characterisation of unmitigated effect	Impact on water quality during the operational phase of the proposed development has been assessed as a permanent negative effect in the absence of mitigation. The magnitude of this impact is slight because all major infrastructure will be located over 50 metres from any significant watercourse (those mapped by the EPA ¹³ and downloaded to GIS) and the footprint of the proposed development will be minimal when compared to the overall size of the site.
Assessment of Significance prior to mitigation	Significant effects on water quality are not anticipated at any geographic scale during the operation of the proposed development.
Mitigation	Whilst no significant effects on water quality are anticipated, potential for effects on water quality associated with the operational phase drainage of the site has been fully mitigated through appropriate design and mitigation as fully described in Section 4.7 ‘Site drainage’, Section 9.5.3 of the EIAR and Section 3.2 of the CEMP. In Section 9.5.3 of Chapter 9 ‘Water’, the assessment concludes that with the implementation of mitigation, ‘no significant effects on the surface water quality will occur’ during the operational phase. The detailed mitigation measures are not repeated here to reduce repetition throughout the document, but are described in Section 9.5.3.1, Chapter 9; the measures used to mitigate the risk of release of hydrocarbons and other pollutants and for sediment control during the construction phase will also be employed as required during the operational phase. Drainage management measures employed during the construction phase will ensure that runoff from the operational development will be effectively mitigated.
Residual Effect following Mitigation	Following the implementation of the mitigation measures outlined above, no potential for significant effect has been identified at any geographic scale as a result of the proposed development.

6.7.3.2 Effects on Fauna during Operation

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

The implementation of the Biodiversity Management and Enhancement Plan (BMEP) will ensure that any Upland blanket bog habitat that is lost to facilitate the proposed infrastructure will be replaced within the site. The BMEP will also incorporate drain blocking and the removal of encroaching conifers from an existing area of Upland blanket bog, as fully described in Appendix 6.4, and will result in the establishment of habitats of higher value for local faunal species during the operational period. As such the operation of the proposed development will not result in a significant impact at any geographic scale. Such measures will have positive effects on the non-volant terrestrial fauna at the site of the proposed development. There is no potential for significant negative effects on non-volant terrestrial fauna including otter that was identified as a KER during the construction phase of the development.

It should be noted that no significant habitat for salmonids, lamprey, European eel, aquatic invertebrates or other aquatic species was recorded within the footprint of the proposed development and all major infrastructure such as turbine bases are located over 50 metres from the watercourses and wetlands within the site. The potential for significant effects on the above aquatic species is restricted to indirect effects on their habitat resulting from water pollution. This has been assessed in Section 6.7.4.1.1 and is not repeated below.

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

¹³ EPA, 2020, Online Map viewer. Available at: <https://gis.epa.ie/EPAMaps/>

6.7.3.2.1 Assessment of Potential Effects on Bats during operation

Table 6-7 Assessment of Potential Impacts on Bats

<p>Description of Effect</p>	<p>As per SNH Guidance, wind farms present four potential risks to bats:</p> <ul style="list-style-type: none"> • Collision mortality, barotrauma and other injuries; • Loss or damage to commuting and foraging habitat; • Loss of, or damage to, roosts and • Displacement of individuals or populations. <p>No 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 development, as no removal or works to potentially suitable bat habitat will occur during the operational phase.</p>
<p>Characterisation of unmitigated effect</p>	<p>Collision Risk</p> <p>Activity levels for low-risk species at the site including <i>Myotis</i> species and brown long eared bat (lesser horseshoe bat were not recorded during dedicated bat surveys) were low. 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 on these species are anticipated.</p> <p>The following high-risk species were recorded during the dedicated surveys:</p> <ul style="list-style-type: none"> • Leisler's bat • Common pipistrelle • Soprano pipistrelle <p>Overall Risk for each high risk species was determined, in accordance with Table 3b of NatureScot guidance (Tables 5-2 – 5-4, 'Bat Report', Appendix 6-2), by a cross-tabulation of the site risk level (i.e., Medium) and Ecobat bat activity outputs for each species (see Section 5.1.2 of Appendix 6.2 - Bat Report). Overall risk levels for these high collision risk bat species was assigned as Medium, with High seasonal peaks recorded for some species.</p> <p>Site-level collision risk for high collision risk bat species was typically Medium. Overall bat activity levels were typical of the nature of the site, which is upland commercial forestry, with young to mature forestry coverage and areas of clear fell with low levels of bat activity recorded during the static detector surveys as well as the walked and driven transects undertaken. (see Section 5.1.3 of the Bat Report (Appendix 6.2)).</p>
<p>Assessment of Significance prior to mitigation</p>	<p>Death may occur through collision with turbine blades or as a result of barotrauma. Fatalities may negatively affect local bat populations. Significant effects are not anticipated at the county or national scale.</p> <p>To date, no studies have conclusively linked pre-construction activity surveys to post-construction fatality rates (Hein et al. 2013). However, there is a strong positive correlation between post-construction activity and fatality at wind farms (Kunz et al. 2007, Baerwald and Barclay 2009, Amorim et al. 2012, Korner-Nievergelt et al. 2013).</p> <p>The magnitude of this effect, in respect of local bat populations, in the absence of mitigation is Moderate at the local scale.</p>

