5. BIODIVERSITY

5.1 INTRODUCTION

This chapter of the EIAR contains an assessment of the likely significant effects of the Proposed Project on biodiversity - flora and fauna, with the exception of avifauna, which is addressed separately in Chapter 6 - Ornithology.

This chapter should be read in conjunction with Chapter 1 – Introduction and Chapter 2 – Description of the Proposed Project.

5.1.1 Purpose of the Chapter

The purpose of this chapter is to:

- Describe the baseline ecological conditions of the Proposed Project, collected through both desk study and field surveys;
- Determine the ecological value and sensitivity of the identified ecological receptors;
- Assess the likely significant effects of the potential impacts, including direct, indirect and secondary impacts which may result from the construction, operation and/or decommissioning of the Proposed Project;
- Provide an assessment of the significance of any residual and/or cumulative effects in relation to the impacts on biodiversity; and
- Identify appropriate biodiversity compensation measures and/or post-construction monitoring if required and how these could be delivered.

5.1.2 Brief Description of the Site

A detailed description of the proposed Wind Farm Site is provided in Chapter 2 – Section 2.4.1 Proposed Wind Farm Site.

5.1.3 Brief Description of the Proposed Project

A detailed description of the Proposed Project is provided in Chapter 2 – Section 2.3 Proposed Project Description Summary.

The Proposed Project comprises:

- A proposed wind farm comprising fourteen (14) wind turbines and other ancillary infrastructure including access tracks and drainage;
- An on-site 110kV electrical substation and underground Grid Connection Route (GCR), to connect the wind farm to the National Grid at the existing ESBN Srananagh substation in Co. Sligo;
- A proposed Turbine Delivery Route (TDR) comprising accommodations along the public road network between Killybegs, Co. Donegal and the proposed Wind Farm Site to facilitate turbine and construction material delivery.

References to the Proposed Project in the EIAR relate to the entire project (i.e. wind farm, on-site substation, GCR, and temporary/permanent accommodations along the TDR). The definitions of the following terms will provide clarity throughout the report:

- The proposed Wind Farm Site refers only to the site of the wind farm as delineated by the Red Line Boundary in Figure 5-1. It does not include the GCR and TDR.

- The proposed Wind Farm Site includes 11 watercourse crossings which will executed using 10 clear span bridges and one bottomless culvert extension.
- The Survey Area for the proposed Wind Farm Site is delineated by the Blue Line Boundary in Figure 5-1, and was determined through land ownership folios. It is of relevance to the baseline environment discussed in this chapter.
- The Enhancement Lands refer to lands within the Red Line Boundary where proposed compensation measures will be implemented. These lands are beyond the Survey Area of the Proposed Wind Farm Site for the purposes of the Biodiversity Chapter. Details on the habitats within the Enhancement Lands are presented in full in the Outline Biodiversity Management Plan (EIAR Chapter 6 – Ornithology, Appendix 6-13).
- The Points of Interest (POIs) along the TDR refers to locations where accommodations are proposed to allow the delivery of oversize loads, such as where vegetation clearance is required, as shown in Figure 5-2.
- The GCR relates to the route for the proposed underground cable between the onsite substation and the existing Srananagh substation near Sligo, as shown in Figure 5-3.
- The proposed GCR involves two off-road HDD watercourse crossings.

5.1.4 Study Area

The Study Area generally refers to all areas assessed during the desk study and field surveys and is closely linked with the Zone of Influence (Section 5.1.4.1). The Survey Area is the area where ecological field surveys were undertaken by specialists for each ecological feature. The Survey Area for the proposed Wind Farm Site is defined by the blue line (Figure 5-1). The Survey Area for the TDR is defined by the oversail and overrun areas as outlined in the Swept Path Analysis Report (Figure 5-2). The Survey Area for the GCR is comprised of the full length of the GCR, inclusive of buffers for Important Ecological Features (IEFs) up to 150m (Figure 5-3).

5.1.4.1 Zone of Influence

The '*Zone of Influence*' (ZoI) for a project is the area over which ecological features may be subject to significant effects because of the Proposed Project and associated activities (CIEEM, 2018). This is likely to extend beyond the proposed Wind Farm Site, for example where there are ecological or hydrological links to downstream IEFs (Figure 5-1). The ZoI will vary for different ecological features depending on their sensitivity to an environmental change (CIEEM, 2018).

The ZoI for the Proposed Project was identified through a review of the nature, size and location of the Proposed Project, the sensitivities of the ecological features and the potential for cumulative effects, which is considered standard best practice (DEHLG, 2009). Consultation responses received from statutory and non-statutory bodies have also influenced the ZoI as they reference specific ecological features of relevance to the Proposed Project (Section 5.1.5). The ZoI is described hereunder:

- The ZoI for direct habitat loss is inclusive of;
    - The Survey Area for the proposed Wind Farm Site and, specifically, to habitats within the footprint of turbines and associated infrastructure (i.e., internal access tracks, turning bays, hardstands, turbine bases, borrow pits);

    - Works along the GCR, specifically the width of the trench to be excavated and the necessary habitat loss associated with Horizontal Directional Drilling (HDD) when crossing river waterbodies; and
    - The POIs along the TDR to allow for over-run and over-sail for the delivery of large turbine components to the proposed Wind Farm Site.
- The ZoI for potential surface water quality impacts is defined as 50m from a watercourse or drainage channel in accordance with Standards for Felling and Reforestation (DAFM, 2019).
- The ZoI for water quality impacts is confined to water bodies present within or downstream of the proposed Wind Farm Site where a hydrological pathway exists, until the first depositional water body is reached (i.e., lake water body; estuary). The ZoI for hydrological impacts for the proposed Wind Farm Site is therefore defined as waterbodies within, adjacent to, or downstream of the proposed Wind Farm Site and GCR, which in this case includes three lake water bodies and twenty-two river water bodies until the Ballysadare Estuary (Water Framework Directive (WFD) IE_WE_460_0300) is reached (Section 5.4.1.4);
- The ZoI for groundwater impacts includes eleven ground water bodies encompassing the proposed Wind Farm Site and GCR (Section 5.4.1.4);
- The ZoI for air quality (i.e., dust impacts) for the proposed Wind Farm Site is within the spatial limit of 50m to 250m (50m from the proposed Wind Farm Site and up to 250m from the site entrance) (IAQM, 2024). Therefore, the ZoI for dust impacts to vegetation is defined to be 50m surrounding all turbines and associated infrastructure, areas of stockpiling, borrow pits and internal access tracks utilised by machinery, and the GCR; and,
- The ZoI for disturbance to terrestrial mammals is defined in accordance with the best practice guidelines including *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes* (NRA, 2006b), and *Guidelines for the Treatment of European otters prior to the Construction of National Roads Schemes* (NRA, 2008b), which state that noise impacts from construction works can impact breeding badger setts/European otter holts within 150m of a noise source. Other protected mammal species potentially present at the locality (e.g., hedgehog, *Erinaceus europaeus*), are likely to have a smaller ZoI, as impacts are predominantly associated with habitat damage and will therefore be captured within the 150m survey buffer.
- The ZoI for marsh fritillary was defined as 14km, as maximum dispersal distances for the species between 10–14 km has been reported in studies on gene flow (Sigaard et al., 2008). Other genetic studies indicate that short-distance dispersal (<400 m) occur frequently, while long-distance movements (>4 km) are infrequent, concluding populations located >4km function as separate populations (Davis, 2019).

5.1.5 Consultation

Consultation with statutory and non-statutory bodies was undertaken on 4th December 2024 to inform this EIAR. Responses relating to biodiversity were received from the following bodies:

- Development Application Unit (DAU) - Department of Housing, Local Government and Heritage (DHLGH);
- Inland Fisheries Ireland (IFI);
- Leitrim County Council; and,
- Fermanagh County Council.

The consultation response from the DAU issued on the 11th February 2025 notes a number of 'environmental sensitivities' within the proposed Wind Farm Site and surrounding Survey Area, including hydrological connections to the Lough Gill Special Area of Conservation (SAC) and Lough Melvin SAC. A summary of the response is presented in Table 5-1 and the consultation response is presented in full in EIAR Chapter 1 Introduction, Appendix 1-2 EIAR Scoping Consultation Responses.

No response was received from IFI to the consultation letter dated December 2024. However, a summary of the response from IFI to an earlier consultation on the Proposed Project in April 2021 is provided below (Table 5-1).

The consultation response from Leitrim Co. Co. lists the proximity of the Proposed Project to Arroo Mountain SAC, Lough Melvin SAC and Lough Gill SAC. The response is summarised in Table 5-1 and reproduced in full in EIAR Chapter 1 Introduction, Appendix 1-2 EIAR Scoping Consultation Responses.

A consultation meeting with the Ecological and Guidance Advisory Unit at the National Parks and Wildlife Service was held on 12th March 2026. The discussion points relevant to the Biodiversity Chapter are summarised in Table 5-1.

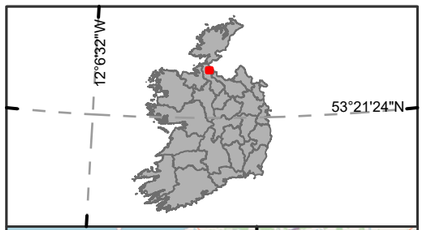
Table 5-1: Consultation responses relevant to the Biodiversity Chapter

Consultee	Summary of Response	Relevant Section
Development Applications Unit (DAU), Department of Housing, Local Government and Heritage	Response (ref. G Pre00386/2024 received 11/02/25) highlighted a number of environmental sensitivities of relevance. The Coillte plantations on which the wind farm is proposed are located downslope of the Dough/Thur Mountains NHA and therefore are unlikely to impact directly on the habitats for which the site has been designated. Indirect impacts may exist however via peat instabilities on the slopes downslope of the NHA, with the potential for a bog slide event to occur in areas unsuitable for development. A number of hydrological connections to the Lough Gill SAC and Lough Melvin SAC have been highlighted within the proposed area that need to be considered individually as part of a Natura Impact Statement. Siltation risks to the SACs during construction works via these watercourses are therefore high. White-clawed Crayfish, Brook Lamprey, Salmon and European otter have all been recorded in the Owenmore River within the Lough Gill SAC. The Ballagh River in the Lough Melvin SAC also contains spawning grounds for Salmon and Brown Trout. Two flora protection order species - Small White Orchid (*Pseudorchis albida*) and the bryophyte *Brachydontium trichodes*, have been recorded in the Study Area at Faughary and Killea respectively. There may be additional unrecorded sites for these or other FPO species elsewhere within the Study Area and this should be considered during botanical surveys where suitable habitats exist.	Section 5.6.2.2.1.1 Section 5.6.2.1.1.3 Section 5.6.2.1.1.4 Section 5.6.2.1.1.5 Section 5.6.2.10 Section 5.6.2.4
Inland Fisheries Ireland (IFI)	No response received to consultation undertaken in December 2024. Response received to previous consultation in April 2021 summarised below: The EIS should assess the potential impacts the proposed development may have including, damage to the aquatic and associated riparian habitat, pollution of water, introduction of non-native species and interference with upstream and downstream movement of aquatic life. The assessment should include all aspects of the development. All watercourses that will receive drainage from the construction site including the turbines or the access roads must be assessed in terms of aquatic biodiversity with particular emphasis on fish, the food of fish, spawning grounds and fish habitat in general. Invertebrate sampling is recommended. Electrofishing surveys will be required for all waters. Quantitative data in relation to all fish species should be compiled. The presence of salmonid species, crayfish and lamprey species should be assessed. The aquatic habitat and physical nature of any watercourse affected by the development must be fully described in detail. The riparian habitat is integral to the functioning of the aquatic environment. The potential impacts of the development on the riparian habitat should be assessed. Adequately sized aquatic buffer zones must be established along all watercourses. Settlement ponds and other silt treatment/mitigation measures must be engineered to ensure sufficient retention times are provided for sediment settlement. All instream works or other works which may impact directly on a watercourse should only be carried out during the open season which is from 1st July to 30th of September (so as to avoid impacting on the aquatic habitat during the spawning season). There must be no spread of invasive species as a result of the proposed development. A survey for the presence of invasive species should be carried out and a management plan put in place where found.	Section 5.6.2.10 Section 5.6.2.5 Appendix 5-4 Appendix 5-4 Section 5.5 Appendix 5-6

Consultee	Summary of Response	Relevant Section
Leitrim County Council	Whilst the study area does not appear to contain European sites, it is adjacent to the Lough Gill SAC (Site Code 001976) to the southwest with Arroo Mountain SAC (Site Code 001403) to the west of the R282 and Lough Melvin SAC (Site Code 000428) a similar distance to the northwest. There is therefore a need to carry out Screening for Appropriate Assessment under the Habitats Directive and further assessment if necessary. The results of such assessments will inform the Biodiversity section of the EIAR. The Appropriate Assessment will need to focus on the potential impacts arising on the European sites arising from the operational and particularly the construction phases of the development. Potential adverse impacts on the conservation objectives for designated habitats arising from the proposed development require careful consideration and analysis based on best available techniques and underpinned by the precautionary principle in formulating any recommendations/conclusions stemming from such analysis. Cumulative impacts with other developments, including but not limited to other wind farms, should be assessed for all sensitive receptors. Interactions with other environmental disciplines, especially hydrology and climate should also be assessed. The EIAR should make reference to the following documents: • Leitrim Heritage Plan 2020-2025; • Leitrim Biodiversity Action Plan 2022-2027; • Leitrim County Development Plan 2023-2029.	Section 5.6.2.1 Section 5.7
Fermanagh County Council	While the report covers a broad range of topics, FODC recommends placing greater emphasis on the site's proximity to Fermanagh and Omagh District Council area, as it lies just 3 km from the border which is within the Zone of Influence (ZoI). Also at a more local level, the Council adopted on 16 March 2023, its Plan Strategy (Fermanagh and Omagh Local Development Plan 2030, Plan Strategy). Whilst this relates to planning applications within the FODC boundary area, it does contain relevant designations, information and data, that should be carefully considered as part of the current process. Additionally, while the Environmental Impact Assessment (EIA) considers Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) within the Zone of Influence in Northern Ireland, including Lough Melvin SAC and Pettigoe Plateau SPA. FODC recommends incorporating information from sources in Northern Ireland, such as NBN Atlas and CEDaR, due to the proximity of the proposed development to County Fermanagh. This is particularly important as many species are transboundary in nature and/or inhabit environments linked through shared hydrological and hydrogeological systems. FODC acknowledges the broad range of surveys included under Section 6.4.2, Field Surveys. However, additional surveys, such as bird surveys including wintering bird surveys, should also be considered. Access to the results of the completed surveys would be helpful to provide a fully informed response regarding potential issues and the overall impact of the development. FODC agrees that having a separate Nature Impact Statement (NIS) represents best practice. However, allowing consultees to review the NIS would be beneficial, as it could provide valuable insights into the connections between the development site and European designated sites including those designated sites within the Fermanagh and Omagh District. This proposal is one which has the potential to have adverse impacts within Fermanagh and Omagh District Council and therefore will engage the transboundary requirements of the EIA legislation. The Council will reserve its position on the planning merits of the proposal until a formal transboundary consultation is issued. At that stage, the application will be accompanied with various surveys, which will help inform the Council's assessment of the proposal.	Section 5.8 Table 5-6

Consultee	Summary of Response	Relevant Section
National Parks and Wildlife Service	It is important to demonstrate avoidance of intact open peatlands. Demonstrate the use of the mitigation hierarchy for peatlands. Identify degraded areas of peatland with potential for suitable development such as fragmented, hydrologically degraded, habitats with a low potential for restoration.	Appendix 5-2 Section 5.6.2.3.2 Section 5.6.2.3.16 Section 5.6.2.3.17 Section 5.6.2.3.18

8°5'52"W



Legend

- Survey Area of the proposed Wind Farm Site
- proposed Wind Farm Site
- Enhancement lands

0 0.75 1.5
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	23/03/2026	First issue	S.P	S.R

Client:
Ireland
FuturEnergy

Project:
Lissinagroagh Wind Farm

Title:
Figure 5-1:
Proposed Wind Farm Site, Survey Area of the proposed Wind Farm Site, and Enhancement Lands

Scale @ A3: 1:30,000

Prepared by:	Checked by:	Date:
S.Pezzetta	S.Ryan	March 2026

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Map Ref:
10955-034-P.App.BO-AE-TOB-A

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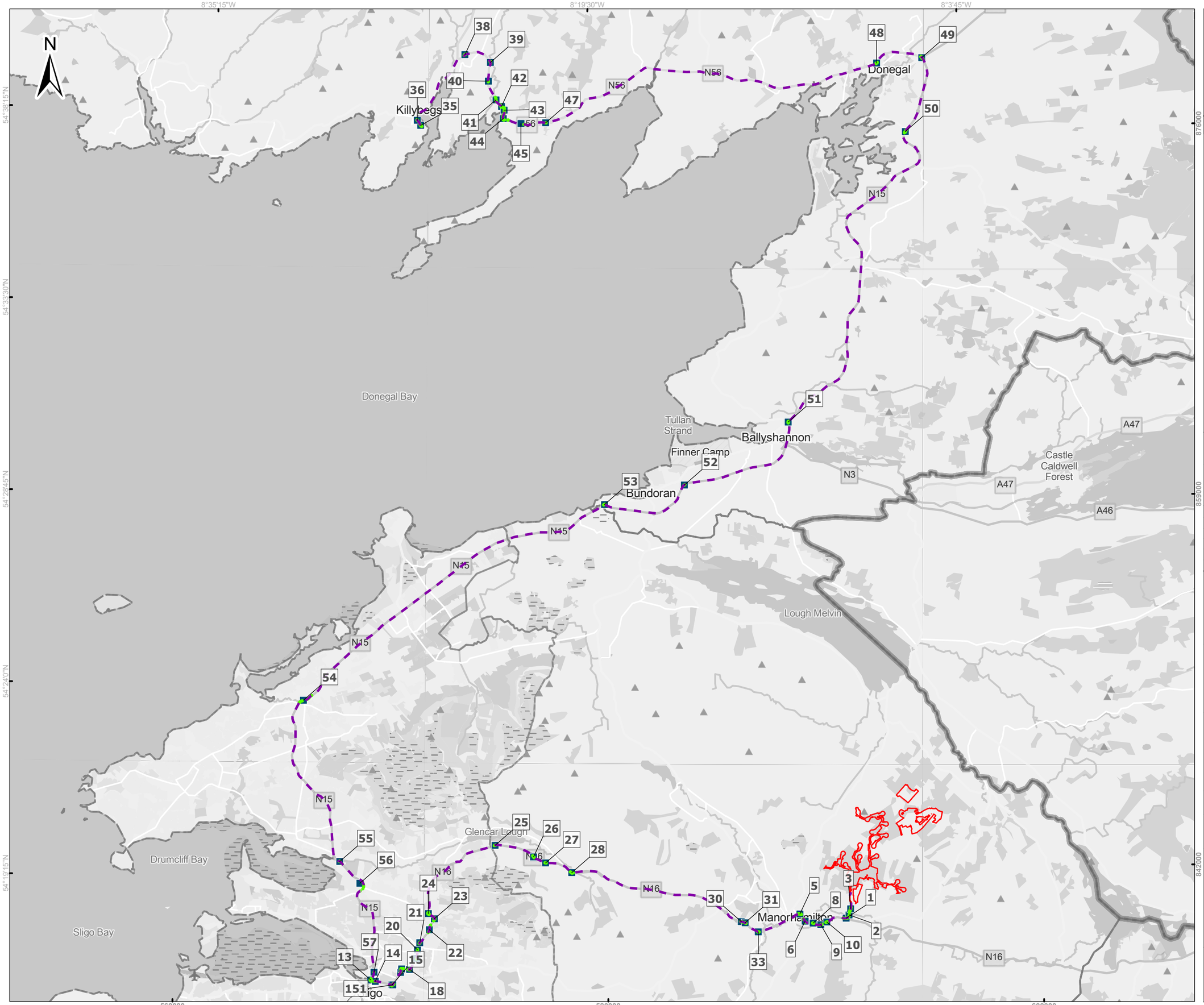

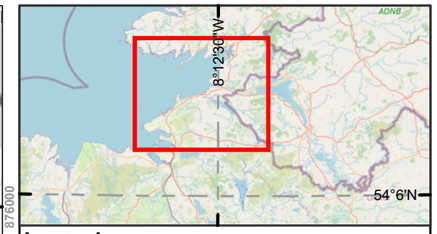

Legend

- proposed Wind Farm Site
- Turbine Delivery Route
- TDR
- Point of Interest - Locations

0 4 8
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	04/03/2026	First issue	S.P	S.R

Client: FuturEnergy Ireland

Project: Lissinagroagh Wind Farm

Title: Figure 5-2: Turbine Delivery Route from Killybegs, Co Donegal to the proposed Wind Farm Site Co. Leitrim

Scale @ A3: 1:160,000

Prepared by:	Checked by:	Date:
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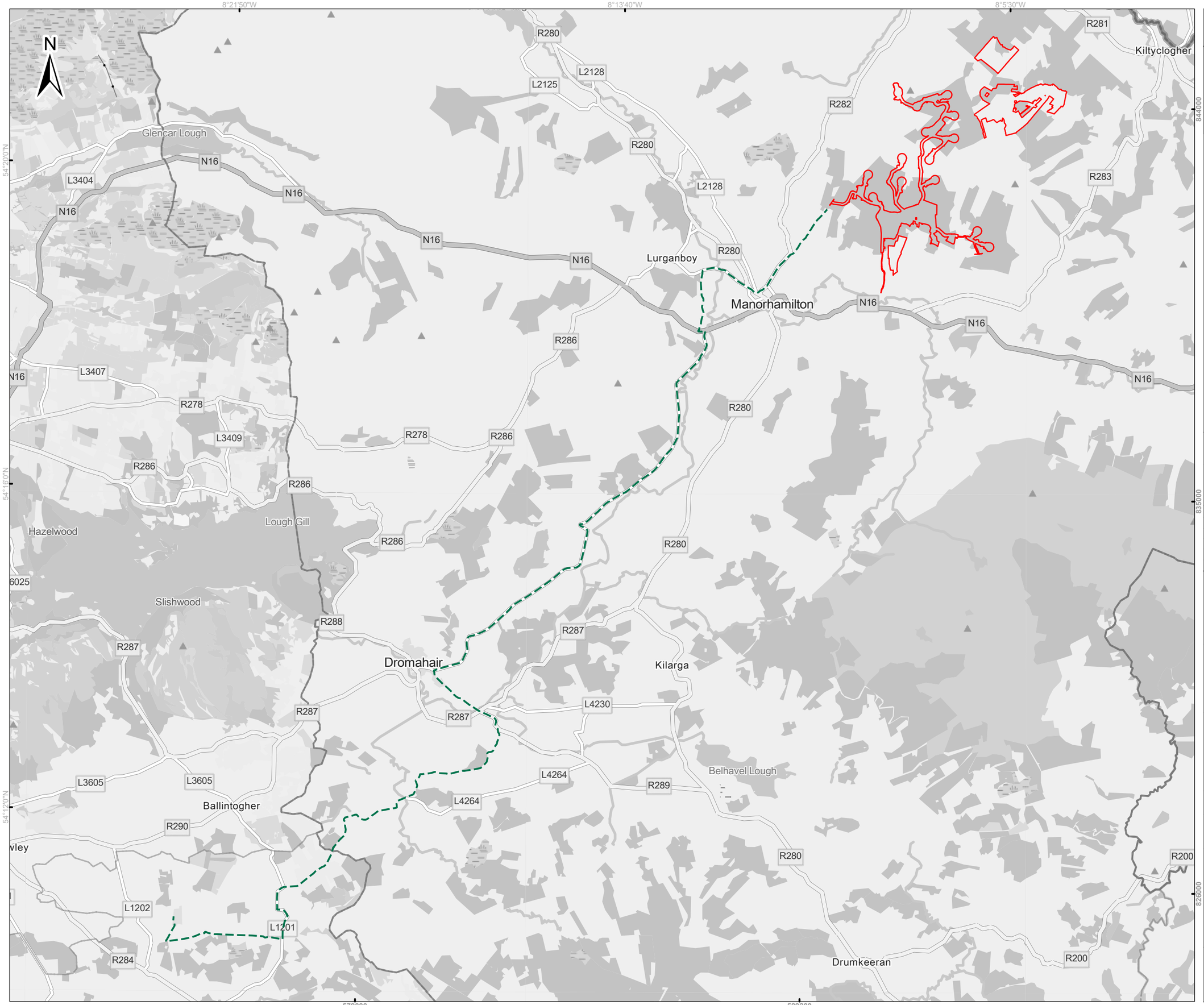
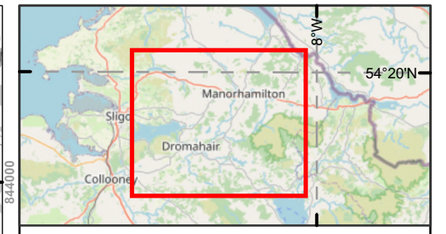
Map Ref: 10955-035-TDR-P.App.BO-TOB-A

Draft: A





Legend

- proposed Wind Farm Site
- Grid Connection Route

0 2 4
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	23/02/2026	First issue	S.P	S.R

Client: Ireland FuturEnergy

Project:
Lissinagroagh Wind Farm

Title:
Figure 5-3:
Grid Connection Route from the proposed Wind Farm Site Co. Leitrim to Sranagh Substation Co Sligo

Scale @ A3: 1:80,000

Prepared by: S.Pezzetta
Checked by: S.Ryan
Date: February 2026

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Map Ref: 10955-036-GCR-P.App.BO-TOB-A

Draft: A

5.1.6 Relevant Legislation and Policy

5.1.6.1 Legislation

The following legislation is relevant to this chapter:

- The Habitats Directive 92/43/EEC;
- European Communities (Birds and Natural Habitats) Regulations 2011 – 2021 (S.I. No. 293 of 2021), and Third Schedule (S.I. 477/2011) which lists invasive non-native species subject to restrictions;
- The Inland Fisheries Acts 1959-2027, as amended;
- The EU Water Framework Directive (2000/60/EC) as amended;
- The EIA Directive 2011/92/EU, as amended by Directive 2014/52/EU;
- Wildlife Acts 1976 (as amended), herein referred to as the Wildlife Act;
- Flora (Protection) Order 2022 (S.I. No. 235 of 2022); and

The relevant international and national legislation is provided in more detail in Appendix 5-1.

5.1.7 Project Team

This chapter was prepared by TOBIN Senior Ecologist Meadhbh Costigan (M.Sc.), Principal Ecologist Áine Sands (B.Sc. Hons), and Project Ecologist Ria Aherne (B.Sc.). TOBIN ecologists carried out multi-disciplinary ecological surveys to inform the proposed Wind Farm. The aquatic ecology technical note (see Appendix 5-4) was prepared by TOBIN Project Ecologist Joe Freijser (M.Sc.). TOBIN ecologists carried out Phase 1 habitat surveys, protected flora and fauna surveys, and aquatic surveys to inform the Proposed Project. Further credentials of TOBIN ecologists are provided hereunder.

5.1.7.1 TOBIN Ecologists

Ria Aherne (B.Sc. Hons.)

Ria Aherne (a former Project Ecologist with TOBIN) led the Phase 1 surveys, invasive species surveys, and terrestrial mammal surveys, and co-authored the biodiversity chapter for the Proposed Project. She has seven years post-graduate experience in ecology and environmental consultancy. Ria has predominantly been involved in the surveying and reporting of large-scale public and private infrastructure projects where she has carried out numerous Screenings for Appropriate Assessments, Natura Impact Statements and Ecological Impact Assessments for Proposed Projects.

Meadhbh Costigan (M.Sc. ACIEEM)

This report was co-authored by Meadhbh Costigan M.Sc. ACIEEM, Senior Ecologist with TOBIN. Meadhbh graduated from Trinity College Dublin with a B.A. (Hons) in Natural Science, reading Botany. She then received a M.Sc. in Botany from the University of Kent with training from the Royal Botanic Gardens, Kew. She has 5 years' experience in consulting, primarily engaged in the preparation of impact assessments and biodiversity chapters for the renewable energy sector. Her work focusses on the identification of Annex I habitat types and the assessment of habitat condition. She applies the information she gathers in the field to provide guidance to clients on avoiding and mitigating adverse effects on natural habitats of community importance. She is an

Associate member of Chartered Institute of Ecology and Environmental Management (CIEEM) and is an elected member of the CIEEM Irish Section Committee.

Joe Freijser (M.Sc.)

Joe undertook the aquatic surveys and co-authored the aquatic sections in the biodiversity chapter as well as the aquatic baseline report (see Appendix 5-4). He has 10 years post-graduate experience in aquatic and terrestrial ecology, environmental consultancy and civil engineering. Joe has predominantly been involved in a variety of water and infrastructure related projects like flood relief schemes, drainage maintenance works, WWTP upgrades and construction projects throughout Ireland. For these projects he carried out numerous Screenings for Appropriate Assessment, Natura Impact Statements and Ecological Impact Assessments often also operating as Ecological Clerk of Works and environmental drainage maintenance auditor. Joe has a strong background in fish identification, aquatic surveys and fish habitat assessment including electrofishing, macroinvertebrate kick-net sampling and identification, dip net sampling for fish and amphibians, macrophyte and bryophyte identification and European otter and crayfish surveys. Joe also has extensive experience in chemical water quality sampling and terrestrial habitat, mammal and passerine bird nest surveys

Sinead O'Reilly (M.Res.)

Sinead O' Reilly Senior Ecologist with TOBIN undertook the aquatic surveys and Phase 1 habitat surveys as well as co-authored the aquatic sections in this chapter and undertook aquatic surveys. She is a qualified and experienced environmental consultant with thirteen years' post-graduate experience in freshwater sciences and environmental consultancy in Ireland. Sinead has a strong technical background as a freshwater ecologist and has extensive field experience in freshwater habitats and species across Ireland.

Jaroslaw Majkusiak (M.Sc.)

Jaroslaw is an Ornithologist with TOBIN. He conducted the multidisciplinary surveys to support the impact assessments for this biodiversity chapter including aquatic surveys, marsh fritillary surveys, and invasive species surveys. Jarek's role at TOBIN involves carrying out Ornithological surveys such as Wintering Birds (IWebs), Vantage Point, Transect, Raptors, Woodcock, and Habitat surveys (general and designated habitats); Jarek has strong GIS mapping software skills (QGIS & ArcGIS) which contributes greatly to his report writing. Jarek has experience in data management and data modelling, allowing him to oversee complex survey records. Jarek's contributed to many projects since he started with TOBIN and his main tasks involved producing and reviewing interim baseline bird reports and impact assessment. Other tasks involved reviews of field surveys such as breeding bird surveys, winter transects surveys, raptor, and wader surveys.

Joao Martins (B.E. (Hons), M.Sc.)

Joao Martins is Senior Ecologist in TOBIN's Environment & Planning (E&P) division in TOBIN. He provided Quality Assurance checks on the Biodiversity Chapter before release to client. He has over 15 years' experience in freshwater ecology, associated with monitoring for the EU Water Framework Directive (e.g., macroinvertebrates, habitat/hydromorphology) and projects of scientific nature, in Germany, Portugal and Ireland. He has worked for over 8 years in environmental consultancy, developing his expertise in AA, Ecological Impact Assessment

(EcIA) and Environmental Impact Assessment (EIA). Joao has also conducted and coordinated bird surveys (e.g. I-WeBS, Vantage Point (VP), Countryside Bird Survey (CBS), Woodcock), botanical and habitat surveys, mammal surveys (bats and non-volant) and inland fisheries (electrofishing).

Eoghan Phelan (B.Sc.)

Eoghan holds the position of Project Ecologist/Ornithologist within TOBIN's Environment and Planning Division. He undertook the multidisciplinary surveys for this biodiversity chapter including aquatic surveys, marsh fritillary surveys, invasive species surveys. Eoghan has four years' experience in the environmental sector and has conducted National Ornithological surveys for Chough, Curlew and Red Grouse as well as being part of Ornithological impact assessment surveys for large-scale developments including wind farms, flood relief schemes and housing developments.

Aine Sands (B.Sc. Hons)

Áine is a Principal Ecologist and part of the Environment & Planning division in TOBIN. She was project manager and lead ecologist for the project. She conducted the Phase 1 habitat surveys and terrestrial mammal surveys within the Survey Area for the proposed Wind Farm Site as well as the habitat surveys and PRF surveys along the TDR. Áine has over ten years post-graduate experience in ecology and environmental consultancy and has predominantly been involved in large renewable energy projects such as wind farms, solar farms and hydrogen production plants. Within her role, Áine has carried out numerous Screenings for Appropriate Assessments, Natura Impact Statements and Ecological Impact Assessments for a variety of projects. Áine also has a strong understanding of National and European legislation associated with biodiversity and is cognisant of relevant rulings by the Court of Justice of the European Union (CJEU). Importantly, Áine has experience with undertaking ecological surveys for protected habitats and species and is able to collect robust data from these surveys. Áine holds full CIEEM Membership and is working towards Chartership.

5.1.7.2 Third-Party Specialists

A number of third party consultancies were contracted to conduct specialist surveys. Aquafact conducted aquatic macroinvertebrate surveys and compiled the associated report. The Aquafact survey team was comprised Kevin Mc Caffrey and Brendan O'Connor. Aztec Management Consultants carried out the electrofishing surveys and compiled the associated report. The team was led by Martin O'Farrell with assistance provided by Eddie McCormack BSc Marine Science, PhD Zoology and Ross Macklin BSc, PhD. Fisheries Ecology. AECOM carried out the Annex I habitat condition assessments within the Survey Area for the proposed Wind Farm Site, details of their findings are outlined in a baseline report with reporting and surveying conducted by Nick Dadds. Bat Eco Services led BY Dr. Tina Aughney conducted the bat surveys and compiled the baseline reporting. An Invasive Species Management Plan (ISMP) was prepared by INVAS with Dr. Will Earle as lead ecologist.

Kevin Mc Caffrey BSc Biology, MSs Environmental Sustainability

Kevin holds a B.Sc. in applied freshwater & marine biology and a M.Sc. in environmental sustainability from UCD. He is experienced in the taxonomic identification of aquatic flora and fauna, measurements of the physical and chemical aspects of marine and freshwater

environments. Kevin is also proficient in data analysis, using Excel and Minitab, as well as mapping data using QGIS and MapInfo. One of Kevin's main roles in Aquafact has been as an onsite ecologist, this has included regular water sampling, fish surveys and monitoring of ongoing works. He has conducted multiple surveys on first and second order streams throughout Ireland since 2012 using Q-value scheme and SSRS. Kevin has been involved in the training of members of multiple County Councils and private sector companies in identification of macro invertebrates and freshwater sampling to a level sufficient to perform SSRS assessments.

Dr. Brendan O'Connor PhD. Zoology

Dr. Brendan O'Connor is an expert in ecological matters and the full spectrum of environmental assessment techniques, methodologies and statutes. Professionally, he is a member of relevant institutes requiring the highest standards of professional competence and integrity. He is a full member of the CIEEM.

Brendan has 40 years of experience in the field of marine science and has published c. 75 scientific papers and numerous reports specialising in the biology and ecology of sea-floor communities. Brendan is an internationally recognised polychaete taxonomist and has led numerous international workshops in polychaete taxonomy including workshops as part of the UK BEQUALM/NMBAQC. He has over 90 publications on marine invertebrate taxa including descriptions of new species, revisions of families and additions to the European and Irish fauna.

As Managing Director of Aquafact Brendan has been responsible for all aspects of management including the design, execution and reporting of numerous desk studies, surveys, assessments and environmental outputs including NIS, AA screening and EIARs.

Dr. Martin O'Farrell BSc., Ph.D. Fisheries Management

Dr. Martin was team leader, lead surveyor and author of the electrofishing surveys conducted by Aztec Management Consultancy. Martin completed his undergraduate studies at NUI Galway (B.Sc. (Hons) in Zoology and also carried out research of the feeding ecology of fish populations in the Clare River system for his Ph.D degree which was also completed at NUI Galway. He held a post-doctoral fellowship at the Zoology Department, Trinity College, Dublin for a three-year period during the 1980s. During this decade he also worked as a Scientific Officer for the then Central Fisheries Board, carrying out fisheries management related research on Atlantic salmon and sea trout on the River Erriff and other west of Ireland catchments.

He commenced his fisheries consultancy business in 1985 and during the past three decades or so has been involved in the assessment of fisheries management issues on industrial rivers fuelling hydroelectric generating stations and supplying cooling water for thermal electricity generating stations in Ireland, UK, Switzerland, France, Norway, Sweden, Russia and the USA. These issues have included assessment of turbine passage survival, assessment of fish species life stage migration patterns through the deployment of fish census technology, mitigation measures involving selected generating protocols and hatchery operations and the design and installation of fish deterrent technologies to improve upstream and downstream passage of migratory fish species life stages through and around obstacles in the path of their migrations.

Dr. Eddie McCormack BSc Marine Science, PhD Zoology

Dr. Eddie McCormack assisted Martin O'Farrell during the electrofishing field surveys. He is Associate Director of Aquafact, with over 20 years taxonomic experience. He received his BSc in Marine Science and his PhD in Zoology both from NUI Galway. He specialises in marine and freshwater invertebrate taxonomy, subtidal and intertidal sampling, Environmental Impact Assessment Reports (EIAR), Natura Impact Statement (NIS), statistical analysis, assessing the impacts of human activity on the benthos.

Eddie is a taxonomist with over 20 years' experience. His taxonomic experience is wide ranging and includes Crustacea, Polychaetes, Mollusca, Echinoderms and other minor taxa of subtidal macrofauna. In addition, he has extensive experience in the taxonomy and identification of meiofauna (especially Crustacea and Nematoda), deep sea invertebrates, zooplankton and freshwater macroinvertebrates. He has developed and delivered training workshops on the identification of marine invertebrates. He is responsible for conducting training courses in SSRS (Small Streams Risk Score) – an EPA developed programme to train freshwater surveyors in a biological risk assessment system designed to assist in the identification of diffuse sources of pollution in support of the Water Framework Directive.

Eddie has experience working on a wide variety of projects e.g. Annex I habitat monitoring and reporting, aquaculture, dredging, disposal at sea, seaweed harvesting, harbour/pier extensions, undersea cable and pipeline crossings. He has worked for the Aquaculture Licence Appeal Board (ALAB) as a technical advisor on a number of separate appeal cases, including oral hearing.

Dr. Ross Macklin BSc, PhD. Fisheries Ecology

Dr. Ross Macklin assisted Martin O'Farrell during the electrofishing surveys. He founded Triturus Environmental Ltd. in Co. Cork. Ross is an environmental scientist who specialises in freshwater and fisheries ecology, in addition to informing engineering solutions for construction works on rivers, including site improvement and rehabilitation. He has fifteen years professional experience and holds a BSc PhD Fisheries Ecology.

Nick Dadds BSc (Hons) MCIEEM

Dr. Nick Dadds conducted the Annex I habitat condition assessment surveys and wrote the associated baseline report. He is a Principal ecologist AECOM, with over 23 years' experience. His expertise is in ecological impact assessment, protected species and National Vegetation Classification (NVC). Projects he has been involved with range from largescale infrastructure and energy schemes (including wind farms, pipelines, power lines, transport projects and masterplan schemes) to conservation-related projects (including commissioned work for Scottish Natural Heritage). He is a full member with the Chartered Institute of Ecologists and Environmental Management.

Dr Tina Aughney PhD Environmental Policy and Entomology

Dr. Tina Aughney of Bat Eco Services led the bat surveys and compiled the baseline report. Dr. Aughney has worked as a Bat Specialist since 2000 and has undertaken extensive survey work for all Irish bat species including large scale development projects, road schemes, residential developments, wind farm developments and smaller projects in relation to building renovation or habitat enhancement. She is a monitoring co-ordinator and trainer for Bat Conservation Ireland. She is a co-author of the 2014 publication *Irish Bats in the 21st Century*. This book

received the 2015 CIEEM award for Information Sharing. Dr Aughney is a contributing author for the Atlas of Mammals in Ireland 2010-2015. All bat analysis and reporting have been completed by Dr. Tina Aughney. Data collection and surveying is often completed with the assistance of a trained field assistant.

Dr. William Earle PhD. Aquatic Ecology and David Parkinson BSc

Dr. William Earle of INVAS Biosecurity prepared the Invasive Species Management Plan (ISMP) with Principal Environmental Consultant David Parkinson (BSc., MIEMA, CEnv). Dr. Earle is responsible for IAS, macrophyte and ecological field surveys using drone and GPS technology. He is in charge of GIS mapping and map production in INVAS IAS survey reports and Appropriate Assessment preparation. David is the Principal Environmental Consultant of EcoQuest Environmental with 17 years of environmental consultancy experience in Ireland and Australia. David has previously been involved in numerous invasive species surveys, management plans, invasive species awareness presentations, is a Full Member of the Institute of Sustainability & Environmental Professionals (MISEP) and is a Chartered Environmentalist (CEnv).

5.2 METHODOLOGY

5.2.1 Baseline Data Collection

5.2.1.1 Desk Study

The desk study consisted of the following:

- Identification of all important sites for nature conservation i.e., SACs (inclusive of candidate SACs), Special Protection Areas (SPAs), NHAs, and proposed NHAs within the ZoI of the proposed Wind Farm Site;
- A species list for the proposed Wind Farm Site was generated using the National Biodiversity Data Centre map viewer (NBDC, 2025a), the NBN Atlas map viewer (NBN Atlas, 2006), and an information request sent to the Centre of Environmental Data & Recording (CEDAR, 2026). Only rare or protected species recorded during the past 10 years within the 10km grid squares (hectad) G94, G84, G83, G82, and G72, which encompass the proposed Wind Farm Site, were evaluated. For the GCR a species list was generated within 1km of the proposed works;
- Article 17 habitats and species datasets (NPWS, 2019a; NPWS, 2019b), National Survey of Native Woodlands 2003-2008 (NPWS, 2008), Ancient and Long-Established Woodlands (NPWS, 2012a) and the Irish Semi-Natural Grassland Survey 2007-2012 (NPWS, 2012b), available from NPWS were studied to assess the presence of such within, and with connectivity to, the proposed Wind Farm Site and GCR (NPWS, 2025);
- A review of published data and documents from BCI, Botanical Society of Britain (BSBI) and IFI; and,
- A review of aerial imagery basemaps of Open Street Map to determine broad habitats that occur within the Survey Area for the proposed Wind Farm Site (OSM, 2024).

5.2.1.1.1 Sensitive Data Request

A sensitive data request for hectads G94, G84, G83, G82, and G72 (which encompass the Survey Area for the proposed Wind Farm Site and GCR) was issued to NPWS on 19th December 2024, with a follow-up email sent on 02nd April 2025. A response was received on December 19th 2025 The data received has been used to inform the desk study (Section 5.4.1.3.1.2).

5.2.1.1.2 National Biodiversity Data Centre

A search of the NBDC database (NBDC, 2025a) was carried out in September 2024 for recorded protected flora and fauna (excluding avifauna), and invasive species listed under the Third Schedule (S.I. 477/2011) within hectads G94, which encompass the Survey Area for the proposed Wind Farm Site along with the grid squares G84, G83, G82, and G72 which encompass the GCR. Results of protected flora and fauna are listed in Table 5-5 and results of the Third Schedule (S.I. 477/2011) invasive flora and fauna species are listed in Table 5-5.

5.2.1.1.3 CEDAR and NBN Atlas

An information request was sent to CEDAR on 20th January 2026 for recorded protected flora and fauna (excluding avifauna), and invasive species listed under the Third Schedule (S.I. 477/2011) within 10km of the Survey Area for the proposed Wind Farm Site (inclusive of the hectads G94, G95, H04).

A search of the NBN Atlas (NBN Atlas, 2026) was carried out in January 2026 for recorded protected flora and fauna (excluding avifauna), and invasive species listed under the Third Schedule (S.I. 477/2011), within 10km of the Survey Area for the proposed Wind Farm Site.

5.2.1.1.4 Collision Risk Model

The collision risk model for bat species uses the largest parameter of the design flexibility for turbine models namely; a blade tip height range of 180-185 m inclusive, a rotor diameter range from 149 m to 163 m inclusive, a hub height range from 101 m to 110.5 m (see Appendix 5-5). The collision risk model for bat species uses the largest parameters within the design envelope, thereby representing a worst-case scenario that encompasses the collision risk associated with smaller turbine models. No other IEF within the biodiversity chapter will be impacted by the design flexibility for turbine models.

5.2.1.2 Field Surveys

Ecological field surveys were undertaken within the Survey Area for the proposed Wind Farm Site, Grid Connection Route (GCR) and Turbine Delivery Route (TDR) between September 2020 and September 2025 by qualified and experienced ecologists to inform the assessment (Table 5-2, Figure 5-1).

Surveys along the TDR were carried out at each of the POIs as defined in Chapter 2 – Description of Proposed Project, Appendix 2-1 Turbine Delivery Route Report.

The relevant specialist reports for biodiversity field surveys are included as appendices to this chapter, and consist of:

- Appendix 5-2 as is summarised in Section 5.2.1.2.1.1;
- Appendix 5-4 as is summarised in Section 5.4.1.5;
- Appendix 5-5 as is summarised in Section 5.4.2.5;
- Appendix 5-6 as is summarised in Section 5.4.2.3.

Further details of field survey methodologies are presented in the subsequent paragraphs.

Details of the Project Team are presented in Section5.1.7.

Table 5-2: Ecological Field Surveys undertaken at the Survey Area for the proposed Wind Farm Site, GCR and TDR

Surveys		Location	Survey Dates	Personnel
Habitat Surveys	Habitat Classification, Description & Mapping	Wind farm site	September 2020	TOBIN
			July 2021 September 2021	TOBIN
			May 2024	TOBIN
		GCR	October 2024	TOBIN
	Annex I Habitat Condition Assessment Surveys	Site A, B, C*	September 2024	AECOM
	Invasive Species Surveys	TDR	October 2024	TOBIN
		GCR	October 2024	TOBIN
		Wind farm site	September 2025	TOBIN
Non- volant Mammal Survey	Mammal Surveys	Wind farm site	September 2020, July 2021, August 2025	TOBIN
	Mammal Surveys	GCR	August 2025	TOBIN

Surveys		Location	Survey Dates	Personnel
Bat Survey	Static Detectors	Wind farm site	Autumn 2020 Spring-summer 2021 Spring-autumn 2024	Bat EcoServices
	Transects	Wind farm site	August 2021 June-August 2024	Bat EcoServices
	Potential Roost Feature surveys	Wind farm site	June 2024 August 2021	Bat EcoServices
	Potential Roost Feature surveys	TDR	October 2024 June 2024	TOBIN
	Potential Roost Feature surveys	GCR	September 2024	TOBIN
Aquatic Surveys	Kick Sampling	Downstream of the proposed Wind Farm Site^	September 2021,	TOBIN
	Kick Sampling	Wind farm site and GCR	August 2025, September 2025	TOBIN
	Hydromorphology surveys	Wind farm site and GCR	August 2025, September 2025	TOBIN
	Electrofishing Survey	Downstream of the proposed Wind Farm Site^	September 2021	AZTEC Consultancy Aquafact
Marsh Fritillary Survey	Larval web survey	Wind farm site	September 2020 September 2025	TOBIN
Amphibians and Reptiles	Walkover Survey	Wind Farm Site	September 2020, August 2021, May 2024, September 2025	TOBIN

*Site A, B, and C are presented and mapped within Appendix 5-2.

^Surveys were undertaken downstream of the Survey Area for the proposed Wind Farm Site within tributaries of the Garvouge, Drowes and Erne catchments (refer to Appendix 5-4).

5.2.1.2.1 Habitat Surveys

Initial habitat surveys were conducted by TOBIN across the Survey Area for the proposed Wind Farm Site from the 14th to the 17th of September 2020, and on the 3rd and 5th of October 2020 by TOBIN and AECOM. Habitat surveys targeted to the GCR were conducted by TOBIN on the 5th and 6th of July 2021, the 6th to 10th of September 2021, the 13th to the 17th of May 2024 and between the 30th of September to the 4th of October 2024. Additional habitat surveys, targeted to locations (POIs) along the TDR where accommodations will require the temporary removal of vegetation, were conducted on 2nd October 2024 by TOBIN.

Habitat surveys were undertaken following methodologies outlined within *Best practice guidance for habitat survey and mapping* (Smith *et al.* 2011) and NRA (2008a) guidelines. All representative habitats encountered during the multidisciplinary survey were classified in accordance with Fossitt (2000) and satellite imagery was used to assist in the delineation of habitat boundaries. Appropriate plant identification keys were used as necessary, including

Parnell and Curtis (2012) and Stace (2010) for higher peatland plants as well as Fitter and Fitter (1984) for grasses, sedges and rushes.

Following the completion of the field surveys, habitat maps were prepared in accordance with the best practice methodology (Smith *et al.*, 2011), for the Survey Area for the proposed Wind Farm Site, as well as the GCR and the TDR where appropriate. Maps which illustrate the habitats recorded within the Survey Area for the proposed Wind Farm Site are presented in Appendix 5-3.

Particular attention was dedicated in the identification of plant species protected under the Flora Protection Order (S.I. No. 235/2022), as well as those listed under the Ireland Red List of Vascular Plants (King *et al.*, 2011; Lockhart *et al.*, 2012; Wyse Jackson *et al.*, 2016), were also recorded and habitats that could afford its classification as those designated under the Annex I of the Habitats Directive (Section 5.2.1.2.1.1).

Annex I habitat types are listed in the Habitats Directive and require member states to establish Special Areas of Conservation with the aim to maintain or restore the natural habitat types (Council Directive 92/43/EEC). Annex I habitats identified as those in danger of disappearing, have a small natural range, and present outstanding examples of European biogeographical regions. Priority Annex I habitat types are those which are critically endangered.

5.2.1.2.1.1 Annex I Habitat Surveys

The survey of potential Annex I habitats within the Survey Area for the proposed Wind Farm Site was carried out by AECOM 23rd -24th September 2024 (Section 5.1.7.2).

The identification of Annex I habitat types within the Survey Area for the proposed Wind Farm Site was informed by expert opinion and relevant definitions as stated in *Interpretation Manual of European Union Habitats* (European Commission, 2013). Assessments of the conservation status of habitats listed in Annex I of the EU Habitats Directive following best practice guidelines:

- *Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland* (Perrin *et al.* 2014);
- *The development of methodologies to assess the conservation status of Limestone Pavements and associated habitats in Ireland* (Murphy and Fernandez, 2009);
- *The monitoring and assessment of four EU Habitats Directive Annex I woodland habitats* (Daly *et al.* 2023).

An assessment outcome of 'unfavourable condition' refers to an Annex I habitat type which failed the monitoring stops conducted within the habitat. It does not mean that the habitat is not an Annex I habitat type, as this classification is based on expert judgement and the guidelines.

The classification system presented in *A Guide to Habitats in Ireland* (Fossitt, 2000) was applied to other habitats that did not correspond to any Annex I habitat types. For further detail on the methods used during survey of upland Annex I habitat types please refer to Appendix 5-2.

5.2.1.2.1.2 Invasive Non-Native Species Surveys

The Survey Area for the proposed Wind Farm Site, GCR and TDR were surveyed by TOBIN (Section 5.1.7.1) for evidence of invasive non-native species (INNS) listed in Part 1 of the First

Schedule listed species under the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) and Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011), which restricts the spread of these species . Guidance on the identification of INNS, as outlined in the *Field Guide to Invasive Species in Ireland* (Early *et al.*, 2018), was consulted as necessary.

Initial INNS surveys were conducted across the Survey Area for the proposed Wind Farm Site from the 14th to the 17th of September 2020 and on the 3rd and 5th of October 2020. These surveys were updated on the 3rd and 4th September 2025. The proposed GCR was surveyed for INNS on 30th September 2024 and 01st October 2024. INNS surveys along the proposed TDR were carried out on 24th June 2025.

5.2.1.2.2 Fauna

5.2.1.2.2.1 Non-volant Terrestrial Mammals

A terrestrial mammal survey was carried out by TOBIN in line with best practice guidance as outlined in *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (NRA, 2008a). All signs and tracks were evaluated as they were encountered in the field (Bang *et al.* 2006). Targeted surveys for specific protected species were also undertaken and are outlined in the following sections. Terrestrial mammal surveys were conducted by TOBIN between 15th -17th September 2020, 5th-6th July 2021, 25th-29th August 2025.

5.2.1.2.2.1.1 European otter

European otter (*Lutra lutra*) surveys were carried out following guidelines set out in *Guidelines for the Treatment of European otters prior to the Construction of National Roads Schemes* (NRA, 2008b). Surveys were conducted at water features within 150m of the proposed Wind Farm Site and within 150m of the GCR and within 150m of watercourse crossings where accommodations are proposed along the TDR, as access allowed. Any evidence of European otter presence or activity, such as holts (breeding and temporary), slides and territorial marking points (spraints), was recorded.

5.2.1.2.2.1.2 Badger

Badger (*Meles meles*) activity was determined by field surveys for setts, trails, latrines and feeding signs, following the approach set out in nest practice guidelines (NRA, 2006b). Surveys for badger activity were undertaken at the Survey Area for the proposed Wind Farm Site, paying particular attention to suitable habitat in proximity to the proposed infrastructure sites.

5.2.1.2.2.1.3 Deer

The presence of deer was noted throughout the Survey Area for the proposed Wind Farm Site. No determination was made on species. The ecological survey techniques were in accordance with best practice guidelines contained in NRA (2008a).

5.2.1.2.2.1.4 Pine marten

Pine marten (*Martes martes)* surveys were carried out following best practice guidelines (NRA, 2008a). Given the nocturnal nature of this species, a search of their suitable habitat (conifer and broadleaved woodland habitat) within 150m of the Survey Area for the proposed Wind Farm Site was carried out for the presence of activity, such as scat and potential dens.