<p>Mitigation</p>	<p>In accordance with NIEA Guidance¹⁴, and in order to reduce the value of the habitat for bat species in the areas surrounding the turbines, a buffer of at least 50m between the tip of the blade and any trees or other tall vegetation that could provide high quality foraging habitat for bat species will be implemented. Details of this mitigation and how it is calculated is provided in Section 6.1.3 of the ‘Bat Report’ (Appendix 6-2).</p> <p>Following per detector Ecobat analysis, detectors D03 (i.e. Turbine 3), D05 (i.e. Turbine 8), D08 (i.e. Turbine 11), D10 (i.e. Turbine 6) and D11 (i.e. Turbine 5) showed high median activity levels across at least one season (Table 5-5). Taking a precautionary approach and given the potential for high collision risk was recorded at median activity levels at these detectors, an adaptive monitoring and mitigation strategy has been devised for the Proposed Development. The strategy is in line with the case study example provided in Appendix 5 of the NatureScot Guidance and has been informed by the extensive suite of site-specific survey data. Curtailment will be implemented during periods with high median bat activity (i.e. Summer at T6, and Autumn at T3, T5, T6, T8 and T11), with simultaneous activity monitoring taking place. Turbines will be curtailed during the weather conditions most suitable for bat activity at the site. Section 6.1.1 of the Bat Report provides full details of the curtailment strategy to be implemented.</p> <p>It is noted in the NatureScot (2021) guidelines that bat activity on windfarm sites is highly liable to change following construction of a wind farm, due to the changes in habitat that occur to facilitate construction. Therefore, continued monitoring of operational wind farms for up to three years’ post construction is recommended in NIEA and NatureScot (both 2021) guidelines and will be undertaken at this site, to verify the predicted post construction effects on the local bat populations.</p> <p>Full details of the proposed operational bat monitoring programme for the proposed development are provided in Section 6.1.2 of the Bat Report (Appendix 6-2) and include measurement of bat activity using static detectors at turbine bases, walked survey transects and corpse searching to record any bat fatalities resulting from collision. Monitoring of weather parameters known to influence collision risk including wind speed, temperature and precipitation will be undertaken in parallel with this. At a minimum, monitoring will be conducted for 3 years post construction. The monitoring will also include carcass searches to monitor and record bat fatalities, which shall be conducted at each turbine in accordance with NatureScot Guidance (See section 6.1.2.3 of Appendix 6.2 – Bat Report).</p> <p>The results of post construction monitoring shall be utilised to assess changes in bat activity patterns post construction and to monitor the implementation of the mitigation strategy. The performance of the curtailment programme in terms of its ability to respond to the changes in bat abundance based on temperature and wind speed will be analysed to confirm the efficacy of the curtailment during different periods of bat activity. At the end of each year, the efficacy of the curtailment programme will be reviewed, and any identified efficiencies incorporated into the curtailment programme. This approach allows for an evidence-based review of the potential for bat fatalities at the site, post construction, to ensure that the necessary measures, based on a new baseline post-construction, are implemented for the protection of bat species locally.</p>
<p>Residual Effect following Mitigation</p>	<p>Taking into consideration the sensitive design of the project and the proposed best practice and adaptive mitigation measures, there is no potential for significant effects on bat populations as a result of the Proposed Development.</p>

¹⁴ Northern Ireland Environment Agency Natural Environment Division (NED) published Guidance on Bat Surveys, Assessment and Mitigation for Onshore Wind Turbine Developments in Northern Ireland (NIEA, 2021).

6.7.4

Likely Significant Effects During Decommissioning phase

Decommissioning is fully described within the Decommissioning Plan (Appendix 4.6) and Chapter 4 of this EIAR. There will be no additional habitat loss associated with the decommissioning of the Proposed Development and therefore there will be no significant effects in this regard.

The wind turbines proposed as part of the Proposed Development 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 Development may be decommissioned fully.

Upon decommissioning of the Proposed Development, the wind turbines dismantling will be undertaken in reverse order to methodology employed during their construction. All above ground turbine components will be separated and removed off-site for recycling. Turbine foundations will remain in place underground and will be backfilled and covered, following the dismantling and removal of the wind turbines, with soil material where the concrete foundation is protruding above ground level. If there is usable soil or overburden material on the site after construction, this material will be used. Alternatively, where material is not readily available on site, soil will be sourced locally and imported to site on heavy goods vehicles (HGVs). The imported soil will be spread and graded over the foundation using a tracked excavator and revegetation enhanced by spreading of a native Irish and local provenance wildflower seed mix or Irish Wildflower Conservation Grade Mix seeds, to assist in revegetation and accelerate the resumption of the natural drainage management that will have existed prior to any construction.

All access roads and hardstanding areas forming part of a site roadway network will be left in situ for future use by landowners and for ongoing forestry operations. It is intended that all above ground components and underground cabling (ducting left in-situ) will be removed from the site as part of the decommissioning of the Proposed Development.

The underground cabling connecting the Proposed Development to the existing 110kV substation in the townland of Ballynahone will be removed from the underground cable ducting at the end of the useful life of the renewable energy development. The cabling will be pulled from the cable duct using a mechanical winch which will extract the cable and re-roll it on to a cable drum. This will be undertaken at each of the joint bays/pull pits along the cable. The ground above original pulling pits/joint bays will be excavated using a mechanical excavator and will be fully re-instated once the cables are removed. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance for an underground element that is not visible.

The onsite substation will remain in place as it will be under the ownership of the ESB and will form a permanent part of the national electricity grid.

A Decommissioning Plan has been prepared (Appendix 4-6) the detail of which will be agreed with the local authority prior to any decommissioning. The Decommissioning Plan will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will be agreed with the competent authority at that time. The potential for effects during the decommissioning phase of the proposed renewable energy development has been fully assessed in this EIAR.

The impacts on biodiversity will also be similar in nature to those experienced during construction but on a far lesser scale and magnitude. There will be no additional or ancillary impacts associated with the decommissioning phase. The existing site roads will be used during decommissioning. The redundant underground cables will be pulled from their trenches without the requirement for significant excavation.

The same mitigation to prevent significant impacts on water quality and associated aquatic fauna and other terrestrial fauna during construction will be applicable to the decommissioning phase. Section 6 of the Decommissioning Plan, provided as Appendix 4-6, summarises all decommissioning specific mitigation measures. Section 3 of the CEMP for the Proposed Development (see Appendix 4-3 of this EIAR) provides the details of the mitigation and best practice that will be employed to avoid any potential for significant residual effects relating to the environment from the Proposed Development. In addition, the measures incorporated into the construction phase, in Section 6.7.3 of this EIAR, including specific mitigation provided in relation to water quality in Chapter 9: 'Water', will be implemented during decommissioning. It can be concluded that following the implementation of preventative mitigation, there is no potential for the decommissioning of the Proposed Development to result in significant effects on biodiversity.

6.7.5 Effects on Designated Sites

None of the elements of the proposed development are located within the boundaries of any Nationally or European designated sites. There will be no direct effects on any designated site as a result of the construction, operation and decommissioning of the wind farm project including the turbine delivery route, substation and grid connection.

6.7.5.1 Impacts on Nationally Designated Sites

One Nationally designated site was identified as being within the zone of influence and as a KER i.e. Lough Swilly Including Big Isle, Blanket Nook & Inch Lake pNHA (potential impacts on Lough Swilly SAC are fully considered under the European designation within the NIS; this is discussed further below).

Potential hydrological connectivity has been identified from the proposed development site to the Lough Swilly Including Big Isle, Blanket Nook & Inch Lake pNHA. No potential for residual adverse impacts on water quality have been identified following implementation of mitigation measures in relation to potential effects on rivers/streams and sensitive aquatic faunal species, as described above in Section 6.7.2 (also see Table 6-14) and therefore no significant effects on this NHA are anticipated.

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

No potential for impacts on Nationally designated sites have been identified.

6.7.5.2 Impacts on European Sites

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

As per the aforementioned EPA draft Guidance (2017), “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”. This section provides a summary of the key assessment findings with regard to Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

The Screening for Appropriate Assessment concluded as follows:

‘it cannot be excluded beyond reasonable scientific doubt, in view of best scientific knowledge, on the basis of objective information and in light of the conservation objectives of

the relevant European sites, that the proposed development, individually or in combination with other plans and projects, would be likely to have a significant effect on the following sites:

- *Lough Swilly SAC*
- *North Inishowen Coast SAC*
- *Lough Swilly SPA*
- *Lough Foyle SPA*
- *Lough Foyle SPA [UK9020031]*
- *Trawbreaga Bay SPA*
- *Horn Head to Fanad Head SPA*

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

The findings presented in the NIS are that,

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

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

6.8 Cumulative Impacts

The proposed development was considered in combination with other plans, existing and approved projects and planning applications pending a decision, in the surrounding area that could result in cumulative impacts on the Key Ecological Receptors (KERs) identified in Section 6.6.3 of this report, including European Sites and Nationally designated sites. This included a review of online Planning Registers and served to identify past, present and future plans and projects, their activities and their predicted environmental effects. The projects considered are listed in Chapter 2: Background of the Proposed Development. The full list of projects has been considered and relevant ones from this list are discussed in this section.