5.2.1.2.2.1.5 Other Small Mammals

The presence of small mammals within the Survey Area for the proposed Wind Farm Site were noted as appropriate. Protected small mammal species include red squirrel (*Sciurus vulgaris*), Irish stoat (*Mustela erminea hibernca*), Irish hare (*Lepus timidus hibernica*), hedgehog (*Erinaceus europaeus*), and pygmy shrew (*Sorex minutus*). Signs such as droppings, prints and suitable habitat were recorded during the surveys of the site. These species are likely to occur within the Survey Area for the proposed Wind Farm Site as previous records exist (NBDC, 2025a). The ecological survey techniques were conducted in accordance with best practice guidelines contained in NRA (2008a).

5.2.1.2.2.2 Bats

Field surveys for bats were undertaken by Bat Eco Services, with support from TOBIN ecologists. Surveys involved daytime inspections of potential bat roosts (PBRs) such as buildings and trees. PBRs were assessed to determine their suitability as a bat roost and described using the classifications put forward in Collins (2023). Surveys were conducted along the GCR by TOBIN (30th September 2024), TDR by TOBIN (24th June 2024 and 2nd October 2024) and within the by Bat Eco Services (17th-19th June 2024 and 1st July 2024 and 9th-12th August 2021).

Dusk and dawn surveys were conducted by Bat Eco Services on fourteen buildings to confirm presence of bat roosts on 17th-19th June 2024, 1st July 2024, 22nd July 2024 and 19th August 2024.

Static bat detector units were deployed by Bat Eco Services at 14 locations within the Survey Area for the proposed Wind Farm Site for up to 17 consecutive nights to determine bat activity over the spring, summer, autumn seasons in 2024 following best practice guidelines *Bats and onshore wind turbines-survey, assessment and mitigation* (Nature Scot, 2021). Static detectors were also deployed in autumn 2020, spring 2021 and summer 2021.

Transect surveys were conducted by Bat Eco Services using a combination of walking and driving transects undertaken (18th June 2021, 27th June 2021, 9th -12th August 2021, 17th -19th June 2024, 1st July 2024, 22nd July 2024 and 19th August 2024) following methodology set out in Collins (2023).

Full details regarding the methodology for bat surveys are presented in Appendix 5-5.

5.2.1.2.2.3 Amphibians and Reptiles

Common frog (*Rana temporaria*), smooth newt (*Triturus vulgaris*), and common lizard (*Lacerta vivipara*) have a widespread distribution in Ireland. The following sections describe the survey methodologies undertaken for these species.

5.2.1.2.2.3.1 Common Frog

A common frog survey was carried out by TOBIN in suitable habitat within the Survey Area for the proposed Wind Farm Site, such as tyre ruts, drainage ditches and small ponds, following methodologies outlined in the NRA (2009b) and Reid *et al.* (2013). No net dipping, which requires a derogation licence, was carried out. The visual daytime survey included the searching of water bodies looking for signs of frogs and tadpoles). Suitable habitat was searched for the presence Common frog during walkover surveys on 16th September 2020, 05th August 2021, and 15th May 2024.

5.2.1.2.2.3.2 Common Lizard

Common lizard is widespread in Ireland and occurs in habitats such as stone walls, dry banks, heathland and bog habitats (King *et al.*, 2011). Suitable habitat was searched for the presence of Common lizard during the walkover surveys by TOBIN surveyors during 04th September 2025. Survey techniques followed best practice guidelines (NRA, 2009b).

5.2.1.2.2.3.3 Smooth Newt

A Smooth Newt survey was conducted by TOBIN ecologists on the 15th May 2024. Surveys included visual daytime searches for adults and juveniles (efts) and egg inspection, was carried out within suitable habitat within the Survey Area for the proposed Wind Farm Site, following standard methodologies (Meehan, 2013). The suitable survey sites (small pools and drainage ditches) were surveyed during the day by walking around the perimeter of the water feature and stopping every 2m to examine the water for newts of all life cycle stages (Meehan, 2013). No trapping or net dipping, which require a derogation licence, was carried out.

5.2.1.2.2.4 Invertebrates

Targeted marsh fritillary (*Euphydryas aurinia*) surveys were undertaken within the Survey Area for the proposed Wind Farm Site by TOBIN ecologists on the 15th September 2020 and 04th September 2025. Survey techniques followed best practice guidelines as set out in *Marsh Fritillary Larval Survey Monitoring Information Sheet for Surveyors* (NBDC, 2021). The survey included the search for suitable habitat for marsh fritillary, which is largely dependent on the presence of devil's bit scabious (*Succisa pratensis*), the species main food source (Phelan *et al.*, 2021).

5.2.1.2.2.5 Aquatic Ecology

Aquatic surveys were undertaken by TOBIN between 25th – 29th August 2025 and 1st -5th September 2025. Surveys were conducted along streams and rivers present within and downstream of the Survey Area for the proposed Wind Farm Site, and along the GCR. The surveys comprised of an evaluation of the aquatic habitats, a biological water quality assessment (according to aquatic macroinvertebrate species composition).

Aquatic surveys consisted of biological river quality aquatic macroinvertebrate species composition (McGarrigle *et al.*, 2002), as well as the assessing the presence/absence of protected aquatic species including that of white-clawed crayfish (*Austropotamobius pallipes*), Atlantic salmon (*Salmo salar*), brook lamprey (*Lampetra planeri*), river lamprey (*Lampetra fluviatilis*), sea lamprey (*Petromyzon marinus*) and suitability of habitat for European eel (*Anguilla anguilla*) and freshwater pearl mussel (FWPM) (*Margaritifera margaritifera).*

Electrofishing for the presence/absence of protected fish species was conducted by Aquafact on the 27th - 29th September 2021. Macroinvertebrate surveys were conducted by Aztec Management Consultants 27th - 29th September 2021.

The TDR follows the existing public road network. Proposed vegetation clearance is highly localised to the POIs and a 50m buffer zone between vegetation clearance of a watercourses will be observed. As such, aquatic surveys along the TDR were scoped out.

5.2.1.2.2.5.1 Watercourse Surveys Site Selection

The site selection was guided by ecological expertise and comprised of the local catchment within the Survey Area for the proposed Wind Farm Site and at watercourse crossings along the GCR (Smith *et al*., 2011). The morphology, gradient, size and flow type in terms of the potential downstream export of pollution and sedimentation through mixing zones, were considered during the selection of sites. While survey sites downgradient of the Survey Area for the proposed Wind Farm Site and GCR may be influenced by external factors not related to the proposed Wind Farm Site, downstream biota are nonetheless receptors for the negative impacts, and acquisition of baseline information at these locations is considered relevant to provide a complete understanding of the receiving environment and aquatic sensitivities.

Aquatic survey sites were also selected based on safe accessibility, previous Q-value status from Environmental Protection Agency (EPA) surveys, stream order, and at locations which would provide a good representation of the overall aquatic ecology throughout the ZoI. Watercourse surveys along the TDR were deemed unnecessary because the proposed accommodations are confined to the public roads corridor and are restricted to vegetation removal, removal of street furniture, minor road widening works etc. (Chapter 2 – Description of Proposed Project, Section 2.4.2).

The proposed Wind Farm Site, inclusive of the Survey Area for the proposed Wind Farm Site and GCR, includes several waterbodies (Section 5.4.1.4). For the purpose of this assessment, all river waterbodies are referred to using WFD naming conventions when describing hydrological connectivity and EPA naming conventions when referring to a specific watercourse.

5.2.2 Limitations Encountered

5.2.2.1 Field Surveys

Some locations within the Survey Area for the proposed Wind Farm Site could not be fully surveyed on foot due to dense vegetation cover, primarily at conifer plantations and steep riverine valleys. Following best practice guidelines as listed in *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2018), these areas were instead surveyed and visually assessed from adjacent lands and/or from public roads using binoculars, where possible, and were supported by information obtained from a review of aerial photography and desktop study data. This approach is considered sufficient to generate accurate baseline data.

Due to the extensive nature of the Survey Area for the proposed Wind Farm Site and the inconspicuous growth habit of the following twoFlora Protection Order (FPO) species highlighted during consultation (Table 5-1); bristle-leaf (*Brachydontium trichodes*) and small white orchid (*Pseudorchis albida*), it is possible that these species are present despite not being identified during the field surveys. However, no records for FPO species were found during the extensive habitat surveys and specialist Annex I surveys carried out within the Survey Area for the proposed Wind Farm Site. In addition, an NBDC search of publicly available data returned no records of FPO species within the Survey Area for the proposed Wind Farm Site. However, taking a precautionary approach, the potential likely significant effects of the proposed Wind Farm Site on the presence of these species and appropriate mitigation measures have been considered in Section 5.4.1.3.1.2.

Access along watercourses was limited in areas, and for Health and Safety reasons, 150m buffer zones to survey for European otter holts were reduced along the GCR to what was practicable, often less then 50m. The inaccessible areas have been considered in determining the impact significance and are reflected in the mitigation strategy. Sufficient data was gathered to reliably inform the impact assessment despite not being able to fully access these areas.

A comprehensive description of the baseline biodiversity of the ZoI, likely to be impacted by the proposed Wind Farm Site, was captured and is presented herein. Sufficient data was gathered to reliably inform the impact assessment.

5.3 Assessment Approach

The ecological evaluation and impact assessment approach used in this report complies with best practice guidance (CIEEM, 2018).

5.3.1 Important Ecological Features

Ecological features (habitats, species and ecosystems) can be important for a variety of reasons and the rationale used to identify them is explained in the text below (CIEEM, 2018). Importance may relate, for example, to the quality or extent of the site or habitats therein; habitat and/ or species rarity; the extent to which such habitats and/ or species are threatened throughout their range, or to their rate of decline.

5.3.2 Geographic Context

To establish the value of IEFs, regard was made to the ecological valuation examples set out in best practice *Guidelines for Assessment of Ecological Impacts of National Roads Schemes* (NRA, 2009a), using a hierarchical scale of importance, namely:

- International Importance;
- National Importance;
- County Importance;
- Local importance (higher value); and
- Local importance (lower value).

Those ecological features identified as being of local importance (higher value) or greater, are carried forward in the ecological assessment as IEFs when considering the potential for significant effects (NRA, 2009a).

5.3.3 Impact Assessment

The impact assessment process involves the following steps:

- identifying and characterising potential impacts;
- assessing pre-mitigation significance;
- incorporating measures to avoid and mitigate (reduce) these impacts;
- assessing the significance of any residual effects after mitigation;
- identifying appropriate compensation measures to offset significant residual effects (if required); and
- identifying opportunities for ecological enhancement.

When describing significant effects, reference has been made to the following characteristics, as appropriate:

- Positive or negative;
- Extent;
- Magnitude;
- Duration;
- Timing;
- Frequency; and
- Reversibility.

The impact assessment process considers both direct and indirect impacts: direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat occupied by a species during the construction process. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process or feature, e.g. the creation of roads which cause hydrological changes, which, in the absence of mitigation, could lead to the drying out of wet grassland.

5.3.4 Conservation Status

Consideration of conservation status and objectives is important for evaluating the significance of impacts on IEFs, following best practice guidance set out in CIEEM (2018).

The definitions for conservation status given in the EU Habitats Directive 92/43/EEC, in relation to habitats and species, are also used in the CIEEM (2018) and NRA (2009a) guidance:

- For natural habitats, conservation status means the sum of the influences acting on the natural habitat and its typical species, that may affect its long-term distribution, structure and functions, as well as the long-term survival of its typical species, at the appropriate geographical scale. (CIEEM, 2018)
- For species, conservation status means the sum of influences acting on the species concerned that may affect the long-term distribution and abundance of its populations, at the appropriate geographical scale (CIEEM, 2018).

The term 'conservation objectives' is used in CIEEM guidelines to refer to nature conservation plans and policy, which may be specific (e.g. for a European site) or broad (e.g. local policy objective) (CIEEM, 2018). Article 17 of the Habitats Directive (Council Directive 92/43/EEC) necessitates reporting on the conservation status for protected species and habitats as published in *The Status of EU Protected Habitats and Species in Ireland* (NPWS, 2019a). The conservation status is assessed at a national level and not just within the Natura 2000 network (NPWS, 2019a). Conservation status informs the conservation objectives and measures which are set for Annex I habitats and Annex II species protected species and habitats (NPWS, 2019a).

5.3.5 Significant Effects

In line with CIEEM (2018) guidelines, the word "impact" is used when referencing potential changes in the receiving environment as a result of the proposed Wind Farm Site, whereas "effect" refers to the ecological consequence of that change on important ecological features and is the basis for determining likely significant effects.

The concept of ecological significance is addressed in paragraphs 5.24 through to 5.28 of the CIEEM guidelines (CIEEM, 2018). Significance is a concept related to the weight that should be attached to effects when decisions are made. A significant effect is one which undermines the conservation status and objectives for IEFs or biodiversity in general (CIEEM, 2018). This should comprise a description of the effect and a statement of the geographic level at which the effect is likely to be significant (i.e. local, county, national, international) (NRA, 2009a; CIEEM, 2018).

In some cases, an impact may not be significant at the geographic scale at which the ecological feature has been valued but may be significant at a lower geographical level (CIEEM, 2018). For example, a particular impact may not be considered likely to have a negative effect on the overall conservation status of a species which is considered to be internationally important. However, an impact may occur at a local level on this internationally important species. In this case, the impact on an internationally important species is considered to be significant at only a local, rather than international level.

5.3.6 Cumulative Effects

The assessment of cumulative effects is carried out to examine whether the Proposed Project when considered in-combination with impacts of other proposed or permitted plans and projects, can result in significant effects on biodiversity.

5.3.7 Avoidance, Mitigation, Compensation and Enhancement

Where potentially significant effects have been identified, the mitigation hierarchy has been applied, as recommended in best practice guidelines (CIEEM, 2018). The mitigation hierarchy sets out a sequential approach beginning with the avoidance of impacts where possible, the application of mitigation measures to minimise unavoidable impacts, and then compensation for any remaining impacts. Once avoidance and mitigation measures have been applied residual effects are then identified along with any necessary compensation measures, and incorporation of opportunities for enhancement.

It is important for the EIAR to clearly differentiate between avoidance, mitigation, compensation and enhancement and these terms are defined here as follows (CIEEM, 2018):

- Avoidance - Seek options that avoid harm to ecological features (for example, by locating on an alternative site);
- Mitigation - Negative effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation;
- Compensation - Where there are significant residual negative ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures; and;
- Enhancement - Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation.

Guidance published by the CIEEM uses the term *compensation measures* within the mitigation hierarchy, to describe measures taken to offset residual effects on IEFs (CIEEM, 2018). Where the potential for significant effects on certain IEFs remain after applying appropriate mitigation measures, then compensation measures have been proposed to offset these residual effects.

The objective of these measures is to ensure that overall residual effects are not significant at any geographic scale.

The proposed mitigation and compensation solutions, are consistent with the geographical scale at which an effect is significant. For example, mitigation and compensation for effects on a species population significant at a local scale has ensured appropriate compensation at a local scale.

Under Article 6(4) of the Habitats Directive (92/43/EEC) in the context of Appropriate Assessment the term *compensatory measures* are implemented only where a plan or project is permitted to proceed despite adverse effects on the integrity of a European site, in order to ensure that the overall coherence of the Natura 2000 network is maintained.

The Natura Impact Statement (NIS) prepared for the Proposed Project concluded that, following the implementation of mitigation measures, no adverse effects on the integrity of any European site are predicted (TOBIN, 2026b). Accordingly, **compensatory measures, as defined under Article 6(4) of the Habitats Directive, are not required for the Proposed Project**.

5.4 EXISTING ENVIRONMENT

The following sections provide a description of the baseline conditions of the existing environment within the Survey Area for the proposed Wind Farm Site, and along the GCR and the TDR. This section is divided into the Desk Study (Section 5.4.15.4.1) and the results of the Field Surveys (Section 5.2.2.10).

5.4.1 Desktop Study Results

5.4.1.1 Important Sites for Nature Conservation

In the following sections all sites of international and national importance within the ZoI are evaluated.

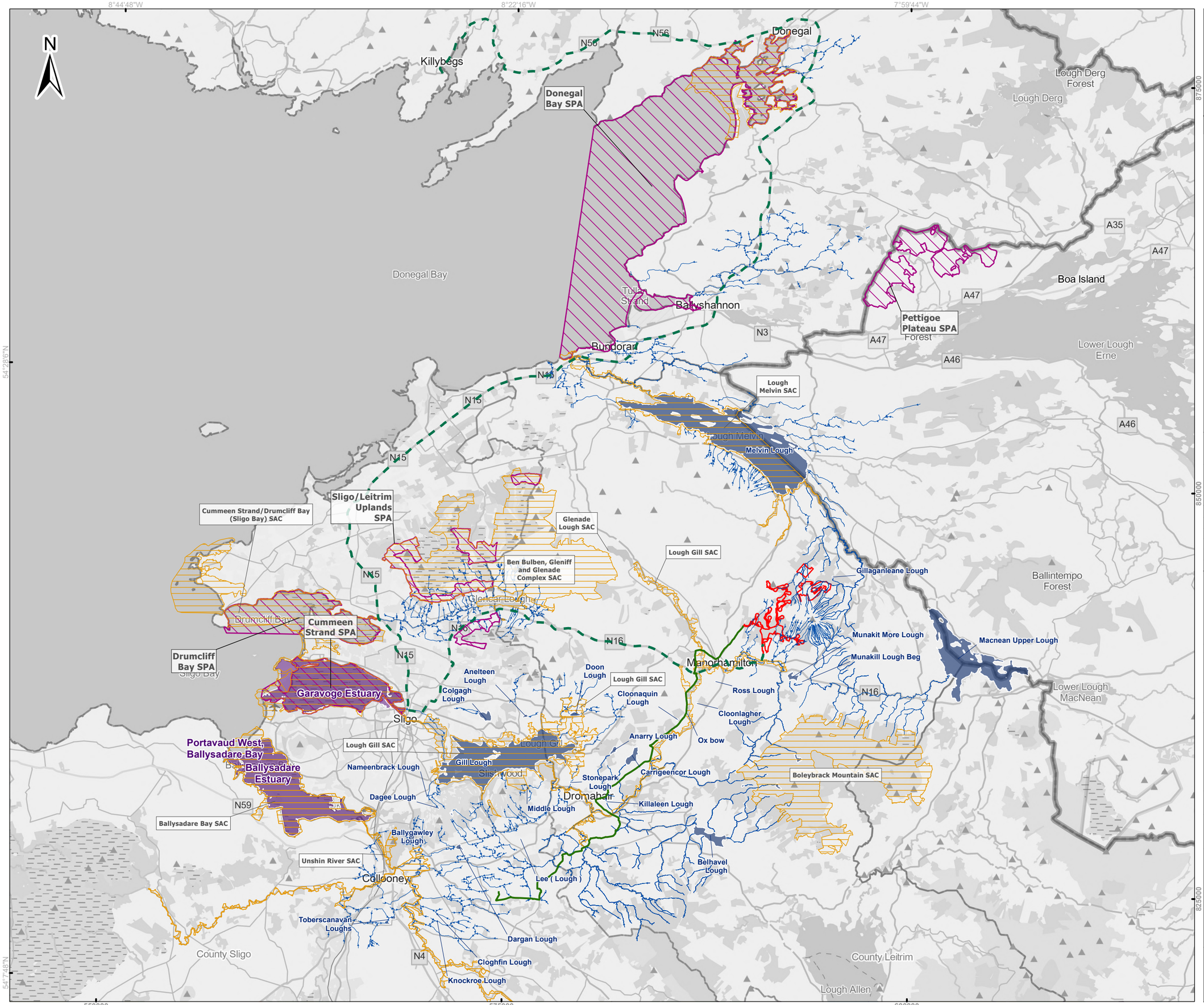
5.4.1.1.1 European Sites

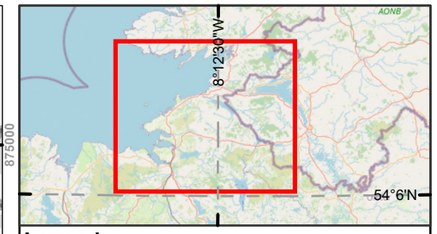
All European sites with source-pathway-receptor links to the Proposed Project, inclusive of the Survey Area for the proposed Wind Farm Site, GCR and TDR, were considered in the assessment of likely significant effects on European sites as outlined in detail in the Appropriate Assessment (AA) Screening Report, and the Natura Impact Statement (NIS) (Tobin, 2026a; TOBIN 2026b). These European sites are illustrated in Figure 5-4.

In the absence of mitigation, the pathways for potential likely significant effects were identified for the 9 SACs within the ZoI of the Proposed Project, namely;

- Arroo Mountain SAC;
- Ballysadare Bay SAC;
- Ben Bulben, Gleniff and Glenade SAC;
- Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC;
- Glenade Lough SAC;
- Lough Gill SAC;
- Lough Melvin SAC;
- Lough Melvin SAC (NI); and,
- Unshin River SAC.

The pathways for potential likely significant effects on the aforementioned European sites are the siltation/contamination of surface water and ground water, as well as disturbance to QI/SCI species as a result of proposed construction phase activities along the proposed Wind Farm Site, GCR and TDR.





Legend

- proposed Wind Farm Site
- Grid Connection Route
- Turbine Delivery Route
- WFD - River Water Bodies
- WFD - Lake Water Bodies
- WFD - Transitional Water Bodies
- Special Areas of Conservation (SACs)

0 5 10
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	23/02/2026	First issue	S.P	S.R

Client: FuturEnergy Ireland

Project: Lissinagroagh Wind Farm

Title: Figure 5-4: Special Areas of Conservation within the Zone of Influence of the Proposed Project

Scale @ A3: 1:215,000

Prepared by:	Checked by:	Date:
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Map Ref: 10955-037-EU.S-ZoI-TOB-A

Draft: A

Table 5-3: Designated sites with listed Qualifying Interests and identified source-pathway-receptor linkages

European Sites	QI/SCIs	Connectivity	Within Zone of Influence
Special Areas of Conservation			
Aroo Mountain SAC [001403] Distance: 1.2km north-west of the proposed Wind Farm Site	• Northern Atlantic wet heaths with Erica tetralix [4010] • European dry heaths [4030] • Alpine and Boreal heaths [4060] • Blanket bogs (* if active bog) [7130] • Petrifying springs with tufa formation (Cratoneurion) [7220] • Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) [8120] • Calcareous rocky slopes with chasmophytic vegetation [8210]	**Physical:** Aroo Mountain SAC is located c. 1.2km to the north-west from the proposed Wind Farm Site. Due to the separation distances involved there is no physical pathway between the Proposed Wind Farm Site and the SAC. **Hydrological:** The SAC is located upstream of the proposed Wind Farm Site, GCR and TDR. There is no hydrological pathway between the proposed Wind Farm Site and the SAC. **Hydrogeological:** Aroo Mountain SAC shares the Glenaniff and Glencar GWBs with the proposed Wind Farm Site. Both of these GWBs are karstified aquifers (GSI, 2025a; GSI, 2025b). As such, a potential hydrogeological pathway exists between the Proposed Wind Farm Site and the SAC, through the Glenaniff and Glencar GWBs. **Ecological:** No ecological pathway was identified for impacts upon the listed QI's, beyond the ground water dependant habitats (see above).	**Yes** – A source-pathway receptor link was identified.
Ballysadare Bay SAC [000622] Distance: 8.9km north-west of the proposed GCR	• Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]	**Physical:** Ballysadare Bay SAC is located 8.9km north-west of the proposed GCR and 25.2km south-west of the proposed Wind Farm Site. Due to the separation distances involved there is no physical pathway between the Proposed Wind Farm and the SAC. **Hydrological:** Ballysadare Bay SAC is located c. 17km downstream of the south-western extent of the proposed GCR with hydrological connectivity via the Ballysadare_010, Unshin_050, Unshin_40. As such, a hydrological pathway exists between the Proposed Wind Farm and the SAC. **Hydrogeological:** No potential hydrogeological pathway was identified between the SAC and the Proposed Wind Farm Site.	**Yes** – A source-pathway receptor link was identified.

European Sites	QI/SCIs	Connectivity	Within Zone of Influence
	• Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Humid dune slacks [2190] • *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] • *Phoca vitulina* (Harbour Seal) [1365]	**Ecological:** No potential ecological pathway was identified between the SAC and the proposed Wind Farm Site and GCR.	
Ben Bulben, Gleniff and Glenade SAC **[000623]** Distance: 8.3km north-west of the proposed Wind Farm Site.	• Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] • Northern Atlantic wet heaths with *Erica tetralix* [4010] • European dry heaths [4030] • Alpine and Boreal heaths [4060] • *Juniperus communis* formations on heaths or calcareous grasslands [5130] • Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites) [6210] • Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230]	**Physical: Ben** Bulben, Gleniff and Glenade SAC is located c. 8.3km north-west of the proposed Wind Farm Site. Due to the separation distances involved there is no physical pathway between the Proposed Project and the SAC. **Hydrological:** The Ben Bulben, Gleniff and Glenade SAC is located ca 9.5km upstream of the north-western extent of the proposed Wind Farm Site. There is no hydrological pathway between the Proposed Wind Farm Site and the SAC. **Hydrogeological**: The Ben Bulben, Gleniff and Glenade SAC shares the Glencar GWB with the proposed Wind Farm Site. As such, a potential hydrogeological pathway exists between the Proposed Wind Farm Site and the SAC, via the Glencar GWB. **Ecological:** The Annex II species 1355 European otter (*Lutra lutra*) is a QI of the SAC and is a highly mobile species, with home ranges extending over tens of kilometres (Chanin, 2003). As such, a potential ecological pathway exists between the Proposed Wind Farm Site and the upstream SAC.	**Yes** – A source-pathway receptor link was identified.

European Sites	QI/SCIs	Connectivity	Within Zone of Influence
	• Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] • Blanket bogs (* if active bog) [7130] • Transition mires and quaking bogs [7140] • Petrifying springs with tufa formation (Cratoneurion) [7220] • Alkaline fens [7230] • Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) [8110] • Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) [8120] • Calcareous rocky slopes with chasmophytic vegetation [8210] • *Vertigo geyeri* (Geyer's Whorl Snail) [1013] • *Lutra lutra* (European otter) [1355]		
Boleybrack Mountain SAC **[002032]** Distance: 3.8km south-east of the	• Natural dystrophic lakes and ponds [3160] • Northern Atlantic wet heaths with *Erica tetralix* [4010] • European dry heaths [4030]	**Physical:** The Boylebrack Mountain SAC is located 3.8km south-east of the proposed Wind Farm Site and 4.8km south-east of the proposed GCR at nearest distance. Due to the separation distances involved there is no physical pathway between the Proposed Wind Farm Site on the SAC.	**No-** A source-pathway-receptor-link was not identified.

European Sites	QI/SCIs	Connectivity	Within Zone of Influence
proposed Wind Farm Site.	• Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] • Blanket bogs (* if active bog) [7130]	**Hydrological:** The SAC is located upstream of the Proposed Project. There is no hydrological pathway between the Proposed Project and the SAC. **Hydrogeological:** Boleybrack Mountain SAC shares the Glenfarne GWB with the proposed Wind Farm Site. But as Glenfarne is not a karstic aquifer, there is no potential for likely significant effects as a result of the Proposed Wind Farm Site as any impacts of ground water abstraction will be highly localised. As such, there is no potential hydrogeological pathway between the Proposed Wind Farm Site and the SAC. **Ecological:** There is no ecological pathway between the SAC and the Proposed Wind Farm Site and GCR.	
Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC **[000627]** Distance: 12.7km north-west of the proposed GCR	• Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Juniperus communis formations on heaths or calcareous grasslands [5130] • Semi-natural dry grasslands and scrubland facies on calcareous	**Physical:** Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC is located 22km south-west from the proposed Wind Farm Site and 12.7km north-west of the GCR at nearest distance. However, the TDR borders the boundary of the SAC where vegetation clearance is proposed for 76m and as such a physical pathway exists. **Hydrological:** The SAC lies downstream of the Lough Gill SAC, with mapped hydrological connectivity via the Garavogue EPA stream (35G01) Garavogue_010 WFD. However, Lough Gill SAC functions as the first depositional water body downstream of the Proposed Wind Farm Site. Therefore, it is outside of the ZoI for water quality impacts (as discussed in Section 5.1.4.1). There is no hydrological pathway between the Proposed Wind Farm Site and the SAC. **Hydrogeological:** The SAC does not share any GWB with the proposed Wind Farm Site or GCR. There is no hydrogeological pathway between the Proposed Wind Farm Site and the SAC. **Ecological:** There is no ecological pathway between the Proposed Wind Farm Site and the SAC.	**Yes-** A source-pathway-receptor-link was identified.

European Sites	QI/SCIs	Connectivity	Within Zone of Influence
	substrates (Festuco-Brometalia) (* important orchid sites) [6210] • Petrifying springs with tufa formation (Cratoneurion) [7220] • Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] • Petromyzon marinus (Sea Lamprey) [1095] • Lampetra fluviatilis (River Lamprey) [1099] • Phoca vitulina (Harbour Seal) [1365]		
Glenade Lough SAC [001919] Distance: 7.6km to the north-west of the proposed Wind Farm Site.	• Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150] • *Austropotamobius pallipes* (White-clawed (Crayfish) [1092] • *Najas flexilis* (Slender Naiad) [1833]	**Physical:** Glenade Lough SAC is located 7.6km to the north-west of the proposed Wind Farm Site. Due to the separation distances involved there is no physical pathway between the Proposed Wind Farm Site and the SAC. **Hydrological:** Glenade Lough SAC is located ca 7.7km upstream of the north-western extent of the GCR. As such, there is no hydrological pathway between the Proposed Wind Farm Site and the SAC. **Hydrogeological**: Glenade Lough SAC shares the Glencar GWB with the proposed Wind Farm Site. As such, a potential hydrogeological pathway exists between the Proposed Wind Farm Site and the SAC. **Ecological:** There is no ecological pathway between the Proposed Wind Farm Site and the SAC.	**Yes –** A source-pathway-receptor link was identified.
Lough Gill SAC (001976)	• Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation [3150]	**Physical:** The SAC is located c. 165m south of the proposed Wind Farm Site. The GCR is located within the boundary of Lough Gill SAC. A	**Yes**- A source-pathway-receptor link was identified.

European Sites	QI/SCIs	Connectivity	Within Zone of Influence
Distance: 0m, GCR overlaps the SAC	• Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210] • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] • Alluvial forests with *Alnus glutinosa* and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] • *Austropotamobius pallipes* (White-clawed Crayfish) [1092] • *Petromyzon marinus* (Sea Lamprey) [1095] • *Lampetra planeri* (Brook Lamprey) [1096] • *Lampetra fluviatilis* (River Lamprey) [1099] • *Salmo salar* (Atlantic Salmon) [1106] • *Lutra lutra* (European otter) [1355]	physical pathway exists between the Proposed Wind Farm Site and the SAC. **Hydrological:** The proposed Wind Farm Site is located upstream and hydrologically connected to the SAC via 10 WFD river waterbodies. Furthermore, two off-road HDD crossings are proposed along the GCR and trenching works along the GCR within 50m of watercourses constitute potential for hydrological connectivity. As such, a hydrological pathway exists between the proposed Wind Farm Site and GCR and the SAC. **Hydrogeological:** The Proposed Wind Farm Site and the SAC share two GWBs Killarga and Killarga South. The QI Alluvial forests is a ground water dependant habitat. Therefore, a hydrogeological pathway for effects has been identified. **Ecological:** Lough Gill SAC is designated for Annex II aquatic species as well as Annex I aquatic or riparian habitats. As such, a potential ecological pathway exists between the Proposed Wind Farm Site and the SAC.	
Lough Melvin SAC (000428) Distance: 2km north of the proposed Wind Farm Site	• Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130]	**Physical:** Lough Melvin SAC is located 2km north of the proposed Wind Farm Site. Due to the separation distances involved, no physical pathway exists between the Proposed Wind Farm Site and the SAC. **Hydrological:** Lough Melvin SAC is located at an approximate hydrological distance downstream of 6.4km via the Lattone_35_010 River. As such, a hydrological pathway exists between the SAC and the proposed project.	**Yes** – A source-pathway-receptor link was identified.

European Sites	QI/SCIs	Connectivity	Within Zone of Influence
	• Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] • *Salmo salar* (Atlantic Salmon) [1106] • *Lutra lutra* (European otter) [1355]	**Hydrogeological:** The proposed Wind Farm Site does not share a groundwater body with the SAC. No hydrogeological pathway exists between the Proposed Wind Farm Site and the SAC. **Ecological:** Lough Melvin SAC is designated for Annex I aquatic habitats as well as Annex II aquatic species. As such, a potential ecological pathway exists between the Proposed Wind Farm Site and the SAC.	
Lough Melvin SAC NI (UK0030047) Distance: 5.8km north-west of the proposed Wind Farm Site	• Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] • Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] • Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] • *Salmo salar* (Atlantic Salmon) [1106]	**Physical:** Lough Melvin SAC Northern Ireland (NI) is located 5.8km north of the proposed Wind Farm Site. Due to the separation distances involved, no physical pathway exists between the Proposed Wind Farm Site and the SAC (NI). **Hydrological:** The SAC (NI) is hydrologically connected to the proposed Wind Farm Site at an approximate downstream hydrological distance of 8.6km via the Lattone_35_010 River (Section5.4.1.5).. As such, a hydrological pathway exists between the SAC and the proposed project. **Hydrogeological:** The proposed Wind Farm Site does not share a groundwater body with the SAC. No hydrogeological pathway exists between the Proposed Wind Farm Site and the SAC (NI). **Ecological:** Lough Melvin SAC (NI) is designated for Annex I aquatic habitats as well as Annex II aquatic species. As such, a potential ecological pathway exists between the Proposed Wind Farm Site and the SAC (NI).	**Yes** – A source-pathway-receptor link was identified.
Union Wood SAC (000638) Distance: 6.9km north-west of the GCR	• Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	**Physical:** Union Wood SAC is located 6.9km north-west of the GCR. Due to the separation distances involved, no physical pathway exists between the Proposed Wind Farm Site and the SAC. **Hydrological:** The proposed GCR is located c. 13km downstream of the SAC via the Ballysodare_010, Unshin_040 and Unshin_050 WFD river waterbodies. A hydrological pathway exists between the Proposed	**No** – A source-pathway-receptor link was not identified.

European Sites	QI/SCIs	Connectivity	Within Zone of Influence
		Wind Farm Site and the SAC but as the SAC is designated for a terrestrial habitat only. No source-pathway-receptor link is identified. **Hydrogeological:** The proposed Wind Farm Site does not share a groundwater body with the SAC. No hydrogeological pathway exists between the SAC and the Proposed Wind Farm Site. **Ecological:** No ecological pathway exists between the SAC and the Proposed Wind Farm Site as the Annex I habitat type91A0 Old sessile oak woods is a terrestrial habitat only. **N**o source-pathway-receptor link is identified.	
Unshin River SAC (001898) Distance: 4.6km west of the proposed GCR	• Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] • Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] • *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0] • *Salmo salar* (Atlantic Salmon) [1106] • *Lutra lutra* (European otter) [1355]	**Physical:** The SAC is located 4.6km west of the southern extent of the proposed GCR. Due to the separation distances involved, no physical pathway exists between the Proposed Wind Farm Site and the SAC. **Hydrological:** The SAC is located 7.5km downstream of the proposed GCR via the Unshin_040. A hydrological pathway exists between the SAC and the proposed GCR. **Hydrogeological:** The SAC shares the Lavagh-Ballintogher and Ballymote GWBs with the proposed GCR. A hydrogeological pathway exists between the SAC and the Proposed Wind Farm Site. **Ecological:** The SAC is designated for Annex I riparian habitats as well as Annex II aquatic species. As such, a potential ecological pathway exists between the Proposed Wind Farm Site and the SAC	**Yes –** A source-pathway-receptor link was identified.

Table 5-4: Natural Heritage Areas and proposed Natural Heritage Areas and identified source-pathway-receptor linkages with the Proposed Wind Farm Site

Site Name	Important Ecological Feature	Connectivity	Within Zone of Influence
NHAs			
Dough/Thur Mountains NHA (2384) Distance: c. 40m east of the proposed Wind Farm Site	Peatlands	**Physical:** The NHA is located c. 40m at nearest distance from the proposed Wind Farm Site (red line) at T5 and T8. A such, there is a physical pathway for potential likely significant effects.	**Yes-** A source-pathway-receptor-link was identified.
Lough Melvin NHA (428) Distance: 2km north of the proposed Wind Farm Site	No data available.	See corresponding SAC for details.	**Yes-** A source-pathway-receptor-link was identified.
ASSI			
Lough Melvin ASSI (140) Distance: 5.8km north-west of the proposed Wind Farm Site	The northern shores of Lough Melvin contain: • open water plant communities typical of mesotrophic (unenriched) conditions; • a narrow fringe of emergent swamp and fen; • and a number of wooded islands; and, the surrounding lands contain traditionally-managed grasslands that are rich in plant species.	**Hydrological:** The ASSI is hydrologically connected to the proposed Wind Farm Site via tributaries of the Lattone_010 , Rosfriar_10, County river (Caravan west) (Section 2.2.1.1.1). At the nearest distance, Lough Melvin ASSI is located 8km downstream via the EPA streams; Lattone 35 (35L66), Rosfrair (35R32), and Lisdarush (35L68).	**Yes-** A source-pathway-receptor-link was identified.
Proposed NHAs			

Aroo Mountain pNHA (1403)	No data available.	See corresponding SAC for details.	**Yes-** A source-pathway-receptor-link was identified.
Ballysadare Bay pNHA (622)	No data available.	See corresponding SAC for details.	**Yes-** A source-pathway-receptor-link was identified.
Ben Bulben, Gleniff and Glenade pNHA (623)	No data available.	See corresponding SAC for details.	**Yes-** A source-pathway-receptor-link was identified.
Bonet River pNHA (1404)	No data available.	See corresponding Glenade Lough SAC for details.	**Yes-** A source-pathway-receptor-link was identified.
Cummeen Strand/Drumcliff Bay pNHA (627)	No data available.	See corresponding SAC for details.	**Yes-** A source-pathway-receptor-link was identified
Glenade Lough pNHA (1919)	No data available.	See corresponding SAC for details.	**Yes-** A source-pathway-receptor-link was identified
Lough Melvin pNHA (428)	No data available.	See corresponding SAC for details.	**Yes-** A source-pathway-receptor-link was identified
Lough Gill pNHA (1976)	No data available.	See corresponding SAC for details.	**Yes-** A source-pathway-receptor-link was identified
Union Wood pNHA (638)	No data available.	See corresponding SAC for details.	**No –** A source-pathway-receptor link was not identified.
Unshin River pNHA (1898)	No data available.	See corresponding SAC for details.	**Yes-** A source-pathway-receptor-link was identified

5.4.1.1.2 Other Sites of Conservation Interest

5.4.1.1.2.1 Dough/Thur Mountain NHA

The eastern extent of the Survey Area of the proposed Wind Farm Site (see blue line Figure 5-5) shares a boundary with Dough/Thur Mountains NHA [002384] and the boundaries overlap between T5 and T13 (Figure 5-5). This shared boundary constitutes a pathway for potential ecological effects for on the terrestrial flora and fauna of the NHA.

The NHA is important for peatland habitats. Habitats found within the site include extensive areas of upland blanket bog, dry heath, wet heath, and upland grassland (NPWS, 2003). The peatland habitats are likely active as the bryophyte layer has been reported to contain a "deep spongy understorey of bog mosses (*Sphagnum subnitens*, *S. capillifolium*, *S. papillosum*) and hummocks of the moss *Racomitrium lanuginosum* up to 1 m wide" (NPWS, 2003). Therefore, there is potential for likely significant effects on Dough/Thur Mountains NHA as a result of the proposed Wind Farm Site.

The boundary of Dough/Thur Mountains NHA is illustrated in Figure 5-5.

There is potential for likely significant effects on Dough/Thur Mountain NHA as a result of the proposed Wind Farm Site.

5.4.1.1.2.2 Areas of Special Scientific Interest

Areas of Special Scientific Interest (ASSIs) are a conservation designation denoting a protected area in Northern Ireland. Lough Melvin ASSI (UK0030047), Northern Ireland is located c. 5.8km north-west of the proposed Wind Farm Site at nearest distance. Lough Melvin ASSI is located c. 8km downstream of the proposed Wind Farm Site with hydrological connectivity via the Lattone 35_010 (WFD Code: IE_NW_35L660960).

Lough Melvin ASSI is a large mesotrophic lake of high scientific interest. The lake water quality is high and relatively unpolluted. The lake supports sympatric populations of three distinct sub-species of trout: sonaghen (*Salmo nigripinnis*), gillaroo (*Salmo stomachicus*) and ferox (*Salmo trutta*) (DAERA, 2025). In addition, the lake supports Atlantic salmon and the Arctic charr (*Salvelinus alpinus*), which is an Irish Red List species (DAERA, 2025).

Habitats of interest within the ASSI consist of swamp communities, boulder and rocky shore, fens, woodlands and species-rich grassland (DAERA, 2025). Notable plant species Plant species consist of: lesser meadow-rue (*Thalictrum minus*), chaffweed (Lysimachia minima), fragrant agrimony (*Agrimonia procera*), upland enchanter's-nightshade (*Circaea alpina*), northern bedstraw (*Galium boreale*), slender-leaved pondweed (*Stuckenia filiformis*), water lobelia (*Lobelia dortmanna*), blue-eyed-grass (*Sisyrinchium bermudiana*), and globeflower (*Trollius europaeus*).

5.4.1.1.2.3 Ramsar Sites

The Cummeen Strand (842) is located downstream of the Lough Gill SAC. It should be noted that the Garavogue_010 WFD river water body has been mapped as to include the Garavogue EPA stream (EPA code: 35G01), which flows downstream to the Gill SO WFD lake water body, discharging into Cummeen Strand Ramsar site. However, as Lough Gill is considered a depositional water body, and following the definition of the ZoI outlined in Section 5.1.4.1, the assessment of likely significant effects on water quality is confined to water bodies present within or downstream of the proposed Wind Farm Site and is not considered effective once the

first water body of depositional nature is reached (i.e., lake water body; transitional water body). As such, there is no source-pathway-receptor link between Cummeen Strand Ramsar site and the proposed Wind Farm Site.

The proposed TDR passes within c. 20m of Cummeen Strand Ramsar site at POI 13 and as such there is potential for likely significant effects on the Ramsar site.

5.4.1.2 Proposed Natural Heritage Areas

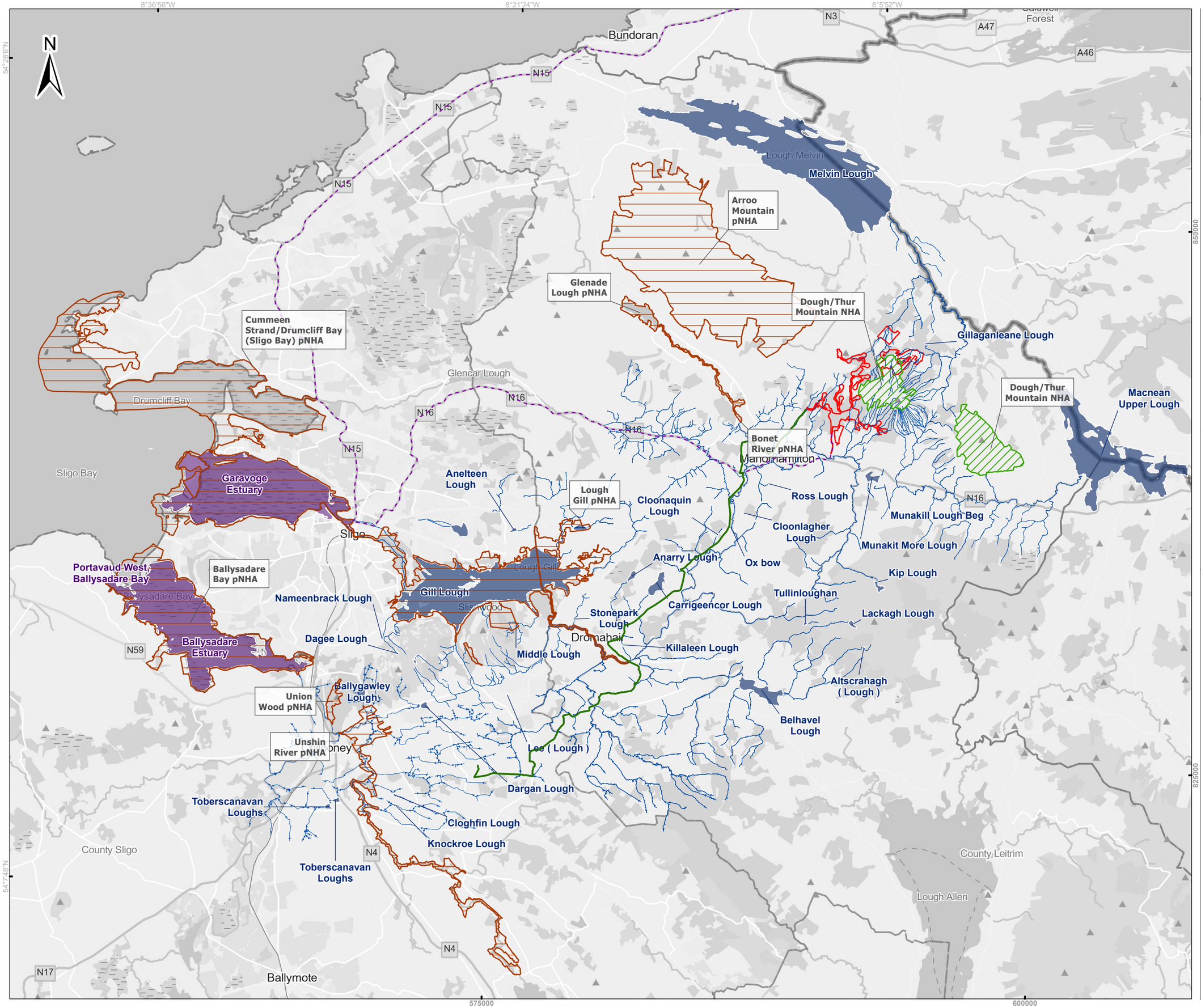
Proposed Natural Heritage Areas (pNHA) were published on a non-statutory basis in 1995 and have not since been statutorily designated. Prior to statutory designation, pNHAs are subject to limited protection, including recognition of the ecological value of pNHAs by Planning and Licensing Authorities.

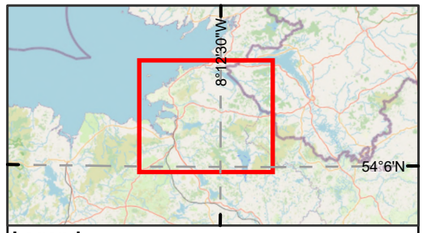
There are no pNHAs within the boundary of the proposed Wind Farm Site. Potential for likely significant effects were identified for 10 pNHAs, namely:

- Aroo Mountain (1403);
- Ballysadare Bay (622);
- Ben Bulben, Gleniff and Glenade (623);
- Bonet River (1404);
- Cummeen Strand/Drumcliff Bay (627);
- Glenade Lough (1919);
- Lough Melvin pNHA (428);
- Lough Gill pNHA (1976); and,
- Unshin River (1898).

These pNHAs are listed in Table 5-4 and illustrated in Figure 5-5. No other sites of conservation interest (i.e., National Parks or Nature Reserves) have been identified as having a source-pathway-receptor link to the proposed Wind Farm Site.

As publicly available information on these pNHAs is lacking and considering they share boundaries with corresponding European sites, likely significant effects on European sites will be assumed to constitute likely significant effects on the corresponding pNHAs.





Legend

- proposed Wind Farm Site
- Grid Connection Route
- Turbine Delivery Route
- WFD - River Water Bodies
- WFD - Lake Water Bodies
- WFD - Transitional Water Bodies
- Natural Heritage Areas (NHAs)
- proposed Natural Heritage Areas (pNHAs)

0 4 8
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	04/03/2026	First issue	S.P	S.R

Client: FuturEnergy Ireland

Project: Lissinagroagh Wind Farm

Title: Figure 5-5: National Heritage Areas and Proposed National Heritage Areas within the Zone of Influence of the Proposed Wind Farm Site

Scale @ A3: 1:160,000

Prepared by:	Checked by:	Date:
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Map Ref: 10955-038-Na.S-ZoI-TOB-A

Draft: A

Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Enhancement lands
- Turbine Locations
- Natural Heritage Areas (NHAs)

0 0.5 1
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

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Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community,

Rev	Date	Description	By	Chkd.
A	23/02/2026	First issue	S.P	S.R

Client: Ireland FuturEnergy

Project:
Lissinagroagh Wind Farm

Title:
Figure 5-6:
Boundary of Dough/Thur Mountain Natural Heritage Area and the Survey Area for the proposed Wind Farm Site

Scale @ A3: 1:22,000

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Map Ref: 10955-070-NHA-P.App.BO-TOB-A

Draft: A

8°9'20"W
8°7'30"W
8°5'40"W
54°21'0"N
54°20'0"N
54°19'0"N
844000
842000
840000
590000
592500
595000
N
R282
R283
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
T13
T14
Skreeny Manor
Skreeny (Rosclogher By)
N16
hilton

Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Enhancement lands
- Turbine Locations

Article 17 Annex I - Terrestrial Habitats

- Forests
- Grasslands
- Heath and Scrub
- Bogs, Mires and Fens

0 0.5 1
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	23/02/2026	First issue	S.P	S.R

Client: Ireland FuturEnergy

Project: Lissinagroagh Wind Farm

Title: Figure 5-7: Article 17 Annex I habitats identified (Source: NPWS, 2025)

Scale @ A3: 1:20,841

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Draft: A

5.4.1.3 Data from Ecological Stakeholders

The desktop assessment included a review of available data from ecological stakeholders with findings summarised in the following sections.

5.4.1.3.1 National Parks and Wildlife Service

5.4.1.3.1.1 Spatial Data Review

The following datasets were downloaded and reviewed to determine the overlap with the Survey Area for the proposed Wind Farm Site:

- EU Habitats Directive Article 17 GIS and Metadata (NPWS, 2025);
- National Survey of Native Woodlands (DHLGH, 2025a);
- National Survey of Long-Established Woodlands (DHLGH, 2025B);
- Irish Semi-natural Grassland Survey (DHLGH, 2025C).

The 10km grid square within which the Survey Area for the proposed Wind Farm Site is located (G94), has been identified as likely (with a certainty ranking of 2) to contain one site of the priority Annex I habitat type 91E0 Alluvial woodland*, in bad condition (NPWS, 2025).

The spatial data review indicated that several Annex I habitat types potentially occur across Saddle Hill, within the Survey Area for the proposed Wind Farm Site, namely (NPWS, 2025);

- Annex I habitat type 4060 Alpine and subalpine heath; and,
- Priority Annex I habitat type 7130* Blanket bog (active).

A small, isolated area (<350m) of the Annex I habitat type Alpine and subalpine heath is mapped at Turbine T7 within the Survey Area for the proposed Wind Farm Site (NPWS, 2025).

These areas were further investigated in detail during habitat surveys (Section 5.4.2.1).

Several Annex I habitat types have been mapped across Dough Mountain, including (NPWS, 2025):

- Annex I habitat type 4060 Alpine and subalpine heath;
- Priority Annex I habitat type 7130* Blanket bog (active); and,
- Priority Annex I habitat type 6230* Species-rich Nardus grassland.

Of these the mapped extent of 26.3ha of Annex I habitat type 4060 Alpine and subalpine heath is located within the eastern extent of the Survey Area for the proposed Wind Farm Site, to the east of T7 and south-east of T5. Similarly, the mapped extent of 1.5ha of the priority Annex I habitat type 7130* Blanket bog (active) is located within the proposed Wind Farm Site, to the south-east of T5. However, satellite imagery shows a significant portion of this area, 17.5ha, has been planted with commercial forestry (Google, 2023). The Annex I habitat type 6230* Species-rich Nardus grassland is located beyond the Survey Area for the proposed Wind Farm Site c. 800m north-east of T14.

Beyond the Proposed Wind Farm Site, within Faughary Wind Farm there is mapped area of Annex I habitat type 7230 Alkaline fens (NPWS, 2025). The habitat is located c. 430m from T6. This habitat is considered beyond the ZoI of the development not only due to the separation distances involved but also because of the extent of commercial forestry between the Annex I habitat and the proposed work corridor, and the associated impacts of this forestry on the hydrology of the alkaline fen.

The Irish Semi-Natural Grassland Survey data show the mapped extent of GS3 Dry-humid acid grassland on Dough Mountain to the east of the Survey Area for the proposed Wind Farm Site (DHLGH, 2025b). One small polygon (0.1ha) at the centre of the GS3 Dry-humid acid grassland c. 390m beyond the boundary of the proposed Wind Farm Site is identified as the priority Annex I habitat type 6230* Species-rich Nardus grassland. This is considered beyond the ZoI of the development due to the separation distances involved.

5.4.1.3.1.2 Flora Protection Order Species

As outlined in Section 5.1.5, a EIA scoping response received from the DAU cites the presence of two FPO species within the Study Area (Table 5-1).

The FPO protects listed species throughout the state and is not confined to designated sites for nature conservation. It is illegal to cut, uproot or damage the listed species as well as to illegal to alter, damage or interfere in any way with the habitats of listed species (NPWS, 2026a).

An information request for sensitive data, including the location of FPO species, was sent to NPWS on the 19th December 2024 and a response was received on December 19th 2025. The data received has been used to inform the desk study.

5.4.1.3.1.2.1 Bristle leaf

According to current NBDC records, multiple records of bristle-leaf (*Brachydontium trichodes*) are recorded within Dough /Thur Mountains NHA at Killea along the northern slopes of Dough Mountain. Information contained within the sensitive data issued by NPWS, indicates the presence of bristle-leaf in the same general locality. In total, 11 records for bristle-leaf are listed all from 2016. The nearest record for bristle-leaf is c. 420m beyond the Survey Area for the proposed Wind Farm Site and c. 1.1km from the proposed Wind Farm Site infrastructure at nearest distance, namely T4 (Figure 5-8). This information on the location of bristle-leaf is also publicly available on the FPO Map Viewer (NPWS, 2026b).

The population occurs along a stream valley within a heathland habitat on north facing slopes (Hodd, 2017). As a species, bristle-leaf displays a preference for “shaded sandstone rocks by streams” and “vertical or overhanging rocks” (Atherton *et al.*, 2025:552). No records of the species in Ireland exist on limestone or chalk substrates, although the species is reported to occur on calcareous rocks in Britain and Scandinavia (Lockhart *et al.*, 2012). Bristle-leaf prefers north facing slopes which are humid (Lockhart *et al.*, 2012).

According to the All-Ireland Red List, Bristle-leaf is considered a nationally endangered species (Nelson *et al.*, 2019). According to NBDC records, the species has a disparate distribution throughout Ireland concentrated in the north and northwest (NBDC,2025a). As such, the distribution of the national population is highly localised and fragmented making it more vulnerable to stochastic events. Bristle-leaf is recorded at its highest density nationally within Dough Mountain NHA (NBDC, 2025a).

5.4.1.3.1.2.2 Small-white orchid

According to the NBDC records (NBDC 2025a), the nearest location of small-white orchid (*Pseudorchis albida*) is c. 3km to the north of the Survey Area for the proposed Wind Farm Site.

Information contained within the sensitive data issued by NPWS, indicates the presence of small-white orchid within the townland of Faughary (ITM E590624.950, N842562.069), c. 42m

to the west of the Survey Area for the proposed Wind Farm Site and c. 100m from the proposed Wind Farm Site infrastructure at nearest distance, namely T11. Two records for the species exist at the same location one from 2015 and the second from 2017. This information on the location of small-white orchid is also publicly available on the FPO Map Viewer (NPWS, 2026b).

From ariel imagery the supporting habitat appears to be rough grazing pasture, likely (GS4) Wet grassland, and management within the field appears to involve low intensity cattle grazing.

Small-white orchid generally grows in nutrient-poor acid grasslands and heaths (Walker, 2014). It is also rarely found "in base-rich mires, limestone heath, Juniper scrub, scree, and montane rock ledges" (Walker, 2014:1). In Ireland, small-white orchid has shown an affinity for "areas that are lightly grazed by cattle, and not areas over-grazed by sheep" (Walker, 2014:3).

Small-white orchid is considered a vulnerable species nationally (Nelson *et al*., 2019). The species has been recorded throughout the north of Ireland with some occurrences in the south also (NBDC, 2025a).

Table 5-5: Protected Species under the Habitats Directive (HD) and Wildlife Acts (WA) [Source: (NBDC, 2025a)

Hectad	Species name	Date of last record	Designation	Location of Feature
Plant Species				
G83, G94	Fir clubmoss (Huperzia selago)	19/04/2018 (G83)	EU HD Annex V	No species records are located within 500m of the Proposed Project boundary or the GCR.
G84	Atlantic pouncewort (*Lejeunea mandonii*)	07/12/2016	WA FPO (2022)	Records of this species overlay 2.2km of the GCR and 1.7 hectares of the most southeasterly area of the proposed Wind Farm Site (G84).
G83	Spruce's bristle-moss (*Orthotrichum sprucei*)	05/12/2016	WA FPO (2022)	Records of this species overlay the GCR 7km from the proposed Wind Farm Site (G83).
G84	Ribbed extinguisher-moss (*Encalypta rhaptocarpa*)	06/12/2016	WA FPO (2022)	No species records are located within 500m of the Proposed Project boundary or the GCR.
G84	Small mouse-tail moss (*Myurella julacea*)	06/12/2016	WA FPO (2022)	Records of this species overlay 2.2km of the GCR and 1.7 hectares of the most southeasterly area of the proposed Wind Farm Site (G84).
G94	Bristle-leaf (*Brachydontium trichodes*)	05/10/2016	WA FPO (2022)	No species records are located within c. 350m from the Proposed Project boundary or the GCR.
Amphibians and Reptiles				
G72, G84, G94	Smooth newt (*Lissotriton vulgaris*)	25/10/2019 (G94)	WA	Previous records of smooth newt overlay the final 8km of the GCR (G72).
G72, G82, G83, G84, G94	Common frog (*Rana temporaria*)	30/04/2023 (G72)	EU HD Annex V, WA	Previous records of common frog overlay almost the entirety of the proposed wind farm boundary (with the exception of the southeastern parcel of land). Records of common frog also almost entirely overlay the grid connection route.
Terrestrial Mammals				
G72, G82, G83, G94	European badger (*Meles meles*)	27/03/2018 (G72)	WA	Previous records of badger overlay the entire boundary of the proposed wind farm and large sections of the GCR.
G72, G82, G83, G84, G94, G95	Red squirrel (*Sciurus vulgaris*)	28/04/2023 (G94)	WA	No records of this species in the last 10 years exist within or in proximity to the proposed Wind Farm Site boundary or GCR.

Hectad	Species name	Date of last record	Designation	Location of Feature
G72, G82, G83, G84	West European hedgehog (*Erinaceus europaeus*)	09/09/2023 (G72)	WA	Records of this species overlay the final 12km of the GCR (G72,G82); 1.3km north of the GCR and approximately 4km, 5.5km and 6km east of the proposed Wind Farm Site (G83, G84)
G82, G83, G94	Red deer (*Cervus elaphus*)	19/01/2023	WA	Records of red deer overlay the majority of the lands included within the redline boundary of the proposed Wind Farm Site (G94). Records of this species also overlay the GCR south of the townland of Dromahair (G82), 1.8km from the GCR.
G84	Eurasian pygmy shrew (*Sorex minutus*)	04/09/2015	WA	Records of this species overlap the final 10km of the GCR (G84).
G72, G82, G83, G94	Pine marten (*Martes martes*)	09/04/2023	EU HD Annex IV, WA	Previous records of this species overlay the majority of the wind farm boundary (G94) and almost the entirety of the GCR (G83; G82; and G72).
G82, G83, G84	European otter (Lutra lutra)	19/01/2023 (G82)	EU HD Annex II, IV and WA	Records of this species overlay the final 13km of the GCR (G82); 1.2km from the GCR to the east of Manorhamilton town (G83); and 2km north of the GCR (G84).
Bat Species				
G72, G94	Brown long-eared bat (*Plecotus auritus*)	09/08/2020 (G72)	EU HD Annex IV, WA	No previous records of this species exist within the proposed wind farm site or GCR. The nearest record is c.6km north-west of the proposed Wind Farm Site.
G72, G82, G83, G84, G94	Daubenton's bat (*Myotis daubentonii*)	09/08/2021; 30/08/2021	EU HD Annex IV, WA	Previous records of this species exist 0.3km and 1km south of the proposed Wind Farm Site's most southerly boundary. (G94) Records of this species overlay 0.7km of the grid connection in the town of Manorhamilton (G84); records overlap 0.8km of the GCR (G83) and 600m from the GCR at Carrigeencor Lough. Finally, records of Daubenton's bat overlay the GCR southeast of the town of Dromahair.(G83).
G72, G82, G83, G84, G94	Leislers bat (*Nyctalus leisleri*)	27/08/2018 (G94)	EU HD Annex IV, WA	Records of lesser noctule overlap 0.7km of the grid connection in (G83). Records of this species also exist 80m, from the grid connection route and approximately 0.7km from the wind farm boundary (G83). One record of this species exists towards the western boundary of the wind farm (G94).

Hectad	Species name	Date of last record	Designation	Location of Feature
G72	Natterer's bat (*Myotis nattereri*)	24/08/2017	EU HD Annex IV, WA	No records of this species in the last 10 years exist within or in proximity to the wind farm or GCR.
G72, G82, G83, G84, G94	Soprano pipistrelle (*Pipistrellus pygmaeus*)	27/08/2018 (G94)	EU HD Annex IV, WA	Records of this species overlap the GCR in the town of Manorhamilton (G83). Records also show they are located 600m from the GCR at Carrigeencor Lough (G83) and are situated 2.5km north of the GCR east of the town of Dromahair (G73).
G94	Pipistrelle (*Pipistrellus pipistrellus sensu lato*)	20/08/2018	EU HD Annex IV, WA	Records of this species exist approximately 4km north of the proposed Wind Farm Site (G94).
G94	Whiskered bat (*Myotis mystacinus*)	27/08/2018	EU HD Annex IV, WA	Records of this species exist 4km east of the proposed Wind Farm Site boundary (G94)
Invertebrates				
G72, G82, G94	Marsh fritillary (*Euphydryas aurinia*)	04/03/2023 (G94)	EU HD Annex II	Previous recent records of marsh fritillary overlap with the southern boundary of the proposed Wind Farm Site (G94).
Aquatic Ecology				
G72, G83, G84	White-clawed crayfish (*Austropotamobius pallipes*)	03/10/2018 (G83)	EU HD Annex II, WA	Previous records of freshwater white-clawed crayfish exist along the Owenmore (Manorhamilton) River. The GCR crosses over this river at two points in the town of Manorhamilton (G83).

Table 5-6: Species of conservation interest located in Northern Ireland within the ZoI of the proposed Wind Farm Site since 2016 (Source: CEDaR, 2026, NBN Atlas, 2026)

Hectad	Species name	Date of last record	Designation	Location of Feature
Plant Species				
G93, G94, G95, H04	Bell Heather (*Erica cinerea*)	28/06/2021 (H04)	RedList_ENG_post2001-NT[1]	Thur Mt. Co. Leitrim, Rosskit Island, Lough Melvin, Mullaghmore, Black River
G95	Bitter-vetch (*Lathyrus linifolius*)	25/06/2024	RedList_ENG_post2001-NT	Rosskit Island, Lough Melvin, Lough Melvin
G94	Bluebell (*Hyacinthoides non-scripta*)	05/04/2016	WACA[2]-Sch 8	Glenariff River
G95	Blue-eyed-grass (*Sisyrinchium bermudiana*)	22/06/2023	NIPS Tranche1[3], W(NI)O-Sch8_part1[4], Wildlife (NI) Order [5] Sch. 8	Garrison, Lough Melvin
G94, G95	Bogbean (*Menyanthes trifoliata*)	14/07/2021 (G95)	ECCITES[6]-D	Lough Aleater, Glen West, S of Glen River; E of Garrison, Lough Melvin, Bilberry Island, Lough Melvin
G95, H04	Bog-myrtle (*Myrica gale*)	14/07/2021 (G95)	RedList_ENG_post2001-NT	Glen West, S of Glen River; E of Garrison, Rosskit Island, Lough Melvin, Mullaghmore, Black River
G95	Bog-sedge (*Carex limosa*)	13/06/2017	RedList_ENG_post2001-EN	Glen West, S of Glen River; E of Garrison
G95	Broad-leaved Helleborine (*Epipactis helleborine*)	06/08/2019	ECCITES-B	Garrison, Lough Melvin, Rosskit Island, Lough Melvin
H04	Common Butterwort (*Pinguicula vulgaris*)	28/06/2021	RedList_ENG_post2001-VU	Mullaghmore, Black River
G93, G94, G95, H04	Common Cottongrass (*Eriophorum angustifolium*)	28/06/2021 (H04)	RedList_ENG_post2001-VU	Lough Aleater, Glen West, S of Glen River; E of Garrison, Thur Mt. Co. Leitrim, Mullaghmore, Black River
H04	Common Cow-wheat (*Melampyrum pratense*)	28/06/2021	RedList_ENG_post2001-NT	Mullaghmore, Black River
G94, G95	Common Spotted-orchid (*Dactylorhiza fuchsia*)	06/08/2019 (G95)	ECCITES-B	Lough Aleater, Rosskit Island, Lough Melvin

[1] RedList_ENG_post2001- England Red List (post-2001 assessment) – Near Threatened (NT), Vulnerable (VU), (EN) Endangered

[2] WACA-Sch1/Sch5/Sch8 – (UK) Wildlife and Countryside Act 1981 (as amended), Schedule 1/ Schedule 5 species, Section 9(1), Section 9(4)(a), Section 9(4)(b), Section 9(4)(c), Section 9(5)(a)/ Schedule 8

[3] NIPS Tranche1 - Northern Ireland Priority Species – Tranche 1 List

[4] W(NI)O-Sch1_part1/Sch5/Sch8_part1 - Wildlife (Northern Ireland) Order 1985, Schedule 1/ Schedule 5/ Schedule 8

[5] Wildlife (NI) Order Sch 8 - W(NI)O-Sch1_part1/Sch5/Sch8_part1 - Wildlife (Northern Ireland) Order 1985, Schedule 1/ Schedule 5/ Schedule 8

[6] ECCITES-A/B/C/D - Council Regulation (338/97/EC) Convention on International Trade in Endangered Species Annex A/B/C/D

Hectad	Species name	Date of last record	Designation	Location of Feature
G94	Common Twayblade (*Neottia ovata*)	18/06/2021	ECCITES-B	Lough Aleater, Ross
G95	Common Valerian (*Valeriana officinalis*)	14/07/2021	RedList_ENG_post2001-NT	Rosskit Island, Lough Melvin
H04	Cornish Heath (*Erica vagans*)	28/06/2021	NI Rare & Scarce Plants[7], NIPS Tranche1, RedList_ENG_post2001-NT, W(NI)O-Sch8_part1, Wildlife (NI) Order Sch 8	Mullaghmore, Black River
G95	Creeping Willow (*Salix repens*)	06/08/2019	RedList_ENG_post2001-NT	Rosskit Island, Lough Melvin
G94, G95, H04	Cross-leaved Heath (*Erica tetralix*)	28/06/2021 (H04)	RedList_ENG_post2001-NT	Glen West, S of Glen River; E of Garrison, Thur Mt. Co. Leitrim, Rosskit Island, Lough Melvin, Mullaghmore, Black River
G94, G95, H04	Devil's-bit Scabious (*Succisa pratensis*)	25/11/2021 (H04)	RedList_ENG_post2001-NT	Lough Aleater, Rosskit Island, Lough Melvin, Mullaghmore, Black River, Glenfarne
G94, G95, H04	Flea Sedge (*Carex pulicaris*)	28/06/2021 (H04)	RedList_ENG_post2001-NT	Lough Aleater, Rosskit Island, Lough Melvin, Mullaghmore, Black River
G94	Frog Orchid (*Coeloglossum viride*)	08/08/2022	BAP-2007[8], ECCITES-B, England_NERC_S.41[9], NIPS Tranche1, RedList_ENG_post2001-VU	Ross ASSI
G95	Globeflower (*Trollius europaeus*)	25/06/2024	NI Rare & Scarce Plants, NIPS Tranche1, W(NI)O-Sch8_part1, Wildlife (NI) Order Sch 8	Lough Melvin
H04	Goldenrod (*Solidago virgaurea*)	28/06/2021	RedList_ENG_post2001-NT	Mullaghmore, Black River
G95	Harebell (*Campanula rotundifolia*)	06/08/2019	RedList_ENG_post2001-NT	Rosskit Island, Lough Melvin
G95, H04	Heath Milkwort (*Polygala serpyllifolia*)	28/06/2021 (H04)	RedList_ENG_post2001-NT	Glen West, S of Glen River; E of Garrison, Rosskit Island, Lough Melvin, Mullaghmore, Black River
G94, H04	Heath Speedwell (*Veronica officinalis*)	28/06/2021 (H04)	RedList_ENG_post2001-NT	Glenariff River, Lough Aleater, Mullaghmore, Black River
G95, H04	Heath Spotted-orchid (*Dactylorhiza maculata*)	28/06/2021 (H04)	ECCITES-B	Glen West, S of Glen River; E of Garrison, Mullaghmore, Black River
G93, G94, G95, H04	Heather (*Calluna vulgaris*)	25/11/2021 (H04)	RedList_ENG_post2001-NT	Lough Aleater, Thur Mt. Co. Leitrim, Rosskit Island, Lough Melvin, Mullaghmore, Black River

[7] NI Rare & Scarce Plants – Northern Ireland Rare and Scarce Plants

[8] BAP-2007 - UK Biodiversity Action Plan (2007 Priority Species List)

[9] England_NERC_S.41 – (UK) Section 41 of the Natural Environment and Rural Communities Act 2006.

Hectad	Species name	Date of last record	Designation	Location of Feature
H05	Killarney Fern (*Trichomanes speciosum*)	28/04/2021	Bern[10]-A1, HabDir[11]-A2, HabDir-A4, HabReg-Sch5[12], NI Rare & Scarce Plants, NIPS Tranche1, WACA-Sch8	Lough Navar, Correl Glen National Nature Reserve,
G95	Knotted Pearlwort (*Sagina nodosa*)	06/08/2019	RedList_ENG_post2001-VU	Rosskit Island, Lough Melvin
G94, H04	Lesser Butterfly-orchid (*Platanthera bifolia*)	28/06/2023 (H04)	BAP-2007, ECCITES-B, England_NERC_S.41, NIPS, RedList_ENG_post2001-EN, RedList_GB_post2001-VU	Lough Aleater, Drumcully ASSI
G94, G95	Lesser Marshwort (*Apium inundatum*)	14/07/2021 (G95)	RedList_ENG_post2001-VU	Lough Aleater, Lough Melvin
G94, G95, H04	Lesser Spearwort (*Ranunculus flammula*)	29/06/2021 (H04)	RedList_ENG_post2001-VU	Glen West, S of Glen River; E of Garrison, Lough Aleater, Rosskit Island, Lough Melvin, Mullaghmore, Black River, Shore at Stable Park, Lough Macnean Upper
G95, H04	Lesser Water-plantain (*Baldellia ranunculoides*)	14/07/2021 (G95)	RedList_ENG_post2001-VU	Rosskit Island, Lough Melvin, Shore at Stable Park, Lough Macnean Upper, Lough Melvin
G95	Long-stalked Pondweed (*Potamogeton praelongus*)	14/07/2021	RedList_ENG_post2001-EN	Lough Melvin
G95	Lousewort (*Pedicularis sylvatica*)	06/08/2019	RedList_ENG_post2001-VU	Rosskit Island, Lough Melvin
G95, H04	Mackay's Horsetail (*Equisetum x trachyodon*)	29/06/2021 (H04)	NIPS Tranche1	Rosskit Island, Lough Melvin
G94	Marsh Arrowgrass (*Triglochin palustre*)	13/06/2017	RedList_ENG_post2001-NT	Lough Aleater
G94	Marsh Cinquefoil (*Potentilla palustris*)	14/07/2021	RedList_ENG_post2001-NT	Lough Aleater, Glen West, S of Glen River; E of Garrison, Rosskit Island, Lough Melvin
G94, G95, H04	Marsh Pennywort (*Hydrocotyle vulgaris*)	29/06/2021 (G95)	RedList_ENG_post2001-NT	Lough Aleater, Rosskit Island, Lough Melvin, Shore at Stable Park, Lough Macnean Upper
G94, G95, H04	Marsh Ragwort (*Senecio aquaticus*)	25/11/2021 (G94)	RedList_ENG_post2001-NT	Glenariff River, Glenfarne, Lough Aleater, Rosskit Island, Lough Melvin
G94	Marsh Speedwell (*Veronica scutellata*)	13/06/2017	RedList_ENG_post2001-NT	Lough Aleater
G93, G94, H04	Mat-grass (*Nardus stricta*)	28/06/2021 (H04)	RedList_ENG_post2001-NT	Lough Aleater, Thur Mt. Co. Leitrim, Mullaghmore, Black River
H04	Needle Spike-rush (*Eleocharis acicularis*)	29/06/2021	RedList_ENG_post2001-NT	Lough Macnean Upper, Shore at Stable Park, Lough Macnean Upper
G94, G95, H04	*Pedicularis sylvatica* subsp. hibernica	28/06/2021 (H04)	RedList_ENG_post2001-VU	Lough Aleater, Glen West, S of Glen River; E of Garrison, Mullaghmore, Black River

[10] Bern-A2 - Appendix II of the Convention on the Conservation of European Wildlife and Natural Habitats 1979 (Bern Convention)

[11] HabDir A2/A4- *Annex II/IV of Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive), Annex II/IV*

[12] HabReg-Sch2/5 - HabReg-Sch2 – (UK) Schedule 2 or Schedule 5 of the Conservation of Habitats and Species Regulations 2017 (as amended)

Hectad	Species name	Date of last record	Designation	Location of Feature
G94	Red Pondweed (*Potamogeton alpinus*)	13/06/2017	RedList_ENG_post2001-VU	Lough Aleater
G95, H04	Round-leaved Sundew (*Drosera rotundifolia*)	28/06/2021 (H04)	RedList_ENG_post2001-NT	Glen West, S of Glen River; E of Garrison, Mullaghmore, Black River
G94, G95, H04	Sanicle (*Sanicula europaea*)	29/06/2021 (H04)	RedList_ENG_post2001-NT	Glenariff River, Rosskit Island, Lough Melvin, Mullaghmore, Black River, Shore at Stable Park, Lough Macnean Upper
H04	Six-stamened Waterwort (*Elatine hexandra*)	29/06/2021	NI Rare & Scarce Plants , NIPS Tranche1	Lough Macnean Upper, Shore at Stable Park, Lough Macnean Upper
G94, G95, H04	Star Sedge (*Carex echinata*)	28/06/2021	RedList_ENG_post2001-NT	Glen West, S of Glen River; E of Garrison, Lough Aleater, Mullaghmore, Black River
G93, G94, G95, H04	Tormentil (*Potentilla erecta*)	28/06/2021 (H04)	RedList_ENG_post2001-NT	Glenariff River, Lough Aleater, Thur Mt. Co. Leitrim, Rosskit Island, Lough Melvin, Mullaghmore, Black River
G94, G95, H04	Tufted-sedge (*Carex elata*)	14/07/2021 (G95)	RedList_ENG_post2001-NT	Lough Aleater, Shore at Stable Park, Lough Macnean Upper, Lough Melvin, Bilberry Island, Lough Melvin
G94, H04	Tunbridge Filmy-fern (*ymenophyllum tunbrigense*)	25/11/2021 (H04)	NI Rare & Scarce Plants , NIPS Tranche1	Glenfarne, Thur Mt. Co. Leitrim
G95	Various-leaved Pondweed (*Potamogeton gramineus*)	14/07/2021	RedList_ENG_post2001-NT	Bilberry Island, Lough Melvin
G95	White Beak-sedge (*Rhynchospora alba*)	11/10/2019	RedList_ENG_post2001-NT	Glen West Lakelet
G94, H04	Wild Strawberry (*Fragaria vesca*)	25/11/2021 (H04)	RedList_ENG_post2001-NT	Glenariff River, Lough Aleater, Glenfarne
G94, H04	Wilson's Filmy-fern (*Hymenophyllum wilsonii*)	28/06/2021 (H04)	RedList_GB_post2001-NT	Thur Mt. Co. Leitrim, Mullaghmore, Black River
G94, G95, H04	Wood-sorrel (*Oxalis acetosella*)	25/11/2021	RedList_ENG_post2001-NT	Glenariff River, Rosskit Island, Lough Melvin, Mullaghmore, Black River, Glenfarne
Amphibians and Reptiles				
H04, G94, G93	Common frog (*Rana temporaria*)	26/03/2018 (G93)	Bern-A3, EU HD Annex V, WACA-Sch5_sect9.5a	Glenfarne; Thur Mt. Co. Leitrim
G94, G95	Common Lizard (*Zootoca vivipara*)	20/07/2023 (G94)	BAP-2007, Bern-A3, England_NERC_S.41, NIPS, NIPS Tranche1, W(NI)O-Sch5, WACA-Sch5_sect9.1(kill/injuring), WACA-Sch5_sect9.5a, Wildlife (NI) Order Sch 5	G94: Frevagh; Basking on rocks G95: Peat bog
Terrestrial Mammals				
G95, H04	European Otter *(Lutra lutra)*	09/10/2024 (G95)	BAP-2007, Bern-A2, ECCITES-A, England_NERC_S.41, HabDir-A2, HabDir-A4, HabReg-Sch2, NIPS Tranche1, WACA-Sch5_sect9.4b, WACA-Sch5_sect9.5a, WACA-Sch5Sect9.4c	County Bridge, County River, S of Garrison; Black River; Lattone Bridge, Lattone tributary; Rosskit Island, Lough Melvin; Drumkeenagh shore, Lough Macnean Upper
G94, G95, H04	Red Squirrel (Sciurus vulgaris)	20/01/2024 (G95)	BAP-2007, Bern-A3, England_NERC_S.41, NIPS Tranche1, RedList_GB_post2001-EN, W(NI)O-Sch5, WACA-Sch5_sect9.1(kill/injuring), WACA-	Garrison, Lough Melvin; Woodland at Scribbagh; Dervish Villa, Garrison;

Hectad	Species name	Date of last record	Designation	Location of Feature
			Sch5_sect9.1(taking), WACA-Sch5_sect9.2, WACA-Sch5_sect9.4.a, WACA-Sch5_sect9	
G95	Irish Hare (*Lepus timidus* subsp. Hibernicus)	31/07/2019	BAP-2007, Bern-A3, England_NERC_S.41, HabDir-A5, HabReg-Sch4, NIPS Tranche1, RedList_GB_post2001-NT	Glen East, S of Glen River; E of Garrison
G95	Irish Stoat (*Mustela erminea* subsp. Hibernica)	30/04/2024	Bern-A3, NIPS Tranche1	Garrison, Lough Melvin
G93, G94, G95, H04	Pine Marten (*Martes martes*)	29/08/2022	BAP-2007, Bern-A3, England_NERC_S.41, HabDir-A5, HabReg-Sch4, NIPS Tranche1, W(NI)O-Sch5, WACA-Sch5_sect9.1(kill/injuring), WACA-Sch5_sect9.1(taking), WACA-Sch5_sect9.2, WACA-Sch5_sect9.4.a, WACA-Sch5_sect9.4b, WACA-Sch5	Garrison, Lough Melvin; Muckenreagh Forest; Drumkeenagh, SE of Kiltyclogher; Glenfarne; Scribbagh
Bat Species				
G95, H04	Common Pipistrelle (*Pipistrellus pipistrellus*)	11/07/2018 (H04)	CMS[13]_A2, CMS_EUROBATS-A1, HabDir-A4, HabReg-Sch2, NIPS Tranche1, WACA-Sch5_sect9.4b, WACA-Sch5_sect9.5a, WACA-Sch5Sect9.4c	Glen River; Lattone Bridge, Lattone tributary; Black Bridge, Black River
H04	Daubenton's Bat (*Myotis daubentonii*)	11/07/2018	Bern-A2, CMS_A2, CMS_EUROBATS-A1, HabDir-A4, HabReg-Sch2, NIPS Tranche1, WACA-Sch5_sect9.4b, WACA-Sch5_sect9.5a, WACA-Sch5Sect9.4c	Lattone Bridge, Lattone tributary
H04	Leisler's Bat (*Nyctalus leisleri*)	11/07/2018	Bern-A2, CMS_A2, CMS_EUROBATS-A1, HabDir-A4, HabReg-Sch2, NIPS Tranche1, RedList_GB_post2001-NT, WACA-Sch5_sect9.4b, WACA-Sch5_sect9.5a, WACA-Sch5Sect9.4c	Lattone Bridge, Lattone tributary; Black Bridge, Black River
G94, G95, H04	Soprano Pipistrelle (*Pipistrellus pygmaeus*)	20/08/2018 (G94)	BAP-2007, Bern-A2, CMS_A2, CMS_EUROBATS-A1, England_NERC_S.41, HabDir-A4, HabReg-Sch2, NIPS, NIPS Tranche1, WACA-Sch5_sect9.4b, WACA-Sch5_sect9.5a, WACA-Sch5Sect9.4c	Lakeshore, Garrison; Roogagh River at Tower Beg; Glen River; Lattone Bridge, Lattone tributary; Black Bridge, Black River; Lattone Lough
Invertebrates				
G95, H04, H05	Common Darter (*Sympetrum striolatum*)	02/10/2020 (H05, H05)	RedList_GB_post2001-DD	Shore of Lough Melvin, NW of Garvros; Corracloona; Big Dog Forest
G94	*Dinocras cephalotes*	12/09/2018	NIPS Tranche1	Glenaniff River
G94, G95, H04, H05	Marsh Fritillary (*Euphydryas Aurinia*)	29/08/2022 (G95)	BAP-2007, Bern-A2, England_NERC_S.41, HabDir-A2, NIPS Tranche1, RedList_GB_post2001-VU, W(NI)O-Sch5, WACA-Sch5_sect9.1(kill/injuring), WACA-Sch5_sect9.1(taking), WACA-Sch5_sect9.2, WACA-Sch5_sect9.4.a, WACA-Sch5_sect9.4b, WACA-Sch5_s	Tower More ASSI, North, Tower More ASSI, South, Glen East ASSI, Lough Melvin ASSI

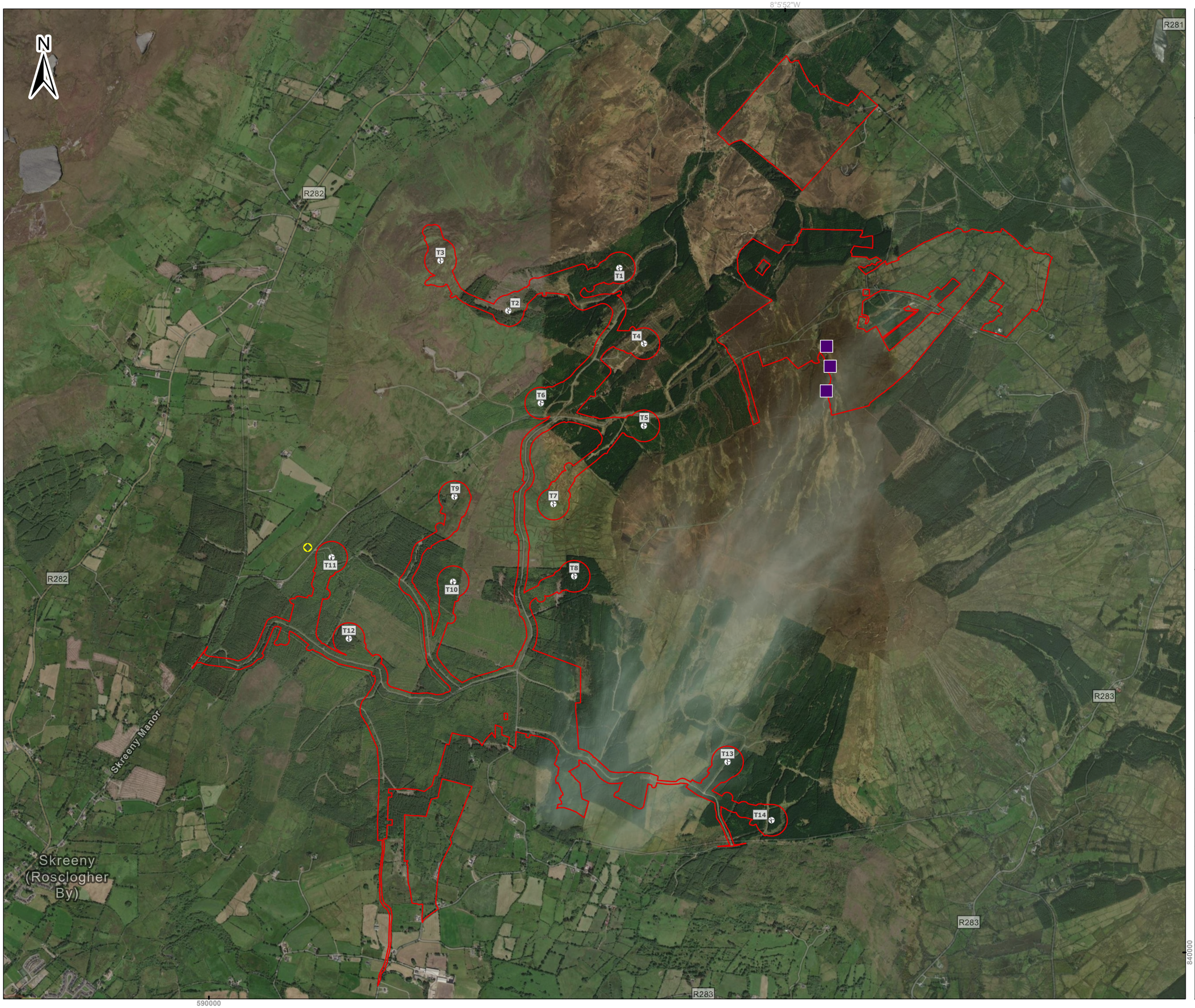
[13] CMS_A1/A2 - Convention on the Conservation of Migratory Species of Wild Animals Annex I/Annex II

Hectad	Species name	Date of last record	Designation	Location of Feature
H04	Small Heath (*Coenonympha pamphilus*)	09/07/2021	BAP-2007, England_NERC_S.41, NIPS Tranche1, RedList_GB_post2001-NT	Mullaghmore, Black River, Ballintempo, 6km SW of Ballintempo Forest

Table 5-7: Third Schedule (S.I. 477/2011) Invasive Flora and Fauna Species (Source: NBDC, 2025a)

Hectad	Species name	Date of last record	Designation	Location of Feature
G72, G82, G83, G94	Japanese knotweed (*Fallopia japonica*)	27/05/2023 (G94)	High Impact Invasive Species	Records of this species overlay a significant portion of the proposed Wind Farm Site, 2.8km of the GCR starting at the proposed Wind Farm Site and intersects the GCR.
G82, G83	Indian balsam (*Impatiens glandulifera*)	15/08/2017 (G82)	High Impact Invasive Species	No records of this species overlay the proposed Wind Farm Site boundary or the GCR. The nearest record is c. 1.5km east of the proposed GCR.
G82, G83, G94	Rhododndron *(Rhododendron ponticum)*	28/04/2023 (G94)	High Impact Invasive Species	Records of this species overlay 1.3km of the GCR, to the northwest of Manorhamilton town (G84).
G94	Three-cornered garlic (*Allium triquetrum*)	28/04/2023	High Impact Invasive Species	No records of this species overlay the proposed Wind Farm Site boundary or the GCR. The nearest record is c. 4.3km north-east of the proposed Wind Farm Site.
G72	Fallow deer (*Dama dama*)	13/07/2015	High Impact Invasive Species	Records of this species exist within a small woodland 0.4km south of the proposed Wind Farm Site and overlay almost the entirety of the GCR.
G83	Sika deer (*Cervus nippon*)	19/11/2015	High Impact Invasive Species	Records of this species overlaps the majority of the proposed Wind Farm Site boundary (G83).
G84	Zebra mussel (*Dreissena (polymorpha*)	13/04/2017	High Impact Invasive Species	Records of this species exist within the Glenade Lough 7.8km west of the proposed Wind Farm Site and GCR. No hydrological link exist between the lake and the Proposed Project.
G84	American mink (*Mustela vison*)	12/09/2015	High Impact Invasive Species	Records of this species exist at Glenade Lough, 7.8km west of the proposed Wind Farm Site and GCR.

8°5'52"W



Legend

- proposed Wind Farm Site
- Bristle-leaf (Brachydontium trichodes)
- Small White Orchid (Pseudorchis albida)

0 0.5 1
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	23/02/2026	First issue	S.P	S.R

Client: FuturEnergy Ireland

Project: Lissinagroagh Wind Farm

Title: Figure 5-8: Locations of Flora Protection Order Species Bristle Leaf (Brachydontium trichodes) [MHC1.1][MC1.2] and small-whiteorchid (Pseudorchis albida)

Scale @ A3: 1:22,000

Prepared by:	Checked by:	Date:
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Map Ref: 10955-039-BRISLE-P.App.BO-TOB-A

Draft: A

5.4.1.4 Bat Species

A 10km radius search was performed for the Survey Area for the proposed Wind Farm Site (refer to Appendix 5-5). The data search provided data for 35 roosts, three transects and 54 Ad Hoc records. The majority of roost records is the result of bridge surveys in the data search area and as a result the roost records are of bat species that typically roost in bridges (i.e. Daubenton's bat and Natterer's bat).

According to the BCIreland database there is a record for Leisler's bat, soprano pipistrelle and common pipistrelle located site 500m north-west of T11 (Table 5-8). Another record for Leisler's bat, soprano pipistrelle and common pipistrelle exists 1km west of T3. There is also a roost record for a Daubenton's bat at Leminea Bridge (ITM E591040.58E, N839619.62), which is located 240m to the south of the southern entrance to the proposed Wind Farm Site.

Table 5-8: Bat Conservation Ireland Bat Records for 10km radius search.

Bat Species	Records	Roost Records	Transect Records	Ad Hoc Records
Brown long-eared bat	3	1	1	1
Common pipistrelle	23	0	1	22
Daubenton's bat	41	20	2	19
Leisler's bat	23	5	1	17
Lesser horseshoe bat	0	0	0	0
Nathusius' pipistrelle	0	0	0	0
Natterer's bat	15	13	1	1
Soprano pipistrelle	31	1	1	29
Whiskered bat	2	1	0	1
Pipistrellus species	1	0	0	1
Myotis species	4	0	1	3

The Survey Area for the proposed Wind Farm Site displays a Low to Medium favourability for bats according to the Bat Landscape Favourability Model (Lundy *et al.*, 2011). Two karstic Non-marine caves (EU1) are located within the Survey Area for the proposed Wind Farm Site and have potential as roost features. However, according to the BCI database no bat data is currently available for any of these features, and they are not known roosts. The full details for the desk assessment for bats is listed in Appendix 5-5.

5.4.1.5 Aquatic Environment

5.4.1.5.1 Inland Fisheries Ireland

A desktop review of the Inland Fisheries Ireland's National Research Survey Programme (NRSP) and Water Framework Directive (WFD) Rivers, Lakes, and Transitional and Coastal Water (TRAC) sampling programme was carried out to identify fisheries data within the ZoI for the proposed Wind Farm Site, GCR and TDR.

The only data point within the ZoI of the Proposed Project was located within the Bonet_050 (IE_WE_35B060630) and recorded the following species as present; European eel (*Anguilla anguilla*), gudgeon (*Gobio gobio)*, lamprey species, minnow (*Phoxinus phoxinus*), perch (*Perca fluviatilis*), Atlantic salmon (*Salmo salar*), stone loach (*Barbatula barbatula*), three spined stickle back (*Gasterosteus aculeatus*) and brown trout (*Salmo trutta*).

5.4.1.5.2 Surface Waterbodies

5.4.1.5.2.1 Proposed Wind Farm Site and GCR

A thorough review of the baseline aquatic environment is provided in Chapter 8 – Hydrology and Hydrogeology (Section 8.3) as well as an assessment of potential impacts and a description of the proposed mitigation measures. In addition, an assessment of compliance with the Water Framework Directive determines the Proposed Project is in compliance with the objectives of the WFD (see EIAR Appendix 8-1).

Hydrologically, the proposed Wind Farm Site is located within the Sligo Bay (35) and Erne (36) WFD Catchments, while the proposed GCR lies within Sligo Bay (35) WFD Catchment.

The proposed Wind Farm Site drains into five WFD river waterbodies (Brackary_010; Cornavannoge_010; Lattone_010; Owenmore (Manorhamilton)_020; and Rosfriar_010). All of these river waterbodies have achieved their WFD objectives during the monitoring period 2019-2024 (i.e. minimum of *Good* water quality status. These river water bodies form the initial extent of a hydrological pathway that includes a total of 20 WFD river water bodies.

The proposed GCR intersects, or runs in the immediate vicinity of, 10 WFD river water bodies, including the Brackary_010, and the Owenmore (Manorhamilton)_020 which are mentioned above, as well as the Bonet_030; Bonet_040; Bonet_050; Cashel Stream (Bonet)_010; Killanumery_010; Killanumery_020; Shanvaus_10; and, Unshin_040. Similarly to the previous group, all of these river water bodies achieved their WFD objectives during the monitoring period 2019-2024.

The GCR is constrained to the public roads network which crosses 20 named EPA rivers and 7 unnamed EPA streams. The EPA name and code of the rivers is listed in Table 5-10 along with the associated WFD river waterbodies, as listed above.

The hydrological pathway from the Proposed Project also includes three WFD lake water bodies which are downstream of the Proposed Project: Melvin, Macnean Upper, Gill SO. All three lakes received a *moderate* score for ecological status or potential.

The hydrological pathway from the Proposed Project terminates at two WFD transitional water bodies: Ballysadare Estuary and Garavoge Estuary. The ecological status of these estuaries is valued as *moderate*.

It should be noted that the Garavogue_010 WFD river water body has been mapped as to include the Garavogue EPA stream (EPA code: 35G01), which flows downstream into the Gill SO WFD lake waterbody, ultimately discharging into the Garavoge Estuary. Following the criteria set in Section 5.1.4.1, as Gill SO WFD constitutes an intervening depositional water body, the Garavoge Estuary WFD transitional water body is not included in the hydrological pathway from the Proposed Project.

5.4.1.5.2.2 Proposed TDR

The proposed TDR passes through the following WFD Catchments, Donegal Bay North (37), Erne (36), and Sligo Bay (35).

Of these 57 POIs along the TDR, proposed accommodations include the clearance of topsoil within 50m of watercourses at a total of 9 POIs, consisting of POI 13, 21, 22, 25, 50, 51, 52, 53, 55 (Figure 5-2). This constitutes a potential pathway for likely significant effects, particularly during heavy rainfall events.

The recent EPA water quality for these WFD waterbodies is listed in Table 5-9.

5.4.1.5.3 Groundwater bodies

5.4.1.5.3.1 *Proposed Wind Farm Site*

In terms of hydrogeology, the proposed Wind Farm Site extends over seven WFD groundwaterbodies (GWB), such as: Glenaniff (IE_NW_G_043); Glencar (IE_WE_G_0060); Glenfarne (IE_NW_G_042); Kilcoo (IEGBNI_NW_G_017); Kiltyclogher (IE_NW_G_074); Killarga (IE_WE_G_0055); and, Killarga South (IE_WE_G_0056). Four of these GWBs have karstic aquifers, consisting of Glenaniff, Glencar, Kilcoo, and Killarga South.

Accommodations along the GCR and TDR are not expected to impact GWBs.

Glenaniff GWB is a karstified aquifer. Here the groundwater flow is considered to be predominantly unconfined, with flow paths typically in the order of approximately 100–300m but on occasion the flow path lengths extending over several kilometres (GSI, 2025a). The Glenaniff GWB encompasses T3 within the proposed Wind Farm Site.

Karstification is extensive throughout the Glencar GWB, with swallow holes, enclosed depressions, and cave systems recorded locally. General flow within this GWB will be towards the rivers and lakes, but the karstified nature of the bedrock provides for highly variable groundwater flow directions (GSI, 2025b). Within the proposed Wind Farm Site the Glencar GWB encompasses T11, the substation location and the construction compound, both to the south-west of T11.

There is no publicly available description from GSI for the Kilcoo GWB. However, the GSI Spatial Resources (DCENR, 2025) projects a karstified aquifer present within the area occupying the Kilcoo GWB. Groundwater flow directions within this type of aquifers can be highly variable, with the possibility of flow path lengths extending to several kilometres in length. The infrastructure for the proposed Wind Farm Site located within the Kilcoo GWB is T1 and T4.

Killarga South GWB encompasses the proposed location for T2, T6, T5, T7, T8, T10, T13 and T14 as well as the borrow pits to the north and south of the proposed Wind Farm Site. Karstification is evident from four caves located in the northern side of the GWB, and this is considered

representative of a fraction of existing features (GSI, 2004). General flow directions are likely to be across the GWB toward the river Bonet (GSI, 2004).

5.4.1.5.3.2 Proposed TDR and GCR

Proposed TDR and GCR The GWBs bodies over which the proposed accommodations along the TDR and GCR are situated are considered outside of the ZoI for the Proposed Project as proposed accommodations in these locations are limited to vegetation clearance. Therefore, there is no potential for likely significant effects on these GWBs.

8°11'10"W 8°9'20"W 8°7'30"W 8°5'40"W 8°3'50"W

54°21'0"N 54°20'0"N 54°19'0"N 54°18'0"N

844000 842000 840000

590000 592500 595000

N

R282 R283

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 T13 T14

OWENMORE (MANORHAMILTON)_020

BRACKARY_010

Skreeny_Manor

Skreeny (Rosclogher By)

Amorset

Manorhamilton

Lough Gill SAC

N16

R280

Munakit More

Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Turbine Locations
- Enhancement lands
- Special Areas of Conservation (SACs)
- WFD - River Water Bodies

0 0.5 1
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	23/02/2026	First issue	S.P	S.R

Client: FuturEnergy Ireland

Project: Lissinagroagh Wind Farm

Title: Figure 5-9: The Water Framework Directive river waterbodies draining the proposed Wind Farm Site.

Scale @ A3: 1:25,000

Prepared by:	Checked by:	Date:
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Map Ref: 10955-072-L.GILL..SAC-HYDRO..Co-TOB-A

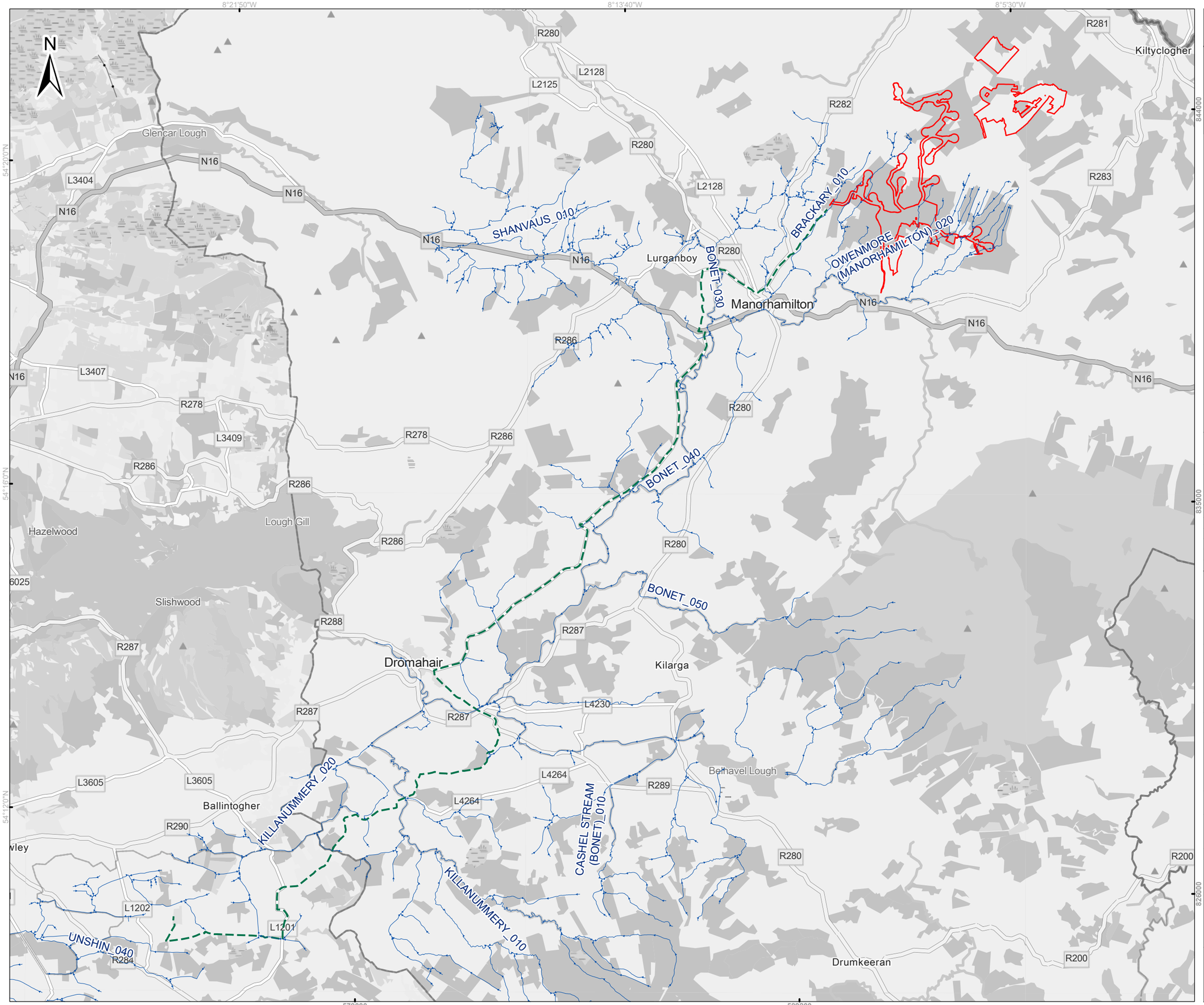
Draft: A

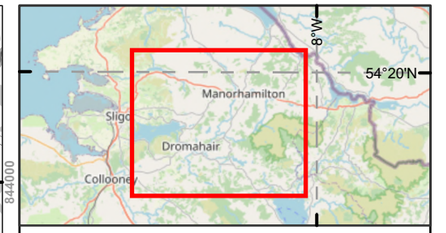
Table 5-9: WFD Water Bodies hydrologically connected to the proposed Wind Farm Site and GCR with the EPA 2019-2024 water quality status

Water Body Name	WFD Reference	WFD Water Quality Status	Assessment Technique	Status Confidence	Limiting Element
Ballysodare_010	IE_WE_35B050100	Poor	Monitoring	Medium confidence	Other Aquatic Flora Status or Potential Phytobenthos Status or Potential
Ballysadare Estuary	IE_WE_460_0300	Moderate	Monitoring	High confidence	Phytoplankton Status or Potential Supporting Chemistry Conditions Specific Pollutant Conditions
Bonet_030	IE_WE_35B060200	Good	Monitoring	High confidence	-
Bonet_040	IE_WE_35B0609.500	Good	Monitoring	High confidence	-
Bonet_050	IE_WE_35B060630	Good	Monitoring	Medium confidence	-
Brackary_010	IE_WE_35B100500	Good	Monitoring	High confidence	-
Cashel Stream (Bonet)_010	IE_WE_35C031000	Good	Monitoring	High confidence	-
Cornavannoge_010	IE_NW_36C040400	High	Monitoring	High confidence	-
Cornavannoge_020	IE_NW_36C040600	High	Monitoring	High confidence	-
County River (Carran West)	UKGBNI1NW353504075	Good	Monitoring	No information or unknown	-
Garavoge Estuary	IE_WE_470_0100	Poor	Monitoring	High confidence	Phytoplankton Status Macroalgae status
Garavogue_010	IE_WE_35G010200	Poor	Monitoring	Medium confidence	Invertebrate Status or Potential

Water Body Name	WFD Reference	WFD Water Quality Status	Assessment Technique	Status Confidence	Limiting Element
Gill SO	IE_WE_35_158	Moderate	Monitoring	High confidence	Macrophyte status or Potential Fish status or Potential
Killanumery_010	IE_WE_35K030600	Moderate	Monitoring	High confidence	Biological Status or Potential Chemical water status
Killanumery_020	IE_WE_35K030900	Good	Monitoring	High confidence	-
Lattone_010	IE_NW_35L660960	Good	Modelling	Medium confidence	-
Melvin (Freshwater lough)	IE_NW_35_160	Moderate	Monitoring	High confidence	Macrophyte Status or Potential
Macnean Upper	IE_NW_36_673	Moderate	Monitoring	High confidence	Macrophyte Status or Potential Fish Status or Potential Supporting Chemistry Conditions General Conditions Nutrient Conditions Phosphorous Conditions Total phosphorous
Owenmore (Manorhamilton)_020	IE_WE_35O080400	Good	Monitoring	High confidence	-
Owenmore (Sligo)_080	IE_WE_35O060900	Moderate	Monitoring	Medium confidence	Other Aquatic Flora Status or Potential Phytobenthos Status or Potential Invertebrate Status or Potential
Rosfriar_010	IE_NW_35R320460	Good	Modelling	Medium confidence	-
Shanvaus_010	IE_WE_35S011100	Good	Monitoring	High confidence	-

Water Body Name	WFD Reference	WFD Water Quality Status	Assessment Technique	Status Confidence	Limiting Element
Unshin_040	IE_WE_35U010500	High	Monitoring	High confidence	-
Unshin_050	IE_WE_35U010600	High	Monitoring	High confidence	-





Legend

- proposed Wind Farm Site
- Grid Connection Route
- WFD - River Water Bodies

0 2 4
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

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Rev	Date	Description	By	Chkd.
A	23/02/2026	First issue	S.P	S.R

Client: FuturEnergy Ireland

Project: Lissinagroagh Wind Farm

Title: Figure 5-10: The Water Framework Directive river waterbodies draining the proposed Grid Connection Route.