6.8.1 Assessment of Plans

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

- County Donegal Development Plan 2018 – 2024
- National Biodiversity Action Plan 2017-2021
- Northern & Western Regional Assembly Regional Spatial and Economic Strategy 2020-2032 (RSES)

The review focused on policies and objectives that relate to nationally designated sites for nature conservation, biodiversity and protected species. Policies and objectives relating to the conservation of peatlands and sustainable land use were also reviewed, particularly where the policies relate to the preservation of surface water quality. An overview of the search results with regard to plans is provided in Table 6-20.

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

Table 6-20 Assessment of Plans

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
<p>Donegal County Development Plan 2018 – 2024</p>	<p>NH-O-1: “To protect, sustainably manage and enhance the rich biodiversity of County Donegal for present and future generations.” •</p> <p>NH-O-10: “To maintain and restore ecosystems and to conserve valuable or threatened habitats and species in order to prevent further loss of biodiversity and to meet the EU’s target to halt biodiversity loss by 2020 through the implementation of the EU Biodiversity Strategy (2011) or as updated.” •</p> <p>NH-O-11: “To ensure the conservation and management of Peatlands in the County.” and,</p> <p>NH-P-5: “It is a policy of the Council to require consideration of the impact of potential development on habitats of natural value that are key features of the County’s ecological network and to incorporate appropriate mitigating biodiversity measures into development proposals.”</p>	<p>The Development plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the biodiversity, protected species and designated sites.</p> <p>The proposed development has been designed in order to avoid habitats identified as KERs including peatland and hedgerow habitats where possible and where some loss has been identified, appropriate mitigation and offsetting measures have been incorporated into the proposed project through a Biodiversity Management Plan.</p> <p>The proposed development is located</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
		<p>outside of any Nationally designated sites, as described in Section 6.5.1.</p> <p>No potential for negative cumulative impacts when considered in conjunction with the current proposal were identified.</p> <p>No developments or projects identified within the Development Plan were found to occur in the wider area surrounding the proposed development.</p>
<p>National Biodiversity Action Plan 2017-2021</p>	<p>Objective 1 Mainstream biodiversity into decision-making across all sectors</p> <p>Developments in the area of Green Infrastructure are being initiated at the local and regional level. Green Infrastructure is a strategically planned network of natural and semi natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services such as water purification, air quality, space for recreation and climate mitigation and adaptation.</p> <p>Objective 4 - Conserve and restore biodiversity and ecosystem services in the wider countryside</p>	<p>The Development plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the biodiversity, protected species and designated sites. The proposed</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
	<p>Target 6.2 - Sufficiency, coherence, connectivity, and resilience of the protected areas network substantially enhanced by 2020.</p>	<p>development has been designed in order to avoid any potential fragmentation of habitats or commuting corridors.</p> <p>No potential for negative cumulative impacts when considered in conjunction with the current proposal were identified.</p>
<p>Northern & Western Regional Assembly Regional Spatial and Economic Strategy 2020-2032 (RSES)</p>	<p>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.</p> <hr/> <p>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 areas. Conserve and protect European sites and their integrity.</p>	<p>There will be no adverse effects on peatlands or on QI's/SCI's/SSCO's as a result of the proposed development and no cumulative impacts in this regard.</p> <p>The proposed development has been designed to avoid any effects on water quality</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
	<p>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.</p>	<p>and/or designated Natura 2000 sites outside the site as set out in Section 3 of the accompanying NIS.</p> <p>The proposed development has been subject to a full environmental assessment i.e. EIA and AA.</p>

6.8.2 Assessment of Projects

As described in Section 2.2 of the EIAR, relevant projects have been assessed in-combination with the proposed wind farm development and include planning applications in the vicinity of the site, within the zone of influence of all habitats and species considered in this report, and include other wind energy applications within the wider area. The list has not been repeated here to reduce the duplication of information within this EIAR. However, they have been fully considered in the assessment with further detail provided below. In addition, Section 6.8.4 concludes on their potential for impact on biodiversity.

For the purposes of this cumulative assessment in relation to other wind farm projects, those within a 20-kilometre radius of the proposed development area were considered in further detail below. Windfarms occurring at greater distances were considered, however, given the nature of the KERs identified within the EIAR study area further detailed analysis is not provided below.