Scale @ A3: 1:80,000

Prepared by: S.Pezzetta | Checked by: S.Ryan | Date: February 2026

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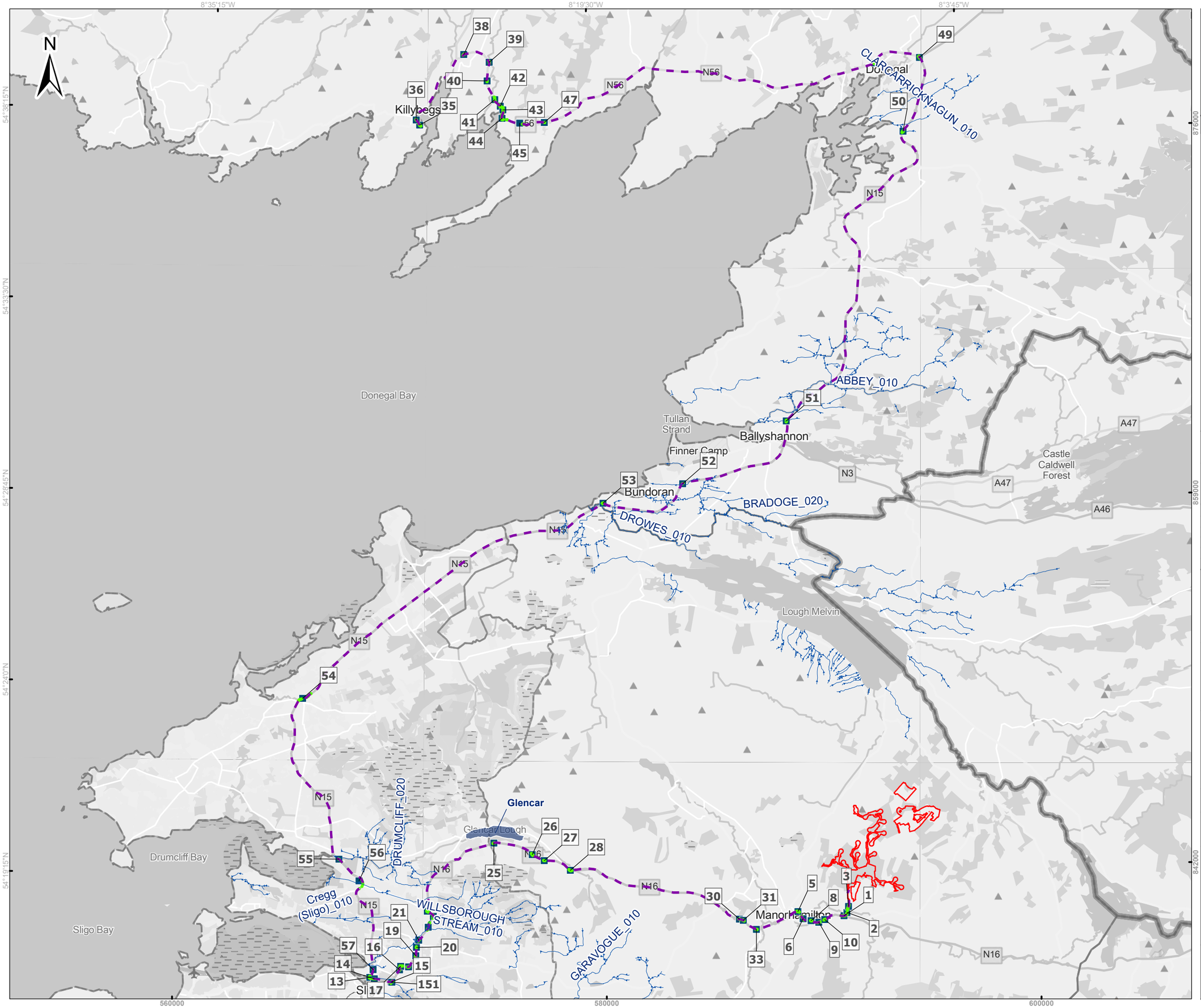
Map Ref: 10955-082-GCR-WFD-TOB-A

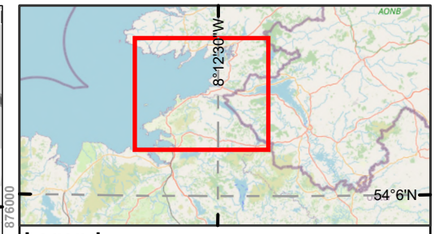
Draft: A

Table 5-10: Names and Codes for the EPA Rivers intersecting the GCR and the corresponding WFD River Waterbody Names and Codes

EPA Name	EPA Code	EPA Segment Code	ORDER_	RWB Code/ WFD Code	WFD Name
Bonet	35B06	35_3493	4	IE_WE_35B060200	BONET_030
Boihy	35B76	35_3456	2	IE_WE_35B0609.500	BONET_040
Cornstauk Drain	35C09	35_4761	1	IE_WE_35B0609.500	BONET_040
Gortgarrigan	35G61	35_1409	1	IE_WE_35B0609.500	BONET_040
Lough_Carrigeencor	35L88	35_2849	1	IE_WE_35B0609.500	BONET_040
Bonet	35B06	35_2997	5	IE_WE_35B060630	BONET_050
Rubbal	35R44	35_4166	2	IE_WE_35B060630	BONET_050
Brackary	35B10	35_3609	3	IE_WE_35B100500	BRACKARY_010
Curraghfore	35C68	35_3221	2	IE_WE_35B100500	BRACKARY_010
Kilcoon	35K11	35_2755	1	IE_WE_35C031000	CASHEL STREAM (BONET)_010
Killananima	35K09	35_567	1	IE_WE_35C031000	CASHEL STREAM (BONET)_010
Killanummery	35K03	35_4802	3	IE_WE_35K030600	KILLANUMMERY_010
Barroe 35	35B97	35_2766	1	IE_WE_35K030900	KILLANUMMERY_020
BAWN 35	35B11	35_3909	1	IE_WE_35K030900	KILLANUMMERY_020
Null	Null	35_3088	1	IE_WE_35K030900	KILLANUMMERY_020

EPA Name	EPA Code	EPA Segment Code	ORDER_	RWB Code/ WFD Code	WFD Name
Rathgeean	35R37	35_3089	2	IE_WE_35K030900	KILLANUMMERY_020
Lissnagroagh 35	35L59	35_4210	2	IE_WE_35O080400	OWENMORE (MANORHAMILTON)_020
Moneenshinnagh 35	35M60	35_2999	2	IE_WE_35O080400	OWENMORE (MANORHAMILTON)_020
Mt_Dough	35M62	35_3841	3	IE_WE_35O080400	OWENMORE (MANORHAMILTON)_020
Null	Null	35_2909	1	IE_WE_35O080400	OWENMORE (MANORHAMILTON)_020
Null	Null	35_2951	1	IE_WE_35O080400	OWENMORE (MANORHAMILTON)_020
Null	Null	35_3973	1	IE_WE_35O080400	OWENMORE (MANORHAMILTON)_020
Null	Null	35_4059	1	IE_WE_35O080400	OWENMORE (MANORHAMILTON)_020
Null	Null	35_4070	1	IE_WE_35O080400	OWENMORE (MANORHAMILTON)_020
Null	Null	35_4203	1	IE_WE_35O080400	OWENMORE (MANORHAMILTON)_020
Skrenny	35S46	35_4030	3	IE_WE_35O080400	OWENMORE (MANORHAMILTON)_020
Shanvaus 35	35S01	35_4791	4	IE_WE_35S011100	SHANVAUS_010
Ballygrania	35B81	35_741	1	IE_WE_35U010500	UNSHIN_040
Unshin 35	35U01	35_3101	5	IE_WE_35U010600	UNSHIN_050





Legend

- proposed Wind Farm Site
- Turbine Delivery Route
- TDR
- Point of Interest - Locations
- WFD - Lake Water Bodies
- WFD - River Water Bodies

0 5 10
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	04/03/2026	First issue	S.P	S.R

Client:
FuturEnergy Ireland

Project:
Lissinagroagh Wind Farm

Title:
Figure 5-11:
The Water Framework Directive waterbodies draining the proposed Turbine Delivery Route.

Scale @ A3: 1:160,000

Prepared by:	Checked by:	Date:
S.Pezzetta	S.Ryan	March 2026

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Map Ref: 10955-083-TDR-WFD-TOB-A

Draft: A

Table 5-11: WFD Water Bodies hydrologically connected to the TDR with the EPA 2019-2024 water quality status

Water Body Name	WFD Reference	WFD Water Quality Status	Assessment Technique	Status Confidence	Limiting Element
Abbey_010	IE_NW_36A010300	Good	Modelling	Low	-
Bradoge_020	IE_NW_35B070200	Good	Monitoring	High	-
Clarcarricknagun_010	IE_NW_37C240980	Good	Modelling	Low	-
Cregg 35_010	IE_WE_30C030150	Poor	Monitoring	Medium	Biological Status or Potential
Drowes_010	UKGBNI1NW353504082	Good	Monitoring	High	-
Drumcliff_020	IE_WE_35D040400	Good	Monitoring	High	-
Garavogue_010	IE_WE_35G010200	Poor	Monitoring	Medium	Invertebrate Status or Potential
Glencar	IE_WE_35_139	Moderate	Monitoring	High	Other Aquatic Flora Status or Potential
Willsborough Stream_010	IE_WE_35W010300	Moderate	Monitoring	High	Biological Status or Potential

8°5'52"W

N

Lattone Road

R281

R281

Kiltyclogher

R282

R281

R283

R283

R283

N16

N16

N16

Skreeny
(Rosclogher
By)

Amorset

Manorhamilton

R280

R280

Munakit
More
Lough

54°16'54"N

590000

840000

Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Enhancement lands

WFD - Groundwater Bodies

- Ballintougher
- Glenaniff
- Glencar
- Glenfarne
- Kilcoo
- Killarga
- Killarga South
- Kiltyclogher

0 1 2
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	24/02/2026	First issue	S.P	S.R

Client: FuturEnergy Ireland

Project: Lissinagroagh Wind Farm

Title: Figure 5-12: Survey Area for the proposed Wind Farm Site with ground water bodies

Scale @ A3: 1:40,000

Prepared by:	Checked by:	Date:
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Map Ref: 10955-073-GWB-P.App.BO-TOB-A

Draft: A

Table 5-12: Water quality status of groundwater bodies which underly the proposed Wind Farm Site

Water Body Name	WFD Reference	WFD Water Quality Status	Assessment Technique	Status Confidence	Limiting Element
Ballintougher	IE_WE_G_0051	Good	-	-	-
Ballymote	IE_WE_G_0037	Good	-	-	-
Dromahair	IE_WE_G_0054	Good	-	-	-
Glenaniff	IE_NW_G_043	Good	No Data	No Data	-
Glencar	IE_WE_G_0060	Good	Monitoring	Medium confidence	-
Glenfarne	IE_NW_G_042	Good	No Data	No Data	-
Kilcoo	IEGBNI_NW_G_017	Good	No Data	No Data	-
Killarga	IE_WE_G_0055	Good	No Data	No Data	-
Killarga South	IE_WE_G_0056	Good	No Data	No Data	-
Kiltyclogher	IE_NW_G_074	Good	No Data	No Data	-
Lavagh-Ballintougher	IE_WE_G_0038	Good	No Data	No Data	-

5.4.2 Field Survey Results

The findings of the ecological field surveys undertaken at the Survey Area for the proposed Wind Farm Site and along the GCR and the TDR in 2020, 2021, 2024, and 2025 are detailed in the following sections.

5.4.2.1 Habitats

5.4.2.1.1 Amenity grassland

This habitat was identified along roadside verges in urban areas along the TDR. A combined total of 0.26ha is located at POI 13, 14, 15, 17, 48, 52, and 53.

The habitat is species poor and dominated by annual meadow grass (*Poa annua*), with ruder weedy species such as daisy (*Bellis perennis*) and dandelion (*Taraxacum officinale* agg.) also present.

The habitat is valued as of **Local Importance (lower value)** because it is likely of some local importance for wildlife.

5.4.2.1.2 Buildings and Artificial Surfaces (BL3)

The buildings and artificial surfaces (BL3) identified within the Survey Area for the proposed Wind Farm Site consists of: public roads, agricultural sheds, derelict and inhabited houses. The habitat is dominant along the public roads identified for the proposed GCR and TDR.

The habitat is man-made and supports low diversity of flora. However, six derelict buildings within the ZoI were identified as supporting bat roosts (Building 4, Building 6, Building 7, Building 8, Building 12 and Building 19). As such, these features are of higher ecological value. Bat roosts are protected under Annex IV of the Habitats Directive. The impact of the Proposed Project on bat species is discussed further in Section 5.6.2.8.

The buildings which have been identified confirmed roosts are valued as of **Local Importance (higher value)** as it supports a locally important resident population of Annex IV species.

5.4.2.1.3 Conifer Plantation (WD4)

Conifer plantation (WD4) is the most widespread habitat within the Survey Area for the proposed Wind Farm Site, amounting to a combined total of 609.43ha. It occurs in all areas except for the centre of the Survey Area for the proposed Wind Farm Site, which is dominated by Wet grassland (GS4).

The habitat is species poor and dominated by non-native species, which are often planted in monocultural stands of Sitka spruce (*Picea sitchensis*), Norwegian spruce (*Picea abies*), and Lodgepole pine *(Pinus contorta)*. Native species recorded in the understory and ground flora consists of: bramble (*Rubus fruticosus agg.*), bracken (*Pteridium aquilinum*), ling heather (*Calluna vulgaris*), gorse (*Ulex europaeus*), creeping buttercup (*Ranunculus repens*), tormentil (*Potentilla erecta*), fox glove (*Digitalis purpurea*), male fern (*Dryopteris filix-mas*), ivy (*Hedera hibernica*) and ragged robin (*Silene flos-cuculi*). Bryophyte species include great wood rush (*Luzula sylvatica)*, glittering wood moss (*Hylocomium splendens*), springy-turf moss (*Rhytidiadelphus squarrosus*), and peat mosses (*Sphagnum* spp.).

The habitat is valued as of **Local Importance (lower value)** because it is dominated by non-native species and as such will not be considered further in this assessment.

5.4.2.1.4 Cutover Bog (PB4)

Cutover bog (PB4) is located at discrete locations within the peatland habitats within the Survey Area for the proposed Wind Farm Site, with parcels of Cutover bog (PB4) mapped in the immediate vicinity of T3, to the south of T4, as well as to the east and north-east of T10 (Figure 5-13). A combined total of 5.54ha is located within the Survey Area of the proposed Wind Farm Site.The habitat is in overall poor condition often failing several condition criteria in the assessment for the non-priority Annex I habitat type 7130 Blanket bog (inactive), including: number of positive indicator species, cover of disturbed bare ground, dominance of purple moor-grass (*Molinia caerulea*), cover of heather (*Calluna vulgaris*), and cover of cutting/ditches/tracking/trampling (see Appendix 5-2). As such, the Cutover bog (PB4) within the Survey Area for the proposed Wind Farm Site is considered non-priority Annex I habitat type 7130 Blanket bog (inactive) in Unfavourable Bad condition with an overall conservation status of Unfavourable Bad.

The Cutover bog (PB4) at T3 (Site A) is in a highly degraded condition existing with ongoing threats to the integrity of the habitat include drainage and grazing pressures (see Appendix 5-2). Only a "small to very small quantity" of the peat forming *Sphagnum papillosum* was recorded within the habitat (see Appendix 5-2). The survey found that the peatland flora recorded here already "tends towards the drier type" and the habitat is currently considered inactive as denoted by the selection of the non-priority Annex I habitat type (see Appendix 5-2).

The Cutover bog (PB4) at T4 (Site B) is located within four distinct parcels c. 40m south of the proposed hardstand. Here, the species diversity is low with purple moor-grass (*Molinia caerulea*) and hare's-tail cottongrass (*Eriophorum vaginatum*) dominant. The vegetation composition lacks positive indicator species. Encroachment from non-native conifer saplings is an ongoing threat to the habitat.

The Cutover bog (PB4) at T10 (Site C) is located within two distinct parcels to the east and north-east of the proposed hardstand (Photo 5-1). Species diversity is low and positive indicator species are lacking. The vegetation tussocky and purple moor-grass (*Molinia caerulea*) and dominant.

The following species were recorded within the habitat: ling heather (*Calluna vulgaris*), purple moor-grass (*Molinia caerulea*), bog asphodel (*Narthecium ossifragum*), hare's-tail cottongrass (*Eriophorum vaginatum*), common cottongrass (*Eriophorum angustifolium*), cross-leaved heath (*Erica tetralix*), and heath rush *(Juncus squarrosus)*. The bryophyte layer consists of peat mosses (*Sphagnum* spp.): papillose bog-moss (*Sphagnum papillosum*), feathery bog-moss (*Sphagnum cuspidatum*), blunt-leaved bog-moss (*Sphagnum palustre*), *and* flat-topped bog-moss (*Sphagnum fallax*).

Where there is potential for restoration of peatlands in unfavourable condition, it is essential not to under value the ecological importance of the habitat (CIEEM, 2018). Even in degraded condition peatlands can support high biodiversity in a local context, such as positive indicator species and near natural features (CIEEM, 2018).

The Cutover bog (PB4) habitat is considered a semi-natural habitat with high biodiversity context in spite of its degraded condition. Remnants of Cutover bog (PB4) are essential to maintain links between parcels of higher value peatland habitat, such as Upland blanket bog (PB2). As such, the habitat is valued as of **Local Importance (higher value)**.

Photo 5-1: Cutover bog (PB4) east of T10

5.4.2.1.5 Depositing/Lowland Rivers (FW2)

The habitat type Depositing/lowland rivers (FW2) was identified at four locations along the GCR (Aquatic Site 17, 18, 21 and 22).

The proposed GCR located along the local road (L4165) intersects and crosses the Bonet_050 (IE_WE_35B060630) at Site 22. This river is wide and slow flowing with steep banks. The Bonet_050 is a protected watercourse as it is included within the boundaries of Lough Gill SAC. At Aquatic Site 17, the proposed GCR crosses the Shaunvas_010 (IE_WE_35S011100), which is also located within the boundaries of Lough Gill SAC and as such is a protected watercourse.

Species growing along the bank consists of: grey willow (*Salix cinerea)*, white willow (*Salix alba*), and alder (*Alnus glutinosa).* Several invasive non-native species were also recorded along the riverbank, including sycamore (*Acer pseudoplatanus*), montbretia (*Crocosmia × crocosmiiflora*), and Himalayan balsam (*Impatiens glandulifera*) which is listed on the Third Schedule (S.I. 477/2011).

The Depositing/lowland rivers (FW2) at Site 22 (Bonet_050) and Aquatic Site 17 (Shaunvas_010) are located within the boundaries of Lough Gill SAC and is therefore valued to

be of **International Importance.** Other Depositing/lowland rivers (FW2) along the GCR are valued as of L**ocal (higher) Importance**.

5.4.2.1.6 Drainage Ditches (FW4)

A combined total of 22,430m of drainage ditches (FW4) were mapped throughout the Survey Area for the proposed Wind Farm Site. The habitat was also identified as along the proposed GCR (Aquatic Site 2, 12, 16) and TDR. The condition of this habitat is classified as poor to moderate. Some ditches were noted carrying a flow of water, some with a damp bed, and others were dry at time of survey (September 2022 and 2023, August 2024 and April 2025).

Species consists of: bramble (*Rubus fruticosus* agg.), soft rush (*Juncus effusus*), flat-topped bog-moss (*Sphagnum fallax*), dog rose (*Rosa canina*), nettle (*Urtica dioica*), horsetail (*Equisetum* sp.), common hogweed (*Heracleum sphondylium*), and yellow iris (*Iris pseudacorus*).

The habitat is valued to be of **Local Importance (higher Value)** because Drainage ditches (FW4) act as ecological corridors within the landscape, often connecting features of higher ecological value.

5.4.2.1.7 Dry-humid and Acid Grassland (GS3)

Dry-Humid Acid Grassland (GS3) occurs at several discrete locations within the Survey Area for the proposed Wind Farm Site, amounting to a combined total of 4.79ha. One notable area is located to the east of the site, along a steep sloping ravine (Photo 5-2). Species recorded within this habitat include bent grasses (*Agrostis* spp.), annual meadow-grass (*Poa annua*), Yorkshire fog (*Holcus lanatus*), soft rush (*Juncus effusus*), meadow buttercup (*Ranunculus acris*), bird's-foot-trefoil (*Lotus corniculatus*), tormentil (*Potentilla erecta*), pineapple weed (*Matricaria discoidea*), foxglove (*Digitalis purpurea*), coltsfoot (*Tussilago farfara*), and peat mosses (*Sphagnum* spp.).

Dry/humid acid grassland (GS3) is also present in small parcels within the Survey Area for the proposed Wind Farm Site at Site A and Site C, both of which were surveyed during the Annex I habitat assessments (see Appendix 5-2). However, the habitat does not correspond to any Annex I habitat types. Additionally, Dry/humid acid grassland (GS3) occurs in a mosaic with dry siliceous heath (HH1) near the summit of Saddle Hill (Site A), in the immediate vicinity of turbine T3, where it is subject to heavy grazing. Typical species at this location include heath bedstraw (*Galium saxatile*), common bent (*Agrostis capillaris*), mat-grass (*Nardus stricta*), and soft rush (*Juncus effusus*).

The habitat is valued as **Local Importance (lower value)** as a site of semi-natural habitat that is of some importance for local wildlife but is not considered to have high biodiversity. As such, the habitat will not be considered further in this assessment.

Photo 5-2: Dry-Humid Acid Grassland GS3 along Ravine

5.4.2.1.8 Dry Meadows and Grassy Verges (GS2)

Dry meadows and grassy verges (GS2) were frequently recorded along the existing access roads within the Survey Area for the proposed Wind Farm Site, amounting to a combined total of 12.31ha. As the habitat is associated with linear features of the access roads it provides good connectivity within the Survey Area for the proposed Wind Farm Site.

Species consists of: annual meadow-grass (*Poa annua*), Yorkshire fog (*Holcus lanatus*), bent grasses (*Agrostis spp.*), purple moor-grass (*Molinia caerulea*), wavy hair-grass (*Deschampsia flexuosa*), and sweet vernal-grass (*Anthoxanthum odoratum*). The herbaceous component displays low to moderate species diversity with white clover (*Trifolium repens*), heath bedstraw (*Galium saxatile*), herb Robert (*Geranium robertianum*), coltsfoot (*Tussilago farfara*), eyebright (*Euphrasia officinalis*), marsh thistle (*Cirsium palustre*), ribwort plantain (*Plantago lanceolata*) and occasional to locally frequent devil's-bit scabious (*Succisa pratensis*).

Within the Survey Area for the proposed Wind Farm Site, the recorded dry meadows and grassy verges were valued to be of **Local Importance (higher value)**, as subsections of this habitat were identified as supporting local populations of marsh fritillary (*Euphydryas aurinia*) and the habitat is essential in maintaining ecological corridors and supporting features of higher ecological value.

This habitat was also evident along the TDR, with a combined total of approximately 0.3ha recorded at POI 44, 45, 49, 50, 51 and 52. The habitat was primarily identified at vegetated roadside verges and green areas of roundabouts and as such is subject to routine management

and mowing. Species diversity is little as a result and was largely comprised of perennial rye grass *(L. perenne*). For this reason, dry meadows and grassy verges along the TDR were valued to be of **Local Importance (lower value)** will not be considered further within this assessment.

5.4.2.1.9 Dry siliceous heath (HH1)

Dry siliceous heath (HH1) is highly localised to the northern extent of the Survey Area for the proposed Wind Farm Site, with a combined total of 2.81ha present (Site A as presented in (see Appendix 5-2). Two moderately sized parcels (c. 0.5 ha and 1.2 ha) are located to the west-south-west of T3, at a distance of c. 35 m and 160m respectively. Two smaller parcels (<0.3 ha) are located to the east of T3 at a distance of c. 145 m. The mapped areas of Dry siliceous heath (HH1) on Saddle Hill correspond to the Annex I habitat type 4030 European dry heaths in Unfavourable Inadequate/Bad condition with an overall conservation status of Unfavourable Inadequate/Bad. On-going threats to the integrity of the habitat include grazing pressure. Failed assessment criteria include a lack of positive indicator species, and limited heather (*Calluna vulgaris)* growth phases. Dry siliceous heath (HH1) also occurs in a mosaic with Dry/humid acid grassland (GS3) near the summit of Saddle Hill in the immediate vicinity of T3.

Species consists of: heather (*Calluna vulgaris*), bell heather (*Erica cinerea*), green-ribbed sedge (*Carex binervis*), little shaggy-moss (*Rytidiadelphus loreus*), and glittering-wood moss (*Hylocomium splendens*).

Dry siliceous heath (HH1) corresponding to Annex I habitat type 4030 European dry heaths in unfavourable condition is valued as of **County Importance**.

5.4.2.1.10 Dry siliceous heath (HH1)/Dry humid acid grassland (GS3)

A mosaic of Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) habitat is located in the immediate vicinity of T3 within the Survey Area for the proposed Wind Farm Site, amounting to 3.61ha in total. The parcel measures 1.15ha in size. The grazing pressure is recorded a "obviously significant" (see Appendix 5-2). In general, this dry heath is clearly not in good condition owing to grazing pressure, which is the reason it exists in a mosaic with acid grassland.

While the heath components of the habitat correspond to the Annex I habitat type 4030 European dry heaths, the Dry humid acid grassland (GS3) components do not. Indeed, the Dry humid acid grassland (GS3) components are indicative of the severe grazing pressure noted throughout the habitat.

Within this in this dry heath mosaic habitat, two monitoring stops were taken and both failed due to the low number of positive indicator species present. As such, the habitat shows relatively low species diversity for Dry siliceous heath (HH1). Consequently, the habitat condition is assessed as poor with the structure and functions assessed as Unfavourable Bad, and the overall conservation status also considered Unfavourable Bad.

The dry heath habitat within the Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) mosaic corresponds to the Annex I habitat type 4030 European dry heaths in unfavourable condition is considered of **County Importance.**

5.4.2.1.11 Eroding/Upland Rivers (FW1)

These natural streams and small watercourses are often high gradient and fast flowing with steep banks. The riverbed is often composed of boulders, cobble or gravel. Silt and mud deposits

were rare occurrences within these habitats. Scrub (WS1) often covers the banks and margins of the Eroding/Upland rivers (FW1).

Species consists of: ash (*Fraxinus excelsior*), hazel (*Corylus avellana*), willow species (*Salix* spp.), bramble (*Rubus fruticosus* agg.), bracken (*Pteridium aquilinum*), hawthorn (*Crataegus monogyna*), Yorkshire fog (*Holcus lanatus*), and soft rush (*Juncus effusus*).

Further details of aquatic ecology of rivers can be found in (see Appendix 5-4).

Twelve named Eroding/Upland rivers (FW1) drain the lands within the Survey Area for the proposed Wind Farm Site (Table 5-13). In addition to these mapped watercourses, several unmapped Eroding/upland rivers (FW1) were recorded within the west and east of the Survey Area for the proposed Wind Farm Site (Figure 5-13).

Table 5-13: Eroding/Upland rivers (FW1) which drain the lands within the Survey Area for the proposed Wind Farm Site

EPA Name (Code)	WFD Name (Code)
Boleyboy 35 (35B77)	Owenmore (Manorhamilton)_020 (IE_WE_35O080400)
Curraghfore (35C68)	Brackary_10 (IE_WE_35B100500)
Faughary (35F13)	Brackary_10 (IE_WE_35B100500)
Mt_Dough (35M62)	Owenmore (Manorhamilton)_020 (IE_WE_35O080400)
Moneenshinnagh 35 (35M60)	Owenmore (Manorhamilton)_020 (IE_WE_35O080400)
Lissinagroagh 35 (35L59)	Owenmore (Manorhamilton)_020 (IE_WE_35O080400)
Lattone 35(35L66)	Lattone_010 (IE_NW_35L660960)
Lisdarush (35L68)	Lattone_010 (IE_NW_35L660960)
Rosfriar (35R32)	Cornavannoge_010 (IE_NW_36C040400)
Tawnylust (35T47)	Owenmore (Manorhamilton)_020 (IE_WE_35O080400)
Twanyfeacle (35T21)	Owenmore (Manorhamilton)_020 (IE_WE_35O080400)
Skrenny (35S46)	Owenmore (Manorhamilton)_020 (IE_WE_35O080400)

Eroding upland rivers (FW1) are valued as being of **Local Importance (higher value)** as they fit the definition of semi-natural habitats with a high degree of naturalness and high biodiversity in a local context as well as providing ecological corridors within the landscape. However, Eroding upland rivers (FW1), which form part of the Lough Gill SAC are valued as of **International Importance.** These protected watercourses often define the boundaries of Lough Gill SAC.

The proposed GCR crosses Eroding/Upland rivers (FW1) at 16 locations in total. At three of these locations the Eroding/Upland rivers (FW1) are within the boundaries of Lough Gill SAC (Table 5-14).

Table 5-14: Eroding Upland Rivers (FW1) located within Lough Gill SAC which are crossed by the GCR

EPA Name (Code)	WFD Name (Code)	Aquatic Site
Bonet (35B06)	Bonet_030 (IE_WE_35B060200)	15
Boihy (35B75)	Bonet_040 (IE_WE_35B0609.500)	19
Killanummery (35K03)	Killanummery_010 (IE_WE_35K030600)	24

5.4.2.1.12 Exposed Sand, Gravel or Till (ED1)

Exposed Sand, Gravel or Till (ED1) was recorded within the mid-northern section of the Survey Area for the proposed Wind Farm Site, in the form of an excavated exposed pit. Species include: coltsfoot (*Tussilago farfara*), ribwort plantain (*Plantago lanceolata*) and dandelion (*Taraxacum officinale agg.*).

The habitat is valued as being of **Local Importance (lower value)** and will not be considered further within this assessment.

5.4.2.1.13 Exposed Calcareous Rock (ER2)

The habitat is highly localised and located to the south-east of T3, on the southern slopes of Saddle Hill, amounting to a combined total of 0.44ha. The habitat is present in "very small occurrences", where the limestone bedrock has become exposed, often measuring less than c. 50m x 25 m, with the largest expanse measuring c. 150m x 25 m (see Appendix 5-2). The habitat is heavily over-grazed, with "extreme shortness of vegetation" noted (see Appendix 5-2). The following species were recorded within the habitat: thistle *(Cirsium* spp.), wild thyme (*Thymus drucei*) and maidenhair spleenwort (*Asplenium trichomanes*). The habitat corresponds to the Annex I habitat type 8240* Limestone Pavements in Unfavourable Bad condition and the overall conservation status is also Unfavourable Bad.

The habitat is valued as of **County Importance**, as it is listed under Annex I of the Habitats Directive, but does not fulfil the criteria for a 'viable area' (NRA, 2009a). A viable area is broadly synonymous with favourable conservation status and is defined as a habitat which is resilient to stochastic change, such as climate change (NRA, 2009a).

5.4.2.1.14 Hedgerows (WL1)

Hedgerows (WL1) are a frequent feature along the proposed GCR and TDR. A combined total of 1,067m of Hedgerow (WL1) was recorded at POIs along the TDR at POI 1, 5, 10, 13, 39 and 43.

The extent of the habitat within the Survey Area of the proposed Wind Farm Site is limited to the southern access track. A combined total of 199m of Hedgerow (WL1) is located within the proposed Wind Farm Site, primarily along the southern entrance. The Hedgerows (WL1) are generally well established, and predominantly composed of native species, exhibiting poor-moderate structure.

Species include hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), ash (*Fraxinus excelsior*), holly (*Ilex aquifolium*), gorse (*Ulex europaeus*), bramble (*Rubus fruticosus* agg.), and willow (*Salix* spp.).

The habitat is valued as **Local Importance (higher value)**, because Hedgerows (WL1) function as ecological corridors within the landscape.

5.4.2.1.15 Improved Agricultural Grassland (GA1)

A small parcel of Improved Agricultural Grassland (GA1) was recorded along the internal access track to T13, within the proposed Wind Farm Site, amounting to a combined total of 0.52ha. A total of 0.1ha of Improved Agricultural Grassland (GA1) was recorded at POI 3 along the TDR.

The habitat supports relatively low biodiversity and shows evidence of heavy sheep grazing throughout. Species consists of: perennial rye-grass (*Lollium perenne*), Creeping buttercup (*Ranunculus repens*), white clover (*Trifolium repens*), annual meadow-grass (*Poa annua*), Yorkshire fog (*Holcus lanatus*), common daisy (*Bellis perennis*), broadleaved dock (*Rumex obtusifolius*) and soft-rush (*Juncus effuses*).

The habitat is considered to be of **Local Importance (lower value)** and will not be considered further within this assessment.

5.4.2.1.16 (Mixed) Broadleaved Woodland (WD1)

This habitat is located in three areas within the Survey Area for the proposed Wind Farm Site, two large parcels in the south-west and one small parcel to the east totalling 11.34ha. The largest parcel (c. 1.1 ha) in the south-west of the site is mature with the canopy height reaching c. 15m. The habitat borders the river and local road (L61801).

Tree and shrub composition includes: hawthorn (*Crataegus monogyna)*, beech (*Fagus sylvatica)*, ash, rowan (*Sorbus aucuparia)*, *willow*, elder (*Sambucus nigra*), downy birch (*Betula pubescens*), hazel (*Corylus avellana*), and holly (*Ilex aquifolium*). The ground flora consists of herb Robert (*Geranium robertianum*), nettle, and common hogweed (*Heracleum sphondylium*). The non-native Sitka spruce and the invasive non-native species sycamore (*Acer pseudoplatanus*) were also identified within these parcels.

This habitat was recorded at three POIs along the TDR, approximately 0.1ha at POI 38, 0.07ha at POI 42 and 0.03 ha at POI 45, totalling 0.2ha.

The habitat is also recorded at HDD Site 1 along the GCR.

The habitat is valued as **Local Importance (higher value)**, as it is a semi-natural habitat type with high biodiversity in a local context.

5.4.2.1.17 Mixed Broadleaved/Conifer Woodland (WD2)

This habitat was recorded on two occasions within the mid-western and northern area of the Survey Area for the proposed Wind Farm Site, amounting to a combined total of 16.2ha. The canopy is relatively open with a height reaching c. 20m. The dominant species is semi-mature Sitka spruce (*Picea sitchensis*) with an understory of native broadleaved trees and shrubs, including ash (Fraxinus excelsior), willow (*Salix* spp.), and hawthorn (*Crataegus monogyna*). The ground flora includes creeping buttercup (*Ranunculus repens*), marsh thistle (*Cirsium palustre*), hairy bittercress (*Cardamine hirsuta)*, nettle (*Urtica dioica*), and yellow iris (*Iris pseudacorus*).

The habitat has been valued as **Local Importance (lower value)**, as the dominant species is non-native, and as such will not be considered further.

5.4.2.1.18 Non-Marine Caves (EU1)

This habitat was recorded on two occasions within the mid to north section of the Survey Area for the proposed Wind Farm Site. These sink holes or caves are karstic features and contain underground streams.

The Annex I habitat type 8310 Caves not open to the public, can host endemic and highly specialised invertebrates and molluscs (European Commission, 2013:100). However, according to Article 17 reporting there is little evidence to suggest this is the case in Ireland (NPWS, 2019:1016). As such, in an Irish context the Annex I habitat type 8310 designation is restricted to caves which are not used for tourism and which host the Annex II species lesser horseshoe bat (*Rhinolophus hipposideros*) (NPWS, 2019:1016). The caves within the Survey Area for the proposed Wind Farm Site are not considered Annex I as the range of the lesser horseshoe bat does not extend to Leitrim (NPWS, 2019:1016).

Plant species recorded within and around this habitat consists of: rowan (*Sorbus aucuparia)*, ivy (*Hedera helix)*, male fern (*Dryopteris filix-mas*), bilberry (*Vaccinium myrtillus)*, primrose (*Primula vulgaris*), bluebell (*Hyacinthoides non-scripta*), foxglove (*Digitalis purpurea*), wood rush (*Luzula campestris*), and lesser celandine (*Ficaria verna*).

The habitat is valued as **local importance (higher value)**, as it is rare in a local context and as a hydrological feature it likely provides connectivity to other ecological features within the landscape.

Photo 5-3: Non-Marine Caves (EU1) near T7

5.4.2.1.19 Ornamental/ non-native shrub (WS3)

This habitat was identified along the GCR at three locations and approximately 39m of this habitat was recorded at POI 17. The habitat was dominated by non-native shrubby species at each location including *Cotoneaster* spp. As the habitat is dominated by non-native species, it is assessed as of **Local Importance (lower value)** and therefore will not be considered further within this assessment**.**

5.4.2.1.20 Recolonising Bare Ground (ED3)

Recolonising bare ground (ED3) is largely associated with the access roads distributed throughout the Survey Area for the proposed Wind Farm Site, where vegetation cover exceeds 50%. Plant species recorded in these habitats consists of: glittering wood-moss (*Hylocomium splendens*), soft rush, Yorkshire fog (*Holcus lanatus*), bramble (*Rubus fruticosus* agg.), sweet vernal grass (*Anthoxanthum odoratum*), and willow *(Salix* spp.).

A total of 0.15ha of this habitat was recorded along the TDR.

The habitat was valued as **Local Importance (lower value)** and therefore will not be considered further within this assessment.

5.4.2.1.21 Recently Felled Woodland (WS5)

A large expanse (c. 5.7 ha) of Recently felled woodland (WS5) is located in the south-eastern extent of the Survey Area for the proposed Wind Farm Site. The area was previously Conifer plantation (WD4), which was clear-felled and removed. The site is slow to recolonise with some soft rush, sweet vernal grass (*Anthoxanthum odoratum*), and peat mosses (*Sphagnum* spp.) noted.

This habitat has been valued as **Local Importance (lower value)** and will not be considered further.

5.4.2.1.22 Riparian Woodland (WN5)

The habitat is a linear feature (c. 1 ha) associated with the Skrenny (35S46) [Owenmore (Manorhamilton)_020], within the western area of the Survey Area for the proposed Wind Farm Site and to the north of T11. The habitat is relatively species rich.

The Riparian woodland (WN5) is described in the field notes as a strip of birch and willow which follows the stream. The canopy is dominated by willow (*Salix* spp.). No clear indicators of periodic flooding were recorded (e.g. accumulation of river borne debris, fine coating of grey mud on tree bases) (Fossitt, 2000). The steep banks of the Eroding upland river (FW1) further reduce the likelihood of flooding. While stands of willow along rivers are representative of the Fossitt (2000) Riparian woodland (WN5), the willow dominated gallery forests which are awarded Annex I status are distinguished by tree roots which are "almost continuously submerged" (Daly *et al*., 2023).

The Annex I habitat type 91E0* Alluvial forests have specific hydrological conditions which must occur for it to qualify, namely periodic flooding with heavy soils (European Commission, 2013). As these conditions do not occur within this habitatthere is no evidence to suggest that the necessary hydrological conditions are present to meet the criteria for Annex I status.

In terms of species composition, target species for the priority Annex I habitat type 91E0* Alluvial forests recorded in the Riparian woodland (WN5) consists of: willow (*Salix* spp.) which

was recorded as dominant, alder (*Alnus glutinosa*) which is recorded as frequent, and ash (*Fraxinus excelsior*) which is recorded as rare. A functioning alluvial forest will have good structural diversity and is a multi-layered system and the canopy should be dominated by ash (*Fraxinus excelsior*) and/or alder (*Alnus glutinosa*)" (Daly *et al*., 2023).

In terms of positive indicator species for the priority Annex I habitat type 91E0* Alluvial forests, four were identified out of a minimum requirement of six, namely: downy birch (*Betula pubescens*), hawthorn (*Crataegus monogyna*), meadow sweet (*Filipendula ulmaria*), and creeping buttercup (*Ranunculus repens*). The negative indicator species identified within the Riparian woodland (WN5) consists of the non-native species Sitka spruce (*Picea sitchensis*), beech (*Fagus sylvatica*), and larch (*Larix decidua*).

Other species frequently recorded within the habitat consists of: rowan (*Sorbus aucuparia*), blackthorn (*Prunus spinosa)*, bracken (*Pteridium aquilinum*), hard fern (*Blechnum spicant*), herb Robert (*Geranium robertianum*), bramble (*Rubus fruticosus* agg.), speedwells (*Veronica persica*), golden saxifrage (*Chrysosplenium oppositifolium*), primrose (*Primula vulgaris*), and bush vetch (*Vicia sepium).*

An Annex I assessment was not carried out in the field, as it was determined the Riparian woodland (WN5) habitat does not meet the criteria for Annex I status, in terms of hydrological conditions and species composition. It is therefore classified as Riparian woodland (WN5)

This habitat has been valued as of **Local Importance (higher value)**, as it is a semi-natural habitat with high biodiversity in a local context.

Photo 5-4: Riparian woodland (WN5) located north of T11

5.4.2.1.23 Scrub (WS1)

Scrub (WS1) is located throughout the Survey Area for the proposed Wind Farm Site, with some larger parcels (c. 1 ha) located to the south-east, amounting to a combined total of 16.97ha. The

habitat is often located along steep sloping ground, riverbanks, and ravines where grazing pressure from livestock is likely lower.

This habitat was recorded at two POIs along the TDR, approximately 0.01ha at POI 13 and 0.09ha at POI 43.

Species consists of: grey willow (*Salix cinerea*), goat willow (*Salix caprea*), gorse (*Ulex europaeus*), downy birch (*Betula pubescens*), alder (*Alnus glutinosa*), bramble (*Rubus fruticosus* agg.), and ling heather (*Calluna vulgaris*), with a ground layer including soft rush (*Juncus effusus*) and willowherb (*Chamaenerion angustifolium*).

The habitat has been valued as **Local Importance (higher value)** as it is a semi-natural habitat essential in maintaining linkages between features of higher ecological value.

Photo 5-5: Scrub (WS1) along a steep ravine

5.4.2.1.24 Spoil and Bare Ground (ED2)

The habitat is associated with the access roads throughout the Survey Area for the proposed Wind Farm Site. Spoil and bare ground (ED2) can include paved surfaces, unlike Recolonising bare ground (ED3). Frequent disturbance from vehicles, machinery and livestock mean bare ground is an inherent component of this habitat and vegetation cover does not exceed 50%.

Species consists of: bramble, Yorkshire fog (*Holcus lanatus*), sweet vernal grass (*Anthoxanthum odoratum*), annual meadow-grass (*Poa annua*), soft rush, thistle (*Cirsium* spp.), white clover (*Trifolium repens*), and glittering wood-moss (*Hylocomium splendens*).

This habitat was valued as being of **Local Importance (lower value)** and will not be considered further within this assessment.

5.4.2.1.25 Stonewalls and Other Stonework (BL1)

Stonewalls and other stonework (BL1) is a commonly occurring habitat along the TDR and GCR. It is often co-occurring with other linear habitats such as Hedgerows (WL1) and Drainage ditches (FW4). Approximately 71m of this habitat was also noted within POI 21 along the TDR. Stone walls and other stonework (BL1) is present in the form of a derelict building without a roof (not a Potential Roost Feature for bats) within the Survey Area for the proposed Wind Farm Site, located in the immediate vicinity of T6.

The habitat is present in the form of dry-stone walls, the walls of bridges along watercourse crossings along the GCR. The habitat often supports a diversity of mosses and ferns (Fossitt, 2000). The habitat functions as an ecological corridor between features of higher ecological value and is valued as of **Local Importance (higher value)**.

Recorded species consists of: ivy (*Hedera hibernica*), meadowsweet (*Filipendula ulmaria*), bracken (*Pteridium aquilinum*), cocksfoot (*Dactylis glomerata*), and ash (*Fraxinus excelsior*).

5.4.2.1.26 Treelines (WL2)

Approximately 283m of this habitat was recorded along the TDR at various POIs, namely; POI 1, 5, 10, 13, 39, 43. A total of 867m of Treeline (WL2) is also present within the southern and eastern sections of the Survey Area for the proposed Wind Farm Site.

Species consists of: ash, willow species, alder, hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), and holly (*Ilex aquifolium*). The non-native horticultural species Leyland cypress (*Cupressus × leylandii*) was also recorded within this habitat.

The habitat is valued as of **Local Importance (higher value)** due to its function as an ecological corridor within the landscape.

5.4.2.1.27 Upland Blanket Bog (PB2)

Upland Blanket Bog (PB2) is largely located in the north of the Survey Area for the proposed Wind Farm Site with some smaller parcels persisting between the Conifer plantations (WD4) to the south. A combined total of 38.83ha of Upland blanket bog (PB2) is present within the Survey Area of the proposed Wind Farm Site. The habitat corresponds to the priority Annex I habitat type 7130* Blanket bog (active) and non-priority Annex I habitat type 7130 Blanket bog (inactive).

The Upland blanket bog (PB2) in the immediate vicinity of the proposed access track to T3 (Site A, see Appendix 5-2). corresponds to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in Unfavourable Bad condition with an overall conservation status of Unfavourable Bad. The vegetation composition in this area failed two out of three assessment stops and lacks the required positive indicator species. The Habitat Condition Survey (see Appendix 5-2) noted that the vegetation is “evidently rather dry” with relatively low species diversity and some species becoming locally dominant e.g. heather (*Calluna vulgaris*) The dryness is attributed to historic turf-extraction in the immediate vicinity as well as the underlying limestone bedrock (see Appendix 5-2). On-going threats to the integrity of the habitat include livestock grazing.

A parcel of intact Upland blanket bog (PB2) located c. 210m to the south-west of T3 (Site A) corresponds to the priority Annex I habitat type 7130* Blanket bog (active). Here three out of the four monitoring stops conducted passed all assessment criteria. This included a pass for the

required number of positive indicator species present within the immediate vicinity (<2m) of the monitoring stop location. As such, the habitat was assessed as in Favourable condition but with an overall conservation status of Unfavourable Inadequate due to identified threats to the integrity of the habitat, including grazing.

The Upland blanket bog (PB2) located c. 5 m to the south of T4 (Site B) is sub-divided based on habitat condition assessment results. The smaller parcels to the northern and western extent of Site B corresponds to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable bad condition. On-going threats to the habitat include encroaching non-native conifer saplings, drainage, and erosion. The larger parcel of Upland blanket bog (PB2) located c. 40m to the south of T4 (Site B) corresponds to the priority Annex I habitat type 7130* Blanket bog (active) in favourable condition. High species diversity was recorded in the area and all five of the monitoring stops conducted for area passed the assessment. The overall conservation status of the habitat is considered Unfavourable Inadequate, due to identified threats to the integrity of the habitat such as (WD4) Conifer plantation.

A linear strip of Upland blanket bog (PB2) is the only peatland habitat to the east of T10 (Site C) which lies within the boundary of the proposed Wind Farm Site, as the remaining Upland blanket bog (PB2) surrounding T10 falls outside the boundary. This area is discussed and mapped in detail in (see Appendix 5-2). The Upland blanket bog (PB2) corresponds to non-priority Annex I habitat type 7130 Blanket bog (inactive) in Unfavourable bad condition with an overall conservation status of Unfavourable bad. Of the sixteen monitoring stops conducted at Site C, all but one failed on species diversity. On-going threats to the habitat include drainage and the presence of self-seeded non-native conifers.

Species consists of: purple moor-grass (*Molinia caerulea*), deergrass (*Trichophorum germanicum*), common cottongrass (*Eriophorum angustifolium*), hare's-tail cottongrass (*Eriophorum vaginatum*), cross-leaved heath (*Erica tetralix*). The bryophyte layer is composed of delicate bog-moss (*Sphagnum tenellum*), papillose bog-moss (*Sphagnum papillosum*), red bog-moss (*Sphagnum capillifolium*), glittering wood-moss (*Hylocomium splendens*), woolly fringe-moss (*Racomitrium lanuginosum*), and *Cladonia* spp.

Upland blanket bog (PB2) corresponding to Annex I habitat type 7130* Blanket bog (active) in favourable condition is valued as of **National Importance**, while that corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition is valued as of **County Importance**.

Photo 5-6: Upland bog (PB2) located to the south-east of T3

5.4.2.1.28 Wet Grassland (GS4)

The habitat is widespread throughout the Survey Area for the proposed Wind Farm Site, often in large parcels (c. >5 ha) amounting to a combined total of 132.45ha. Survey results show the parcels of Wet grassland (GS4) at T7 and as well as proposed road widening works between T6 and T10 were noted as being heavily grazed by sheep. As such, the Wet grassland (GS4) at these locations supports low species diversity (Section 5.4.2.1.28).

Wet grassland (GS4) habitat was recorded along the TDR at POI 44, c. 0.1ha.

Species include soft rush (*Juncus effusus*), common bent (*Agrostis capillaris*), meadow buttercup (*Ranunculus acris*), sweet vernal grass (*Anthoxanthum odoratum*), marsh thistle (*Cirsium palustre*), common haircap (*Polytrichum commune*), and creeping buttercup (*Ranunculus repens*).

The habitat is valued as **Local Importance (lower value)** and will not be considered further.

5.4.2.1.29 Wet Heath (HH3)

Wet heath (HH3) is located across the Survey Area for the proposed Wind Farm Site in discrete parcels, between Conifer Plantation (WD4). A combined total of 4.1ha of Wet heath (HH3) is present within the Survey Area for the proposed Wind Farm Site.

Species include ling heather (*Calluna vulgaris)*, cross leaved heath (*Erica tetralix*), purple moor grass (*Molinia caerulea)*, common haircap (*Polytrichum commune*), red bog moss (*Sphagnum capillifolium*), creeping cinquefoil (*Potentilla reptans),* bilberry (*Vaccinium myrtillus)*, deergrass (*Trichophorum germanicum)* and glittering wood-moss (*Hylocomium splendens*). Specific Annex I assessments were not conducted within the Wet Heath (HH3) habitat at these locations, and as such, the habitat is considered to correspond to Annex I habitat type 4010 Northern Atlantic wet heaths with *Erica tetralix* in favourable condition on a precautionary basis.

There is also a small amount of Wet heath (HH3) to the south of T4 (Site B), which was identified during the Annex I surveys. This occurrence of the habitat lies outside the Survey Area for the proposed Wind Farm Site. It corresponds to the Annex I habitat type 4010 Northern Atlantic

wet heaths with *Erica tetralix* in favourable condition. The overall conservation status of the habitat is considered Unfavourable Inadequate, due to ongoing threats to the integrity of the habitat including (WD4) Conifer plantation.

Species consists of: purple moor-grass (*Molinia caerulea*), heather (*Calluna vulgaris*), cross-leaved heath (*Erica tetralix*), bell heather (*Erica cinerea*), red-peat moss (*Sphagnum capillifolium)*, and woolly-fringe moss (*Racomitrium lanuginosum*).

Wet heath (HH3) corresponds to Annex I habitat type 4010 Northern Atlantic wet heaths with *Erica tetralix* in favourable condition and is valued of **National Importance**.

5.4.2.1.30 Wet willow-alder-ash woodland (WN6)

Wet willow-alder-ash woodland (WN6) is located along the GCR at six locations all constituting small woodland parcels (<1ha). This habitat was located along the banks of the River Bonet (Bonet_030, Bonet_040, and Bonet_050) and evidence of continuous waterlogging or periodic flooding was noted at almost all these locations. The two locations where waterlogging and flooding was not noted were at Aquatic Sites 18 and 20. At these two locations the canopy was dominated by scrubby grey willow (*Salix cinerea*). The willow gallery forests which are awarded Annex I status are dominated by tall non-native white willow (*Salix alba*) and tree roots which are "almost continuously submerged" (Daly *et al*., 2023:47). As such, Aquatic Site 18 and 20 do not meet these Annex I criteria. At these sites, Wet willow-alder-ash woodland (WN6) is valued at **Local Importance (higher value)**. Aquatic Site 18 is by far the largest of all Wet willow-alder-ash woodland (WN6) parcels measuring 0.9ha.

At the remaining four locations (Aquatic Site 28, 13, 14 and 16) the woodland supports near-natural features and a canopy dominated by alder (*Alnus glutinosa*) with ash (*Fraxinus excelsior*) and grey willow (Salix cinerea) (see Appendix 5-3). These are the target species for Annex I habitat type 91E0 Alluvial forests. Evidence of periodic flooding or waterlogging was noted at these locations, which is a determining feature of Annex I habitat type 91E0 Alluvial forests. As such, at these locations (Aquatic Site 28, 13, 14 and 16) the woodland parcels show potential affinity to the Annex I habitat type 91E0 Alluvial forests.

In terms of positive indicator species for the priority Annex I habitat type 91E0* Alluvial forests, a maximum of four were identified at one location out of a minimum requirement of six (Site 28). The positive indicator species recorded across the woodland parcels consists of: downy birch (*Betula pubescens*), meadow sweet (*Filipendula ulmaria*), creeping buttercup (*Ranunculus repens*), nettle (*Utrica dioica*) yellow iris (*Iris pseudacorus*), and water mint (*Mentha aquatica*).

It is important to note that Annex I habitat type 91E0* Alluvial forests is still assigned Annex I status, even when the condition of the habitat is unfavourable, provided the aforementioned criteria regarding waterlogging and species composition are met (Daly *et al*., 2023).

However, the size of the woodland parcels at Aquatic Site 28, 13, 14 and 16 are very small (each measuring <0.34ha). Best practice guidance advises that discontinuous strips of woodland which are surrounded by open habitat should not be assigned to Annex I habitat type 91E0 Alluvial forests, if they cannot be considered to be functioning woodlands (Daly *et al*., 2023). In this case, the woodland parcels although small and fragmented show good connectivity with hedgerows, scrub and other woodlands within the wider landscape.

Although an Annex I assessment was not conducted in the field, the Wet willow-alder-ash woodland (WN6) habitat at Aquatic Site 12, 13, 14 and 16 likely correspond to the Annex I habitat type 91E0 Alluvial forests. Due to the low number of positive indicator species recorded at each woodland parcel and the lack of structural diversity within the largely immature stands, the habitat is determined to be in unfavourable condition.

The locations of these woodland parcels fall outside of Lough Gill SAC for which the Annex I habitat type 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) is a QI. As such, Wet willow-alder-ash woodland (WN6) is assessed as of **County Importance.**

Photo 5-7: Wet willow-alder-ash woodland (WN6) at Aquatic Site 28

Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Turbine Locations
- Site layout footprint
- BL3 - Buildings and artifical surfaces
- FW1 - Eroding/ upland rivers
- FW4 - Drainage ditches
- WL1 - Hedgerows
- WL2 - Treelines
- BL3 - Buildings and artifical surfaces
- ED1 - Exposed sand, gravel or till
- ED2 - Spoil and bare ground
- ED3 - Recolonising bare ground
- ER2 - Exposed calcareous rock
- EU1 - Non-marine caves
- GA1 - Improved agricultural grassland
- GS1 - Dry calcareous
- GS2 - Dry meadows and grassy verges
- GS3 - Dry-humid acid grassland
- GS4 - Wet grassland
- HH1 - Dry siliceous heath
- HH1/GS3 - Dry siliceous heath/Dry humid acid grassland mosaic
- HH3 - Wet heath
- PB2 - Upland blanket bog
- PB4 - Cutover bog
- PF2 - Poor fen and flush
- WD1 - (Mixed) broadleaved woodland
- WD2 - Mixed broadleaved/ conifer woodland
- WD4 - Conifer plantation
- WN5 - Riparian woodland
- WS1 - Scrub
- WS5 - Recently felled woodland

0 0.5 1
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	24/03/2026	First issue	S.P	S.R

Client: Ireland FuturEnergy

Project:
Lissinagroagh Wind Farm

Title:
Figure 5-13:
Fossitt 2000 habitat types mapped within the Survey Area for the proposed Wind Farm Site.

Scale @ A3: 1:21,000

Prepared by:	Checked by:	Date:
S.Pezzetta	S.Ryan	March 2026

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Map Ref: 10955-042-HAB-P.App.BO-TOB-A

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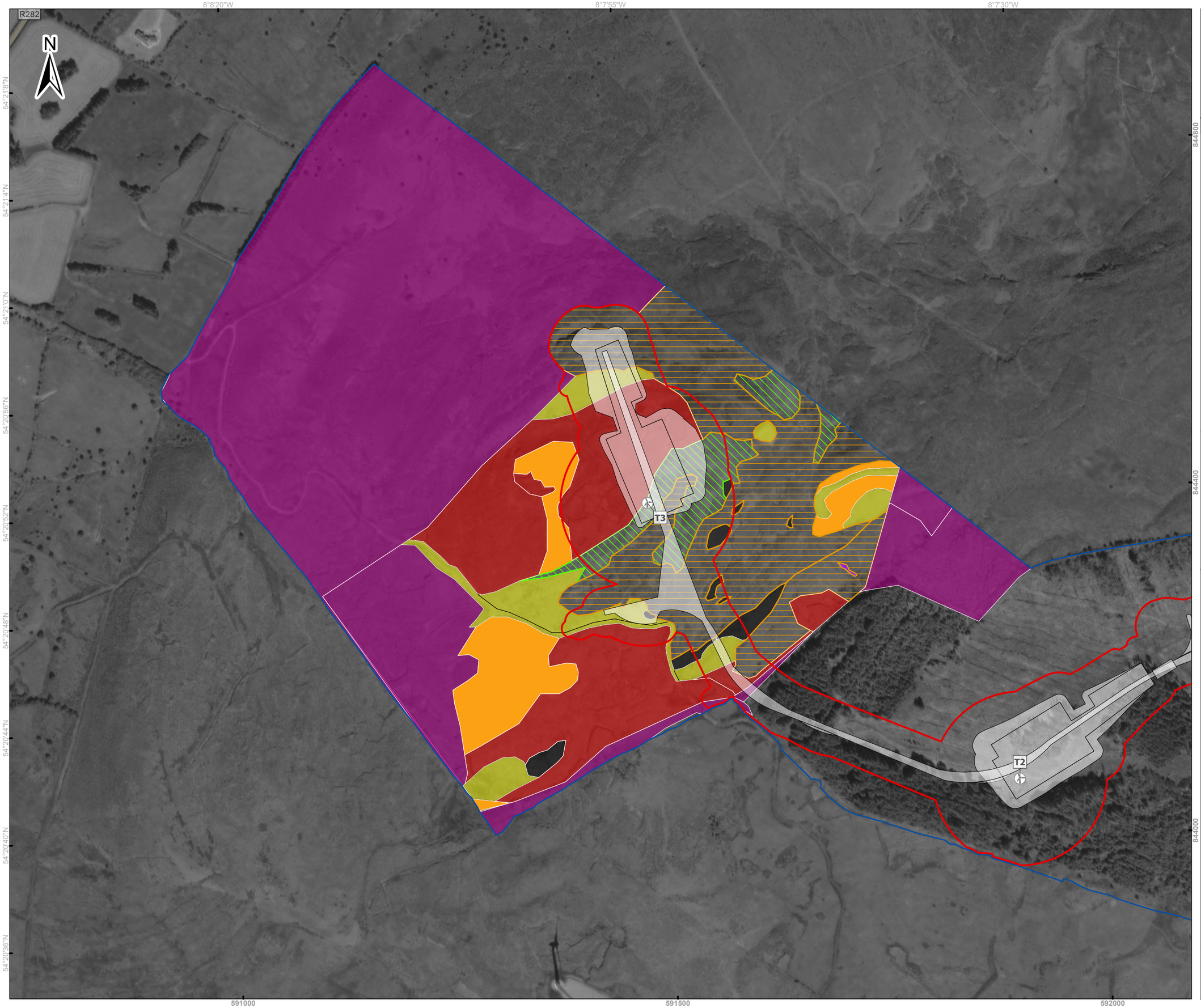

Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Turbine Locations
- Site layout footprint

Annex I Habitats

- GS3 - Dry-humid acid grassland
- PF2 - Poor fen and flush
- ER2 - Exposed calcareous rock Priority Annex I 8240* Limestone Pavements
- HH1 - Dry siliceous heath Annex I 4030 European dry heath
- HH1/GS3 - Dry siliceous heath/Dry humid acid grassland mosaic Annex I 4030 European dry heath
- PB2 - Upland blanket bog Non-priority Annex I 7130 Blanket bog
- PB2 - Upland blanket bog Priority Annex I 7130* Blanket bog (active)
- PB4 - Cutover bog Non-priority Annex I 7130 Blanket bog

0 100 200
Metres

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	23/02/2026	First issue	S.P	S.R

Client: Ireland FuturEnergy

Project: Lissinagroagh Wind Farm

Title: Figure 5-14: Annex I Habitat in the Immediate Vicinity of T3

Scale @ A3: 1:4,000

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Map Ref: 10955-043-HAB..AnnexI-P.App.BO-TOB-A

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5.4.2.2 Flora Protection Order Species

The two FPO species bristle-leaf and small white orchid are easily "overlooked" during field surveys due to their diminutive stature (Walker, 2014:1): Bristle-leaf is a "very small" moss, measuring 1-2mm in height (Atherton *et al.*, 2025). Small-white orchid has a short flowering period from mid-May to mid-July and "has a tendency to form small populations" (Walker, 2014).

Due to existing records of bristle-leaf and small-white orchid within the vicinity (c. 1km) of the Survey Area for the proposed wind farm site, there is potential for these species to occur within the proposed Wind Farm Site.

Potentially suitable habitat for bristle-leaf within the Survey Area for the proposed Wind Farm Site includes sandstone rocks, on north facing slopes, near rivers, and above 100m altitude (Lockhart *et al.*, 2012). No specific survey for the location of sandstone rocks was conducted during field surveys.

Potentially suitable habitat for bristle-leaf within the Survey Area for the proposed Wind Farm Site includes Non-marine caves (EU1) located to the south of T7, which fit the definition of vertical or overhanging rocks (Section 5.4.2.1.18). Although, this habitat is less likely to support bristle-leaf, as no records exist for the species on calcareous rocks in Ireland (Lockhart *et al.*, 2012). For health and safety reasons, no survey of the Non-marine caves (EU1) was undertaken.

The most likely habitat to support small-white orchid within the Survey Area for the proposed Wind Farm Site is Wet grassland (GS4) habitat, given this is the habitat where the local population occurs (Section 5.4.1.3.1.2). Wet Grassland is located throughout the Survey Area for the proposed Wind Farm Site, often in large parcels (c. >5 ha) (Section 5.4.2.1.28). Parcels of Wet grassland (GS4) occurring within the footprint of the proposed Wind Farm Site includes T6, T7, T9, and T13 as well as road widening works between T6 and T10. However, survey results show the Wet grassland (GS4) at T7 and as well as proposed road widening works between T6 and T10 was noted as being heavily grazed by sheep. As such, the Wet grassland (GS4) at these locations supports low species diversity (Section 5.4.2.1.28).

In Ireland, small-white orchid displays a preference for pasture which is lightly grazed by cattle and not areas over grazed by sheep (Walker, 2014). Over grazing has been reported to "reduce seed set and recruitment" impacting viability of local populations (Walker, 2014:3). As such, following field surveys the suitability of these sites for the species is considered low.

Small-white orchid also occurs in heathland (Walker, 2014). As such, there is also potential for the species to be located within the Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) habitat located at T3. No records for small-white orchid were taken during the detailed Annex I surveys conducted in this habitat. T3 is located c. 1.9km north of the local population of small-white orchid in Faughary townland

In summary, neither of bristle-leaf or of small white orchid were identified during field surveys. However, as potential for the species to occur within the proposed Wind Farm Site remains, the FPO species will be carried forward to the assessment.

5.4.2.3 Invasive Non-Native Species

Field surveys identified several invasive alien species present within the Survey Area of the proposed Wind Farm Site, GCR, and TDR (Table 5-15). Of these, three species are listed on the Third Schedule (S.I. No. 477/2011) as amended, and subject to legal restrictions under Regulations 49 and 50. The species consist of:

- Himalayan balsam (Impatiens glandulifera);
- Japanese Knotweed (Fallopia japonica); and,
- Rhododendron (Rhododendron ponticum).

Japanese Knotweed was identified within the Survey Area of the proposed Wind Farm Site at three locations. A large stand (35m x 5m) is located c. 10m to the south-west of the proposed borrow pit to the south of T8 (ITM E592308.75, N841608.41) (Figure 5-15). Another large stand (25m x 5m) is located c. 15m to the north of the existing access track (283) c. 420m to the south-west of the same borrow pit (ITM E592448.13, N841212.93). Japanese Knotweed is also located c. 50m to the south of T8 (Figure 5-15). A small stand of Japanese knotweed is also located at along the TDR (ITM E574911.85, N876957.92), c. 35m south-east of POI 41 (Figure 5-23). Several immature Japanese knotweed plants were identified along the roadside verge (ITM E576946.90, N876034.30) c. 165m west of POI 47.

Along the GCR Survey Area, several stands of Japanese Knotweed are located within a c. 200m stretch of the local road L-2169 (ITM E587039.27, N838498.78) as shown in Figure 5-16. Another stand of Japanese Knotweed is located to the south of Aquatic Site 17 along the local road L-2169 (ITM E586404.66,N837150.27) as shown in Figure 5-17. Another stand is located elsewhere along the GCR Survey Area along the regional road R-289 north of Aquatic Site 23 (ITM E582254.80, N829845.25) as shown in Figure 5-18.

Himalayan balsam is located at one location along the proposed GCR (ITM E581819. N57,830217.50), where HDD is proposed along the local road L4165 (Aquatic Site 22). At this site, Himalayan balsam is located on the southern bank of the Bonet_050 along a c. 100m stretch (Figure 5-19).

Rhododendron is present at two locations within the Survey Area of the proposed Wind Farm Site. A small rhododendron shrub is located c. 5 m to the north of the proposed access track (ITM E592741.57, N841112.10), at the edge of the Conifer plantation (WD4) (Figure 5-15). Another rhododendron shrub was identified (ITM E591030.91, N841268.64) c. 65m to the west of the access track which runs south towards Cherrybrook (Figure 5-15).

Rhododendron is also located at two locations along the proposed GCR, including a dense thicket of rhododendron located north of Aquatic Site 16 along the roadside verge of the local road L-21361 (ITM E586906.47, N839001.25) (Figure 5-20), and another rhododendron shrub is located along local road L-4135 (ITM E582788.2, N832719.0) north-east of Aquatic Site 21 as shown in Figure 5-21. Rhododendron was also identified at one location along the TDR, c. 90m north of POI 33, as shown in Figure 5-22, which is the same stand identified in Figure 5-20.

Table 5-15: Third Schedule INNS identified within the Proposed Project as well as species considered medium risk of invasiveness

Common Name	Scientific Name	Third Schedule Listed	Risk Assessment	Citation
Cherry Laurel	*Prunus laurocerasus*	No	High	(Kelly *et al*. 2013); NBDC, 2025c)
Himalayan balsam	*Impatiens glandulifera*	**Yes**	High	(Millane and Caffrey, 2014; Kelly *et al*. 2013; NBDC, 2025d)
Himalayan honeysuckle	*Leycesteria formosa*	No	Medium	(Kelly *et al*. 2013; NBDC, 2025e)
Japanese Knotweed	*Fallopia japonica*	**Yes**	High	(Kelly *et al*. 2013; NBDC, 2025f)
Rhododendron	*Rhododendron ponticum*	**Yes**	High	(O'Rourke and Lysaght, 2014; Kelly *et al*. 2013; NBDC, 2025h)

An additional two species are listed as medium to high-risk INNS according to risk assessments carried out by the Northern Ireland Environment Agency (NIEA), the National Parks and Wildlife Service (NPWS), Inland Fisheries Ireland (IFI) and the NBDC (Kelly *et al*., 2013; Millane and Caffrey, 2014) meaning they are not subject to legal restrictions, namely:

- Cherry Laurel (*Prunus laurocerasus*); and,
- Himalayan honeysuckle (*Leycesteria formosa*).

However, as medium to high impact invasive species are subject to best practice guidance on the control of invasive species as set out in:

- The Management of Invasive Alien Plant Species on National Roads – Standard (TII, 2020a); and
- The Management of Invasive Alien Plant Species on National Roads – Technical Guidance (TII, 2020b).

One occurrence of cherry laurel is located within the Survey Area for the proposed Wind Farm Site, in the Mixed broadleaved woodland (WD1) parcel c. 90m to the west of T12 (Figure 5-15). Several mature cherry laurel shrubs are located c. 30m to the south of the local road L4135 along the banks of the Bonet_030 (Aquatic Site 15) (ITM E590775.72, N842001.43).

A single stand of Himalayan honeysuckle (*Leycesteria formosa*) is located at one location along the northern extent of the TDR (ITM E575234.2, N876479.4).

In addition to the above species, several non-native species which are not considered invasive were identified within the Survey Area for the proposed Wind Farm Site and along the GCR and TDR (Table 5-16).

Full details on the location of these species are provided in Appendix 5-6.

Table 5-16: Non-native species identified within the Proposed Project that are not considered invasive species

Common Name	Scientific Name	Third Schedule Listed	Risk Assessment	Citation
Wilson's Honeysuckle	*Lonicera nitida*	No	N/A	(NBDC, 2025i)
Fuchsia	*Fuchsia magellanica*	No	N/A	(NBDC, 2025j)
Montbretia	*Crocosmia x crocosmiiflora*	No	N/A	(NBDC, 2025k)
Snowberry	*Symphoricarpos albus*	No	N/A	(NBDC, 2025l)

8°9'20"W
8°7'30"W
8°5'40"W
8°3'50"W
54°20'0"N
54°19'0"N
844000
842000
840000
590000
592500
595000
N
R282
R283
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
T13
T14
Skreeny Manor
Skreeny (Rosclogher By)
N16

Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Turbine Locations

Invasive Species

- Japanese Knotweed
- Rhododendron
- Japanese Knotweed
- Rhododendron

0 0.5 1
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	23/02/2026	First issue	S.P	S.R

Client: FuturEnergy Ireland

Project: Lissinagroagh Wind Farm

Title: Figure 5-15: Location of Third Schedule (S.I. 477/2011) listed Invasive Non-Native Species

Scale @ A3: 1:22,000

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S.Pezzetta	S.Ryan	February 2026

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8°11'50"W
8°11'40"W
54°17'50"N
54°17'43"N
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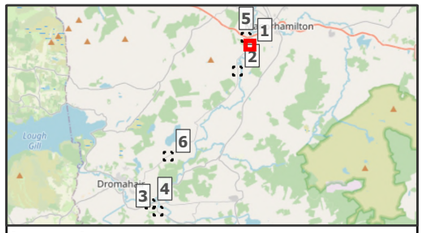
838400
586740
586970
587200
N
Ross Crescent
Lough Gill SAC
Lough Gill SAC



Legend

- Grid Connection Route
- Special Areas of Conservation (SACs)

Invasive Species

- Japanese Knotweed
- Japanese Knotweed

0 50 100
Metres

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	24/02/2026	First issue	S.P	S.R

Client: Ireland FuturEnergy

Project:
Lissinagroagh Wind Farm

Title:
Figure 5-16:
Location of Japanese Knotweed (Fallopia japonica) along the Grid Connection Route south of Aquatic Site 16
Sheet 1 of 6

Scale @ A3: 1:2,000

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Map Ref: 10955-051-INV..SP-GCR-TOB-A

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8°12'40"W
8°12'30"W
8°12'20"W
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837200
837000
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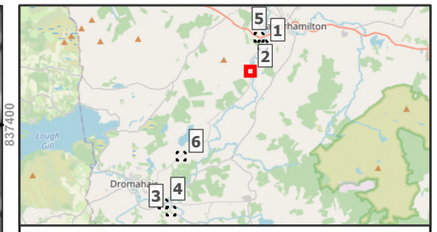
586050
586280
586510

Lough Gill SAC



Legend

Grid Connection Route

Special Areas of Conservation (SACs)

Invasive Species

Japanese Knotweed

0 50 100
Metres

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	24/02/2026	First issue	S.P	S.R

Client: Ireland FuturEnergy

Project: Lissinagroagh Wind Farm

Title: Figure 5-17: Location of Japanese Knotweed (Fallopia japonica) along the Grid Connection Route south of Aquatic Site 17 Sheet 2 of 6

Scale @ A3: 1:2,000

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8°16'10"W
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54°13'3"N
54°12'56"N
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8296000
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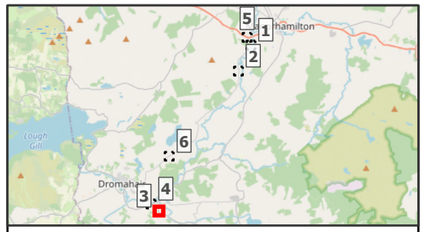
582140
582370
R289
R289
R289
R289
R289
R289
N



Legend

Grid Connection Route

Invasive Species

Japanese Knotweed

0 50 100
Metres

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	24/02/2026	First issue	S.P	S.R

Client: Ireland FuturEnergy

Project:
Lissinagroagh Wind Farm

Title:
Figure 5-18:
Location of Japanese Knotweed (Fallopia japonica) along the Grid Connection Route north of Aquatic Site 23
Sheet 3 of 6

Scale @ A3: 1:2,000

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8°16'50"W
8°16'40"W
8°16'30"W
54°13'17"N
54°13'10"N
581680
581910
582140
830400
830200
830000

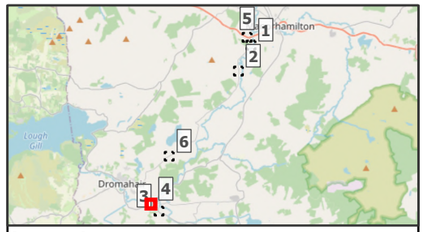
N

Drumlease Road
Drumlease Road
Drumlease Road

Lough Gill SAC
Lough Gill SAC

Bonet River
Bonet River
Bonet River
Bonet River
Bonet River

R287
R287
R287
R287
R287
R289
R289



Legend

Grid Connection Route

Special Areas of Conservation (SACs)

Invasive Species

Himalayan Balsam

0 50 100
Metres

Spatial Reference
Datum: IRENET95
EPSG: 2157

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A	24/02/2026	First issue	S.P	S.R

Client: FuturEnergy Ireland

Project: Lissinagroagh Wind Farm

Title: Figure 5-19: Location of Japanese Knotweed (Fallopia japonica) along the Grid Connection Route at Aquatic Site 22 Sheet 4 of 6

Scale @ A3: 1:2,000

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S.Pezzetta	S.Ryan	February 2026

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8°12'10"W
8°12'0"W
8°11'50"W
54°18'4"N
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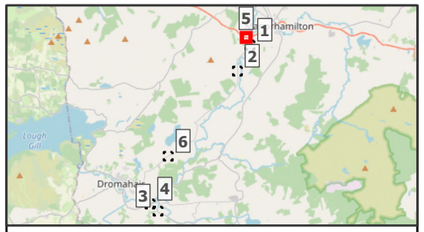
N
N16
Lough Gill SAC
Lough Gill SAC



Legend

- Grid Connection Route
- Special Areas of Conservation (SACs)

Invasive Species

- Rhododendron

0 50 100
Metres

Spatial Reference
Datum: IRENET95
EPSG: 2157

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Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community,

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Client: Ireland FuturEnergy

Project:

Lissinagroagh Wind Farm

Title:

Figure 5-20:
Location of Japanese Knotweed (Fallopia japonica) along the Grid Connection Route north-east of Aquatic Site 16
Sheet 5 of 6

Scale @ A3: 1:2,000

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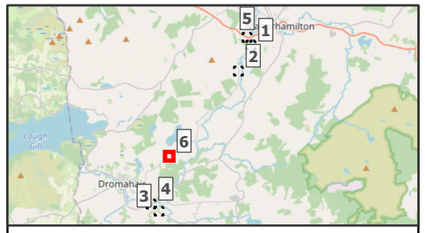

Legend

Grid Connection Route

Invasive Species

Rhododendron

0 50 100
Metres

Spatial Reference
Datum: IRENET95
EPSG: 2157

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Client: Ireland FuturEnergy

Project: Lissinagroagh Wind Farm

Title: Figure 5-21: Location of Japanese Knotweed (Fallopia japonica) along the Grid Connection Route north of Aquatic Site 21 Sheet 6 of 6

Scale @ A3: 1:2,000

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8°12'10"W
8°12'0"W
8°11'50"W
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54°17'57"N
54°17'50"N
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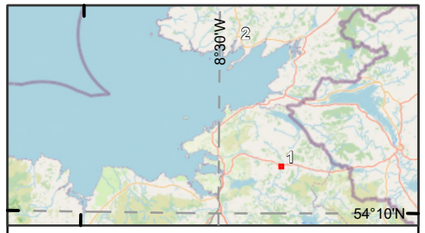
N16
33



Legend

- Turbine Delivery Route
- Point of Interest - Locations

TDR:

- Oversail

Invasive Species

- Rhododendron

0 50 100
Metres

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	04/03/2026	First issue	S.P	S.R

Client: Ireland FuturEnergy

Project:
Lissinagroagh Wind Farm

Title:
Figure 5-22:
Location of Rhododendron ponticum along the Turbine Delivery Route at POI 33
Sheet 1 of 2

Scale @ A3: 1:2,000

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S.Pezzetta	S.Ryan	March 2026

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Map Ref: 10955-052-INV..SP-TDR-TOB-A

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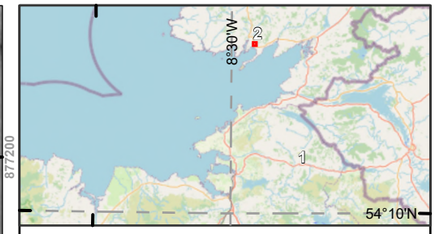

Legend

- Turbine Delivery Route
- Point of Interest - Locations

TDR:

- Oversail

Invasive Species

- Japanese Knotweed

0 50 100
Metres

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd
A	04/03/2026	First issue	S.P	S.R

Client: Ireland FuturEnergy

Project: Lissinagroagh Wind Farm

Title: Figure 5-23: Location of Japanese Knotweed (Fallopia japonica) along the Turbine Delivery Route at POI 41 and 42 Sheet 2 of 2

Scale @ A3: 1:2,000

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Map Ref: 10955-052-INV..SP-TDR-TOB-A

Draft: A

5.4.2.3.1 Amphibians and Reptiles

5.4.2.3.1.1 Common Frog

Common frog (*Rana temporaria*) is listed in Annex V of the Habitats Directive and protected under the Wildlife Act (as amended). It was recorded at two locations in the south-east of the Survey Area for the proposed Wind Farm Site, mostly within the wet habitats such as Drainage ditches (FW4), which is their common breeding habitat (Reid *et al.* 2013). Suitable habitat for this species is present throughout the Survey Area for the proposed Wind Farm Site.

The local common frog population was valued as being of **Local Importance (higher value)**.

5.4.2.3.1.2 Smooth Newt

Smooth newt is protected under the Wildlife Acts (as amended) and is known to use a variety of water body types. During field surveys, no smooth newt (or evidence of) was recorded during surveys. Searches for the species were conducted in suitable habitat, such as Upland blanket bog (PB2). No direct observations of the species were made; however, as potentially suitable habitat exists and previous records indicate its presence within the Survey Area for the proposed Wind Farm Site, potential impacts on the species will be assessed further in accordance with the precautionary principle.

The local smooth newt population was valued as being of **Local Importance (higher value)**.

5.4.2.3.1.3 Common Lizard

Common lizard (*Zootoca vivipara*) listed in Annex IV of the Habitats Directive and is protected under the Wildlife Acts 1976 (as amended). This species is common but difficult to observe, occurring in a range of habitats present within the Survey Area for the proposed Wind Farm Site, such as Upland blanket bogs (PB2) and Exposed calcareous rock (ER2) (NRA, 2009b; Gandola, 2019). No direct observations of the species were made during field surveys, and there are no existing records for the species within the Survey Area for the proposed Wind Farm Site. Common lizard is valued as being of **Local Importance (lower value)** and will not be considered further within the assessment.

5.4.2.4 Terrestrial Mammal Species

5.4.2.4.1 European otter

European otter (*Lutra lutra*) is a listed species on Annex II and Annex IV of the Habitats Directive. Annex II requires the designation of SACs and Annex IV requires a system of strict protection for the species across its natural range, including protection from:

- Disturbance particularly during the period of breeding, rearing, hibernation; and migration; and,
- Damage to a breeding or resting place,

All streams and drainage ditches within the Survey Area for the proposed Wind Farm Site were surveyed for European otter. No holts, spraints, couches, or other evidence of European otter activity was recorded within the Survey Area for the proposed Wind Farm Site.

Field surveys have confirmed European otter activity at Aquatic Site 14, 15, 17, 19, 21 and 22 along the GCR (see Appendix 5-4). Aquatic Sites 15, 17, 19, and 22 are located within Lough gill SAC.

European otter spraints (old and fresh) were recorded at Aquatic Site 14 (see Appendix 5-4). A crayfish claw was observed at Aquatic Site 21, which is suggestive of European otter activity (see Appendix 5-4).

Four spraints were identified at Aquatic Site 15 over a 75m area along the banks of the Bonet (EPA: 35B06, WFD Bonet_030). This confirms European otter activity along the watercourse. Aquatic Site 15 corresponds to proposed HDD Site 1 (see Appendix 5-4).

A spraint and crayfish remains were identified at Aquatic Site 22 where HDD Site 2 is proposed, confirming otter activity at this location (see Appendix 5-4).

A spraint site was identified under the bridge over the Shanvaus 35 (EPA 35S01, WFD Shanvaus_010), at Aquatic Site 17 with more than 25 spraints were identified (see Appendix 5-4). European otters are known to establish spraint sites under bridges to communicate territory (Reid *et al*. 2013).

A spraint was also identified under a bridge at the Boihy (EPA 35B76, WFD Bonet_040) at Aquatic Site 19 (see Appendix 5-4).

No European otter holts or resting places were identified during field surveys along the proposed GCR.

European otter is valued as being of **International Importance** within the boundaries of SACs for which the species is a QI within the ZoI, such as Lough Gill SAC, Lough Melvin SAC and Glenade Lough SAC. Ben Bulben, Gleniff and Glenade SAC, and Unshin River SAC.

Where European otter display functional links with Lough Gill SAC they represent a population of international importance, as a QI species (NRA, 2009a).

According to Article 17 reporting, the national population estimate for breeding females ranges from 7,218-10,186 (NPWS, 2019b). A percentage of this population would be between 72-102 individuals, and a resident population this size outside the SAC would represent a population of national importance. (NRA, 2009a). To provide a rough estimate of 1% of a county population this figure can be divided by 26, meaning a population of 3-4 individuals would constitute a population of County Importance, according to best practice guidance (NRA, 2009a).

The average distribution density of European otters is approximately one European otter per 10 km on many Irish watercourses (NRA, 2008b). The GCR expands over 30km., therefore an estimate of European otter population along the GCR of 3 individuals meets the criteria for a resident population of Annex II/Annex IV species of **County Importance** outside the boundaries of Lough Gill SAC.

5.4.2.4.2 Badger

During the multidisciplinary walkover surveys in 2020 and 2024, there were nine records of badger noted within the Survey Area for the proposed Wind Farm Site. Of the nine records, one was a sett, two records were scat, and the remainder were snuffle holes. All activity was noted within the southern sections of the Survey Area for the proposed Wind Farm Site with the sett recording within the most south-eastern block of Conifer plantation (WD4) forestry.

The sett is valued as an outlier sett. It appeared to be active upon initial assessment; however, it was confirmed to be disused after a camera trap survey showed no activity after four days (May 2024). The sett is located c. 125m from the proposed works corridor, where the road

improvement works are proposed along the public road at the western entrance of the proposed Wind Farm Site.

The desktop study indicates that badger was previously recorded within the Survey Area for the proposed Wind Farm Site and along the GCR and TDR. Due to the large areas of grassland and woodland habitats within the Proposed Project, it is expected that badger utilise these areas for foraging and commuting on occasion. Therefore, the local badger population was valued as being of **Local Importance (higher value).**

5.4.2.4.3 Deer

Deer tracks and scat were identified in a number of different locations throughout the Survey Area for the proposed Wind Farm Site during the 2021 and 2024 surveys.

The local population of red deer (*Cervus elaphus*) are valued as being of **Local Importance (higher value).**

The local population of Fallow deer (*Dama dama*) and Sika deer (*Cervus nippon*) are considered high risk invasive species and are listed on the Third Schedule (S.I. 477/2011) which deals with invasive non-native species. These species are considered **Local Importance (lower value)** and as such are not considered further in the assessment.

5.4.2.4.4 Pine Marten

Pine marten (*Martes martes*), which is listed in Annex V of the Habitats Directive and is protected under the Wildlife Acts 1976 (as amended). Pine marten scat was recorded on one occasion in 2020 and one occasion in 2025, within the south-west section of the Survey Area for the proposed Wind Farm Site. This species was also recorded during the desktop study.

The species is valued as **Local Importance (higher value).**

5.4.2.4.5 Other Small Mammal Species

Other small mammal species recorded in the desktop study include red squirrel (*Sciurus vulgaris*), hedgehog (*Erinaceus europaeus*) and pygmy shrew (*Sorex minutus*) (Table 5-5). Although these species were not recorded during the field surveys, there is potential that these species may utilise the Survey Area for the proposed Wind Farm Site, at least on occasion, due to the presence of suitable habitat, such as Scrub (WS1), Mixed broadleaved/conifer woodland (WD2), and Conifer plantation (WD4).

The small mammal species Irish stoat (*Mustela erminea hibernica*), and Irish hare (*Lepus timidus hibernica*), are protected under the Wildlife Acts 1976 (as amended). Neither species were recorded during field surveys, and no previous records exist for them within the Survey Area for the proposed Wind Farm Site. As such, these species will not be considered further in the assessment.

The local populations of pine marten, red squirrel, hedgehog and pygmy shrew will be considered together under the general heading 'other small mammal species' and valued to be of **Local Importance (higher value)**.

5.4.2.5 Bats

Six buildings (Building 4, Building 6, Building 7, Building 8, Building 12 and Building 19) are confirmed daytime roosts for common pipistrelle (Pipistrellus pipistrellus), soprano pipistrelle

(*Pipistrellus pygmaeus*) and brown long-eared bat (*Plecotus auritus*) (see Appendix 5-5). Building 7 is also a confirmed as a maternity roost for Natterer's bat (*Myotis nattereri*). The following bat species were recorded during dusk surveys and the transects: soprano pipistrelle, common pipistrelle, brown long-eared bat, Natterer's bat, Myotis species (*Myotis spp.*) Nathusius' pipistrelle, Daubenton's bat (*Myotis daubentonii*), Leisler's bat (*Nyctalus leisleri*).

Building 3 is surrounded by eight deciduous trees which were identified as having potential roost features of a moderate value as they are suitable for single roosting bats (see Appendix 5-5)

A total of 18,742 bat passes were recorded on all of the static locations sampled. The total number of common pipistrelles bat passes recorded during all three static surveillance periods was 9,844 (54.5%) and this was the most frequently recorded bat species. Soprano pipistrelles (4,245 bat passes = 23.5%) and Leisler's bats (1,900 bat passes = 10.5%) were the second and third most frequently recorded bat species, respectively. In addition, the following bat species were also recorded during the static surveillance: Natterer's bat, Daubenton's bat, Myotis species and brown long-eared bat.

A low level of bat activity was confirmed at T1, T2, T3, T4, T5, T8 and T14. Moderate level of bat activity was recorded at T9 (Common pipistrelle and Soprano pipistrelle), T10 (Common pipistrelle), and T12 (Leisler's bat). A high level of activity was recorded at T6 (Leisler's bat), T7 (Leisler's bat), T11 (Common pipistrelle and Soprano pipistrelle), and T13 (Common pipistrelle & Soprano pipistrelle).

All bat species in Ireland are listed in Annex IV of the Habitats Directive with lesser horseshoe bat also listed in Annex II. However, the natural range of lesser horseshoe does not extend to Co. Leitrim and no lesser horseshoe bats were recorded during surveys. No SACs for the species are within the ZoI for the project. As such, bat species are considered of **Local Importance (higher value)**.

8°9'20"W
8°7'30"W
8°5'40"W
54°21'0"N
54°20'0"N
54°19'0"N
844000
842000
840000
590000
592500
595000
N
R282
R283
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
T13
T14
Building 20
Building 4
Building 2
Building 3
Building 1
Building 19
Building 23
Building 13
Building 8
Building 6
Building 7
Building 12
Building 15
Bridge 1
Skreeny Manor
Skreeny (Rosclogher By)
Manorhamilton
N16

Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Turbine Locations
- Building Survey Locations

0 0.5 1
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

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Client: Ireland FuturEnergy

Project:
Lissinagroagh Wind Farm

Title:
Figure 5-24:
Buildings surveyed in 2024
for Potential Roost Features

Scale @ A3: 1:22,000

Prepared by:	Checked by:	Date:
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Map Ref: 10955-054-Bat.ROO-P.App.BO-TOB-A

Draft: A

5.4.2.6 Invertebrates

Marsh fritillary (*Euphydryas aurinia*) is widespread across Ireland and can be reasonably common if devil's bit scabious (*Succisa pratensis*) is present in sufficient abundance (Phelan *et al.* 2021). Although widespread, the species is listed as vulnerable on the red list of Irish butterflies and is listed on Annex II of the Habitats Directive, requiring designation of SACs (Regan *et al.* 2010). It is the only invertebrate species protected under the Habitats Directive in Ireland.

Targeted marsh fritillary larval web surveys were carried out in suitable habitat within the Survey Area for the proposed Wind Farm Site in September 2020 and repeated in September 2025. Suitable marsh fritillary habitat was determined through abundance of devil's-bit scabious (*Succisa pratensis)*. A total of 2.82ha of suitable marsh fritillary habitat was identified in the south-west and south of the Survey Area for the proposed Wind Farm Site. The suitable marsh fritillary habitat is associated with the margins of existing access roads and corresponds to Dry meadows and grassy verges (GS2).

These areas were systematically searched during the optimum survey season following best practice guidance (NBDC, 2021). No larval webs were found during the 2020 survey season. Two larval webs were identified during the 2025 survey season. One larval web was identified along the existing access track at the western entrance to the proposed wind farm development (ITM E590111.003, N841849.194), c. 1m from the works corridor and c. 155m to the south-west of the substation. The second larval web was identified c. 1m from the works corridor along the access track c. 90m to the south-west of T12 (ITM E590818.495, N841866.180).

According to NBDC records, marsh fritillary has previously been recorded at grid square G94 (location of the Survey Area for the proposed Wind Farm Site) (NBDC, 2025a).

A meaningful estimate for the population size of marsh fritillary is largely unfeasible and unlikely to ever be produced due to the biology of the species and its colony structure (NPWS, 2019c). It cannot be determined if the population within the Survey Area for the proposed Wind Farm Site is representative of 1% of the county population. As such, based on the precautionary principal and in line with best practice guidance for ecological valuation (NRA, 2009a), the local marsh fritillary population was valued as being of **County Importance**, as a resident population of a species listed in Annex II of the Habitats Directive.

8°9'20"W
8°7'30"W
8°5'40"W
54°21'0"N
54°20'0"N
54°19'0"N
844000
842000
840000
590000
592500
595000
R282
R283
N16
Skreeny Manor
Skreeny (Rosclogher By)
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
T13
T14

Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Enhancement lands
- Turbine Locations
- Marsh Fritillary: confirmed larval webs
- Marsh Fritillary: Suitable Habitat

0 0.5 1
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

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Client: FuturEnergy Ireland

Project: Lissinagroagh Wind Farm

Title: Figure 5-25: Location of confirmed marsh fritillary larval webs and suitable marsh fritillary habitat

Scale @ A3: 1:22,000

Prepared by:	Checked by:	Date:
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Map Ref: 10955-050-MF.HAB-P.App.BO-TOB-A

Draft: A

5.4.2.7 Aquatic Ecology

Full details on the aquatic baseline for the Proposed Project including maps of aquatic survey sites and electrofishing survey sites can be consulted in Appendix 5 4.

No barriers to migration were recorded within any of the WFD River Water Bodies that overlap with the survey sites (IFI, 2025). A barrier is anything in a river that might stop a fish from passing, migrating or slow it down on the way up-river (IFI, n.d.). They can be natural or man-made and include weirs, bridges, waterfalls, and culverts (IFI, n.d.).

5.4.2.7.1 Atlantic Salmon

Atlantic salmon is listed in Annex II and Annex V of the EU Habitats Directive.

Electrofishing surveys confirmed that salmon is present on the Lattone 35_010 (EPA code: 35L66) c. 4km north and downstream of the proposed Wind Farm Site, which ultimately discharges into Lough Melvin SAC (see Appendix 5-4).

Aquatic Site 8 within the proposed Wind Farm Site which flows into the Owenmore [Manorhamilton]_020, shows high spawning habitat suitability (good flow, riffles and clean gravels) and salmonids were visually observed and the water quality was suitable (Q4 - good). High spawning habitat suitability was also identified at Aquatic Site 10 within the proposed Wind Farm Site which flows into the Brackary_010. All other Aquatic Sites surveyed within the proposed Wind Farm Site, displayed low habitat suitability for Atlantic salmon.

Along the GCR, Aquatic Sites 15 (Bonet_030), 17 (Bonet_040), Sites 22 (Bonet_050) and 24 (Killanummery_010) show high suitability for salmon which all lie within the Lough Gill SAC. At Aquatic Site 15, one parr and one fry were caught during kick net sampling.

At Aquatic Site 27 (Killanummery_020) which is located along the GCR but outside of Lough Gill SAC, high to good salmonid spawning and holding habitat was recorded.

Electrofishing was carried out in 2021 in waterbodies within the proposed Wind Farm Site and on connected waterbodies outside of the proposed Wind Farm Site. Salmon was recorded in watercourses outside of the proposed Wind Farm Site. The 2021 electrofishing sites and the 2025 aquatic sites are shown in Appendix 5-4.

Salmon is a QI species for four SACs within the ZoI of the Proposed Project including Lough Gill SAC, Lough Melvin SAC Lough Melvin SAC NI and Unshin River SAC, where the population is valued as being of **International Importance**.

The best single value estimate for the national adult population of salmon is 202,428 (NPWS, 2019c). When this total is distributed evenly across the 26 counties, it gives an indicative figure of county population size of approximately 7,785 adult salmon. On this basis, a population of 78 adult salmon meets the criteria for valuation as of County Importance, as it represents 1% of the county population. Salmon within the ZoI of the Proposed Project but outside of European sites for which they are a QI species, are valued as of **County Importance**.

5.4.2.7.2 Brown Trout

Brown trout and its spawning habitat is protected under the Fisheries (Consolidation) Act 1959 (as revised in 2025).

Electrofishing was carried out in 2021 in waterbodies within the proposed Wind Farm Site and on connected waterbodies outside of the proposed Wind Farm Site. No trout were caught at the electrofishing sites within the proposed Wind Farm Site or downstream of the proposed Wind Farm Site.

Electrofishing surveys have confirmed that brown trout is present on the Brackery_010, which is located upstream and to the south-west of the of the proposed Wind Farm Site. Electrofishing also confirmed trout to the south and upstream of the proposed Wind Farm Site, on the Owenmore [Manorhamilton]_020 c. 2.8km upstream of the confluence with the Moneenshinnagh 35 (EPA Code: 35M53). The 2021 electrofishing sites are shown in Appendix 5-4.

Within the proposed Wind Farm Site, habitat suitability for brown trout was moderate. Aquatic Site 3 to 11 are located show suitable spawning and/or holding habitat for brown trout. At Aquatic Site 8, juvenile salmonids were observed and the water quality was suitable (Q4 - good).

Along the GCR, Aquatic Site 15, 17,19, 24 and 27 show good to high suitability for brown trout. At Aquatic Site 19 one juvenile brown trout was caught during kick net sampling and at Aquatic Site 8, 15, 18, 22 and 27 juvenile salmonids were visually observed.

Aquatic Sites 1 and 2 within the proposed Wind Farm Site as well as Aquatic Site 12, 16, 23, 25, and 26 along the GCR did not comprise suitable spawning and holding habitat for brown trout.

Brown trout was valued as a species of **Local Importance (higher value)**, due to the protection of the species and its habitat under the Fisheries Act.

5.4.2.7.3 Sea Lamprey , River Lamprey and Brook Lamprey

Lamprey spp. are listed in Annex II (and Annex V – river lamprey) of the EU Habitats Directive.

Lamprey suitability is mainly determined by the present of marginal soft sediment habitat typically related to shallow gradient lower altitude rivers and streams. This soft sediment habitat is where juvenile lamprey (ammocoetes) burrow and these juveniles are typically not identifiable to species level in the field. Their spawning habitat would be similar to salmonids.

Within the Survey Area for the proposed Wind Farm Site habitat suitability for lamprey spp. was negligible at Aquatic Site 12, moderate at Aquatic Site 8 and 9 where suitable spawning gravels and soft sediment was observed. Suitability is considered low at all remaining sites within the Survey Area for the proposed Wind Farm Site, due to the upland nature and ephemeral water levels of these streams.

Along the GCR Aquatic Site 17, 19, 21 and 22 showed good to high suitability for lamprey spp. A single lamprey ammocoete was captured at site 21 during kick sampling. Aquatic Site 17, 19 and 22 are located within Lough Gill SAC for which all lamprey species are a QI: Brook Lamprey (*Lampetra planeri*) [1096], River Lamprey (*Lampetra fluviatilis*) [1099] and Sea Lamprey (*Petromyzon marinus*) [1095].

No lamprey species or European eel were recorded at any of the electrofishing sites. The 2021 electrofishing sites are shown in Appendix 5-4.

Lamprey spp. populations within Lough Gill SAC are valued as **International Importance**. Lamprey spp. within the ZoI of the Proposed Project but outside of European sites for which they are a QI species, are valued as of **County Importance**.

5.4.2.7.4 European Eel

European Eel is protected under the Fisheries (Consolidation) Act 1959 (as revised in 2025). European Eel is critically endangered on the IUCN Red List (King *et al*., 2011).

European eel suitability is mainly determined by the presence of suitable refugia (rocks, boulders, concrete structures like bridges, areas with soft sediment and instream root structures) and habitat typically related to shallow gradient lower altitude rivers and streams. European eel will hide under these suitable refugia during the day and emerge to hunt during the night.

Suitable eel habitat was recorded at all Aquatic Sites. However, Aquatic Site 1to 12, which are located within proposed Wind Farm Site, are considered less suitable for European eel due to the upland nature and ephemeral water levels of these streams.

European eel was valued as a species of **Local Importance (higher value)**, because it is critically endangered and due to the protection of the species and its habitat under the Fisheries Act.

5.4.2.7.5 White-clawed Crayfish

Crayfish is listed in Annex II and Annex V of the EU Habitats Directive. Crayfish has full statutory protection within Lough Gill SAC where the species is listed as a QI.

White-clawed crayfish suitability is mainly determined by the presence of suitable refugia (rocks, boulders, concrete structures like bridges, soft sediment banks to burrow into and instream root structures) and habitat typically related to shallow gradient lower altitude rivers and streams. White-clawed crayfish will hide under these suitable refugia during the day and emerge to forage during the night.

Nearly all Aquatic Sites comprised suitable refuges for crayfish except Aquatic Sites 12, 16, 18, 25 and 26.

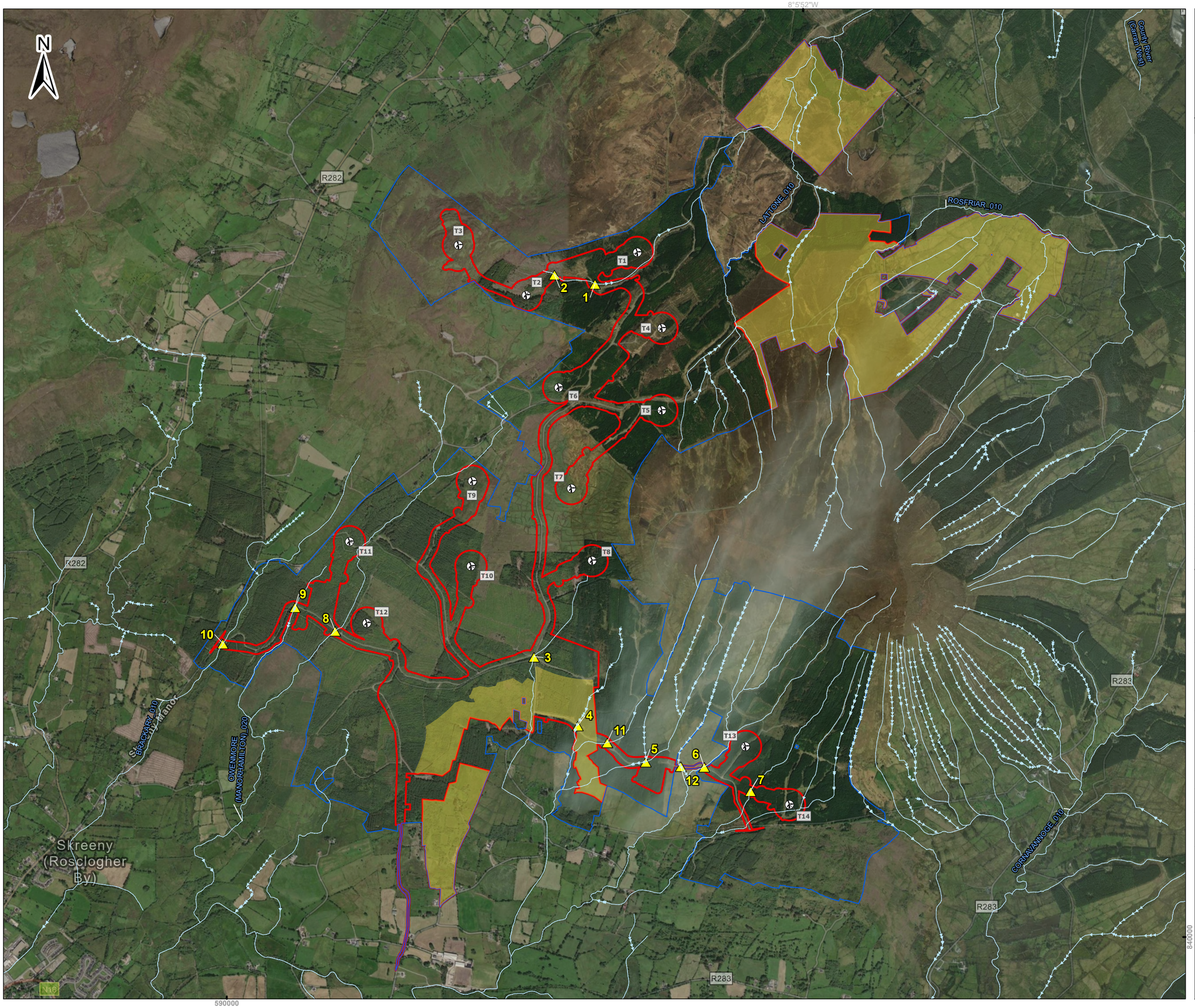
Crayfish were confirmed present by hand search, caught during kick sampling or in European otter spraints. Sites where crayfish (remains) were positively identified included Aquatic Site 14, 15, 17, 19 and 21. All of these Aquatic Sites are located along the GCR. Aquatic Site 15, 17 and 19 are located within the boundaries of Lough Gill SAC.

White-clawed crayfish was valued as a species of **International Importance** within Lough Gill SAC and Glenade Lough SAC.

There is no national population estimate for the species nor is one ever likely to exist (NPWS, 2019c). Local estimates have a high degree of variability, and it is inappropriate to extrapolate national population size from these figures (NPWS, 2019c).

As such, on a precautionary basis the population of white-clawed crayfish within the ZoI of the Proposed Project but outside of the listed SACs is estimated as of **County Importance**.

8°5'52"W



Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Enhancement lands
- Turbine Locations
- Aquatic Survey Locations

0 0.5 1
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

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A	23/02/2026	First issue	S.P	S.R

Client: Ireland FuturEnergy

Project:
Lissinagroagh Wind Farm

Title:
Figure 5-26:
Aquatic Site survey locations within the proposed wind farm site

Scale @ A3: 1:22,000

Prepared by:	Checked by:	Date:
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Map Ref: 10955-040-Aq..SURV.L-P.App.BO-TOB-A

Draft: A

8°21'24"W
8°5'52"W
54°16'54"N
840000
830000
580000
590000
N
Glencar Lough
Kiltyclogher
Manorhamilton
Kiltycahill
Lough Gill
Carrigeencor Lough
Fawn (Drumahaire By)
Umlease
Kingsfort (Tirerrill By)
Lavally (Tirerrill By)
Belhavel Lough
N16
R280
R282
R286
R287
R284
R200
SHANVAUS_010
BONET_030
BONET_040
BONET_050
CARAVOGUE_010
UNSHIN_050
UNSHIN_040
KILLANUMMERY_020
KILLANUMMERY_010
CASHEL STREAM (BONET)_010
DOUGLAS (SLIGO)_010
13
28
15
14
16
17
18
19
20
21
22
23
24
25
26
27

Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Enhancement lands
- Grid Connection Route
- Aquatic Survey Locations
- WFD - River Water Bodies

0 2 4
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

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A	23/02/2026	First issue	S.P	S.R

Client: Ireland FuturEnergy

Project:
Lissinagroagh Wind Farm

Title:
Figure 5 27:
Aquatic Sites survey locations within the proposed Wind Farm Site and along the proposed Grid Connection Route

Scale @ A3: 1:80,000

Prepared by: S.Pezzetta
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Date: February 2026

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Map Ref: 10955-041-Aq..SURV.L-GCR-TOB-A

Draft: A

5.4.3 Summary of Important Ecological Features

Following a review of the existing environment presented above, IEFs within the Study Area were evaluated in accordance with the criteria set out in Section 0. All IEFs for which detailed assessment is required (i.e. all features of Local Importance (Higher Level) or above, and/ or subject to legal protection), the geographical context within which each is considered to be important, their legal status, and their location relative to the Proposed Project are listed in Table 5-17.

Table 5-17: Important Ecological Features, their valuation of importance, their legal status and the relevance to the Proposed Project.