6.8.3 Existing Habitats, KER's and Land Uses

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

The wind farm is primarily located in forestry habitats, which generally provide low value habitats for faunal species. In addition, due to the nature of the plantation forestry, this habitat is of low biodiversity value locally. The proposed development will not result in any significant loss of valuable habitats e.g. upland peatland. The minor loss of peatland habitat that will be affected, will be fully mitigated through habitat enhancement and restoration proposed as part of this development. The wind farm will not contribute to any overall loss of high value habitat, it has been deliberately designed to be located on habitats of low value for faunal species.

6.8.3.11 Other Land Uses

The remaining land use within the site and surrounding area is predominantly agriculture in the form of livestock grazing. The ongoing use of surrounding land for agricultural purposes will not give rise to any additive effects, nor has any potential for new effects to arise acting cumulatively with the proposed development been identified.

6.8.3.12 Other Developments

As described in Section 2.3 of the EIAR, relevant projects have been assessed in-combination with the proposed wind farm development and include planning applications in the vicinity of the site, within the 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 6.8.4 concludes on their potential for cumulative impacts on biodiversity. For the purposes of this cumulative assessment wind farms within a 20-kilometre radius of the Proposed Development area were considered in further detail below. Windfarms occurring at greater distances were considered, however, given the nature of the KERs identified within the EIAR study area and that no significant residual effects were identified, further detailed analysis is not provided below.

Aught Wind Farm

Aught wind farm is c. 100m from the wind farm site and c. 400m from the nearest proposed turbine. The planning file for the development was reviewed on the Donegal County Council Planning Register,

and the Environmental Impact Statement¹⁵ was consulted to determine cumulative impacts from the Proposed Development. The EIS concluded that *‘impacts on ecology during construction and operation of the wind farm are considered to be insignificant provided the mitigation measures are implemented’*.

Based on the information available in the Aught wind farm EIS, significant cumulative impacts are not anticipated.

Sorne Hill 1 Wind Farm

The potential for the proposed development to result in significant cumulative or in combination effects when assessed alongside Sorne Hill I wind farm, a 3-turbine development which is c. 150m from the wind farm site, and c. 500m from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register and no information regarding potential residual effects on ecological receptors was available. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the proposed Glenard Wind Farm when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the proposed development. Taking into consideration also the fact that no significant residual effects on KERs have been identified for the proposed Glenard Wind Farm (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

Crockahenny Wind Farm

The potential for the proposed development to result in significant cumulative or in combination effects when assessed alongside Crockahenny wind farm, which is c.1.1km from the wind farm site, and c. 1.5km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register and no information regarding potential residual effects on ecological receptors was available. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the proposed Glenard Wind Farm when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the proposed development. Taking into consideration also the fact that no significant residual effects on KERs have been identified for the proposed Glenard Wind Farm (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

Copley Rock Wind Turbine

The potential for the proposed development to result in significant cumulative or in combination effects when assessed alongside Copley Rock wind turbine, which is c. 1.2km from the wind farm site, and c. 1.5km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register and no information regarding potential residual effects on ecological receptors was available. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the proposed Glenard Wind Farm when considered on its own.

¹⁵ *Aught Wind Farm, Environmental Impact Statement, Jennings O'Donovan & Partners May 2011.*

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the proposed development. Taking into consideration also the fact that no significant residual effects on KERs have been identified for the proposed Glenard Wind Farm (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

Tony Doherty Wind Turbine

The potential for the proposed development to result in significant cumulative or in combination effects when assessed alongside Tony Doherty wind turbine, which is c. 1.2km from the wind farm site, and c. 1.9km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register and no information regarding potential residual effects on ecological receptors was available. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the proposed Glenard Wind Farm when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the proposed development. Taking into consideration also the fact that no significant residual effects on KERs have been identified for the proposed Glenard Wind Farm (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

Flughland Wind Turbine

The potential for the proposed development to result in significant cumulative or in combination effects when assessed alongside Flughland wind farm, which is c. 1.3km from the wind farm site, and c. 1.5km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register for the applications that comprise the Flughland wind farm and no information regarding potential residual effects on ecological receptors was available. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the proposed Glenard Wind Farm when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the proposed development. Taking into consideration also the fact that no significant residual effects on KERs have been identified for the proposed Glenard Wind Farm (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

Malkell Wind Farm

The potential for the proposed development to result in significant cumulative or in combination effects when assessed alongside Malkell wind farm, which is c. 1.3km from the wind farm site, and c. 1.6km from the nearest proposed turbine, was considered. The planning files were reviewed on the Donegal County Council Planning Register and the EIA¹⁶ was consulted.