Ecological Feature	Valuation at which feature is important (NRA, 2009a)	Legal Status & Relevance to the Proposed Project	Inclusion as Important Ecological Feature (Yes/No)
European Sites			
Aroo Mountain SAC [001403]	International Importance	Legally protected under the EU Habitats Directive, transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). The SAC is hydrologically connected to the proposed Wind Farm Site.	**Yes**
Ballysadare Bay SAC [000622]	International Importance	Legally protected under the EU Habitats Directive, transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). The SAC is hydrologically connected to the proposed Wind Farm Site.	**Yes**
Ben Bulben, Gleniff and Glenade SAC [000623]	International Importance	Legally protected under the EU Habitats Directive, transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). The SAC is hydrologically connected to the proposed Wind Farm Site.	**Yes**
Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC	International Importance	Legally protected under the EU Habitats Directive, transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). The SAC is hydrologically connected to the proposed Wind Farm Site.	**Yes**
Glenade Lough SAC [001919]	International Importance	Legally protected under the EU Habitats Directive, transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). The SAC is hydrologically connected to the proposed Wind Farm Site.	**Yes**
Lough Gill SAC (IE001976)	International Importance	Legally protected under the EU Habitats Directive, transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). The SAC is hydrologically connected to the proposed Wind Farm Site.	**Yes**

Ecological Feature	Valuation at which feature is important (NRA, 2009a)	Legal Status & Relevance to the Proposed Project	Inclusion as Important Ecological Feature (Yes/No)
Lough Melvin SAC (IE00428)	International Importance	Legally protected under the EU Habitats Directive, transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). The SAC is hydrologically connected to the proposed Wind Farm Site.	**Yes**
Lough Melvin SAC NI (UK0030047)	International Importance	Legally protected under the EU Habitats Directive, transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). The SAC is hydrologically connected to the proposed Wind Farm Site.	**Yes**
Unshin River SAC (001898)	International Importance	Legally protected under the EU Habitats Directive, transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). The SAC is hydrologically connected to the proposed Wind Farm Site.	**Yes**
Other Sites of Conservation Interest			
Dough/Thur Mountains NHA (002384)	National Importance	Legally protected under the Wildlife Act (2000). Terrestrial connectivity exists between the Proposed Project and the NHA. However, there are no Proposed Project works to take place within the NHA.	**Yes**
Lough Melvin ASSI (ASSI 140)	National Importance (Northern Ireland)	Legally protected under the Environment (Northern Ireland) Order 2002. The ASSI is hydrologically connected to the proposed Wind Farm Site.	**Yes**
Aroo Mountain pNHA (1403)	National Importance	Non-statutory, but these sites will ultimately be designated as NHAs and protected under the Wildlife Acts (as amended). They are of significance for wildlife and habitats. The pNHA is hydrologically connected to the proposed Wind Farm Site.	**Yes**
Ballysadare Bay pNHA (622)	National Importance	Non-statutory, but these sites will ultimately be designated as NHAs and protected under the Wildlife Acts (as amended). They are of significance for wildlife and habitats. The pNHA is hydrologically connected to the proposed Wind Farm Site.	**Yes**

Ecological Feature	Valuation at which feature is important (NRA, 2009a)	Legal Status & Relevance to the Proposed Project	Inclusion as Important Ecological Feature (Yes/No)
Ben Bulben, Gleniff and Glenade pNHA (623)	National Importance	Non-statutory, but these sites will ultimately be designated as NHAs and protected under the Wildlife Acts (as amended). They are of significance for wildlife and habitats. The pNHA is hydrologically connected to the proposed Wind Farm Site.	**Yes**
Bonet River pNHA (1404)	National Importance	Non-statutory, but these sites will ultimately be designated as NHAs and protected under the Wildlife Acts (as amended). They are of significance for wildlife and habitats. The pNHA is hydrologically connected to the proposed Wind Farm Site.	**Yes**
Cummeen Strand/Drumcliff Bay pNHA (627)	National Importance	Non-statutory, but these sites will ultimately be designated as NHAs and protected under the Wildlife Acts (as amended). They are of significance for wildlife and habitats. The pNHA is hydrologically connected to the proposed Wind Farm Site.	**Yes**
Glenade Lough pNHA (1919)	National Importance	Non-statutory, but these sites will ultimately be designated as NHAs and protected under the Wildlife Acts (as amended). They are of significance for wildlife and habitats. The pNHA is hydrologically connected to the proposed Wind Farm Site.	**Yes**
Lough Melvin pNHA (000428)	National Importance	Non-statutory, but these sites will ultimately be designated as NHAs and protected under the Wildlife Acts (as amended). They are of significance for wildlife and habitats. The pNHA is hydrologically connected to the proposed Wind Farm Site.	**Yes**
Lough Gill pNHA (001976)	National Importance	Non-statutory, but these sites will ultimately be designated as NHAs and protected under the Wildlife Acts (as amended). They are of significance for wildlife and habitats. The pNHA is hydrologically connected to the proposed Wind Farm Site.	**Yes**
Unshin River pNHA (1898)	National Importance	Non-statutory, but these sites will ultimately be designated as NHAs and protected under the Wildlife Acts (as amended). They are of significance for wildlife and habitats. The pNHA is hydrologically connected to the proposed Wind Farm Site.	**Yes**

Ecological Feature	Valuation at which feature is important (NRA, 2009a)	Legal Status & Relevance to the Proposed Project	Inclusion as Important Ecological Feature (Yes/No)
Habitats			
Amenity grassland (GS2)	Local Importance (lower value)	Not a legally protected habitat. This habitat is located along roadside verges along the TDR. The habitat is species poor.	No
Buildings and artificial surfaces (BL3)	Local Importance (higher value)	Not a legally protected habitat. The habitat is man-made and includes public roads, access roads, agricultural sheds and derelict houses. It supports low diversity of flora. However, six buildings within the ZoI were identified as supporting bat roosts (Building 4, Building 6, Building 7, Building 8, Building 12 and Building 19) and as such these features are of higher ecological value.	**Yes**
Conifer plantation (WD4)	Local Importance (lower value)	Not a legally protected habitat. The habitat is the most abundant within the proposed Wind Farm Site. Conifer plantations are dominated by non-native species.	No
Cutover bog (PB4) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition	Local Importance (higher value)	The non-priority Annex I habitat type 7130 Blanket bog (inactive) is listed in Annex I of the EU Habitats Directive and transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). Within SACs where the Annex I habitat type is listed as a Qualifying Interest, it is afforded full statutory protection. Although degraded through past management practices, Cutover bog (PB4) habitat is considered a semi-natural habitat type with a high biodiversity in a local context.	**Yes**
Depositing/lowland Rivers (FW2)	International Importance / Local Importance (higher value)	The habitat intercepts the proposed GCR at four locations. At Aquatic Site 17 and Site 22 the Depositing/lowland Rivers (FW2) are within the boundaries of Lough Gill SAC and as such are protected watercourses of under the EU Habitats Directive.	**Yes**
Drainage ditches (FW4)	Local Importance (higher value)	Not a legally protected habitat. Drainage ditches (FW4) are located across the proposed Wind Farm Site and are essential in maintaining links and ecological corridors within the landscape.	**Yes**

Ecological Feature	Valuation at which feature is important (NRA, 2009a)	Legal Status & Relevance to the Proposed Project	Inclusion as Important Ecological Feature (Yes/No)
Dry-humid and acid grassland (GS3)	Local Importance (lower value)	Not a legally protected habitat. The habitat was recorded along a steep sloping ravine in the east of the proposed Wind Farm Site. Dry/humid acid grassland (GS3) is also present in small parcels within the proposed Wind Farm Site at Site A and Site C. The habitat does not correspond to any Annex I habitat types due to low species diversity.	No
Dry meadows and grassy verges (GS2)	Local Importance (higher value)	Not a legally protected habitat. The habitat was present along roadside verges throughout the proposed Wind Farm Site and is likely to support the Annex II species marsh fritillary (*Euphydryas aurinia*) where conditions are suitable.	**Yes**
Dry siliceous heath (HH1) corresponding to Annex I habitat type 4030 European dry heaths in unfavourable condition	County Importance	The Annex I habitat type 4030 European dry heaths is listed in Annex I of the EU Habitats Directive and transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). Within SACs where the Annex I habitat type is listed as a Qualifying Interest, it is afforded full statutory protection. Dry siliceous heath (HH1) is highly localised to Saddle Hill (Site A). The highly localised extent and unfavourable condition of this Annex I habitat type does not constitute 'a viable area' of habitat (NRA, 2009a).	**Yes**
Dry siliceous heath (HH1)/ Dry humid acid grassland (GS3) corresponding to the Annex I habitat type 4030 European dry heaths	County Importance	The Annex I habitat type 4030 European dry heaths is listed in Annex I of the EU Habitats Directive and transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). Within SACs where the Annex I habitat type is listed as a Qualifying Interest, it is afforded full statutory protection. The Dry siliceous heath (HH1)/ Dry humid acid grassland (GS3) is highly localised to Saddle Hill (Site A). The highly localised extent and unfavourable condition of this Annex I habitat type does not constitute 'a viable area' of habitat (NRA, 2009a).	**Yes**
Eroding/upland rivers (FW1)	International Importance / Local Importance (higher value)	Not a legally protected habitat. Eroding/upland rivers (FW1) are located across the proposed Wind Farm Site. They are semi-natural habitat type and are essential in maintaining ecological corridors.	**Yes**

Ecological Feature	Valuation at which feature is important (NRA, 2009a)	Legal Status & Relevance to the Proposed Project	Inclusion as Important Ecological Feature (Yes/No)
Exposed calcareous rock (ER2) corresponding to the priority Annex I habitat type 8240* Limestone Pavements in unfavourable condition.	County Importance	The priority Annex I habitat type 8240* Limestone Pavements is listed in Annex I of the EU Habitats Directive and transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). Within SACs where the Annex I habitat type is listed as a Qualifying Interest, it is afforded full statutory protection. There are several localised occurrences of this habitat to the north-west of the proposed Wind Farm Site (Site A). The highly localised extent and unfavourable condition of this Annex I habitat type does not constitute 'a viable area' of habitat (NRA, 2009a).	**Yes**
Exposed sand, gravel or till (ED1)	Local importance (lower value)	Not a legally protected habitat. The habitat was found once within the proposed Wind Farm Site, in the form of an excavated pit.	No
Hedgerows (WL1)	Local Importance (higher value)	Not a legally protected habitat. The habitat was not widely recorded within the proposed Wind Farm Site, however Hedgerows (WL1) are abundant along the TDR and GCR. They are essential in maintaining ecological corridors within the landscape.	**Yes**
Improved agricultural grassland (GA1)	Local importance (lower value)	Not a legally protected habitat. The habitat was not widely recorded within the proposed Wind Farm Site, with its occurrence largely localised to the north-west extent. The habitat is highly managed and supports low species diversity.	No
(Mixed) broadleaved woodland (WD1)	Local Importance (higher value)	Not a legally protected habitat. Several parcels of (Mixed) broadleaved woodland (WD1) were recorded within the southern extent of the proposed Wind Farm Site. The habitat shows a good diversity of native tree species and as such is considered a semi-natural habitat with high biodiversity in a local context.	**Yes**
(Mixed) Broadleaved/conifer woodland (WD2)	Local Importance (lower value)	Not a legally protected habitat. The habitat occurs in three areas within the proposed Wind Farm Site, two large parcels in the south-west and one small parcel to the east. Habitat is dominated by non-native Sitka spruce and is considered to have relatively low biodiversity value.	No

Ecological Feature	Valuation at which feature is important (NRA, 2009a)	Legal Status & Relevance to the Proposed Project	Inclusion as Important Ecological Feature (Yes/No)
Non-marine caves (EU1)	Local Importance (higher value)	Not a legally protected habitat. The habitat was recorded in the centre of the proposed Wind Farm Site with some freshwater sources entering the natural karst feature, and as a hydrological feature it is essential in maintaining connectivity with other features. The habitat is rare in a local context.	**Yes**
Recently felled woodland (WS5)	Local importance (lower value)	Not a legally protected habitat. A single occurrence of this habitat is located to the eastern extent of the proposed Wind Farm Site. The habitat is highly managed and supports low species diversity.	No
Recolonising bare ground (ED3)	Local importance (lower value)	Not a legally protected habitat. The habitat exists along access roads within the proposed Wind Farm Site. The habitat supports low species diversity.	No
Riparian woodland (WN5)	Local Importance (higher value)	The habitat is listed in Annex I of the EU Habitats Directive and transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011. The habitat was recorded along the Owenmore (Manorhamilton)_020 River. It is a semi-natural habitat with high biodiversity value in a local context.	**Yes**
Scrub (WS1)	Local Importance (higher value)	Not a legally protected habitat. The habitat occurs frequently throughout the proposed Wind Farm Site and is essential in maintaining linkages between features of higher ecological value.	**Yes**
Spoil and bare ground (ED2)	Local importance (lower value)	Not a legally protected habitat. The habitat is found along access roads throughout the proposed Wind Farm Site. The habitat supports low species diversity.	No
Stone walls and other stonework (BL1)	Local importance (higher value)	Not a legally protected habitat. The habitat was only recorded once within the proposed Wind Farm Site. The habitat functions as an ecological corridor between features of higher ecological value.	**Yes**
Treelines (WL2)	Local Importance (higher value)	Not a legally protected habitat. The habitat is occasionally occurring within the proposed Wind Farm Site and also occurs along the proposed TDR and GCR. The habitat is essential in maintaining links and ecological corridors within the landscape.	**Yes**

Ecological Feature	Valuation at which feature is important (NRA, 2009a)	Legal Status & Relevance to the Proposed Project	Inclusion as Important Ecological Feature (Yes/No)
Upland blanket bog (PB2) corresponding to the priority Annex I habitat type 7130* Blanket bog (active) in favourable condition	National Importance	The priority Annex I habitat type 7130* Blanket bog (active) is listed in Annex I of the EU Habitats Directive and transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). Within SACs where the Annex I habitat type is listed as a Qualifying Interest, it is afforded full statutory protection. The areas of Upland blanket bog (PB2) corresponding to the priority Annex I habitat type 7130* Blanket bog (active) in favourable condition, are located in the north-west of the proposed Wind Farm Site c. 300m to the south of T3 (Site A), as well as in the north of the site c. 50m to the south of T4 (Site B). The favourable condition of this Annex I habitat type constitutes 'a viable area' of habitat Importance (NRA, 2009a).	**Yes**
Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition	County Importance	The non-priority Annex I habitat type 7130 Blanket bog (inactive) is listed in Annex I of the EU Habitats Directive and transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). Within SACs where the Annex I habitat type is listed as a Qualifying Interest, it is afforded full statutory protection. The areas of Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition were identified in the immediate vicinity of T3 (Site A), c. 30m to the south of T4 (Site B), and c. 20m to the east of T10 (Site C). The unfavourable condition of this Annex I habitat type does not constitute 'a viable area' of habitat (NRA, 2009a:16).	**Yes**
Wet grassland (GS4)	Local importance (lower value)	Not a legally protected habitat. This habitat is frequently occurring throughout the proposed Wind Farm Site. It has highly managed and supports low species diversity.	No
Wet willow-alder-ash woodland (WN6) corresponding to Annex I 91E0 Alluvial forests in unfavourable condition	County Importance / Local importance (higher value)	The Annex I habitat type 91E0 Alluvial forests is listed in Annex I of the EU Habitats Directive and transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). Within SACs where the Annex I habitat type is listed as a Qualifying Interest, it is afforded full statutory protection. The Wet willow-alder-ash woodland (WN6) at Aquatic Site 28, 13, 14 and 16 correspond to Annex I 91E0 Alluvial forests in unfavourable condition and is valued at County	**Yes**

Ecological Feature	Valuation at which feature is important (NRA, 2009a)	Legal Status & Relevance to the Proposed Project	Inclusion as Important Ecological Feature (Yes/No)
		Importance. Wet willow-alder-ash woodland (WN6) at Aquatic Site 18 and 20 are valued at Local Importance (higher value) only.	
Wet heath (HH3) corresponding to Annex I habitat type 4010 Northern Atlantic wet heaths with *Erica tetralix* in favourable condition	National Importance	The Annex I habitat type 4010 Northern Atlantic wet heaths with *Erica tetralix* is listed in Annex I of the EU Habitats Directive and transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). Within SACs where the Annex I habitat type is listed as a Qualifying Interest, it is afforded full statutory protection. Linear parcels of Wet heath (HH3) were identified across the proposed Wind Farm Site between stands of Conifer plantation (WD4). A small parcel of Annex I habitat type 4010 Northern Atlantic wet heath with *Erica tetralix* in favourable condition was identified c. 130m south of T4 (Appendix 5-2). The favourable condition of this Annex I habitat type constitutes 'a viable area' of habitat (NRA, 2009a:16).	**Yes**
Species			
Bristle-leaf *(Brachydontium trichodes)*	National Importance	The species is listed on the Flora Protection Order (FPO) pursuant to Section 19 of the Wildlife (Amendment) Act 2000, affording it statutory protection against picking, cutting, uprooting, or otherwise interfering with the species. The nearest record for bristle-leaf is c. 420m beyond the Survey Area for the proposed Wind Farm Site and c. 1.1km from the proposed Wind Farm Site infrastructure at nearest distance, namely T4.	**Yes**
Small white orchid (*Pseudorchis albida*)	National Importance	The species is listed on the Flora Protection Order (FPO) pursuant to Section 19 of the Wildlife (Amendment) Act 2000, affording it statutory protection against picking, cutting, uprooting, or otherwise interfering with the species. Records indicate the presence of small-white orchid within the townland of Faughary, approximately 42 m west of the survey area for the proposed Wind Farm Site and approximately 100 m from the nearest proposed Wind Farm infrastructure, namely Turbine T11.	**Yes**

Ecological Feature	Valuation at which feature is important (NRA, 2009a)	Legal Status & Relevance to the Proposed Project	Inclusion as Important Ecological Feature (Yes/No)
Invertebrates			
Marsh fritillary (*Euphydryas aurinia*)	County Importance	The species is listed in Annex II of the EU Habitats Directive and transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). It is afforded full statutory protection within SACs where the species is listed as a Qualifying Interest.	**Yes**
Terrestrial mammals			
European otter (*Lutra lutra*)	International importance / County Importance	This species is protected under Annex II and IV of the EU Habitats Directive and is also protected under the Wildlife Acts (as amended). European otter has full statutory protection under Annex II of the Habitats Directive within Lough Gill SAC where the species is listed as a Qualifying Interest. Nearly all waterbodies comprised suitable commuting and foraging habitat for European otter and signs were recorded at multiple aquatic survey sites. No European otter signs were recorded within the windfarm site although moderately suitable habitat was recorded. Along the GCR route multiple signs of European otter were recorded and habitat suitability was excellent at many sites.	**Yes**
Badger (*Meles meles*)	Local importance (higher value)	Protected under the Wildlife Act 1976 (as amended). One inactive outlier sett was identified within the proposed Wind Farm Site.	**Yes**
Red Deer (*Cervus elaphus*)	Local importance (higher value)	This species is protected under the Wildlife Act 1976 (as amended). Deer droppings were recorded within the proposed Wind Farm Site.	**Yes**
Pine marten (Martes martes)	Local importance (higher value)	The species are protected under the Wildlife Act 1976 (as amended). Pine marten scat was recorded on one occasion in 2020 and one occasion in 2025, within the south-west section of the Survey Area for the proposed Wind Farm Site	**Yes**
Other small mammal species	Local importance (higher value)	Species include Red squirrel (*Sciurus vulgaris*), Hedgehog (*Erinaceus europaeus*), and Pygmy shrew (*Sorex minutus*). These species are protected under the Wildlife Act 1976s (as	**Yes**

Ecological Feature	Valuation at which feature is important (NRA, 2009a)	Legal Status & Relevance to the Proposed Project	Inclusion as Important Ecological Feature (Yes/No)
		amended). Previous records of these species exist for the proposed Wind Farm Site but no evidence of the species were recorded during field surveys.	
Bats			
Leisler's bat (*Nyctalus leisleri*), Common pipistrelle (*Pipistrellus pipistrellus sensu stricto*), Nathusius' pipistrelle (*Pipistrellus nathusii*) Soprano pipistrelle (*Pipistrellus pygmaeus*) Natterer's bat (*Myotis nattereri*), Daubenton's bat (*Myotis daubentonii*) *Myotis* spp. Brown long-eared bat (*Plecotus auritus*)	Local Importance (higher Value)	All bats are Annex IV European protected species in Ireland and transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). The following bat species were recorded during dusk surveys and the transects soprano pipistrelle, common pipistrelle, Natterer's bat, Myotis species (*Myotis spp.*), Nathusius' pipistrelle, Daubenton's bat, Leisler's bat. Six buildings (Building 4, Building 6, Building 7, Building 8, Building 12 and Building 19) are confirmed daytime roosts for common pipistrelle, soprano pipistrelle and brown long-eared bat. Building 7 is also a confirmed as a maternity roost for Natterer's bat.	**Yes**
Amphibians and Reptiles			
Common frog (*Rana temporaria*)	Local importance (higher value)	Common Frog is protected under the Wildlife Act 1976s (as amended) and is listed in Annex V of the Habitats Directive and transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). Direct observations of the species were made at three locations within the proposed Wind Farm Site.	**Yes**

Ecological Feature	Valuation at which feature is important (NRA, 2009a)	Legal Status & Relevance to the Proposed Project	Inclusion as Important Ecological Feature (Yes/No)
Smooth newt (*Lissotriton vulgaris*)	Local importance (higher value)	Smooth newt is protected under the Wildlife Act 1976s (as amended). Previous records and potentially suitable habitat for the species exists within the proposed Wind Farm Site.	**Yes**
Marsh fritillary (*Euphydryas aurinia*)	County Importance	The species is listed in Annex II of the EU Habitats Directive and transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). It is afforded full statutory protection within SACs where the species is listed as a Qualifying Interest. Two larval webs were identified during the 2025 survey season.	**Yes**
Aquatic species			
White-clawed Crayfish	International Importance / County Importance	This species is listed in Annex II and Annex V of the EU Habitats Directive which is transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). Crayfish has full statutory protection within Lough Gill SAC where the species is listed as a Qualifying Interest. Nearly all waterbodies comprised suitable refugia for crayfish although the proposed wind farm site mainly comprised high energy, high altitude streams some of which had an ephemeral nature which do not comprise high suitability habitat for crayfish. Crayfish and crayfish remnants were recorded at a number of sites along the GCR where habitat suitability was high.	**Yes**
Brown Trout	Local Importance (higher value)	This species and its spawning habitat is protected under the Fisheries (Consolidation) Act 1959 (as revised in 2025). Many waterbodies comprised suitable spawning and holding habitat for brown trout. Suitable spawning gravels and holding habitat was available in the windfarm site and at the sites along the GCR.	**Yes**
Atlantic Salmon	International Importance / County Importance	Atlantic salmon is listed in Annex II and Annex V of the EU Habitats Directive which is transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011), the Wildlife Acts (as amended) and Fisheries (Consolidation) Act 1959 (as revised in 2025). Habitat suitability in the proposed Wind Farm Site was low to negligible but one site showed high suitability.	**Yes**

Ecological Feature	Valuation at which feature is important (NRA, 2009a)	Legal Status & Relevance to the Proposed Project	Inclusion as Important Ecological Feature (Yes/No)
		Along the GCR some sites showed good to high habitat suitability and Atlantic salmon was recorded present on the River Bonet.	
Lamprey species	International Importance / County Importance	Lamprey sp. are listed in Annex II (and Annex V – river lamprey) of the EU Habitats Directive which is transposed into Irish law through the EC Birds and Natural Habitats Regulations 2011 (S.I. No 477 of 2011). Brook Lamprey (*Lampetra planeri)* [1096], River Lamprey (*Lampetra fluviatilis*) [1099] and Sea Lamprey (*Petromyzon marinus*) [1095] are Qualifying Interests of Lough Gill SAC. Lamprey spp. spawning and juvenile habitat was moderate to low within the proposed Wind Farm Site but sites along the CGR showed good to high habitat suitability. Lamprey spp. ammocoete was confirmed present on the River Bonet.	**Yes**
European Eel	Local Importance (higher/lower value)	European Eel is protected under the Fisheries (Consolidation) Act 1959 (as revised in 2025) and is Critically endangered on the IUCN Red List. Suitable eel habitat was recorded at all sites although the sites located within the proposed Wind Farm Site are likely less suitable due to the upland nature and ephemeral water levels of these streams.	**Yes**

5.5 EMBEDDED MITIGATION

Measures were implemented at the design phase of the Proposed Project to avoid and reduce negative impacts on IEFs. Embedded mitigation measures for the Proposed Project relevant to biodiversity consists of:

- The development footprint of the proposed Wind Farm Site does not directly overlap with any designated conservation areas (SAC's, SPA's, NHA's, pNHA's). Proposed vegetation clearance at POI 13 is limited to the public roads network (N4) within the boundaries of Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC where vegetation trimming of c. 17m of Hedgerows (WL1) is proposed. Vegetation removal within Lough Gill SAC is proposed at the reception pits for the off-road HDD Site 1 at Aquatic Site 15; This vegetation clearance is limited to c. 10m of (WL1) Hedgerow within the boundary of Lough Gill SAC. At off-road HDD Site 2, located at Aquatic Site 22, no vegetation clearance within Lough Gill SAC is proposed.
- All turbines are located greater than 50m from watercourses (streams, rivers, lakes);
- Locating the Proposed Project within habitat which is considered to be of Local Importance (lower value) as much as is practicable and the micro-siting of turbines and associated infrastructure to avoid IEFs. For example, the siting of T4 and T10 avoids nearby Upland blanket bog (PB2). Similarly, the siting of T3 was adjusted to avoid the priority Annex I habitat type 7130* Blanket bog in favourable condition and repositioned within degraded Cutover bog (PB4) instead;
- Turbines and associated infrastructure have been sited so as to avoid Important Ecological Features (IEFs) as much as is practicable;
- Facilitating a 100m bat buffer around each turbine in line with best practice guidelines (NatureScot, 2021) to avoid the collision of commuting/foraging bat in proximity to the turbines during operation;
- The number and extent of new internal access tracks within the site have been kept to a minimum. Existing roads/tracks and forestry site entrances utilised where possible;
- No in-stream works are proposed along the GCR, TDR or within the proposed Wind Farm Site. Trenchless techniques will be used (i.e. clear span bridges, horizontal directional drilling (HDD) & oversize bottomless culverts as appropriate);
- Careful construction of new access tracks with appropriate drainage management to control road runoff and sediment mobilisation;
- Drainage management system at substation;
- Near-stream construction work will be carried out in accordance with the IFI (2016) guidance;
- Turbines, borrow pits, compounds and substation are not located within 30 m of any known karst features (dolines etc) or 100 m of swallow holes;
- No onsite washout of concrete vehicle drums (chute only washout where necessary);
- Sediment traps, silt fences and regular maintenance will be installed in line relevant guidance along roads, bridge/culvert works, compounds and borrow pits during construction;

- SuDS measures (e.g. surface water settlement ponds, attenuation to greenfield runoff rates) will be implemented along access roads, hardstands, substation and compounds;
- Hydrocarbon interceptors will be installed at the 2 no. construction compounds and substation with regular inspection and maintenance to ensure optimal performance;
- Fuel stored in bunded areas to 110% capacity at site compounds and substation;
- Surplus peat will be placed in on-site borrow pits to ensure proper handling, storage, and reuse of soils, to contain and control sediment;
- Separate storage of topsoil and subsoil (≤3 m height, dry weather handling) at excavations for roads, hardstands, cables, compounds and substation;
- Tree felling for roads, hardstands, cable routes and turbine locations will be undertaken in accordance with good forestry practice and brash mats will be used to support harvesting and forwarding machinery;
- Electrical and communications cable connections between turbines and from turbines to the substation control building will be underground;
- Electrical and communications cable connections will be alongside or within turbine access tracks;
- Cut and fill required for turbine and access track construction is roughly balanced.
- Surfaces resulting from cut and fill will consist of material that is conducive to the successful re-establishment of local vegetation; and,
- Existing hedgerows, walls and vegetation will be retained insofar as possible.

The above embedded mitigation measures are considered within the Assessment of Effects.

5.6 Assessment of Effects and Mitigation Measures

Key activities associated with the Proposed Project (in the absence of mitigation), relevant to the assessment of ecological effects, are summarised below. This assessment also included the 'Do Nothing Scenario', i.e. existing and future trends in land-use or activities that may impact or change biodiversity.

5.6.1 Do-nothing Scenario

The 'Do-Nothing' scenario describes the circumstance whereby no development occurs. The proposed Wind Farm Site predominantly comprises commercial conifer forestry and rough grazing pasture, with some persistent parcels of semi-natural habitat remaining including Upland blanket bog (PB2). If the Proposed Project does not proceed the existing baseline conditions, as outlined in Section 5.4, will persist along with the current threats to the integrity of IEFs identified within the Survey Area for the proposed Wind Farm Site.

If the Proposed Project does not proceed, it is likely current land management practices would continue into the future. Once the Conifer plantation (WD4) matures the forestry will be clear-felled and replanted under license. Clear-felling will likely result in a significant temporary decrease in water quality of nearby Eroding upland rivers (FW1) and associated downstream aquatic ecology. Without appropriate water protection measures, future clear-felling of the Conifer Plantation (WD4) within the Survey Area for the proposed Wind Farm Site has potential to negatively impact the downstream aquatic ecology and Qualifying Interests listed for Lough

Gill SAC and Lough Melvin SAC, including: White-clawed Crayfish (*Austropotamobius pallipes*) [1092], Sea Lamprey (*Petromyzon marinus*) [1095], Brook Lamprey (*Lampetra planeri*) [1096], River Lamprey (*Lampetra fluviatilis*) [1099], Salmon (*Salmo salar*) [1106], and European otter (*Lutra lutra*) [1355].

The sheep grazing will continue within the frequently occurring Wet grassland (GS4) habitats as well as the occasional parcels of Upland blanket bog (PB2) and Cutover bog (PB4) located within the Survey Area for the proposed Wind Farm Site. Grazing pressure has been noted as a significant threat to the integrity of all of the Annex I habitat types identified within the Survey Area for the proposed Wind Farm Site, including;

- Annex I habitat type 4030 European dry heaths;
- Annex I habitat type 4010 Northern Atlantic wet heath with *Erica tetralix;*
- Priority Annex I habitat type 7130* Blanket bog (active);
- Non-priority Annex I habitat type 7130 Blanket bog (inactive); and,
- Priority Annex I habitat type 8240* Limestone Pavements.

It is likely stocking rates will remain high and continued overgrazing will lead to a significant permanent decrease in the quality and extent of the aforementioned Annex I habitat types, impacting the viability of these habitats (in terms of species composition, ecological processes and function) and resilience to stochastic events over the coming decades (NRA, 2009: 16).

Other on-going threats to the integrity of the Annex I habitat types within the Survey Area for the proposed Wind Farm Site includes drainage, erosion, and the encroachment of self-seeded non-native conifers within the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable bad condition. These threats if not mitigated against will result in a significant permanent decrease in the quality and extent of the non-priority Annex I habitat type 7130 Blanket bog (inactive) over the coming decades.

Given current global climate change projections, it is also likely that the intensity and severity of extreme weather events including drought and heavy rainfall will impact the ecological condition of sensitive IEFs within the Survey Area for the proposed Wind Farm Site. These climatic changes are not expected to be influenced by whether the Proposed Wind Farm proceeds or not.

5.6.2 Construction Phase

The Construction Phase of the Proposed Wind Farm is anticipated to last approximately 24 months and is estimated to commence in January 2028 (Chapter 2 – Description of Proposed Project).

The construction phase will result in direct habitat loss/disturbance to facilitate construction of infrastructure, including excavation of cabling trenches during the installation of the underground grid connection. Felling of vegetation will also be undertaken to implement turbulence buffers and bat mitigation buffers around turbines. The following are potential impacts on biodiversity during the construction phase:

- Habitats loss (permanent and temporary);
- Disturbance/displacement to species;
- Habitat degradation as a result of water quality degradation;
- Habitat degradation as a result of drainage impacts;
- Habitat degradation as a result of surface water run-off;

- Habitat degradation as a result of dust deposition; and
- Risk of mortality.

Potential likely significant effects associated with the construction phase on biodiversity, specifically IEFs, are discussed further below.

A total of eleven watercourse crossings are proposed within the proposed Wind Farm Site. One culvert extension is proposed for Aquatic Site 3, crossing an unnamed river (EPA Code: 35_2909) adjacent to the substation compound in the proposed Wind Farm Site. No instream works are necessary to facilitate the extension of this culvert. All other watercourse crossings within the proposed Wind Farm Site will be constructed with clear span bridges at Aquatic Site 1, 2, 4, 5, 6, 7, 8, 9, 10 and 11. All EPA marked streams will be crossed by clear span bridges (Chapter 8 – Hydrology and Hydrogeology, Section 8.4.5).

At two locations along the GCR (Aquatic Site 15 and 22) which are within the boundaries of Lough Gill SAC, off-road HDD will be used as a method to avoid negative effects on water quality. Upgrades to existing watercourse crossings necessary to facilitate trenching of the cable along the GCR will involve a combination of culvert extensions and clear-span bridges. Therefore, no instream works are proposed along the GCR.

No new watercourse crossings or modification of existing culverts are required for the POIs along the proposed TDR.

5.6.2.1 European Sites

Impacts on European sites have been considered in full within the AA Screening and NIS appended to the planning application (TOBIN, 2025). A summary of the NIS is provided below.

Potential construction phase impacts on European sites associated with the proposed project are discussed hereunder.

- Surface water quality degradation;
- Groundwater quality degradation; and,
- Disturbance.

5.6.2.1.1 Surface Water Quality Degradation

In the absence of embedded mitigation measures for water protection, degredation of surface water quality constitutes a pathway for potential likely significant effects on the integrity of downstream European sites, namely;

- Ballysadare Bay SAC;
- Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC;
- Lough Gill SAC;
- Lough Melvin SAC;
- Lough Melvin SAC (NI); and,
- Unshin River SAC.

5.6.2.1.1.1 Ballysadare Bay SAC

Ballysadare Bay SAC [000622] is located ca. 17km downstream of the south-western extent of the proposed GCR with hydrological connectivity via the Unshin_40.

The construction phase of the proposed GCR has potential to negatively impact the water quality status of Ballysadare Bay SAC, as proposed trenching along the public road is within 50m

of the Ballygrania stream (EPA Code: 35_741), which forms part of the WFD river waterbody Unshin_040.

Following a period of heavy rainfall there is potential for contaminants or sediment to be washed into the waterbodies, in the absence of mitigation. This constitutes a potential pathway for likely significant effects on European sites, such as Ballysadare Bay SAC located ca. 17km downstream.

In the absence of mitigation, the proposed GCR has the potential to result in likely significant effects on the QIs of Ballysadare Bay SAC, specifically those occurring within the estuary and which are sensitive to water quality in the unlikely occurrence of a contamination and/or sedimentation event, namely (NPWS, 2013b):

- 1130 Estuaries;
- 1140 Mudflats and sandflats not covered by seawater at low tide; and,
- 1365 Harbour Seal.

However, considering the embedded mitigation measures for the protection of water quality (Section 5.5) namely the SuDS measures including the control of surface water run-off and the installation of silt fences, likely significant effects on the listed QIs are not anticipated. Any effects are considered short-term as they are limited to the construction phase.

In summary, **no likely significant effects at any geographic scale** are anticipated on the QIs of the SAC nor the overall integrity of the European site as a result of the Proposed Project.

5.6.2.1.1.2 Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC

Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC is located 0m from the POI 13 along the TDR where accommodations are proposed to trim c. 17m Hedgerows (WL1) in the oversail area. These accommodations are limited to the public road network along the N4.

Overrun areas within POI 13 which necessitate the removal of 0.02ha of Amenity grassland (GS2) topsoil to facilitate temporary surfaces are located outside the boundaries of Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC.

Hydrological connectivity exists via the via the *Sligo* (EPA Code: 35S23) which is part of the WFD river waterbody Garavogue_010. The *Sligo* passes under the public road N-15, and discharges into the SAC, 0m from POI 13 along the TDR.

As such, the removal of 0.02ha of topsoil during a heavy rainfall event constitutes potential for likely significant effects on the integrity of the SAC as a result of siltation. The potential for an accidental spillage or leakage of contaminants from machinery and/or vehicles must also be considered and although the likelihood is low, mitigation is necessary to protect the watercourse discharging into the SAC.

In the absence of mitigation, an accidental contamination and/or sedimentation event at POI 13 along the TDR has the potential to result in likely significant effects on the following QIs:

- Estuaries [1130];
- Mudflats and sandflats not covered by seawater at low tide [1140];
- Sea Lamprey (*Petromyzon marinus*) [1095];
- River Lamprey (*Lampetra fluviatilis*) [1099]; and,
- Harbour Seal *(Phoca vitulina*) [1365].

However, considering the embedded mitigation measures for the protection of water quality (Section 5.5) namely the SuDS measures including the control of surface water run-off and the installation of silt fences, likely significant effects on the listed QIs are not anticipated. Any effects are considered short-term as they are limited to the construction phase.

In addition, there is hydrological connectivity from POI 21 and the SAC 3.1km downstream via the Willsborough Stream_010. Again, proposed accommodations at POI 21 consist of vegetation removal to accommodate the oversail area. Risks of siltation therefore are reduced to negligible given that the watercourse is c. 50m from the proposed vegetation clearance. This 50m distance will also reduce the likelihood of contamination of watercourses to negligible following an accidental spillage or leakage of contaminants from machinery of vehicles or machinery. This 50m separation distance equates to the setback distance from aquatic zones recommended for the use of potentially hazardous materials under best practice guidance *Standards for Felling and Reforestation* (DAFM, 2019). As such, there is no potential for significant effects on Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC as a result of proposed accommodations at POI 21.

In summary, **no likely significant effects at any geographic scale** are anticipated on the QIs of the SAC nor the overall integrity of the European site as a result of the Proposed Project.

5.6.2.1.1.3 Lough Gill SAC

The boundary of Lough Gill SAC [001976] is located ca. 200m south of the proposed Wind Farm Site, at the nearest distance. The proposed Wind Farm Site is upstream and hydrologically connected to the SAC via the Brackary_010 and Owenmore (Manorhamilton)_020. As such, a hydrological pathway exists between the Survey Area for the proposed Wind Farm Site and the SAC which is located 2.2km downstream at nearest distance.

There is potential for negative impacts on Lough Gill SAC including the release of sediment laden surface water or otherwise polluted water to watercourses draining the proposed Wind Farm Site. However, it is important to note there are no instream works proposed within the proposed Wind Farm Site.

In addition, sections of the proposed GCR are located within the boundary of Lough Gill SAC for ca. 920m (Figure 5-32). The trenching of the cable within the public road network includes six existing watercourse crossings (Aquatic site 15, 16, 17, 19, 22, 24) within the SAC along the Bonet River, with an additional eight existing watercourse crossing outside of the SAC boundary which drain into Lough Gill SAC (Aquatic site 12, 13, 14, 18, 20, 21, 26, 27). Any trenching within 50m of a watercourse has potential to result in siltation and/or contamination of watercourses. As the vegetation removal to facilitate the temporary launch pits for HDD is located >50m from any watercourses, there is no potential for siltation and/or sedimentation of watercourses as a result.

Habitat surveys along the proposed GCR confirm there will be no direct loss of Annex I habitats within the SAC as a result of the Proposed Project. A loss of c. 10m of Hedgerow (WL1) is proposed within the SAC to accommodate the temporary launch pit at HDD Site 1. There will be no instream works along the GCR.

There is potential for likely significant effects on Lough Gill SAC by undermining the conservation objectives for aquatic species and riparian habitats listed as, namely (NPWS, 2016b):

- 3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation;
- 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae);
- 1092 White-clawed Crayfish;
- 1095 Sea Lamprey;
- 1096 Brook Lamprey;
- 1099 River Lamprey;
- 1106 Atlantic Salmon; and,
- 1355 European otter.

The potential likely significant effects for the following IEFs are considered further under the following sections:

- White-clawed crayfish is considered in Section 5.6.2.10.5;
- Lamprey spp. is considered in Section 5.6.2.10.3;
- Atlantic salmon is considered in Section 5.6.2.10.1; and,
- European otter Section 5.6.2.7.1.

However, likely significant effects on the listed QIs are not anticipated considering the embedded mitigation measures for the protection of water quality (Section 5.5) inclusive of: the SuDS measures, hydrocarbon interceptors, avoidance of instream works, avoidance of karst features, as well as the use of sediment traps, silt fences, and bunded fuel storage.

In summary, **no likely significant effects at any geographic scale** are anticipated on the QIs of the SAC nor the overall integrity of the European site as a result of the Proposed Project.

5.6.2.1.1.4 Lough Melvin SAC

Lough Melvin SAC (000428) is located 6.4km downstream of the proposed Wind Farm Site and hydrologically connected via the Lattone 35_010 (IE_NW_35L660960). As such, a hydrological pathway exists between the SAC and the proposed project.

The proposed internal access tracks to T1 and T2 will traverse the EPA river Lisdarush (EPA Code: 35L68) at 3 locations. In the absence of mitigation there is potential that the proposed works at these watercourse crossings and within 50m of the Lisdarush river, will result in the deterioration of surface water quality through contamination and/or the release of sedimentation leading to siltation of downstream watercourses with hydrological connectivity to the SAC.

In the absence of mitigation, this constitutes a potential pathway for likely significant effects on QIs, specifically those which are sensitive to water quality, namely (NPWS, 2021e):

- 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea;
- 1106 Atlantic Salmon (*Salmo salar*); and
- 1355 European Otter (*Lutra lutra*).

The potential likely significant effects for the following IEFs are considered further under the following sections:

- Atlantic salmon is considered in Section 5.6.2.10.1; and,
- European otter Section 5.6.2.7.1.

However, likely significant effects on the listed QIs are not anticipated considering the embedded mitigation measures for the protection of water quality (Section 5.5) inclusive of: the SuDS measures, hydrocarbon interceptors, avoidance of instream works, avoidance of karst features, as well as the use of sediment traps, silt fences, and bunded fuel storage.

In summary, **no likely significant effects at any geographic scale** are anticipated on the QIs of the SAC nor the overall integrity of the European site as a result of the Proposed Project.

5.6.2.1.1.5 Lough Melvin SAC (NI)

The WFD river waterbody Lattone 35_010 (WFD Code: IE_NW_35L660960), constitutes a potential pathway for likely significant effects between the proposed Wind Farm Site and Lough Melvin NI SAC (NI) (UK0030047), Northern Ireland (Section 5.4.1.1.1).

The proposed internal access tracks to T1 and T2 will traverse the EPA river Lisdarush (EPA Code: 35L68) at 3 locations. In the absence of mitigation there is potential that the proposed works at these watercourse crossings and within 50m of the Lisdarush river, will result in the deterioration of surface water quality through contamination and/or the release of sedimentation leading to siltation of downstream watercourses with hydrological connectivity to the SAC (NI).

Potential likely significant effects on Lough Melvin SAC (NI) are limited to those QIs which are sensitive to water quality, namely;

- Annex I habitat type 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea; and,
- Annex II species 1106 Salmon (*Salmo salar*).

The potential likely significant effects for the following IEFs are considered further under the following sections:

- Atlantic salmon is considered in Section 5.6.2.10.1; and,
- European otter Section 5.6.2.7.1.

The effects of contamination and/or sedimentation of watercourses on the Annex I habitat type 3130 Oligotrophic to mesotrophic standing waters are likely to be limited to the construction phase and have potential to alter the water chemistry and species composition of the macropyhte community.

The effects of contamination and/or sedimentation of watercourses on the Annex II species salmon include negative effects on the population dynamics of the species within the SAC (NI) as well as the presence of clean gravels impacting the integrity of the watercourse for spawning upstream. These negative effects are likely limited to the 24-month duration of the construction phase whereby water quality and flow pathways will likely return to baseline. If a significant contamination event was to coincide with spawning activity, then the magnitude of the negative effect would increase, with potential for long-term negative effects. If siltation of watercourses involves the loss of potential spawning habitat through the deposition of sediment on spawning gravels, then there is potential for long-term negative effects on salmon.

However, likely significant effects on the listed QIs are not anticipated considering the embedded mitigation measures for the protection of water quality (Section 5.5) inclusive of: the SuDS measures, hydrocarbon interceptors, avoidance of instream works, avoidance of karst features, as well as the use of sediment traps, silt fences, and bunded fuel storage.

In summary, **no likely significant effects at any geographic scale** are anticipated on the QIs of the SAC (NI) nor the overall integrity of the European site as a result of the Proposed Project.

5.6.2.1.1.6 Unshin River SAC

The Unshin River SAC (001898) is located 7.5km downstream of the southern extent of the proposed GCR with hydrological connectivity via the Unshin_040. The EPA stream Ballygrania (35B81), which is part of the WFD river waterbody Unshin_040, is located ca. 40m from the proposed GCR. Even though the works will be limited to the public road, there is still potential for run-off from construction activities which could result in siltation and/or contamination of downstream watercourses within c. 50m of proposed works. As such, there is potential for likely significant effects on the SAC as a result of the proposed GCR.

In the absence of mitigation, contamination of water quality arising from surface water runoff, sedimentation, and/or pollution associated with construction works, has the potential to be washed into the Ballygrania (35B81). This constitutes a potential pathway for likely significant effects on Unshin River SAC, which is located ca. 7.5km downstream. There is potential for likely significant effects on QIs, specifically those which are sensitive to water quality, namely (NPWS, 2021d):

- 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation;
- 1106 Atlantic Salmon (*Salmo salar*); and
- 1355 European Otter (*Lutra lutra*).

The potential likely significant effects for the following IEFs are considered further under the following sections:

- Atlantic salmon is considered in Section 5.6.2.10.1; and,
- European otter Section 5.6.2.7.1.

However, likely significant effects on the listed QIs are not anticipated considering the embedded mitigation measures for the protection of water quality (Section 5.5) inclusive of: the SuDS measures, hydrocarbon interceptors, avoidance of instream works, avoidance of karst features, as well as the use of sediment traps, silt fences, and bunded fuel storage.

In summary, **no likely significant effects at any geographic scale** are anticipated on the QIs of the SAC nor the overall integrity of the European site as a result of the Proposed Project.

5.6.2.1.2 Groundwater Quality Degradation

In the absence of embedded mitigation measures, the degredation of groundwater quality constitutes a pathway for potential likely significant effects on the integrity of European sites which share karstified groundwater bodies (GWBs) with the proposed Wind Farm Site, namely;

- Arroo Mountain SAC;
- Ben Bulben, Gleniff and Glenade SAC; and,
- Glenade Lough SAC.

5.6.2.1.2.1 Aroo Mountain SAC

Aroo Mountain SAC is located 1.2km north-west of T3 and 3km north-west of T11 at nearest distance. The Glencar and Glenaniff GWBs encompass Arroo Mountain SAC and the proposed Wind Farm Site (Figure 5-28).

The construction phase of the proposed Wind Farm Site, specifically the road cuttings along the western site entrance towards the nearby substation and construction compound as well as the internal access tracks to T11 and T3, constitute a source of potential contamination of the Glencar and Glenaniff GWBs.

At T3 the Glenanniff GWB is considered to have extreme vulnerability (Chapter 8 – Hydrology and Hydrogeology, Section 8.3.2.4). Similarly, the Glencar GWB at the western site entrance is considered to have extreme vulnerability (Figure 5-29). The groundwater vulnerability of the Glencar GWB at the nearby substation and T11 is considered moderate and at the nearby construction compound it is considered low.

Excavations will increase the vulnerability of the underlying aquifer to pollution through either a complete loss of overburden where cuttings are into the bedrock or by reducing the overburden depth and thus increasing the vulnerability for contaminated road drainage (Chapter 8 – Hydrology and Hydrogeology, Section 8.3.2.4). Vulnerability depends on the quantity of contaminants that can reach the groundwater, the time taken by water to infiltrate to the water table and the attenuating capacity of the geological deposits through which the water travels (Chapter 8 – Hydrology and Hydrogeology, Section 8.3.2.4).

In the absence of embedded mitigation measures, there is potential for the degradation of groundwater quality of the karstified aquifers underlying the proposed Wind Farm Site. This constitutes a pathway for potential likely significant effects on groundwater dependant receptors within the SAC.

Groundwater flow through karst areas is extremely complex and difficult to predict (2004a). Generally, there is a high degree of interconnection between groundwater and surface water in karstified limestone areas (2004a). Any contamination of surface water is rapidly transported into the groundwater system, and vice versa (2024b).

Where karst features exist, permeability is likely to vary widely within the proposed wind farm site (EIAR Chapter 7 – Land, Soils and Geology, Appendix 7-2). Dewatering to accommodate construction activities at T3 and T11 has potential to cause measurable drawdown of groundwater, which constitutes a potential for adverse effects on the hydrological regime of groundwater dependant habitats.

In the absence of mitigation, there is potential for likely significant effects on groundwater quality and the QI habitats for Arroo Mountain SAC which are groundwater dependant, namely (NPWS, 2016c);

- 7220 Petrifying springs with tufa formation (Cratoneurion);
- 4010 Northern Atlantic wet heaths with *Erica tetralix*; and,
- 7130 Blanket bogs (* if active bog).

However, likely significant effects on the listed QIs are not anticipated considering the embedded mitigation measures for the protection of groundwater quality (Section 5.5) inclusive of: the use of existing access roads where possible, the careful construction of new access roads as appropriate inclusive of drainage management, avoidance of karst features, the installation of two hydrocarbon interceptors, and the storage of fuel within bunded areas only.

In summary, **no likely significant effects at any geographic scale** are anticipated on the QIs of the SAC nor the overall integrity of the European site as a result of the Proposed Project.

5.6.2.1.2.2 Ben Bulben, Gleniff and Glenade SAC

Ben Bulben, Gleniff and Glenade SAC is located 8.3km north-west of T11. The Glencar GWB encompasses Ben Bulben, Gleniff and Glenade SAC and the proposed Wind Farm Site, specifically T11 and the internal access roads along the western site entrance towards the nearby substation and construction compound (Figure 5-28).

The Glencar GWB at the western site entrance is considered to have extreme vulnerability at the nearby substation, moderate atT11 and low at the nearby construction compound (Figure 5-29).

Groundwater flow through karst areas is extremely complex and difficult to predict (2004b). Generally, there is a high degree of interconnection between groundwater and surface water in karstified limestone areas (2004b). Any contamination of surface water is rapidly transported into the groundwater system, and vice versa (2004b). This constitutes potential for adverse effects on ground water dependant QI habitats through groundwater contamination associated with site excavation works at T11 as well as the site entrance, substation, and construction compound, all located to the south-west of T11.

Where karst features exist, permeability is likely to vary widely within the proposed Wind Farm Site (EIAR Chapter 7 – Land, Soils and Geology, Appendix 7-2). Dewatering to accommodate construction activities at T11, has the potential to cause measurable drawdown of groundwater, which constitutes a potential for adverse effects on the hydrological regime of groundwater dependant habitats.

In the absence of embedded mitigation measures, there is potential for likely significant effects on groundwater quality and the QI habitats for the SAC which are groundwater dependant, namely (NPWS, 2021a);

- 7220 Petrifying springs with tufa formation (Cratoneurion);
- 7230 Alkaline fens;
- 4010 Northern Atlantic wet heaths with *Erica tetralix*;
- 7130 Blanket bogs (* if active bog);
- 7140 Transition mires and quaking bogs;
- 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels; and,
- 1355 European otter.

However, likely significant effects on the listed QIs are not anticipated considering the embedded mitigation measures for the protection of groundwater quality (Section 5.5) inclusive of: the use of existing access roads where possible, the careful construction of new access roads as appropriate inclusive of drainage management, avoidance of karst features, the installation of two hydrocarbon interceptors, and the storage of fuel within bunded areas only.

In summary, **no likely significant effects at any geographic scale** are anticipated on the QIs of the SAC nor the overall integrity of the European site as a result of the Proposed Project.

5.6.2.1.2.3 Glenade Lough SAC

Glenade Lough SAC [001919] is located c. 7.6km north-west of T11 and shares the Glencar GWB with the proposed Wind Farm Site. Karstification is extensive throughout the Glencar GWB (GSI, 2025b).

The construction phase of the proposed Wind Farm Site, specifically the road cuttings along the western site entrance towards the nearby substation and construction compound as well as the turbine hardstand at T11, constitute a source of potential contamination of the Glencar GWB and a potential pathway for likely significant effects on groundwater dependant receptors within Glenade Lough SAC.

Where karst features exist permeability is likely to vary widely within the proposed Wind Farm Site (EIAR Chapter 7 – Land, Soils and Geology, Appendix 7-2). Dewatering to accommodate construction activities at T11 has potential to cause measurable drawdown of groundwater, which constitutes a potential for adverse effects on the hydrological regime of groundwater dependant habitats, which constitutes a potential for adverse effects on the QI habitats if Glenade Lough SAC.

No dewatering or site excavations will take place during the operational and decommissioning phase.

In the absence of embedded mitigation measures, there is potential for likely significant effects on groundwater quality and the QI habitats for Glenade Lough SAC which are groundwater dependant, namely (NPWS, 2016c);

- 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation;
- 1092 White-clawed crayfish; and
- 1833 Slender naiad.

However, likely significant effects on the listed QIs are not anticipated considering the embedded mitigation measures for the protection of groundwater quality (Section 5.5) inclusive of: the use of existing access roads where possible, the careful construction of new access roads as appropriate inclusive of drainage management, avoidance of karst features, the installation of two hydrocarbon interceptors, and the storage of fuel within bunded areas only.

In summary, **no likely significant effects at any geographic scale** are anticipated on the QIs of the SAC nor the overall integrity of the European site as a result of the Proposed Project.

5.6.2.1.2.4 Lough Gill

The proposed Wind Farm Site is partially located within the Killarga South GWB and shares this groundwater body with the northern extent of the boundaries of Lough Gill SAC along the Owenmore (Manorhamilton)_020 (Figure 5-28).

The Killarga South GWB is a karstified aquifer. Groundwater flow through karst areas is extremely complex and difficult to predict (GSI, 2004c). Generally, there is a high degree of interconnection between groundwater and surface water in karstified limestone areas (GSI, 2004c). Any contamination of surface water is rapidly transported into the groundwater system, and vice versa (GSI, 2004c). This constitutes potential for adverse effects on ground water dependant QI habitats through groundwater contamination associated with site excavation works at T2, T6, T5, T7, T8, T10, T13 and T14 as well as the borrow pits to the north and south of the proposed Wind Farm Site.