Based on the information available in the Malkell EIA, which identifies only temporary minor to moderate negative impacts on underlying cutover bog habitat and temporary displacement of birds due to noise and visual disturbance, both during the construction phase, significant cumulative impacts are not anticipated.

¹⁶ Ecological Impact Assessment. Proposed two-turbine extension to Sorne Wind farm, Stranaclea, Buncrana Inishowen, Co. Donegal, March 2016.

Glackmore Hill Wind Farm

The potential for the proposed development to result in significant cumulative effects when assessed alongside Glackmore Hill wind farm, which is c. 1.4km from the wind farm site, and c. 2km from the nearest proposed turbine, was considered. This wind farm consists of one constructed and one permitted turbine, both of which sought planning permission under separate planning applications. The planning files were reviewed on the Donegal County Council Planning Register and the Report on Flora and Fauna¹⁷ that accompanied the original application and EIA¹⁸ that accompanied the second application were consulted. The 2009 report concluded that *‘from an ecological point of view, the impact will not be significant as the footprint of the proposed development is very limited and habitats within this site area are already much degraded.’* The 2016 EIA concluded that “The potential impacts of this project during the construction, operation and decommissioning phases are deemed not significant”. It was also stated that the cumulative impacts of this development would be negligible due to the scale of the project.

Based on the information available in the Glackmore Hill Report on Flora and Fauna and EIA, significant cumulative impacts are not anticipated.

Sorne Hill II Wind Farm

The potential for the proposed development to result in significant cumulative or in combination effects when assessed alongside Sorne Hill II wind farm, which is c. 1.6km from the wind farm site, and c. 2.5km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register and no information regarding potential residual effects on ecological receptors was available. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the proposed Glenard Wind Farm when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the proposed development. Taking into consideration also the fact that no significant residual effects on KERs have been identified for the proposed Glenard Wind Farm (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

Carrowglen Wind Farm

Carrowglen wind farm is c.1.6km from the wind farm site and c.2.6km from the nearest proposed turbine. The planning file was reviewed on the Donegal County Council Planning Register and the EIAR¹⁹ for the project was consulted to determine the potential for cumulative impacts from the development. The EIAR concludes that *‘subject to the successful implementation of the proposed mitigation measures, residual impacts on ecological features will be temporary and of low ecological significance’* and that *‘There will be no significant adverse impacts on legally protected species or habitats, species or other ecological features of natural heritage importance’*.

Based on the information available in the Carrowglen EIAR, significant cumulative impacts are not anticipated.

¹⁷ Glackmore Hill: Report on Flora and Fauna, Gaia Associates, August 2009.

¹⁸ Ecological Impact Assessment and Appropriate Assessment Screening. For Proposed Turbine at Glackmore Hill, Aught Townland, Inishowen, Co. Donegal. December 2016.

¹⁹

Three Trees Wind Farm

The potential for the proposed development to result in significant cumulative or in combination effects when assessed alongside Three Trees wind farm, which is c. 2km from the wind farm site, and c. 2.3km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register and the EIA²⁰ for the project was consulted. The Ecological Impact Assessment concluded that *‘the impacts of the construction and operation of the proposed wind farm on the habitats and terrestrial species in the footprint of the development are likely to be of a minor significance provided construction follows standard best practice methodology, and the proposed mitigation measures are adopted’*.

Based on the information available in the Three Trees EIA, significant cumulative impacts are not anticipated.

Meenkeeragh I Wind Farm

The potential for the proposed development to result in significant cumulative effects when assessed alongside Meenkeeragh I wind farm, which is c. 2.1km from the wind farm site, and c. 2.7km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register to determine the potential for cumulative impacts from the development, and no information regarding potential residual effects on ecological receptors was available. However, the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the proposed Glenard Wind Farm when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the proposed development. Taking into consideration also the fact that no significant residual effects on KERs have been identified for the proposed Glenard Wind Farm (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

J. McCarron Wind Turbine

The potential for the proposed development to result in significant cumulative or in combination effects when assessed alongside J. McCarron wind turbine, which is c. 2.4km from the wind farm site, and c. 3.4km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register and the Ecology and Ornithology Report²¹ for the project was consulted to determine the potential for cumulative impacts from the development. This report concluded that *‘the single turbine development will not have a significant impact on the ecology of the proposed Bawnloge site.*

Based on the information available in the Ecology and Ornithology Report, significant cumulative impacts are not anticipated, given the intensively managed nature of the habitats within the site and that no residual impacts were identified within the report.

Meenkeeragh II Wind Farm

The potential for the proposed development to result in significant cumulative or in combination effects when assessed alongside Meenkeeragh II wind farm, which is c. 2.7km from the wind farm site, and c. 3.6km from the nearest proposed turbine, was considered. The planning file was reviewed on the

²⁰ *Three Trees Wind Farm, Ecological Impact Assessment. Wetland Surveys Ireland, 2016.*

²¹ *Ecology and Ornithology Report for proposed single turbine at Bawnloge, Co. Donegal. Canavan Associates Ltd. October 2012.*

Donegal County Council Planning Register, where the Environmental Reports²² documentation for the project was available. The ecological impact assessment for the planning application concluded that *‘the proposed development will result in a small loss of existing habitats, however, the impact on the overall ecology of the site is considered to be insignificant.’*

Based on the information available in the Meenkeeragh II ERs, significant cumulative impacts are not anticipated.

Meenkeeragh III Wind Farm

The potential for the proposed development to result in significant cumulative or in combination effects when assessed alongside Meenkeeragh III wind farm, which is c. 2.8km from the wind farm site, and c. 2.6km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register, where the Environmental Reports²³ documentation for the project was available. The ecological impact assessment for the planning application concluded that *‘the proposed development will result in a small loss of existing habitats, however, the impact on the overall ecology of the site is considered to be insignificant.’*

Based on the information available in the Meenkeeragh III ERs, significant cumulative impacts are not anticipated.

Meenward Wind Farm (Beam Hill Wind Farm Extension)

The potential for the proposed development to result in significant cumulative effects when assessed alongside Meenward wind farm, which is c. 8.4km from the wind farm site, and c. 9.5km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register, and the EIS consulted. The EIS²⁴ concluded that the site of the wind farm extension is of moderate ecological value in the local context, that loss of habitat resulting from the construction would be of minor significance in the local context, and that disturbance to birds and other fauna would not be significant. Impacts on ecology during operation of the wind farm extension were considered to be insignificant.

Based on the information available in the Meenward EIS, significant cumulative impacts are not anticipated.

No significant residual effects on ecological receptors were identified.

Beam Hill Wind Farm

The potential for the proposed development to result in significant cumulative effects when assessed alongside Beam Hill wind farm, which is c. 8.7km from the wind farm site, and c. 9.8km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register and no information regarding potential residual effects on ecological receptors was available. However the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the proposed Glenard Wind Farm when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the proposed development. Taking into consideration also the fact that no

²² Proposed Sheeragh Two Wind Turbine, Environmental Reports. Canavan Associates, November 2014.

²³ Proposed Sheeragh II Wind Turbine, Environmental Reports. Canavan Associates, February 2015.

²⁴ Beam Hill Wind Farm Extension, Environmental Impact Statement. Jennings O'Donovan & Partners, August 2009.

significant residual effects on KERs have been identified for the proposed Glenard Wind Farm (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

Drumlough I Wind Farm

The potential for the proposed development to result in significant cumulative or in combination effects when assessed alongside Drumlough I wind farm, which is c. 9.2km from the wind farm site, and c. 10.5km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register and no information regarding potential residual effects on ecological receptors was available. However the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the proposed Glenard Wind Farm when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the proposed development. Taking into consideration also the fact that no significant residual effects on KERs have been identified for the proposed Glenard Wind Farm (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

Sladran Wind Farm

Sladran wind farm is c. 9.3km from the wind farm site, and c. 10.2km from the nearest proposed turbine. The planning file was reviewed on the Donegal County Council Planning Register, and the EIS²⁵ for the project was consulted to determine the potential for cumulative impacts from the Proposed Development. The EIS concluded that the impacts of the construction and operation of the Sladran wind farm on *'the habitats and terrestrial species in the footprint of the development are likely to be minor and will only be significant at a local level provided construction, management and restoration on decommissioning follow best practice procedures, and the proposed mitigation measures are adopted'*.

Based on the information available in the Sladran EIS, significant cumulative impacts are not anticipated.

Drumlough Hill Extension

The potential for the proposed development to result in significant cumulative or in combination effects when assessed alongside Drumlough Hill Extension wind farm, which is c. 9.5km from the wind farm site, and c. 10.5km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register and no information regarding potential residual effects on ecological receptors was available. However the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the proposed Glenard Wind Farm when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the proposed development. Taking into consideration also the fact that no significant residual effects on KERs have been identified for the proposed Glenard Wind Farm (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

²⁵ Environmental Impact Statement, Sladran Wind Farm. Wind Prospect Ireland Limited, 2012.