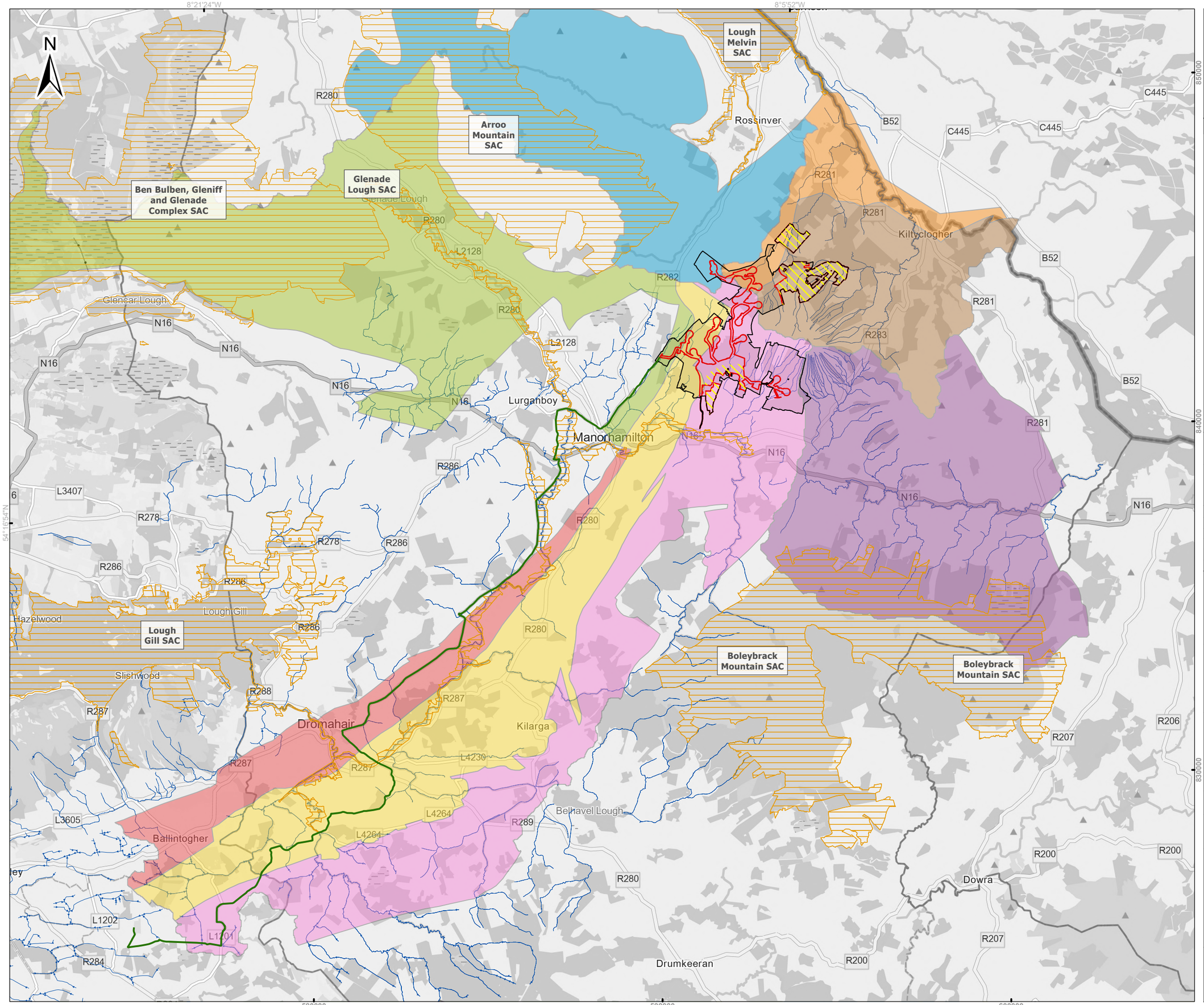
Where karst features exist, permeability is likely to vary widely within the proposed Wind Farm Site (EIAR Chapter 7 – Land, Soils and Geology, Appendix 7-2). Dewatering to accommodate construction activities within the Killarga South GWB at T2, T6, T5, T7, T8, T10, T13 and T14 as well as the borrow pits to the north and south of the proposed Wind Farm Site, has potential to

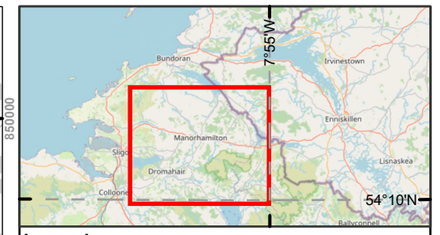
cause measurable drawdown of groundwater. This constitutes a potential for adverse effects on the hydrological regime of groundwater dependant QI habitats.

Groundwater vulnerability is *extreme to high* at T14 and the borrow pit to the south. Groundwater vulnerability is *high* at T2, T7, T8, T13. Groundwater vulnerability is *moderate* at T5, T6, T10 and the borrow pit to the north.

However, the location of these groundwater dependant Annex I habitats within the SAC are located within separate groundwater bodies (NPWS, 2021f). Lough Gill itself is designated Annex I habitat type 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation. It is located c. 12.5km south west of the proposed Wind Farm Site, within the Carrowmore East GWB and Dromahair GWB (NPWS, 2016b). The Annex I habitat type 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)*, is located on the north-western shore of Lough Gill along the Garavogue_010, which lies within the Carrowmore East GWB c. 20km from the proposed Wind Farm Site. A small parcel of the habitat is located along the Bonet River within the GWB. In summary, **there is no potential for likely significant effects on the groundwater dependant habitats of Lough Gill SAC**, namely (NPWS, 2016b);

- 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation; and,
- 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)*





Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Enhancement lands
- Grid Connection Route
- Special Areas of Conservation (SACs)
- WFD - River Water Bodies

WFD - Groundwater Bodies

- Ballintougher
- Glenaniff
- Glencar
- Glenfarne
- Kilcoo
- Killarga
- Killarga South
- Kiltyclogher

0 2 4
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

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Rev	Date	Description	By	Chkd.
A	23/02/2026	First issue	S.P	S.R

Client: Ireland FuturEnergy

Project: Lissinagroagh Wind Farm

Title: Figure 5-28: Groundwater Bodies encompassing the Survey Area for the proposed Wind Farm Site and SACs

Scale @ A3: 1:100,000

Prepared by:	Checked by:	Date:
S.Pezzetta	S.Ryan	February 2026

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Map Ref: 10955-074-EU.S-GWB-TOB-A

Draft: A

8°5'52"W

54°33'N

7°55'W

N

R282

T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
T13
T14

R283

Skreeny Manor

Skreeny (Rosclogher By)

N16

590000

840000

Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Turbine Locations

Site layout

- Construction Compound
- Borrow Pits
- Clear Span Bridge
- Existing Roads
- Hardstands
- Internal Haul Road
- Met Mast Location
- Oversail Area
- Turning Bays
- La_Substation

Groundwater vulnerability

- Rock at or near Surface or Karst
- Extreme
- High
- Moderate
- Low
- Water

0 0.5 1
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

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Rev	Date	Description	By	Chkd.
A	24/02/2026	First issue	K.K	S.R

Client:

Ireland FuturEnergy

Project:

Lissinagroagh Wind Farm

Title:

Figure 5-29:
Groundwater vulnerability of the Survey Area of the Proposed Wind Farm Site

Scale @ A3: 1:22,000

Prepared by:	Checked by:	Date:
K.Kale	S.Ryan	February 2026

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Map Ref: 10955-075-GRD.V-P.App.BO-TOB-A

Draft: A

Legend

- Point of Interest - Locations

TDR:

- Overrun
- Oversail
- Special Areas of Conservation (SACs)
- WFD - River Water Bodies

0 50 100
Meters

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	04/03/2026	First issue	S.P	S.R

Client: FuturEnergy Ireland

Project: Lissinagroagh Wind Farm

Title: Figure 5-30: Cumeen Strand/Drumcliff Bay SAC and POI 13

Scale @ A3: 1:2,000

Prepared by:	Checked by:	Date:
S.Pezzetta	S.Ryan	March 2026

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Email: info@tobin.ie
www.tobin.ie

Map Ref: 10955-076-SACs-POI13-TOB-A

Draft: A

8°9'0"W
8°8'0"W
8°7'0"W
54°19'15"N
54°18'56"N
54°18'37"N
54°18'18"N
8441600
8440400
8439200
589800
591200
592600
Lough Gill SAC
N16
R283

Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Enhancement lands
- Special Areas of Conservation (SACs)

0 250 500
Meters

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	23/02/2026	First issue	S.P	S.R

Client: FuturEnergy Ireland

Project: Lissinagroagh Wind Farm

Title: Figure 5-31: Lough Gill SAC and the southern entrance to the proposed Wind Farm Site

Scale @ A3: 1:10,000

Prepared by:	Checked by:	Date:
S.Pezzetta	S.Ryan	February 2026

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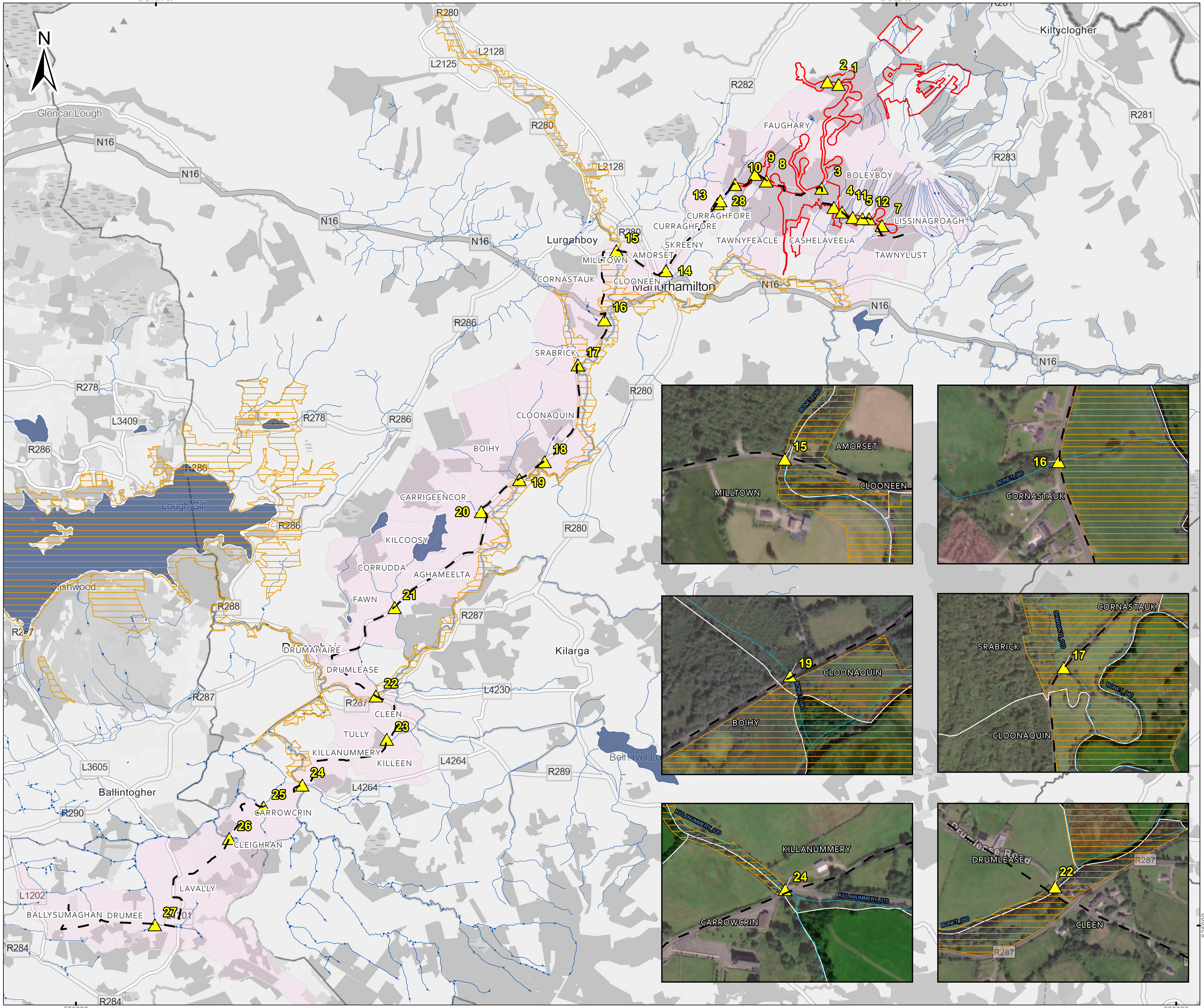
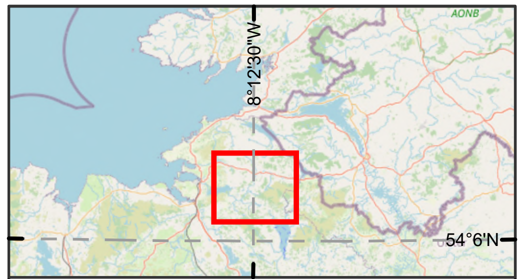
Map Ref: 10955-077-L.GILL..SAC-P.App.BO-TOB-A

Draft: A





Legend

- proposed Wind Farm Site
- Grid Connection Route
- Aquatic Survey Locations
- WFD - River Water Bodies
- WFD - Lake Water Bodies
- WFD - Transitional Water Bodies
- Lough Gill SAC
- Townland Boundaries

0 2.5 5
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

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Rev	Date	Description	By	Chkd.
A	23/02/2026	First issue	S.P	S.R

Client:

FuturEnergy Ireland

Project:

Lissinagroagh Wind Farm

Title:

Figure 5-32:
Existing watercourse crossings along the Grid Connection Route and Aquatic Site survey locations within the boundary of Lough Gill SAC

Scale @ A3: 1:80,000

Prepared by:	Checked by:	Date:
S.Pezzetta	S.Ryan	February 2026

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Map Ref: 10955-053-L.GILL..SAC-GCR-TOB-A

Draft: A

8°12'0"W
8°11'50"W
8°11'40"W
8°11'30"W
54°18'48"N
54°18'40"N
840600
840400
840200
587000
587500

BONET_030
15
Lough Gill SAC

Legend

- Aquatic Survey Locations
- Grid Connection Route
- Launch Pit
- WFD - River Water Bodies
- Special Areas of Conservation (SACs)

0 50 100
Meters

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	23/02/2026	First issue	S.P	S.R

Client: Ireland FuturEnergy

Project:
Lissinagroagh Wind Farm

Title:
Figure 5-33:
Lough Gill SAC and
proposed HDD Site 1

Scale @ A3: 1:2,000

Prepared by:	Checked by:	Date:
S.Pezzetta	S.Ryan	February 2026

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Map Ref: 10955-078-L.GILL..SAC-HDD1-TOB-A

Draft: A

Legend

- Aquatic Survey Locations
- Grid Connection Route
- Launch Pit
- WFD - River Water Bodies
- Special Areas of Conservation (SACs)

0 50 100
Meters

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	23/02/2026	First issue	S.P	S.R

Client: Ireland FuturEnergy

Project:
Lissinagroagh Wind Farm

Title:
Figure 5-34:
Lough Gill SAC and
proposed HDD Site 2

Scale @ A3: 1:2,000

Prepared by:	Checked by:	Date:
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Map Ref: 10955-079-L.GILL..SAC-HDD2-TOB-A

Draft: A

5.6.2.1.3 Disturbance

The proposed POIs along the TDR constitute a pathway for potential likely significant effects on the integrity of SACs within the ZoI (0.5km) through disturbance of sensitive QI species, namely European Otter at the following SACs;

- Ben Bulben, Gleniff and Glenade SAC.
- Lough Gill SAC.

5.6.2.1.3.1 Ben Bulben, Gleniff and Glenade SAC

Along the TDR, POI 25 is located c. 137m from the boundary of Ben Bulben, Gleniff and Glenade SAC at nearest distance. A short section (c. 10m) of Hedgerow (WL1) bordering the public road network will be trimmed to accommodate an oversail area.

In the absence of mitigation, there is potential for this vegetation removal to result in disturbance and/or displacement of European otter as a result of the proposed works. Best practice guidance on *The Treatment of Otters Prior to the Construction of National Road Schemes*, prohibits construction works within 20-150m of the breeding/resting places of European otter, due to the potential for disturbance (NRA, 2008b). European otter use Hedgerow (WL1) habitat for locating couches/holts. As such, there is potential for likely significant effects effects on the distribution of the species temporarily as the vegetation removal is taking place . As POI 25 is located c. 137m from the boundaries of the SAC inclusive of the protected WFD river waterbody Drumcliff_010 watercourse, there is potential that any European otter within the ZoI displays a function link with the SAC population. Noise, vibration, lighting, and human activity, have the potential to temporarily disturb/displace European otter within the SAC, particularly during dawn and dusk when the species is most active.

In the absence of mitigation, disturbance constitutes potential for **likely significant effects on the integrity of Ben Bulben, Gleniff and Glenade SAC**, during the construction and decommissioning phases of the Proposed Project by undermining the conservation objectives for the Annex II species 1355 European otter.

5.6.2.1.3.2 Lough Gill SAC

The loss of c. 10m of Hedgerow (WL1) is proposed at HDD Site 1, Aquatic Site 15, to facilitate the temporary launch pit for the HDD crossing within Lough Gill SAC. The extent of terrestrial habitat for European otter is calculated using a standard 10m buffer around all waterbodies within the SAC, inclusive of rivers, lakes and ponds (NPWS, 2021f). One of the launch pits for HDD Site 1 (Aquatic Site 15) is located within the boundaries of the SAC, where c. 10m of Hedgerow (WL1) will be removed. This vegetation removal is >50m from the nearest watercourse (Bonet_030). As such, the loss of habitat will take place beyond the mapped extent of the terrestrial habitat identified as critical for European otter, which is within 10m of all watercourses (NPWS, 2021). In summary, there is no potential for likely significant effects on the integrity of the SAC as a result of a decline in the extent of terrestrial habitat for European otter.

Field surveys have confirmed European otter activity at Aquatic Site 15, 17, 19 and 22, which are located within the boundaries of Lough Gill SAC and along the proposed GCR. European otter is at risk of disturbance from construction activities particularly during dawn and dusk when they are most active. This is of relevance at HDD Site 1 (Aquatic Site 15) and HDD Site 2

(Aquatic Site 22) where the Horizontal Directional Drilling is proposed. No European otter holts or resting places were identified during field surveys along the proposed GCR.

Given the existing baseline levels of disturbance associated with the public road network, the proposed works along the GCR is considered significant at a local geographic scale only because it is limited to human disturbance, noise, and vibration.

European otter is mostly crepuscular (most active at twilight), and if construction works occur during this period there is increased potential for disturbance/displacement to European otter. As such, disturbance at this location would likely negatively affect the local population of European otter, which is of national importance as it is within the boundaries of Lough Gill SAC.

Although capable of breeding at any time of the year, a peak in breeding occurs during the summer and early autumn (Reid *et al.* 2013:9). Disturbance during the breeding season would likely lead to displacement and abandonment of young. Nevertheless, no breeding holts or resting places were identified at any location during field surveys.

The duration of disturbance events as a result of the Proposed Project is confined to the proposed timeline for construction works along the GCR, namely: a 24-month period from January 2028 (Chapter 2 –Project Description).

Disturbance effects are considered reversible over the short-term as the disturbance does not include disturbance to breeding or resting sites, and following the construction phase the disturbance to European otter is likely to revert to baseline levels.

In the absence of mitigation, disturbance and displacement to European otter within Lough Gill SAC as a result of the proposed GCR is considered **a negative, short-term, reversible, likely significant effect on European otter at a local geographical scale.**

The potential likely significant effects on European otter outside of Lough Gill SAC are considered further under Section 5.6.2.7.1.

5.6.2.1.4 Mitigation Measures for Water Quality Protection

5.6.2.1.4.1 Mitigation Measures for Surface Water Quality

Good work practices will be employed at all times on site during all phases of the proposed project. However, good practice to protect watercourses from sediment contamination will be particularly important during the construction and decommissioning of the proposed project. Good working practices to protect watercourses are embedded in the design of the proposed project and include measures such as those set out in, but not limited to, the following documents:

- Forestry and Water Quality Guidelines (Forestry Service, 2000);
- Environmental Good Practice on Site Guide C811 (CIRIA, 2023);
- Spoil and Peat Management Plan (Chapter 2 – Description of Proposed Project, Appendix 2-5);
- Construction and Environmental Management Plan (CEMP) (Chapter 2 – Description of Proposed Project, Appendix 2-4), and
- Surface Water Management Plan (SWMP) (Chapter 2 – Description of Proposed Project, Appendix 2-7).

The CEMP submitted as part of the documentation supporting the planning application will be revised as required by the appointed contractor and will be treated as a live document to be

updated as required throughout the construction of the development. The CEMP, SWMP and SuDS for the Proposed Project incorporate a large number of tried and tested measures that are used as standard by industry for protection of water quality.

5.6.2.1.4.1.1 Management of Sedimentation

The SWMP will be implemented by the appointed contractor and will be regularly audited throughout the construction phase (see Appendix 2-7). The Environmental Manager will be required to stop works on site if he/she is of the opinion that a mitigation measure or corrective action is not being appropriately or effectively implemented.

In addition, the proposed turbine locations will include an infiltration basin which will be used for control of any surface water runoff. The infiltration basin will be lined with a permeable geotextile membrane/filter material in accordance with TII guidance DN-DNG-03065 formerly NRA HD 45/15. Where limited soils are present such as at proposed turbine locations T3, T7 and T14, a lined pond with a 1m composite base as set out in TII Guidance DN-DNG-03065 will be installed. These ponds will allow for treatment of surface water runoff in infiltration to ground. Swales will re-vegetate following excavation. Vegetation will reduce the flow velocity, treat potential pollutants, increase filtration and silt retention.

Where water within excavations has a heavy silt load, then an additional measure such as a Siltbuster™ or ATAC Lamella Units will be employed.

At the two off-road HDD crossings along the Bonet River, any water in excavations will be pumped to lands that are >10m from any watercourse and discharged via a silt bag and overland flow to a discharge point.

5.6.2.1.4.1.2 Management of Pollutants

- Refuelling of plant and vehicles and the addition of hydraulic oil or lubricants to vehicles/equipment will be done on impermeable and bunded areas, not within 10 m of a non-sensitive watercourse or within 50 m of a sensitive watercourse. A drip tray will be used beneath the fill point during refuelling operations in order to contain any spillages that may occur. Spill-kits and hydrocarbon-absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment. An oil spill response plan will be developed for the construction works;
- An accidental spillage emergency plan will be created for the construction phase of the proposed project. All site personnel will receive appropriate training to apply the accidental spillage emergency plan;
- Spill response protocols include secondary containment, drip trays, supervised refuelling, and impermeable refuelling zones;
- All machinery will be regularly maintained and checked for fuel, oil or hydraulic fluid leaks;
- Servicing of machinery will only be undertaken within the construction compound or offsite;
- No chemicals that are deleterious to aquatic organisms will be used in cleaning works. All raw, uncured waste concrete will be cured at a designated location, 50m of surface water conduit;

- Waste will be removed from the proposed project and disposed of by an approved waste contractor in accordance with prevailing waste management regulations; and
- On completion of the works, all apparatus, plant, tools, offices, sheds, surplus materials, rubbish and temporary erections or works of any kind will be removed from the site.

5.6.2.1.4.2 Mitigation Measures for Groundwater Quality

Groundwater pumped from excavations will be treated to remove silt by the use of silt bags. Water will discharge from the silt bags into settlement ponds/infiltration basins and the SuDS network.

A karst protocol will be employed during construction and involves a series of steps and methodologies in karst areas. The karst feature inspection protocol is documented by Madden & O'Hara (2016). Ground stabilisation measures to be employed include compaction, grouting/stabilisation, geotextile or utilising raft foundations. Where weathered limestone or karst is encountered at formation level, the feature will be mapped in detail. Each feature and associated mitigation measure will be documented and included in the safety file for the Proposed Project. The stabilisation measures will be approved by a geotechnical engineer. Where infilling or grouting is required, works will be supervised by a suitably qualified hydrogeologist to ensure there is no effect on groundwater.

Design measures in relation to the proposed GCR and TDR are outlined in the CEMP (see Appendix 2-4). No additional measures are required for these measures.

5.6.2.1.4.2.1 Alteration of Groundwater Flow

Limited groundwater may be encountered in the borrow pits. Groundwater encountered will be managed and treated in accordance with CIRIA C750, 'Groundwater control: design and practice' (CIRIA, 2016). Groundwater from the borrow pits will be treated in the settlement ponds (see Appendix 2-8, and Drawing 10955-2090 to 10955-2094). No additional measures are required for the proposed GCR or TDR.

5.6.2.1.5 Mitigation Measures for Disturbance to European Otter

Construction activities (including human presence) along the GCR inclusive of the following WFD river waterbodies Bonet_030, Bonet_040, and Bonet_050.and Shanvaus_010, specifically at Aquatic Site 15, 17, and 19, will not begin until one hour after dawn and will cease an hour before dusk. As European otter is a crepuscular species, this restriction will limit disturbance effects on European otter.

A temporary speed limit of 20km/h will be set for all vehicles transiting through the proposed Wind Farm Site, as well as within the active construction corridor along the GCR, for the duration of the Construction Phase. This will include the use of appropriate signage (Department of Transport, 2024):

- Sign reference: RUS 065;
- Normal sign diameter: 450mm;
- Repeater sign diameter: 300mm;
- Spacing between repeaters: 500m.

During pre-construction confirmatory surveys, where a previously unidentified holt or couch is identified, best practice guidance will be followed and is summarised hereunder (NRA, 2008b). There will be a temporary stop works within 150m of the identified holt, as instructed by the

ECoW. Following inspection of the resting place by an ECoW, an exclusion zone will be erected. Trail cameras will be deployed for a minimum period of 5 days, to establish activity.

If the identified holt is an active breeding holt, consultation with NPWS will be sought, and no construction works will take place within 150m.

If the identified holt is active but confirmed as a non-breeding holt, then no tracked vehicles of any kind will be allowed within 20m of the site. Light clearing of vegetation will not take place within 15m of the holt (NRA 2008b).

In the event that disturbance or destruction to a previously unidentified holt becomes necessary, an 'Application for Regulation 54 Derogations for Annex IV species' derogation license will be obtained prior to any interference with the holt (NPWS, 2025b). To minimise the impact of the derogation, when a holt appears to be inactive, then the entrance will be lightly blocked with vegetation and a light application of soil. When after 5 days the hold remains undisturbed, then it will be destroyed immediately using a mechanical digger. This will be carried out under supervision of the holder of the derogation license. For active holts, European otters will be evacuated from the holts prior to any closures. European otters with cubs however will not be evacuated until the European otters have vacated the holt themselves naturally. In the case of non-breeding active holts, general disturbance (e.g. vegetation clearance) and chemical deterrents will be used first to encourage the European otters to vacate the holts. Once the European otters have left the holt, the entrance will then be soft blocked.

In some cases, the installation of one-way gates on the entrances to the holt may be required and a monitoring period of 21 days will be carried out to ensure the European otters have left the holt prior to removal. For active non-breeding holts, general disturbance measures, such as vegetation clearance, will likely suffice in evacuating European otters from non-breeding holts. Following deployment of trail camera for five days to confirm abandonment of the holt, entrances will then be lightly blocked and destroyed, following the same approach as for inactive holts.

All European otter surveys and interventions will be carried out by the ECoW and suitably qualified ecologists A report detailing the methods, actions, and relevant issues will be submitted to NPWS to fulfil the derogation license obligations. The survey works and any mitigation required will be implemented prior to starting site clearance and any construction works.

5.6.2.1.6 Summary of Significant Effects

Following the implementation of the mitigation measures listed above, there is **no potential for significant residual effects at any geographic scale** on any European site, inclusive of QI habitats and species, and/or on the overall integrity of any European site, nor in the attainment of the specific conservation objectives of any European site.

5.6.2.2 Other Sites of Conservation Importance

5.6.2.2.1 Dough/Thur Mountains

Dough/Thur Mountains NHA [002384] is located upslope of the proposed Wind Farm Site. Dough/Thur Mountains NHA shares a boundary with the eastern extent of the Survey Area of the proposed Wind Farm Site, where the boundaries overlap between T5 and T13 (see blue line Figure 5-5). This shared boundary constitutes a pathway for potential ecological effects for on

the terrestrial flora and fauna of the NHA. The Dough/Thur Mountains NHA is reported as being an area of upland peatland bog (NPWS, 2003).

Potential impacts consists of:

- Habitat degradation associated with peat instability;
- Habitat degradation associated with drainage impacts; and,
- Habitat degradation associated with dust deposition.

5.6.2.2.1.1 Habitat Degradation associated with Peat Instability

Peat landslides represent one end of a spectrum of natural processes of peat degradation. They have potential to cause fatalities, injury and damage to infrastructure and farmland. They also have the potential to cause significant damage to peatland habitats. The potential for peat failure at this site is examined with respect to the proposed works as outlined in full in Chapter 7 – Land, Soils and Geology, EIAR Appendix 7 -1 – Peat Stability Risk Assessment. The findings as relevant to Dough Mountain NHA are summarised below.

A review of the landslide information on the GSI Irish Landslides Database indicates 2 shallow peat landslides within the northern extent of the NHA and 2 shallow scree slides to the south-western extent of the NHA.

Eight items of proposed infrastructure are located in "moderately high" susceptibility areas according to the national landslide susceptibility map (GSI,2021) including T7 and T8 which border the NHA. However, it should be noted that the GSI assessment only accounts for the current site topographic and hydrological conditions and is not intended to be used in isolation to determine actual onsite risk.

In the absence of mitigation, the peat stability risk rating at T7 and T8 is *medium*. At nearest distance the boundary of the NHA is located c. 110m from the cut and fill buffer at T7 and c. 155m from T8. A peat slide has potential to result in significant effects on upland habitats such as priority Annex I habitat type 7130* Blanket bog (active) resulting in the permeant loss of habitat as well as degredation of surrounding habitat. Peat slides can facilitate peat erosion further degrading the quality of upland habitats. Severe peat erosion is frequent in the upland blanket bogs due to high rainfall (NPWS, 2019b).

T5 is located c. 80m from the NHA boundary. However, the peat stability risk rating at T5 is low and as such there is no potential for likely significant effects as a result of proposed works at T5.

In summary, the risk of peat instability impacting the upland habitats as a result of the proposed Wind Farm Site is considered a **moderate, long-term, irreversible likely significant effect at a national geographic scale**.

5.6.2.2.1.2 Habitat Degradation associated with Drainage

Dough/Thur Mountains NHA is an area of upland blanket bog, heath and grassland. It is located upslope of the proposed Wind Farm Site. The boundaries of the designated site are largely defined by transitions from blanket bog to rough pasture (NPWS, 2003).

Although connectivity with the proposed Wind Farm Site and NHA exists, there is c. 80m between the boundary of the NHA and the nearest proposed Wind Farm Site infrastructure which is the cut and fill buffer at T5 (Figure 5-6).

Best practice guidance on assessing the impacts of developments on peatlands advise that a range of 30m should be used to calculate indirect impacts of drainage on peatland hydrology, as outlined in *Advising on peatland, carbon-rich soils and priority peatland habitats in development management* (NatureScot, 2023). Therefore, no direct or indirect impacts on the hydrology of the peatland habitats within Dough/Thur Mountains NHA are anticipated due to the separation distances involved.

In summary, **no likely significant effects at any geographic scale** on the peatland habitats of Dough/Thur Mountains as a result of drainage impacts are anticipated as a result of the Proposed Development.

5.6.2.2.1.3 Habitat Degradation associated with Dust Deposition

Temporary effects on the productivity of the peatland habitats within Dough/Thur Mountains NHA are not anticipated as a result of dust deposition due to the separation distances involved (c. 80m). As outlined in Section 5.1.4.1, the ZoI for air quality effects for the development is within 50m of the works corridor (IAQM, 2024). Furthermore, substantial parcels of Conifer plantation (WD4) are located between the NHA and the proposed Wind Farm Site infrastructure inclusive of that surrounding T5, T8, and T13, which will screen construction related dust from the air.

In summary, **no likely significant effects at any geographic scale** on the peatland habitats of Dough/Thur Mountains NHA are anticipated as a result of dust deposition associated with the Proposed Wind Farm Site.

5.6.2.2.1.4 Mitigation Measures for Peat Instability

Mitigation measures will be put in place during the detailed design, construction, operation, and decommissioning of the scheme to reduce the likelihood of a failure. Required mitigation measures to be implemented consist of:

- implementing site-specific temporary and permanent works designs for areas of deeper peat and steeper slopes,
- implementing careful detailed design and construction supervision across the site;
- the stepping or battering back of excavations to a safe angle, and/or the construction of a temporary sheet pile wall and/or rock fill berm to support the peat during construction or decommissioning, and;
- after a significant rainfall event the EcOW will be responsible for ongoing monitoring and maintenance of drains, culverts, settlement ponds, backfilled borrow pits, rock berms created at the top of cuttings, and floated access roads.

Full details on the mitigation measures to be implemented are listed in EIAR Chapter 7 – Land, Soils and Geology, Appendix 7-1, Peat Stability Risk Assessment.

Following the application of these mitigation measures, the findings of the planning stage PSRA indicate a “low” to “negligible” hazard ranking for instability related to the requirement for excavations across the proposed Wind Farm Site, including at T7 and T8.

5.6.2.2.1.5 Mitigation Measures for Drainage

No specific mitigation measures for drainage are necessary as no likely significant effects on Dough/Thur Mountain NHA arising from drainage are anticipated as a result of the Proposed Project.

5.6.2.2.1.6 Mitigation Measures for Dust Deposition

No specific mitigation measures for dust are necessary as no likely significant effects on Dough/Thur Mountain NHA arising from dust deposition are anticipated as a result of the Proposed Project.

5.6.2.2.1.7 Summary of Significant Effects

Following the implementation of the mitigation measures listed above, there is **no potential for significant residual effects at any geographic scale** on Dough Mountain NHA.

5.6.2.2.2 Lough Melvin ASSI

The proposed internal access tracks to T1 and T2 will traverse the EPA river Lisdarush (EPA Code: 35L68) at 3 locations. In the absence of mitigation there is potential that the proposed works at these watercourse crossings and within 50m of the Lisdarush river, will result in the deterioration of surface water quality through contamination and/or the release of sedimentation leading to siltation of downstream watercourses. Lough Melvin ASSI is c. 8km downstream of the proposed Wind Farm Site and hydrologically connected via the Lattone 35_010 (WFD Code: IE_NW_35L660960).

5.6.2.2.2.1 Surface Water Quality Degradation

The effects of contamination and/or sedimentation of watercourses on Lough Melvin ASSI include negative effects on the population dynamics of the endemic salmonid species within the lake, namely sonaghen, gillaroo, and ferox as well as other local populations of fish within the lake including Atlantic salmon and the Arctic charr. In addition, siltation of watercourses has potential to cause the loss of spawning habitat for salmonids.

Groundwater dependant habitats which could experience significant negative effects as a result of the contamination and/or sedimentation of watercourses include swamp communities and fens. Similarly, degradation in water quality has the potential to alter pH, nutrient levels, water colour, dissolved organic carbon, turbidity and transparency of the lake waterbody ultimately leading to reduced cover of aquatic plant species such as slender-leaved pondweed and water lobelia.

However, likely significant effects on these receptors are not anticipated considering the embedded mitigation measures for the protection of water quality (Section 5.5) inclusive of: the SuDS measures, hydrocarbon interceptors, avoidance of instream works, avoidance of karst features, as well as the use of sediment traps, silt fences, and bunded fuel storage.

In summary, **no likely significant effects at any geographic scale** are anticipated on the sensitive ecological receptors of Lough Melvin ASSI nor the overall integrity of site as a result of the Proposed Project.

5.6.2.2.2.2 Mitigation Measures for Surface Water Quality

The additional mitigation measures for the protection of water quality which will be implemented are listed in Section5.6.2.1.4.1.

5.6.2.2.2.3 Summary of Significant Effects

Following the implementation of the mitigation measures listed above, there is **no potential for significant residual effects at any geographic scale** on Lough Melvin ASSI.

5.6.2.2.3 Cummeen Strand Ramsar Site

Cummeen Strand Ramsar site is located ca. 20m at nearest distance to POI 13 along the TDR. The construction phase of the proposed Wind Farm Site, specifically the oversail and overrun areas at POI 13 along the TDR, will involve the removal of c. 17m of Hedgerows (WL1), 0.01ha of Scrub (WL1), 0.02ha of Amenity grassland (GS2) along the public road network (N4). These activities have the potential to result in the release of sediment and/or contaminants to nearby watercourses and/or cause degradation to wetland habitats within the Ramsar site.

As the Cummeen Strand Ramsar site is located downstream of the identified watercourse and in close proximity to the works area (approximately 20m), a potential pathway exists for likely significant effects on receptors within the Ramsar site inclusive of the extensive sand and mud flats which support a diverse macro-invertebrate fauna which provides the main food supply for the wintering waterfowl. Invertebrate species such as lugworm (*Arenicola marina*), Ragworm (*Hediste diversicolor*), cockles (*Cerastoderma edule*), sand mason (*Lanice conchilega*), Baltic Tellin (*Macoma balthica*), spire shell (*Hydrobia ulvae*) and mussels (*Mytilus edulis*) are frequent. Of particular note is the presence of eelgrass (*Zostera noltii* and *Z. angustifolia*) beds, which provide a valuable food stock for herbivorous wildfowl. The estuarine and intertidal flat habitats are of conservation significance and are listed on Annex I of the E.U. Habitats Directive. Areas of salt marsh fringe the bay in places and provide roosting sites for birds during the high tide periods (NPWS 2014a).

However, likely significant effects on the sensitive wetland receptors are not anticipated considering the embedded mitigation measures for the protection of surface water quality (Section 5.5) inclusive of: the avoidance of instream works, as well as the use of sediment traps and silt fences.

There is hydrological connectivity from POI 21 and the Ramsar site c. 3.1km downstream via the Willsborough Stream_010. Again, works at POI 21 involved vegetation removal to accommodate the oversail area. Risks of siltation therefore are reduced to negligible seen as the watercourse is ca. 50m from the proposed vegetation clearance. This 50m distance will also reduce the likelihood of contamination of watercourses to negligible following an accidental spillage or leakage of contaminants from machinery of vehicles or machinery. This 50m separation distance equates to the setback distance from aquatic zones recommended for the use of potentially hazardous materials under best practice guidance *Standards for Felling and Reforestation* (DAFM, 2019). As such, there is no likelihood of significant effects on Cummeen Strand Ramsar site as a result of proposed works at POI 21.

In summary, **no likely significant effects at any geographic scale** are anticipated on the Cummeen Strand Ramsar site nor the overall integrity of the Ramsar site as a result of the Proposed Project.

5.6.2.2.3.1 Mitigation Measures for Surface Water Quality

The additional mitigation measures for the protection of water quality which will be implemented are listed in Section5.6.2.1.4.1.

5.6.2.2.3.2 Summary of Significant Effects on European Sites

Following the implementation of the mitigation measures listed above, there is **no potential for significant residual effects at any geographic scale** on Cummeen Strand Ramsar site.

5.6.2.2.4 Proposed Natural Heritage Areas

Downstream hydrological connectivity exists between the Survey Area for the proposed Wind Farm Site and 10 pNHAs with details on hydrological pathways listed in Table 5-4;

- Aroo Mountain pNHA;
- Ballysadare Bay pNHA;
- Ben Bulben, Gleniff and Glenade pNHA;
- Bonet River pNHA;
- Cummeen Strand/Drumcliff Bay pNHA;
- Glenade Lough pNHA;
- Lough Melvin pNHA;
- Lough Gill pNHA (1976); and,
- Union Wood pNHA; and,
- Unshin River pNHA.

These pNHAs are located entirely within the corresponding European Sites (Table 5-4). As publicly available information on these pNHAs is limited, the assessment of likely significant effects on pNHAs is therefore addressed through the assessment of the corresponding European sites in Section 5.6.2.1.

5.6.2.3 Habitats

Habitats identified as IEFs are outlined in Table 5-18, and are discussed hereunder. As per Section 5.1.4.1, the ZoI for potential impacts from the Proposed Project was considered for each of the IEFs. In the case of habitats, potential impacts are confined to direct habitat loss within the footprint of the infrastructure associated with the Proposed Project (e.g. borrow pits, hardstands, turbine base, cut and fill buffers, internal access tracks, turning bays).

Indirect impacts associated with the Proposed Project are also quantified where possible, for example, dust deposition is considered within the within the spatial limit of 50m from the proposed Wind Farm Site (IAQM, 2024). Similarly, indirect impacts associated with drainage are considered within the spatial limit of 30m from a newly excavated drain, complies with best practice guidance namely, *Advising on peatland, carbon-rich soils and priority peatland habitats in development management*. (NatureScot, 2023).

A summary table of the area of habitat loss pre-mitigation is provided in Table 5-18. Area-based metrics are appropriate when assessing impacts on terrestrial habitats but are largely unsuitable for assessing impacts on aquatic habitats, which are typically evaluated based on hydrological regime and water quality parameters. As aquatic habitats are excluded from Table 5-18. Each potential impact is discussed under each habitat type as appropriate.

The habitat loss for the proposed Wind Farm Site was calculated using for the footprint of the proposed infrastructure, consisting of;

- Internal access tracks;
- Cut and fil buffers;
- Turbine base;
- Hardstands;
- Borrow pits;
- Substation compound;
- Oversail areas; and,

- Bat buffers.

Bat buffers are considered an Operational Phase mitigation measure (Section 5.6.3.8.1.1), but their implementation will be discussed under the Construction Phase due to the necessary loss of potential foraging habitat (Section 5.6.2.8.2).

The proposed works to accommodate the GCR are mostly restricted to the boundaries of existing roads. The exceptions are two locations where the proposed GCR will deviate from public roads network and where HDD will be performed to avoid instream works (at Aquatic Site 15 (HDD Site 1) (Figure 5-33) and 22 (HDD Site 2) (Figure 5-34). At these locations, a standard 10m^2 was estimated for the entry and exit points to allow for excavation of drilling pits, which will require preparation works (including vegetation clearance), and consequent habitat loss. Dust deposition calculations were not made at these locations as no pouring of concrete is necessary. Similarly, no dust deposition calculations were made along the GCR due the limited extent of works needed for the excavation of joint bays along the GCR.

Limited habitat loss is required for the proposed TDR. The accommodations associated with the proposed TDR at POIs (Chapter 2 – Description of Proposed Project, Appendix 2-1 – TDR Report) range from vegetation trimming to facilitate oversail of turbine blades, to vegetation removal to accommodate temporary placement of hardcore surfaces to allow movement of oversize vehicles (Chapter 2 – Description of Proposed Project).

The semi-natural habitats to be lost as a consequence of the works for the proposed TDR are located in the vicinity of POIs 1, 2 and 3 (Chapter 2 – Description of Proposed Project, Appendix 2-1- TDR Report & Drawings). Habitat loss estimations for the TDR include a 2.5m buffer area from each relevant POI to account for a works corridor. Habitats within the oversail areas which would not be affected by vegetation removal, such as Dry grassy verges (GS2) were excluded from the assessment. All habitats within the overrun areas are considered as direct loss of habitat as these areas will be subject to the removal of topsoil and the construction of a temporary surface (Chapter 2 – Description of Proposed Project, Appendix 2-1 - TDR Report).

Table 5-18: Predicted habitat loss for Important Ecological Features associated with the proposed Wind Farm Site infrastructure

IEF Fossitt Habitat	Habitat Loss	Potential Habitat Degredation		Associated Infrastructure
	Habitat Loss-	Drainage Impacts (30m)	Dust Impacts (50m)	
BL3 – Buildings and artificial surfaces	2,009m	-	-	Cut and Fill, Hardstands, Internal access tracks, Oversail
ER2 – Exposed calcareous rock corresponding to the priority Annex I habitat type 8240 Limestone Pavements	0.01ha	0.13ha	0.26ha	Internal access tracks
FW4 – Drainage ditches	4,456m	-	3,754m	Borrow Pits, Cut and Fill, Hardstands, Internal access tracks, Turbine Base, Turning Bays,
GS2 - Dry meadows and grassy verges	2.76ha	-	6.82ha	Borrow Pits, Cut and Fill, Hardstands, Internal access tracks, Turbine Base
GS3 - Dry-humid acid grassland	0.26ha	0.62ha	0.77ha	Cut and Fill, Hardstands, Internal access tracks, Turbine Base
HH1- Dry siliceous heath	-	-	0.07ha	Cut and Fill, Hardstands
HH1- Dry siliceous heath/ GS3 - Dry-humid acid grassland mosaic corresponding to the non-priority Annex I habitat type 4030 European dry heath in unfavourable condition	0.45ha	-	1.04ha	Cut and Fill, Hardstands, Internal access tracks, Turbine Base
HH3 – Wet heath	-	0.13ha	0.27ha	Internal access tracks
PB2 - Upland blanket bog corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition	0.55ha	2.64	4.46ha	Cut and Fill, Hardstands, Internal access tracks, Turbine Base
PB2 - Upland blanket bog	0.01ha	0.34ha	0.90ha	Internal access tracks

IEF Fossitt Habitat	Habitat Loss	Potential Habitat Degredation		Associated Infrastructure
	Habitat Loss-	Drainage Impacts (30m)	Dust Impacts (50m)	
corresponding to the priority Annex I habitat type 7130 *Blanket bog (active) in favourable condition				
PB4 - Cutover bog corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition	0.89ha	1.65ha	2.03ha	Cut and Fill, Hardstands, Internal access tracks, Turbine Base
WD1 - (Mixed) broadleaved woodland	0.12ha	-	2.08ha	Internal access tracks, Oversail Areas
WL1 - Hedgerow	31m	-	774m	Internal access tracks, Oversail Areas
WL2 – Treeline	140m	-	298m	Hardstands, Internal access tracks, Turbine Base
WN2 - Oak-ash-hazel woodland	-	0.07ha	0.21ha	Internal access tracks
WS1 - Scrub	0.82ha	-	5.79ha	Cut and Fill, Internal access tracks, Oversail Areas,

Table 5-19: Habitat loss of IEFs associated with the proposed TDR

IEF Fossitt Habitat	Direct Loss of Habitat (overrun) – Area (ha) or length (m)	Direct Loss of Habitat (oversail) – Area (ha) or length (m)
WD1 - (Mixed) broadleaved woodland	-	0.02ha (POI 38, 42, 45)
WL1 - Hedgerows	116m (POI 13, 44)	950m (POI 1, 2, 13, 15, 18, 21, 22, 44, 45, 53)
WL2 - Treelines	52m	231m

	(POI 5)	(POI 1, 10, 13, 39, 43)
WS1 – Scrub	-	0.1ha (POI 13, 43)

Table 5-20: Habitat loss associated with bat protective buffers

IEF Fossitt Habitat	Direct Loss of Habitat - Area (ha)
WD1 - (Mixed) broadleaved woodland	0.23ha
WN5 - Riparian woodland	0.06ha
WS1 - Scrub	0.50ha

Table 5-21: Habitat loss associated with HDD Site 1 and HDD Site 2

IEF Fossitt Habitat	Direct Loss of Habitat - Area (ha)	HDD Site	Aquatic Site
WL1 – Hedgerow	10m	HDD Site 1	Aquatic Site 15
WD1 - (Mixed) broadleaved woodland	0.01ha	HDD Site 1	Aquatic Site 15
WS1 - Scrub	0.01ha	HDD Site 2	Aquatic Site 22

5.6.2.3.1 Buildings and Artificial Surfaces (BL3)

This habitat is only valued as an IEF due to buildings supporting bast roosts. The identified bat roosts within Building 4, Building 6, Building 7, Building 8, Building 12 and Building 19 (Section 5.4.2.5) will not be removed and the buildings will not be disturbed during the construction phase of the Proposed Project. Further detail on the assessment of effects on bats during the construction phase of the Proposed Project refer to Section 5.6.2.8.

The loss of 2,009m of roads within the proposed Wind Farm Site is considered to have **no likely significant effects at any geographic scale**.

5.6.2.3.1.1 Mitigation Measures

No specific mitigation measures are necessary for the protection for Buildings and Artificial Surfaces (BL3) as no likely significant effects have been identified.

5.6.2.3.1.2 Summary of Significant Effects on Buildings and Artificial Surfaces (BL3)

There is **no potential significant residual effects at any geographic scale** on Buildings and Artificial Surfaces (BL3) as a result of the Proposed Project.

5.6.2.3.2 Cutover bog (PB4) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition

A total of 5.54ha of Cutover bog (PB4) has been identified within the Survey Area for the proposed Wind Farm Site corresponds to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition and is valued as of Local Importance (higher value) – Section 5.4.2.1.4.

The potential impacts of the Proposed Project on Cutover bog (PB4) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition are:

- Habitat loss;
- Habitat degradation associated with drainage;
- Habitat degradation associated with dust deposition; and,
- Habitat degradation associated with surface water run-off.

5.6.2.3.2.1 Habitat loss

The Cutover bog (PB4) habitat corresponds to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition (Section 5.4.2.1.4). The development of wind farms, and the consequent habitat loss, is considered a pressure of medium importance on the conservation status of Annex I habitat type 7130 Blanket bog (NPWS, 2019b).

A total of 0.89ha of Cutover bog (PB4) will be lost to the Proposed Project within the 24 months allocated to the construction phase. The extent of the loss will be limited to T3, where the footprint of the hardstand, turbine base, cut and fill buffer and the internal access track will result in the direct loss of Cutover bog (PB4).

The conservation objectives for Annex I habitat type 7130 Blanket bog is to maintain the current range, surface area and function of the habitat type both inside and outside European sites (NPWS, 2019b). Furthermore, blanket bog is considered an "irreplaceable habitat" even in degraded condition, especially where the habitat supports positive indicator species and has potential for restoration (CIEEM, 2018). As such, the loss of 0.89ha of Cutover bog (PB4) is

considered an irreversible significant effect and undermines the national conservation objectives for the habitat.

The direct loss of 0.89ha of Cutover bog (PB4), corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition, is assessed as a **negative, permanent, irreversible, likely significant effect at local geographic scale**.

5.6.2.3.2.2 Habitat Degradation associated with Drainage

As previously stated, the Cutover bog (PB4) habitat corresponds to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition (Section 5.4.2.1.4). Drainage is considered a pressure of medium importance on the conservation status of the habitat (NPWS, 2019b), which carries long-term and "major implications" for biodiversity (Lindsay *et al.* 2014).

The excavation of substrate at T3, T4, and T10 for the construction of hardstands and access roads will affect the hydrology of the Cutover bog (PB4) habitats in the immediate vicinity (c. 30m) of proposed construction activities. The 30m buffer is a standard estimate for drainage impacts and follows best practice guidance on impact assessments for developments on peatlands (NatureScot, 2023).

A peat bog is a wetland habitat and, as such, is dependent upon a high and stable water table to maintain its structure and function. Drainage lowers the water table and aerates the peat substrate, leading to changes in the structure of the ecosystem through subsidence, and empties the living layer (upper 10-20cm) of the bog of water. The extent of these effects on the persistence and coverage of specialist peatland flora can readily be observed, sometimes over several hundred meters, which, combined with lowering of the water table, provides opportunities for more generalist flora to colonise the impacted habitat (Lindsay *et al.*, 2014a). This ultimately affects the peat forming capacity or function of the habitat. In this way, drainage can undermine both the structure and function of Annex I habitat type 7130 Blanket bog, and lead to significant decreases in biodiversity.

Historical peat extraction has already resulted in a drying effect on the Cutover bog (PB4) at T3. While the habitat has already been assessed as inactive, as the peat forming capacity of the system is impaired, with only a "small to very small quantity" of *Sphagnum papillosum* recorded during surveys (see Appendix 5-2). The effects of further drainage on the structure, function and biodiversity of the Cutover bog (PB4) will be less severe relative to intact priority Annex I 7130 *Blanket bog (active).

A series of pre-exiting drainage channels have been excavated throughout the Conifer planation (WD4) surrounding T4 and T10 to promote establishment. These drainage features have already altered the local hydrology of the Cutover bog (PB4) within the immediate vicinity of the Conifer plantation (WD4). Furthermore, the trees themselves draw from the water table and disrupt the hydrological process through evapotranspiration and canopy interception of rainfall (Lindsay *et al.*, 2014b). Additional drainage impacts on the Cutover Bog (PB4) from the construction of T4 and T10 are likely to be less extensive due to the siting of the hardstands within Conifer planation (WD4).

It is anticipated that the construction of T3, T4 and T10 will negatively affect the hydrology of 1.65ha of Cutover bog (PB4), which lies within the immediate vicinity (c. 30m) of the footprint of the respective proposed hardstands, turbine bases, cut and fill buffers, and internal access tracks. These indirect effects are considered permanent and irreversible as the hardstands and

drainage systems will remain on-site following decommissioning of the Proposed Project (Chapter 2 – Description of Proposed Project). The aim of the conservation objectives for Annex I habitat type 7130 Blanket bog is to maintain the current range, surface area and function of the habitat type, both inside and outside European sites (NPWS, 2019b). As such, the degradation of 1.65ha of Cutover bog (PB4) undermines the national conservation objectives for the Annex I habitat type 7130 Blanket bog, and as such is assessed as a significant effect.

The indirect loss of 1.65ha of Cutover bog (PB4), corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition, is assessed as a **negative, permanent, irreversible, likely significant effect at local geographic scale**.

5.6.2.3.2.3 Habitat Degradation associated with Dust Deposition

Agricultural activities generating air pollution are among the listed threats to the conservation status of the Annex I habitat type 7130 Blanket bog (NPWS, 2019b). Similarly, air pollution from construction activities can affect sensitive peatland flora, such as that within Cutover bog (PB4). Indeed, Cutover bog (PB4) is considered a highly sensitive receptor to pollutant deposition (APIS, 2025).

Dust deposition arising from construction works, primarily that of the proposed excavation works at T3, T4 and T10, is likely to negatively affect sensitive Cutover bog (PB4). As outlined in Section 5.1.4.1, the ZoI for air quality effects for the Proposed Project is within 50m of the proposed works corridor (IAQM, 2024). Alkaline dust, such as that from cement or road chippings, can coat foliage and lead to an overall reduction in vegetative growth, reduction to the production of reproductive structures, and increased susceptibility to plant pathogens (Farmer, 1993). If the deposition is sustained and substantial, it can increase the pH of soils, ultimately leading to changes in vegetation composition (APIS, 2025). These changes will likely promote a reduction in specialist peatland flora (e.g. *Sphagnum* spp.) and other sensitive moss species, although higher peatland plants are not likely to be visible damaged (Farmer, 1993).

As previously stated, the cover of *Sphagnum* spp. within the Cutover bog (PB4) is very limited and the habitat is considered inactive (Section 5.4.2.1.4). As "active" blanket bog is defined as a habitat that supports a "significant area of vegetation that is normally peat forming" (European Commission, 2013), then it follows that inactive blanket bog does not support a significant area of peat forming vegetation. The effects of dust deposition on inactive Cutover bog (PB4) will be less severe than effects on more sensitive habitats dominated by *Sphagnum* spp., such as Upland blanket bog (PB2). As such, dust deposition is not likely to have a "visible damage" to higher peatland plants (Farmer, 1993) such as the grasses, sedges and dwarf shrub vegetation which dominate the habitat (Section 5.4.2.1.4). As neither the peat forming capacity, or the vegetation composition is likely to undergo significant changes as a result of dust deposition, it can be determined that the structure and function of the habitat is not likely to be significantly affected by dust deposition.