Lurganboy Wind Farm

The potential for the proposed development to result in significant cumulative effects when assessed alongside Lurganboy wind farm, which is c. 15.8km from the wind farm site, and c. 16.8km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register and no information regarding potential residual effects on ecological receptors was available. However the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the proposed Glenard Wind Farm when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the proposed development. Taking into consideration also the fact that no significant residual effects on KERs have been identified for the proposed Glenard Wind Farm (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

Clondermot Wind Farm

The potential for the proposed development to result in significant cumulative effects when assessed alongside Clondermot wind farm, which is c. 16.5km from the wind farm site, and c. 17.1km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register and no information regarding potential residual effects on ecological receptors was available. However the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on biodiversity associated with the proposed Glenard Wind Farm when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the proposed development. Taking into consideration also the fact that no significant residual effects on KERs have been identified for the proposed Glenard Wind Farm (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

Cooly Wind Farm

The potential for the proposed development to result in significant cumulative or in combination effects when assessed alongside Cooly wind farm, which is c. 20.1km from the wind farm site, and c. 20.9km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register, and the Environmental Report²⁶ for the project was consulted to determine cumulative impacts from the Proposed Development. The ER concluded that the “proposed development presents little hazard to the ecological quality of the site and the area in general”.

Based on the information available in the Cooly EIS, significant cumulative impacts are not anticipated.

Moonaboy Wind Farm

The potential for the proposed development to result in significant cumulative effects when assessed alongside Moonaboy wind farm, which is c. 20.1km from the wind farm site, and c. 20.3km from the nearest proposed turbine, was considered. The planning file was reviewed on the Donegal County Council Planning Register and no information regarding potential residual effects on ecological receptors was available. However the following factors limit the potential for significant cumulative effects to result: the nature of the habitats on that site (as reviewed on publicly available aerial

²⁶ *Environmental Impact Statement, Sladran Wind Farm. Wind Prospect Ireland Limited, 2012.*

photography) and the lack of significant residual impacts on biodiversity associated with the proposed Glenard Wind Farm when considered on its own.

No potential additive impacts have been identified which would result in the potential for significant cumulative effects with the proposed development. Taking into consideration also the fact that no significant residual effects on KERs have been identified for the proposed Glenard Wind Farm (post mitigation) significant cumulative effects on key ecological receptors are not anticipated.

6.8.4 **Assessment of Cumulative Effects**

The residual construction, operational and decommissioning impacts of the proposed development are considered cumulatively with other plans and projects as described in Sections 6.8.1 & 6.8.2. Particular focus has been placed on those plans and projects that are in closest proximity to the proposed development and those that could be potentially affected via downstream surface water.

Following the detailed surveys undertaken and impact assessment provided in Section 6.7, it is concluded that there will be no significant residual habitat loss, disturbance, deterioration of water quality etc., associated with the proposed Glenard wind farm project. but the proposed development has been deliberately designed to minimise the effects on biodiversity through the siting of the wind farm on habitats of low ecological value (conifer plantation). The project also includes a biodiversity management plan, which will serve to further minimise / offset any potential for individual or cumulative negative effects on biodiversity.

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

In the review of the other wind farm projects and development plans that was undertaken, no connection or pathway for effect that could potentially result in additional or cumulative impacts in combination with the proposed Glenard Wind Farm was identified. Neither was any potential identified for different (new) impacts resulting from the combination of the various projects and plans in association with the proposed development.

6.9 Conclusion

The site is located primarily within a large plantation coniferous forestry (WD4) of varying ages that has been assessed as of low ecological value. Potentially significant effects on the Key Ecological Receptors identified in this report have been avoided through infrastructure siting, project design and mitigated by the implementation of specific mitigation measures as detailed in Section 6.7 of this chapter; including all references made to mitigation specified in Chapters 4 ‘Development Description’, 9 ‘Water’ and within the CEMP Appendix 4.3 of the EIAR.

A small area of Upland blanket bog (PB2) also occurs within the site. This area of peatland and associated habitats have been assessed as corresponding to those listed in Annex I of the EU Habitats Directive and were therefore identified as of County importance. The proposed development has been designed in order to avoid these peatland habitats where possible and where some loss has been identified; appropriate mitigation and management measures have been incorporated into the proposed project through a Biodiversity Management and Enhancement Plan.

Faunal species records within the EIAR study area, during detailed ecological surveys undertaken between 2017, 2019, 2020 and 2021, were found to be common and widespread in the wider area, and in a National context. Protected species such as bats and badger were identified within the site boundary. In addition, a number of standard best practice measures have been incorporated into the project for the avoidance of impact on otter as a result of disturbance/displacement and water quality deterioration. The implementation of these measures in full will ensure compliance with the Wildlife Act.

Taking the above information into consideration and having regard to the precautionary principle, the proposed development will not result in a residual loss of peatland habitat of high ecological significance and will not have any significant impacts on the ecology of the wider area. Provided that the proposed development is constructed, operated and decommissioned in accordance with the design, best practice and mitigation that is described within this application, significant effects on biodiversity are not anticipated at any geographic scale.