In summary, the indirect degradation of the condition of 2.03ha of Cutover bog (PB4), corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition, is assessed as having **no likely significant effect at any geographic scale**.

5.6.2.3.2.4 Habitat degradation associated with Surface Water Run-off

Wind farms are likely to cause significant changes to patterns of surface water flow (NPWS, 2019b). The proposed permanent wind farm footprint comprises approximately c. 53ha

(Chapter 2 – Description of the Proposed Project). The constructed artificial surfaces, including turbine hardstands, will have a poor infiltration capacity and will increase the rate and volume of direct surface water run-off (Chapter 8 – Hydrology and Hydrogeology, Section 8.4.6).

Sustainable Drainage Scheme (SuDS) as an embedded mitigation measure is designed to capture surface water run-off and direct it towards settlement ponds and outlets. In the absence of SuDS, this surface water run-off would flow directly into habitats in the immediate vicinity of the Proposed Project infrastructure, which, in the case of T3, T4 and T10, is Cutover bog (PB4).

SuDS measures will be applied during the construction phase and will reduce the quantity of discharge from the proposed Wind Farm Site to pre-development flows. In the absence of SuDS, increases in the velocity, frequency, and quantity of water discharging directly into the Cutover bog (PB4), surrounding the proposed infrastructure at T3, T4 and T10 would likely to lead to losses of vegetation cover, followed by the erosion of peat (Perrin *et al.*, 2014). Under such circumstances and in the absence of significant remedial action, peat is likely to continue to erode leading to the permanent indirect loss of Cutover bog (PB4) (NPWS, 2019b), which process, once initiated, can be irreversible in upland habitats (Perrin *et al.*, 2014). Severe peat erosion is frequent in the upland blanket bogs due to high rainfall (NPWS, 2019b). For this reason, erosion is considered a pressure and threat of high importance to Annex I habitat type 7130 Blanket bog (NPWS, 2019b).

In this way, the embedded SuDS measures work to prevent peat erosion. Habitat degredation as a result of surface-water run-off is considered to have **no likely significant effect at any geographic scale**.

5.6.2.3.2.5 Mitigation measures for Habitat Loss

The direct loss of 0.89ha of Cutover bog (PB4) cannot be avoided as a result of the Proposed Project. In order to prevent further loss of PB4 habitat, the following measures will be adhered to:

- All machinery will be confined to the works corridor, which will be demarcated in advance of construction with temporary fencing, to minimise the footprint of the works taking place within Cutover bog (PB4);
- No clearance of vegetation will be undertaken outside of the demarcated areas within the Survey Area for the proposed Wind Farm Site, to minimise the footprint of the works taking place within Cutover bog (PB4);
- There will be no temporary storage of construction or waste materials within the Cutover bog (PB4), to minimise the footprint of the works taking place within Cutover bog (PB4);
- Suitably sized bog mats will be used, where appropriate, to protect sensitive peatland vegetation and reduce the risk of peat erosion; and,
- All disturbed ground will be fully reinstated after works to promote natural regeneration.
- The construction area surrounding T3 will be fenced off during the construction phase to reduce grazing pressure promote natural regeneration within the habitat.

Appropriate compensation measures for direct habitat loss of 0.89ha of Cutover bog (PB4) are presented in Section 5.11.

5.6.2.3.2.6 Mitigation measures for Drainage

Limiting the extent of excavations within the Cutover bog (PB4) to what is essential for the Proposed Project will reduce the drainage impacts and their significance. Mitigation measures to reduce the effects of drainage on sensitive habitats, such as Cutover bog (PB4), consist of :

- A Sustainable Drainage Scheme (SuDS) that has been designed for this proposed Wind Farm Site will be implemented; and,
- All excavated areas, such as borrow pits and cut and fill buffers, will be re-instated reducing the drainage impacts of the temporary excavations.

Further details on the SuDS is outlined in the SWMP (Chapter 2 – Description of Proposed Project, Appendix 2-7 – Surface Water Management Plan) and in Chapter 8 – Hydrology and Hydrogeology (Section 8.4.2).

5.6.2.3.2.7 Mitigation Measures for Dust Deposition

As no likely significant effects are anticipated as a result of dust deposition on Cutover bog (PB4), no specific mitigation is necessary.

5.6.2.3.2.8 Mitigation Measures for Surface Water Run-off

The embedded mitigation SuDS measures are detailed in the SWMP (Chapter 2 – Description of Proposed Project, Appendix 2-7 – Surface Water Management Plan), which will control the movement of run-off from project infrastructure across the entirety of the proposed Wind Farm Site, including at T3, T4 and T10.

Embedded mitigation measures for the avoidance of surface water run-off impacts on Cutover bog (PB4) consists of (Chapter 8- Hydrology and Hydrogeology, Section 8.5.1):

- Run-off will be directed to flow away from the sensitive habitats and into the drainage scheme and surface water settlement ponds;
- Groundwater seepages and surface water run-off will directed to, and treated in, the proposed settlement ponds;
- All personnel working on the Proposed Project will be responsible for the environmental control of their work and will perform their duties in accordance with the requirements and procedures of the CEMP;
- Channels will be used to convey water with vegetation and/or erosion control blankets;
- ECoW will halt dewatering if the downgradient area shows elevated turbidity or erosion;
- Outlet protection or any velocity dissipation device will be monitored to ensure that erosion does not take place;
- Ensure a stable, erosion-resistant surface (e.g., well-vegetated grassy areas, clean filter stone, geotextile underlay) is in place at outlets; and,
- Natural revegetation of lands will be supported using adjacent local seed banks, including spoil deposition areas. This will stabilise soils, mitigate peat erosion and allow vegetation to intercept and filter rainfall on site.

5.6.2.3.2.9 Summary of Significant Effects on Cutover bog (PB4)

Following the implementation of the mitigation measures outlined above, there will be no significant indirect effects on Cutover bog (PB4) as a result of drainage, dust deposition, or

surface water run-off. However, significant effects on 0.89ha Cutover bog (PB4) remain as a result of direct habitat loss from proposed infrastructure at T3, T4 and T10.

As a result of the proposed Wind Farm Site there is **potential for significant residual effects at a local geographic scale** on 0.89ha of Cutover bog (PB4) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition. Appropriate compensation measures for this habitat loss are listed in Section 5.11.

5.6.2.3.3 Depositing/lowland Rivers (FW2)

The habitat type Depositing/lowland rivers (FW2) was identified at four locations along the proposed GCR (Aquatic Site 15, 18, 21, and 22). These Depositing/lowland rivers (FW2) are valued as of Local (higher) Importance, except for two locations (Aquatic Site 15 and 22) within Lough Gill SAC, where the habitat is of International Importance.

Table 5-22: Depositing/Lowland Rivers (FW2) located within Lough Gill SAC which are crossed by the GCR

EPA Name (Code)	WFD Name (Code)	Aquatic Site	Method Crossing
Shanvaus 35 (35S01)	SHANVAUS_010 (IE_WE_35S011100)	15	Existing bridge
Bonet (35B06)	BONET_050 (IE_WE_35B060630)	22	HDD Site 2

There will be no direct loss of Depositing/lowland Rivers (FW2) as a result of the Proposed Project. The potential impact on Depositing/lowland Rivers (FW2) is derived from the potential habitat degradation associated with water quality degredation.

5.6.2.3.3.1 Habitat Degradation as a Result of Water Quality Degradation

Likely significant direct effects on watercourses can occur from construction activities, particularly through contaminated surface water entering a watercourse, which can contribute to the deterioration of water quality. In addition, likely indirect impacts can occur through physical alteration to the riverbed and bank morphology, with the potential to alter erosion and deposition rates, locally and on downstream reaches. These effects can potentially to significant effects at an international level if they occur within the catchment of Lough Gill SAC.

However, likely significant effects are not anticipated considering the embedded mitigation measures for the protection of water quality (Section 5.5) inclusive of: the SuDS measures, hydrocarbon interceptors, avoidance of instream works, avoidance of hardstands within 50m of watercourses, avoidance of karst features, as well as the use of sediment traps, silt fences, and bunded fuel storage.

In summary, **no likely significant effects at any geographic scale** are anticipated water quality in Depositing/Lowland Rivers (FW2) as a result of the Proposed Project.

5.6.2.3.3.2 Mitigation Measures for Surface Water Quality

The additional mitigation measures for the protection of water quality which will be implemented are listed in Section 5.6.2.1.4.

5.6.2.3.3.3 Summary of Significant Effects on Depositing /Lowland Rivers (FW2)

Following the implementation of the mitigation measures outlined above, the Proposed Project will result in **no potential for significant residual effects at any geographic scale** on Depositing/lowland rivers (FW2).

5.6.2.3.4 Drainage ditches (FW4)

A combined total of 22,430m of drainage ditches (FW4) were mapped throughout the Survey Area for the proposed Wind Farm Site.

The potential impacts on Drainage ditches (FW4) are:

- Habitat loss;
- Habitat degradation as a result of water quality degradation.

5.6.2.3.4.1 Habitat loss

There is potential for the permanent direct loss of c. 4,325m of Drainage ditches (FW4) as a result of the proposed wind farm. Infrastructure leading to the direct loss of Drainage ditches (FW4) includes a combination of borrow pits, hardstands, turbine bases, cut and fill buffer, internal access tracks and turning bays.

The loss of Drainage ditches (FW4) will reduce the connectivity of the landscape for aquatic and semi-aquatic flora. Within the Survey Area for the proposed Wind Farm Site, a total of 22,974m of Drainage ditch (FW4) habitat is currently available. The total loss of 4,325m of Drainage ditch (FW4) habitat constitutes a significant loss of the total habitat across the Survey Area for the proposed Wind Farm Site. Considering the embedded mitigation measures, namely SuDS the habitat loss will be temporary and reversible, as new Drainage ditches (FW4) will be created to facilitate surface water drainage during the construction phase. The removal and creation of the Drainage ditches (FW4) will take place take place within the 24 months allocated to the construction phase. As such, the indirect impacts of this habitat loss on flora are considered not significant. Impacts on small mammals and amphibians which use the habitat for foraging, commuting as well as critical life-cycle stages, are considered elsewhere (Section 5.6.2.6).

The reduction of drainage channels will likely have a positive impact on the structure and function surrounding wetland habitats including Upland blanket bog (PB2), Cutover bog (PB4) and Wet grassland (GS4) habitat within 30m of where the drains will be lost. However, these positive impacts are not likely to be significant as they are not being implemented in a targeted and structured manner, which is needed for effective conservation and restoration of wetland habitats (LIFE Project, 2008). Impacts of drainage on peatland habitats are discussed in more detail in Section 5.6.2.3.2.2.

The total of 2,300m of Drainage ditches (FW4) are locate within the 10m buffer along the GCR. As works along the GCR are largely confined to the public roads corridor then the impacts on this habitat are likely imperceptible. No further impacts on Drainage ditches (FW4) are considered along the GCR or TDR due to the limited extent of proposed works.

The direct loss 4,325m of Drainage ditches (FW4) within the proposed Wind Farm Site is considered a to have **no likely significant effect at a local geographic scale.**

5.6.2.3.4.2 Habitat Degradation as a Result of Water Quality Degradation

Construction phase activities will take place in close proximity to Drainage ditches (FW4) with 3,754m of the habitat within 50m of construction activities making the habitat susceptible to water quality effects from dust deposition, sedimentation, and contamination.

However, likely significant effects as a result of sedimentation and contamination are not anticipated considering the embedded mitigation measures for the protection of water quality (Section 5.5) inclusive of: the SuDS measures, hydrocarbon interceptors, avoidance of instream works, avoidance of karst features, as well as the use of sediment traps, silt fences, and bunded fuel storage.

During the 24 months of the construction phase, the potential for the degradation water quality as a result of dust deposition on the water quality in Drainage ditches (FW4) is considered a **negative, short-term, reversible, likely significant effect at a local geographic scale.**

5.6.2.3.4.3 Mitigation Measures for Habitat Loss

A series of new Drainage ditches (FW4) will be created around the Proposed Project infrastructure as part of the SuDS and SWMP (Chapter 2 – Description of Proposed Project, Appendix 2-7 – Surface Water Management Plan). These features are likely to revegetate quickly over the short term (within 24 months) with common and widespread species. In this way, the function of the Drainage ditch (FW4) for aquatic and semi-aquatic flora will be reinstated within the 24 months allocated to the construction phase, as part of the proposed works within the proposed Wind Farm Site.

5.6.2.3.4.4 Mitigation Measures for Habitat Degradation associated with Water Quality Degradation

Additional mitigation measures for the protection of water quality which will be implemented are listed in Section 5.6.2.1.4.

Mitigation measures associated with dust deposition from the construction phase of the Proposed Project are outlined in Chapter 11 - Air Quality (Section 11.7.2). Mitigation measures relevant to sensitive habitats including Drainage ditches (FW4) consist of:

- Solid screens or barriers will be erected around dusty activities or the site boundary that are at least as high as any stockpiles on site;
- Where there is a high potential for dust production and the site is active for an extensive period there will be full enclosure of site, or specific operations;
- Where it is not possible to re-vegetate or cover with topsoil, as soon as is practicable, the use of Hessian or mulches will be implemented;
- Cutting, grinding and/or sawing equipment will be fitted with, or used in conjunction with, suitable dust suppression techniques;
- Bulk cement and other fine powder materials will be delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery;
- Bags of smaller supplies of fine powder materials will be sealed after use and stored appropriately to prevent dust; and,
- A water-assisted dust sweeper(s) will be used on the access and local roads, to remove, as necessary, any material tracked out of the site.

5.6.2.3.4.5 Summary of Significant Effects on Drainage Ditches (FW4)

Following the implementation of the mitigation measures outlined above in Section 5.5 and Section 5.6.2.1.4.1, the Proposed Project will result in **no potential for significant residual effects at any geographic scale** on Drainage ditches (FW4).

5.6.2.3.5 Dry meadows and grassy verges (GS2)

Dry meadows and grassy verges (GS2) were frequently recorded along the existing access roads within the Survey Area for the proposed Wind Farm Site, amounting to a combined total of 12.31ha. The habitat has potential to support the marsh fritillary butterfly and other pollinator species. The potential likely significant effects of the Proposed Project on the marsh fritillary butterfly and, by association, on other pollinator species are discussed in Section 5.6.2.9.

The potential impacts on Dry meadows and grassy verges (GS2) are:

- Habitat loss;
- Habitat degradation associated with disturbance;
- Habitat degradation associated with dust deposition; and,
- Habitat degradation associated with drainage and surface water run-off.

5.6.2.3.5.1 Habitat Loss

Approximately 2.76ha of Dry meadows and grassy verges (GS2) will be permanently lost within the proposed Wind Farm Site, during the 24 months of the construction phase. The amount of habitat to be lost constitutes a significant portion of the total cover of Dry meadows and grassy verges (GS2) within the Survey Area for the proposed Wind Farm Site.

The loss of the habitat will occur largely within the southern extent of the proposed Wind Farm Site, along the proposed internal access tracks (2.3ha). The Dry meadows and grassy verges (GS2) habitat is associated with the existing access roads within the proposed Wind Farm Site, which will be lost to accommodate for works at these locations. In addition, a small amount of habitat loss will occur as a result of the construction of hardstands at T11 and T14 (inclusive of the cut and fill buffer and turbine bases), and a marginal amount will be lost as a result of the construction of the borrow pit in the south of the proposed wind farm site.

Along the TDR, there will be direct loss of this habitat POIs 44, 45, 49, 50, 51 and 52, totalling approximately 0.25ha.

The species within the Dry meadows and grassy verges (GS2) habitat are widespread and common species. Following construction of the internal access tracks across the proposed Wind Farm Site, the ruderal species will readily colonise the borders of the internal access tracks and will re-establish the habitat over the short term (less than 5 years). As such, the effects of the Proposed Project on the Dry meadows and grassy verges (GS2) is considered reversible and short-term.

The loss of 3.01ha of Dry meadows and grassy verges (GS2) within the proposed Wind Farm Site is considered to have **no likely significant effect at any geographic scale**.

5.6.2.3.5.2 Habitat Degradation associated with Disturbance Events

Due to the proximity of Dry meadows and grassy verges (GS2) to the access roads within the proposed Wind Farm Site, there is increased likelihood of disturbance events from construction activities and vehicular access. While the habitat is likely somewhat tolerant to disturbance,

given its affinity with roadside verges (Fossitt, 2000), large scale disturbance events, such as those occurring during periods of heavy rainfall, have potential to cause significant direct impacts on the condition of the habitat at a local level. Repeated occurrences could affect soil structure and/or promote water logging, and, over time, lead to changes in species composition. These disturbance events are limited to within c. 5m of the internal access tracks, as this is the area where disturbance from vehicles during the 24 months of the construction phase of the proposed Wind Farm Site is most likely.

Habitat degradation associated with disturbance event is considered to have **no likely significant effect at any geographic scale**.

5.6.2.3.5.3 Habitat Degradation associated with Dust Deposition

Dust deposition arising from construction phase activities and vehicular access is likely to impact Dry meadows and grassy verges (GS2) due to the tendency of the habitat to occupy roadside verges within the proposed Wind Farm Site. A total of 6.82ha of Dry meadows and grassy verges (GS2) is located within a 50m of the proposed infrastructure, will likely be impacted by dust as it coats foliage, which can negatively affect photosynthesis and stomatal occlusion, ultimately reducing plant fitness (Farmer, 1993). However, the effects of dust deposition on grassland vegetation are likely to be short-term and reversible. Due to the vegetation structure of grassland habitats, they are less susceptible to Dust Impacts, when compared to woodlands, due to increased turbulence (APIS, 2025). The deposition of alkaline dust is not likely to significantly affect vegetation composition as, unlike peatlands, the flora recorded within the habitat is not strongly acidophilic (Section 5.4.2.1.8).

Habitat degradation associated with dust deposition over 6.82ha of Dry meadows and grassy verges (GS2) is considered to have **no likely significant effect at any geographic scale.**

5.6.2.3.5.4 Habitat Degradation associated with Drainage and Surface-Water Run-off

The proposed improvements to the access roads within the proposed Wind Farm Site have the potential to negatively affect the locally occurring Dry meadows and grassy verges (GS2) habitat, through alteration in the hydrology of the habitat either through drainage impacts and/or surface water run-off from the project infrastructure, including internal access tracks. Under a worst-case scenario, these effects on GS2 habitat have the potential to be long-term, leading to changes in species composition across 5.54ha of Dry meadows and grassy verges (GS2) located within the immediate vicinity (c. 30m) of the proposed infrastructure within the proposed the proposed Wind Farm Site. Best practice guidance on impact assessments for drainage recommends a standard buffer of 30m when estimating drying effects on peatland soils (NatureScot, 2023). However, as the habitat is already associated with internal access roads throughout the proposed Wind Farm Site, it must be assumed that the habitat type tolerates the roadside conditions, including the hydrological effects of surface water run-off and drainage ditches. A such the effects of the proposed internal access tracks on the hydrology of the Dry meadows and grassy verges (GS2) habitat are considered not significant.

Habitat degradation of 5.54ha of Dry meadows and grassy verges (GS2) associated with surface water run-off and drainage is considered to have **no likely significant effect at any geographic scale**.

5.6.2.3.5.5 Mitigation Measures for Habitat Loss

All areas of Dry meadows and grassy verges (GS2), which are required to be retained as part of the Proposed Project, will be demarcated to ensure that only habitat outside of these areas are subject to removal. The demarcation of the area will be done under guidance and supervision of the ECoW (Section 5.12.1).

5.6.2.3.5.6 Mitigation Measures for Disturbance

No specific mitigation measures are necessary for disturbance events on Dry meadows and grassy verges (GS2) as no significant effects are anticipated on the habitat.

5.6.2.3.5.7 Mitigation Measures for Dust Deposition

No specific mitigation measures are necessary for dust deposition on Dry meadows and grassy verges (GS2) as no significant effects are anticipated on the habitat.

5.6.2.3.5.8 Mitigation Measures for Drainage and Surface Water Run-off

No specific mitigation measures are necessary for surface water run-off on Dry meadows and grassy verges (GS2) as no significant effects are anticipated on the habitat.

5.6.2.3.5.9 Summary of Significant Effects on Dry meadows and grassy verges (GS2)

The dust deposition, disturbance, drainage and surface water run-off will result in no significant residual effects. There will be a direct loss of 2.76ha of Dry meadows and grassy verges (GS2), but this loss is considered temporary as the habitat is likely to recolonise the internal access tracks within the short-term (less than 5 years), following the construction phase. In summary, there will be **no potential for significant residual effects at any geographic scale** on Dry meadows and grassy verges (GS2).

5.6.2.3.6 Dry siliceous heath (HH1) corresponding to Annex I habitat type 4030 European dry heaths in unfavourable condition

Dry siliceous heath (HH1) is highly localised to the northern extent of the Survey Area for the proposed Wind Farm Site, with a combined total of 2.81ha present. The habitat corresponds to Annex I habitat type 4030 European dry heaths in unfavourable condition is assessed as of County Importance.

There will be no direct loss of Dry siliceous heath (HH1) as a result of the Proposed Project. The potential impacts on Dry siliceous heath (HH1) corresponding to Annex I habitat type 4030 European dry heaths in unfavourable condition are:

- Habitat degradation associated with dust deposition; and,
- Habitat degradation associated with surface water run-off;
- Habitat degredation associated with drainage.

5.6.2.3.6.1 Habitat Degradation associated with Dust Deposition

Dust deposition arising from construction works, primarily that of excavation works at T3, has potential to negatively affect sensitive peatland flora within 50m of the works corridor (IAQM, 2024), amounting to a total area of 0.07ha. Dust coats foliage reducing photosynthesis and promoting stomatal closure leading to a decrease in overall plant fitness.

Dry siliceous heath (HH1) is a peatland habitat and as such is considered a highly sensitive receptor to pollutant deposition (APIS, 2025). Furthermore, for sensitive peatland habitats,

such as Dry siliceous heath (HH1), which are dominated by acidophilous species, alkaline dust, that from cement or road chippings, can increase the pH of the substrate, which can lead to changes in species composition, particularly the sensitive bryophyte layer.

However, the bryophyte layer of Dry siliceous heath (HH1) is not typically dominated by peat forming *Sphagnum* spp., which are among the most sensitive species to dust deposition (Fossitt, 2000). Instead, the habitat is dominated by more robust perennial dwarf shrubs, which are not likely to be negatively affected by the dust deposition (Farmer, 1993). The dust deposition will be limited to the 24 months of the construction phase, where earthworks, construction and track out from HGV movement is predicted (Chapter 10 – Air quality).

Habitat degradation associated with dust deposition is considered to have **no likely significant effect at any geographic scale**.

5.6.2.3.6.2 Habitat Degradation associated with Surface Water Run-off

The construction of T3 (inclusive of the hardstand, turbine base, cut and fill buffer) has the potential to adversely affect the surrounding Dry siliceous heath (HH1) if surface water from the project infrastructure was to discharge directly in into the habitat. A small parcel (0.49ha) of Dry siliceous heath (HH1) is located to the south-west of T3, at a distance of c.30m, where. Cutover bog (PB4) screens the Dry siliceous heath (HH1) habitat.

The peat within the Dry siliceous heath (HH1) habitat has likely been extracted with "almost no peat present" at the time of survey (see Appendix 5-2). Shallow upland soils are fragile and vulnerable to erosion, particularly following a loss of vegetation cover. As such, this habitat is at high risk to changes in surface water flow, which can potentially promote and accelerate peat erosion locally (Perrin *et al.*, 2014). This would negatively affect the condition of the Dry siliceous heath (HH1) habitat and/or lead to the permanent indirect loss of habitat, dependant on the velocity, frequency, and quantity of water discharging into the habitat.

However, as previously discussed (Section 5.4.2.1.4), embedded SuDS measures will be applied during the construction phase to reduce the quantity of discharge from the proposed Wind Farm Site to pre-development flows.

Embedded SuDS measures work to prevent peat erosion. Habitat degredation of Dry siliceous heath (HH1) as a result of surface-water run-off is considered to have **no likely significant effect at any geographic scale**.

5.6.2.3.6.3 Habitat Degradation associated with Drainage

A limited extent (<0.001ha) of Dry siliceous heath (HH1) is located within c. 30m of T3. The habitat is not likely at risk of drainage impacts from the proposed project as these habitats are not typically waterlogged and instead occur on free draining acid soils (Fossitt, 2000). Indeed, the cover of cover of peat-forming species within Dry siliceous heath (HH1) is usually highly limited (Perrin *et al.* 2014). Instead, the habitat is dominated by ericaceous dwarf shrubs (NPWS, 2019b). As such, drainage is not a threat to the structure and function of the habitat.

Habitat degradation associated with drainage impacts on Dry siliceous heath (HH1) within the proposed Wind Farm Site is assessed as having **no likely significant effect at any geographic scale**.

5.6.2.3.6.4 Mitigation Measures for Dust Deposition

No specific mitigation measures are necessary for dust deposition on Dry siliceous heath (HH1) as no significant effects are anticipated on the habitat.

5.6.2.3.6.5 Mitigation Measures for Surface Water Run-off

To prevent additional surface water from being discharged into the Dry siliceous heath (HH1), surface water discharge at T3 will be directed to flow into the SuDS, as part of the embedded mitigation measures (Section 5.5).

5.6.2.3.6.6 Mitigation Measure for Drainage

No specific mitigation measures are necessary for drainage impacts on Dry siliceous heath (HH1) as no significant effects are anticipated on the habitat.

5.6.2.3.6.7 Summary of Significant Effects on Dry siliceous heath (HH1)

Following the implementation of the mitigation measures outlined above, **no potential for significant residual effects at any geographic scale** are predicted as a result of the Proposed Project on the Dry siliceous heath (HH1) corresponding to Annex I habitat type 4030 European dry heaths in unfavourable condition.

5.6.2.3.7 Dry siliceous heath (HH1)/Dry humid acid grassland (GS3)

The dry heath component of the Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) mosaic which corresponds to Annex I habitat type 4030 European dry heaths in unfavourable condition is assessed as of County Importance. One parcel of this habitat is partially located within the footprint of T3 (inclusive of the hardstand, turbine base, cur and fill buffer, internal access track - Figure 5-14). The entire parcel measures 1.15ha in size.

The potential impacts on Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) corresponding to Annex I habitat type 4030 European dry heaths in unfavourable condition are:

- Habitat loss;
- Habitat degradation associated with dust deposition;
- Habitat degradation associated with surface water run-off;
- Habitat degradation associated with drainage.

5.6.2.3.7.1 Habitat loss

A total of 0.45ha of Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) mosaic will be lost as a result of the proposed construction of T3. This habitat loss represents a significant portion of the total 1.48ha of the habitat identified within the Survey Area for the proposed Wind Farm Site.

The conservation objectives for Annex I habitat type 4030 European dry heaths include the maintenance of the current range, surface area, and the structure and functions of the habitat type both inside and outside Natura 2000 sites (NPWS, 2019b). As such the loss of 0.45ha of the habitat undermines the conservation objectives of the habitat.

While the heath components of the habitat correspond to the Annex I habitat type 4030 European dry heaths, the Dry humid acid grassland (GS3) components do not. Indeed, the Dry humid acid grassland (GS3) components are indicative of the severe grazing pressure noted throughout the habitat.

The direct loss of 0.45ha of Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) mosaic is considered **a negative, permanent, irreversible, likely significant effect at a local geographic scale**.

5.6.2.3.7.2 Habitat Degradation associated with Dust Deposition

Dust deposition arising from construction works, primarily that of excavation works at T3 has potential to negatively affect sensitive peatland flora within 50m of the proposed works amounting to a total area of 1.04ha.

The likely significant effects of dust deposition on Dry siliceous heath (HH1) have been discussed in Section 5.6.2.3.6.1, and the same discussion applies here.

Habitat degradation of associated with dust deposition of 0.45ha of Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) is considered to have **no likely significant effect at any geographic scale.**

5.6.2.3.7.3 Habitat Degradation associated with Surface Water Run-off

The construction of T3 (inclusive of the hardstand, turbine base, cut and fill buffer, internal access track) has the potential to adversely affect the surrounding Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) mosaic if surface water from the Proposed Project infrastructure was to discharge directly into the habitat.

However, as previously discussed (Section 5.4.2.1.4).,embedded SuDS measures will be applied during the construction phase to reduce the quantity of discharge from the proposed Wind Farm Site to pre-development flows.

Habitat degredation associated with surface water run-off for Dry siliceous heath (HH1) has been presented in detail in Section 5.6.2.3.6.2.

Habitat degradation associated with surface water run-off on Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) mosaic is considered to be **no likely significant effect at any geographic scale**.

5.6.2.3.7.4 Habitat Degradation associated with Drainage

An area of 0.91ha of Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) mosaic is located within c. 30m of T3. The habitat is not likely at risk of drainage impacts from the proposed project as of Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) are not typically waterlogged and instead occur on free draining acid soils (Fossitt, 2000). Indeed, the cover of cover of peat-forming species within Dry siliceous heath (HH1) is usually highly limited (Perrin *et al.* 2014). Instead, the habitat is dominated by ericaceous dwarf shrubs (NPWS, 2019b). As such, drainage is not a threat to the structure and function of the habitat.

Habitat degradation associated with drainage of Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) mosaic within the proposed Wind Farm Site is assessed as having **no likely significant effect at any geographic scale**.

5.6.2.3.7.5 Mitigation Measures for Habitat Loss

The direct loss of 0.45ha of Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) cannot be avoided as a result of the construction phase of the proposed Wind Farm Site. In order to prevent further loss of habitat, the following measures will be adhered to:

- All machinery will be confined to the works corridor, which will be demarcated in advance of construction with temporary fencing, to minimise the footprint of the works taking place within Dry siliceous heath (HH1)/Dry humid acid grassland (GS3)
- No clearance of vegetation will be undertaken outside of the demarcated areas within the proposed Wind Farm Site, to minimise the footprint of the works taking place within Dry siliceous heath (HH1)/Dry humid acid grassland (GS3);
- There will be no temporary storage of construction or waste materials within the Dry siliceous heath (HH1)/Dry humid acid grassland (GS3), to minimise the footprint of the works taking place within the habitat;
- Suitably sized bog mats will be used, where appropriate, to protect sensitive peatland vegetation and reduce the risk of peat erosion; and,
- All disturbed ground will be fully reinstated after works to promote natural regeneration.

Appropriate compensation measures for direct habitat loss of 0.45ha of Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) are presented in Section 5.6.2.3.7

5.6.2.3.7.6 Mitigation Measures for Dust Deposition

No specific mitigation measures are necessary for dust deposition on Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) as no significant effects are anticipated on the habitat.

5.6.2.3.7.7 Mitigation Measures for Surface Water Run-off

To prevent additional surface water being discharged into the Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) mosaic, surface water discharge at T3 will be directed to flow into the SuDS, as part of the as part of the embedded mitigation measures (Chapter 2 – Description of Proposed Project, Appendix 2-7 – Surface Water Management Plan). A summary of these measures is provided in Section 5.6.2.3.2.8.

5.6.2.3.7.8 Mitigation Measures for Drainage

No specific mitigation measures are necessary for drainage impacts on Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) mosaic as no significant effects are anticipated on the habitat.

5.6.2.3.7.9 Summary of Significant Effects on Dry siliceous heath (HH1)/Dry humid acid grassland (GS3

The loss of Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) mosaic corresponding to Annex I habitat type European dry heaths constitutes **potential for significant residual effects at a local geographic scale**. Appropriate compensation measures for the loss of the habitat are discussed in Section 5.11.

5.6.2.3.8 Eroding/upland rivers (FW1)

A total of 22 Eroding/upland rivers (FW1) drain the lands within the Survey Area for the proposed Wind Farm Site, while the proposed GCR crosses twelve more. The habitat is assessed as of Local Importance (higher value) due to the connectivity it provides within the landscape, except for Aquatic Site 15 which is located along the GCR, and within the Lough Gill SAC. As such, the Eroding/upland river (FW1) associated with Aquatic Site 15, namely the Bonet_030, is considered a protected watercourse of international importance (Table 5-23).

No direct loss of Eroding/upland rivers (FW1) will occur as a result of the Proposed Project.

The potential impacts on Eroding/upland rivers (FW1) habitat consists of:

- Habitat degradation as a result of reduction in water quality.

Further details on surface water impacts are outlined in Chapter 8 – Hydrology and Hydrogeology, Section 8.5.1.

Table 5-23: Eroding Upland Rivers (FW1) located within Lough Gill SAC which are crossed by the GCR

EPA Name (Code)	WFD Name (Code)	Aquatic Site	Method of Crossing
Bonet (35B06)	Bonet_030 (IE_WE_35B060200)	15	HDD Site 1
Boihy (35B75)	Bonet_040 (IE_WE_35B0609.500)	19	Existing bridge
Killanummery (35K03)	Killanummery_010 (IE_WE_35K030600)	24	Existing bridge

5.6.2.3.8.1 Habitat Degradation as a Result of Water Quality Degradation

Negative effects on watercourses can occur from construction activities, particularly as a result of sedimentation and/or contaminated surface water entering a watercourse, which can contribute to the deterioration of water quality. Negative water quality effects on specific aquatic receptors are discussed in Section 5.6.2.10.

The Eroding/upland rivers (FW1) within the Survey Area for the proposed Wind Farm Site will be crossed at eleven locations, involving ten clear span bridges and one bottomless culvert upgrades (Chapter 8 – Hydrology and Hydrogeology Section 8.4.4). Furthermore, the proposed GCR intersects Eroding/upland rivers (FW1) at a total of twelve locations (Aquatic Site 13-15, Aquatic Site 19-20, Aquatic Site 22-28). At these locations, there is potential for contamination and sedimentation from the construction works for the Proposed Project, in the absence of mitigation. In addition, forestry removal and vegetation clearance within the Survey Area for the proposed Wind Farm Site during the construction phase can result in sedimentation and acidification. These impacts have the potential to be long-term, as sensitive aquatic receptors presence at these watercourses can be affected by lower water quality status.

No new watercourse crossings or modification of existing culverts are required for the POIs along the proposed TDR.

Likely significant effects on surface water quality are not anticipated considering the embedded mitigation measures for the protection of water quality (Section 5.5) inclusive of: the SuDS measures, hydrocarbon interceptors, avoidance of instream works, avoidance of hardstands within 50m of watercourses, avoidance of karst features, as well as the use of sediment traps, silt fences, and bunded fuel storage.

In summary, **no likely significant effects at any geographic scale** are anticipated on water quality in Eroding Upland Rivers (FW1) as a result of the Proposed Project.

5.6.2.3.8.2 Mitigation Measures for Surface Water Quality

The additional mitigation measures for the protection of water quality which will be implemented are listed in Section 5.6.2.1.4.

5.6.2.3.8.3 Summary of Significant Effects on Eroding/upland rivers (FW1)

Following the implementation of the mitigation measures outlined in Section 5.5 and Section 5.6.2.1.4.1, the Proposed Project will result in **no potential for significant residual effects at any geographic scale** on Eroding/upland rivers (FW1).

5.6.2.3.9 Exposed calcareous rock (ER2) corresponding to the priority Annex I habitat type 8240* Limestone Pavements in unfavourable condition

Exposed calcareous rock (ER2) corresponding to the priority Annex I habitat type 8240* Limestone Pavements is in unfavourable condition (Section 5.4.2.1.13) and is valued as of County Importance. The habitat is located within the vicinity (c. 350m) of the internal access track to T3 amounting to a combined total of 0.44ha.

The potential impacts on Exposed calcareous rock (ER2) corresponding to the priority Annex I habitat type 8240* Limestone Pavements in unfavourable condition are:

- Habitat loss;
- Habitat degradation associated with dust deposition; and,
- Habitat degradation associated with surface water run-off.

5.6.2.3.9.1 Habitat loss

The permanent direct loss of a limited area of 0.01ha of Exposed calcareous rock (ER2) corresponding to the priority Annex I habitat type 8240* Limestone Pavements in unfavourable condition, will result from the construction of the proposed internal access track to T3. The total area of Exposed calcareous rock (ER2) within the Survey Area for the proposed Wind Farm Site is 0.44ha, and the 0.01ha direct loss constitutes a marginal amount (2.3%) of the total habitat available.

As previously mentioned, several threats to the condition of the habitat have been identified, including the highly fragmented distribution of the habitat, and heavy grazing pressure, meaning the condition and overall conservation status was assessed as unfavourable (Section 5.4.2.1.13). Renewable energy developments are not listed as a threat to the habitat and the highest threat/pressure is conversion to agricultural land (NPWS, 2018b). Conversion into agricultural land is the only high intensity threat/pressure identified, and accounts for 78% of habitat loss for the priority Annex I habitat type 8240* Limestone Pavements (NPWS, 2019b).

The conservation objectives for the priority Annex I habitat type 8240* Limestone Pavements are to maintain the current range, surface area, and the structure and functions of the habitat both inside and outside Natura 2000 (NPWS, 2019b). However, the habitat, as it presents within the Survey Area for the proposed Wind Farm Site, is not considered a representative example of the Annex I habitat type due to the highly fragmented distribution, and the low diversity of specialist species recorded within the habitat. As such, the limited extent of the habitat loss, i.e. 0.01ha, which constitutes 2.3% of the available habitat within the immediate vicinity, is not considered to undermine the national conservation objectives for the Annex I habitat type 8240* Limestone Pavements.

The direct loss of 0.01ha of the priority Annex I habitat type 8240* Limestone Pavements is considered to have a **negative, permanent, long term, likely significant effect at a local geographic scale**.

5.6.2.3.9.2 Habitat Degradation associated with Dust Deposition

Dust deposition arising from construction works along the internal access track at T3 have potential to negatively affect the flora of the limestone pavement located within 50m of construction activities (IAQM, 2024), which constitutes 0.26ha, or 59%, of the total habitat available within the Survey Area for the proposed Wind Farm Site. Dust deposition can negatively affect plant fitness (Farmer, 1993). In some habitats, such as acidic peatlands, the deposition of alkaline dust, such as that from cement or road chippings, can also lead to long term changes in the species composition of a habitat (Section 5.6.2.3.2.3). However, as the flora of the priority Annex, I habitat type 8240* Limestone Pavements is specialised to tolerate highly alkaline environments, alkaline dust is not likely to lead to changes in species composition. Indeed, there is evidence that the effect of dust deposition is lessened on habitats supported by limestone substrates. Nevertheless, dust deposition is still likely to lead to an overall reduction in vegetative growth, reduction to the production of reproductive structures, and increased susceptibility to plant pathogens (Farmer, 1993).

Dust deposition will be largely limited to the 24 months of the construction phase, where earthworks, construction and track out from HGV movement is predicted. As such, these effects are considered short-term and reversible, as new vegetative growth will be free from air borne dust associated with construction.

Habitat degradation associated with dust deposition is considered have **no likely significant effect at any geographic scale** on Exposed calcareous rock (ER2) corresponding to the priority Annex I habitat type 8240* Limestone Pavements in unfavourable condition.

5.6.2.3.9.3 Habitat Degradation associated with Surface Water Run-off

The construction of the internal access track at T3 has the potential to indirectly affect the surrounding Exposed calcareous rock (ER2), if surface water from the Proposed Project infrastructure was to discharge directly into the surrounding habitats. This direct discharge may disrupt environmental conditions for the sensitive flora of the limestone pavement, particularly during periods of heavy rainfall. Typically, limestone pavement supports “shallow skeletal soils” (Wilson *et al*., 2013), and significant increases in the velocity, frequency, and quantity of water discharging into the habitat has potential to wash away these fragile soils or lead to water stress in plants and/or a reduction in plant coverage and diversity (Wilson *et al*., 2013).

However, as previously discussed (Section 5.4.2.1.4).,embedded SuDS measures will be applied during the construction phase to reduce the quantity of discharge from the proposed Wind Farm Site to pre-development flows.

Habitat degradation associated with surface water run-off on Exposed calcareous rock (ER2) corresponding to the priority Annex I habitat type 8240* Limestone Pavements in unfavourable condition is considered have **no likely significant effect at any geographic scale**.

5.6.2.3.9.4 Mitigation Measures for Habitat Loss

The direct loss of 0.01ha of Exposed calcareous rock (ER2) corresponding to the priority Annex I habitat type 8240* Limestone Pavements in unfavourable condition, although not significant,

cannot be avoided as a result of the construction phase of the proposed wind farm site. To prevent further loss of habitat the following measures will be adhered to:

- All machinery will be confined to the works corridor, which will be demarcated in advance of construction with temporary fencing, to minimise the footprint of the works taking place within the habitat Exposed calcareous rock (ER2);
- No clearance of vegetation will be undertaken outside of the demarcated areas within the proposed Wind Farm Site, to minimise the footprint of the works taking place within the habitat Exposed calcareous rock (ER2);
- There will be no temporary storage of construction or waste materials within the Exposed calcareous rock (ER2), to minimise the footprint of the works taking place within the habitat Exposed calcareous rock (ER2); and,
- Fencing will be used to exclude livestock from the construction area at T3 and allow for natural regeneration during the construction phase.

5.6.2.3.9.5 Mitigation Measure for Dust Deposition

No specific mitigation measures are necessary for dust deposition on Exposed calcareous rock (ER2) as no significant effects are anticipated on the habitat.

5.6.2.3.9.6 Mitigation Measures for Surface Water Run-off

To prevent additional surface water being discharged into the Exposed calcareous rock (ER2), surface water discharge at T3 will be directed to flow into the SuDS, as part of the as part of the embedded mitigation measures (Chapter 2 – Description of Proposed Project, Appendix 2-7 – Surface Water Management Plan). A summary of these measures is provided in Section 5.6.2.3.2.8.

5.6.2.3.9.7 Summary of Significant Effects on Exposed calcareous rock (ER2)

Following the implementation of the mitigation measures outlined above the Proposed Project will result in **no potential for significant residual effects at any geographic scale** on the Exposed calcareous rock (ER2) corresponding to the priority Annex I habitat type 8240* Limestone Pavements in unfavourable condition.

5.6.2.3.10 Hedgerows (WL1)

The proposed Wind Farm Site is almost devoid of Hedgerows (WL1), with only 199m of the habitat being identified within the Survey Area for the proposed Wind Farm Site. The habitat is more frequent along the proposed GCR and the TDR and is valued as of local importance (higher value) (Section 5.4.2.1.14).

The potential impacts on Hedgerows (WL1) habitat from the construction phase of the Proposed Project are:

- Habitat loss; and
- Habitat degradation resulting from dust deposition.

5.6.2.3.10.1 Habitat loss

The removal of 31m of Hedgerow (WL1) is necessary to facilitate the entrance to the south of the proposed Wind Farm Site, inclusive of the internal access track and the oversail areas.

The loss of habitat is considered significant due to the impact on the function of the habitat as an ecological corridor. The loss of habitat amounts to a significant portion of the total

Hedgerows (WL1) available within the Survey Area for the proposed Wind Farm Site. The scale of significance is considered local as the extent of the habitat loss is restricted to within the southern extent of the Survey Area for the proposed Wind Farm Site. The impact will likely last between 15 and 60 years as brambles, shrubs, and seedlings will likely self-seed along the field margins allowing for the natural regeneration of the hedgerows, provide land management practices are not intensive.

Similarly, temporary loss of hedgerows will occur along the TDR, where vegetation may need to be trimmed to allow for turbine component oversail during transport.

Approximately 1,066 of Hedgerows (WL1) will be temporarily lost at POI 1, 2, 3, 13, 15, 18, 21, 22, 44, 45, and 53. These POIs have been identified as requiring oversail by turbine components during transport and will thus require vegetation trimming to allow unobstructed passage.

The impact of this habitat loss is considered a significant effect as this will affect the function of the habitat as an ecological corridor at a local level over the short-term. The habitat will likely recover from the required trimming within several growing seasons. As such, the effect is considered reversible.

A further 10m of habitat will be lost at HDD Site 1 to accommodate the temporary launch pit for the excavation rig.

The loss of a combined total of 1,107m Hedgerow (WL1) as a result of the Proposed Project is considered a **short-term, reversible, negative, likely significant effect at a local geographic scale.**

5.6.2.3.10.2Habitat Degradation associated with Dust Deposition

Dust deposition arising from construction works have potential to negatively impact the flora of the Hedgerows (WL1) located within 50m of the works corridor, by coating foliage which can negatively affect photosynthesis and can lead to changes in species composition (Farmer, 1993). As such, 199m of Hedgerow (WL1) will likely be affected by dust deposition to facilitate the entrance to the south of the proposed Wind Farm Site, along the internal access track and the oversail areas. The potential impacts from dust deposition on trees is greater relative to shorter vegetation, due to air turbulence dissipating its effects on the latter habitat (APIS, 2025). Visible effects of dust deposition include changes in the pigmentation of leaves, and reduced productivity and vitality (APIS, 2025). However, these effects are considered reversible and short-term, as they will be restricted to the 24 months duration of the construction phase, and following defoliation, broadleaved trees will likely recover within a year.

The habitat degradation of 199m of Hedgerow (WL1) as a result of dust deposition is considered to have **no significant effect at any geographic scale**.

5.6.2.3.10.3Mitigation Measures for Habitat Loss

The loss of Hedgerows (WL1) cannot be avoided as a result of the Proposed Project. The following measures will be adhered to, in order to mitigate the effects of the direct loss of the habitat:

- Vegetation clearance will take place outside of bird nesting season (March 01st – August 31st), in accordance with the Wildlife Act, 1976 (as amended);
- Works will be carried out with regard to Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road

Schemes (NRA, 2006a) will be followed to ensure that any vegetation which is to be retained is given protection during the construction phase. This includes the avoidance of structural damage to trees and the use of protective barriers;

- All areas of woodland/hedgerow/treeline which are required to be retained as part of the Proposed Project will be demarcated to ensure that only habitat outside of these areas are subject to removal;
- If a tree is required to be felled, it will be assessed by an arborist/tree surgeon on how best to fell in order to avoid effects to the surrounding habitats, and determine the proficient size of a root protection area (RPA). The RPA will be defined based upon the recommendation of a qualified arborist;
- The area within the RPA will not be used for vehicle/machinery parking or the storage of any materials (including soils, oils and chemicals). The storage of hazardous materials (e.g., hydrocarbons) or concrete washout areas will also not be undertaken within 5 m of any retained trees, hedgerows and treelines;
- A qualified arborist will assess the condition of, and advise on any repair works necessary to, any trees which are to be retained, or that lie outside of the Proposed Project but whose RPA could be affected by the proposed works. Any remedial works required will be carried out by a qualified arborist;
- A buffer zone of at least 5m will be maintained between construction works and retained hedgerows to ensure that the RPA are not damaged.

Appropriate compensation measures for the loss of Hedgerow (WL1) are presented in Section 5.11.

5.6.2.3.10.4 Mitigation Measures for Dust Deposition

No specific mitigation measures are necessary for dust deposition on Hedgerows (WL1) as no significant effects are anticipated on the habitat.

5.6.2.3.10.5 Summary of Significant Effects on Hedgerows (WL1)

Following the implementation of the mitigation measures outlined above there is **potential for significant residual effects at a local geographic scale** due to the direct loss of Hedgerows (WL1) as a result of the Proposed Project. Appropriate compensation measures for the loss of the habitat are discussed in Section 5.11.

5.6.2.3.11 (Mixed) Broadleaved Woodland (WD1)

A total of 11.34ha of (Mixed) broadleaved woodland (WD1) is recorded within the Survey Area for the proposed Wind Farm Site and approximately 0.2ha of this habitat was recorded at POIs along the TDR. This habitat is assessed as of local (higher) importance. The potential impacts to (Mixed) broadleaved woodland (WD1) habitat are:

- Habitat loss; and
- Habitat degradation resulting from dust deposition.

5.6.2.3.11.1 Habitat loss

A total of 0.12ha of (Mixed) broadleaved woodland (WD1) will be lost as a result of the proposed Wind Farm Site to accommodate internal access tracks and associated oversail areas along the western entrance to the proposed wind farm site. The loss of habitat amounts to a fraction of the total available area of (Mixed) broadleaved woodland (WD1) within the Survey Area for the proposed Wind Farm Site. As such, the extent of the proposed habitat loss is not considered

significant. In addition, the habitat loss will take place along the existing access roads, meaning no fragmentation of the woodland habitat will occur. The habitat is likely to regenerate within the oversail area (0.03ha) rapidly, after the 24 months of the construction phase as broadleaved tree species are tolerant of trimming and pruning. For these reasons, the loss of the habitat is considered not significant.

A total of 0.23ha of (Mixed) broadleaved woodland (WD1) will be lost due to the implementation of the bat buffer at T12 (Section 5.6.3.8.1.1). As above, the habitat loss will not result in further fragmentation of the woodland parcel, as less than 5m of trees will be removed from the margin of the habitat.

Approximately 0.2ha of (Mixed) broadleaved woodland (WD1) will be temporarily lost due to vegetation trimming required at oversail areas along the TDR, namely at POIs 38, 42 and 45. As this habitat loss will take place along the existing road network of the TDR, there will be no fragmentation of this woodland habitat. The broadleaved shrub component of the (Mixed) broadleaved woodland (WD1) will regenerate readily within 5 years. However, the semi-mature trees within the habitat will take longer to re-establish themselves. There is potential the trimming will increase susceptibility of individual trees to disease and plant pathogens. Furthermore, topped trees are likely to permanently lose their apical dominance and re-grow in a shrubby habit. The effect is considered long-term and reversible as seedlings are likely to propagate within the habitat following trimming/topping due to increase light on the woodland floor, allowing for the natural regeneration.

A further loss of 0.01ha of (Mixed) broadleaved woodland (WD1) is necessary along the GCR to facilitate the temporary launch pit for the excavation rig at HDD Site 1 at Aquatic Site 15 to cross the Bonet_030.

The total loss of 0.56ha of (Mixed) broadleaved woodland (WD1) as a result of the Proposed Project is considered a **negative, long-term, reversible, likely significant effect at a local geographic scale**.

5.6.2.3.11.2Habitat Degradation associated with Dust Deposition

Dust deposition arising from construction works have potential to negatively affect the flora of the (Mixed) broadleaved woodland (WD1) located within 50m of the works corridor (IAQM, 2024), constituting 2.08ha in total. The areas affected are located along the internal access tracks on the western entrance of the proposed Wind Farm Site. Dust can negatively affect plant fitness by reducing rates of photosynthesis, increasing water stress and increasing susceptibility to pathogens. Due to air turbulence, dust deposition on trees is greater relative to shorter vegetation. Visible effects include changes in the pigmentation of leaves and reduced vitality (APIS, 2025). These effects are considered reversible and short-term, as they will be restricted to the 24 months duration of the construction phase of the Proposed Project, and following defoliation broadleaved trees will likely recover within a year.

Habitat degradation associated with dust deposition on 2.08ha of (Mixed) broadleaved woodland (WD1) is considered to have **no likely significant effect at any geographic scale**.

5.6.2.3.11.3Mitigation Measures for Habitat Loss

The mitigation measures outlined in Section 5.6.2.3.10.3 will be adhered to, in order to avoid any impacts on individual trees which are to be retained. Appropriate compensation measures for direct habitat loss of (Mixed) broadleaved woodland (WD1) are presented in Section 5.11.

5.6.2.3.11.4 Mitigation Measures for Dust Deposition

No specific mitigation measures are necessary for dust deposition (Mixed) broadleaved woodland (WD1) as no likely significant effects are anticipated on the habitat.

5.6.2.3.11.5 Summary of Significant Effects on (Mixed) broadleaved woodland (WD1)

Following the implementation of the mitigation measures outlined above, there is **potential for significant residual effects at a local geographic scale** on (Mixed) broadleaved woodland (WD1) due to habitat loss as a result of the Proposed Project.

5.6.2.3.12 Non-Marine Caves (EU1)

Due to the highly localised extent of this habitat within the Survey Area for the proposed Wind Farm Site, and the separation distances involved from the proposed works corridor (c. 90m), **no likely significant effects are predicted at any geographic scale** for Non-marine caves (EU1).

5.6.2.3.12.1 Mitigation Measures for Non-Marine Caves

No mitigation measures are necessary as no likely significant effects on Non-marine caves (EU1) are anticipated as a result of the Proposed Project.

5.6.2.3.12.2 Summary of Significant Effects on Non-marine caves (EU1)

There is **no potential for significant residual effects at any geographic scale** on Non-marine caves (EU1) as a result of the Proposed Project.

5.6.2.3.13 Riparian Woodland (WN5)

A total of c. 1ha of Riparian woodland (WN5) is recorded at one location within the Survey Area for the proposed Wind Farm Site, along the internal access track which runs from the west of T9 to T6. The habitat is assessed as of local (higher) importance.

The potential impacts to Riparian woodland (WN5) habitat are:

- Habitat loss; and
- Habitat fragmentation;
- Habitat degradation resulting from dust deposition.

5.6.2.3.13.1 Habitat loss

The direct loss of 0.06ha of Riparian woodland (WN5) is required to facilitate the bat buffer at T11. The total loss of habitat constitutes a fraction of the total habitat available within the Survey Area for the proposed Wind Farm Site. The direct loss of 0.06ha of Riparian woodland (WN5) is not considered significant due to the limited extent of the habitat loss combined with the poor baseline condition of the habitat (Section 5.4.2.1.22). The loss of the habitat will occur during the 24 months allocated for the construction phase.

The direct loss of 0.06ha of Riparian woodland (WN5) is considered to have **no likely significant effect at a local geographic scale**.

5.6.2.3.13.2 Habitat fragmentation

Although the direct loss of Riparian woodland (WN5) itself is not significant, the fragmentation effect on the habitat must also be considered. The implementation of the bat buffer will reduce the extent of the woodland parcel creating a potential barrier to dispersal for woodland flora and fauna. The Annex I habitat type 91E0 presents as highly fragmented in Ireland (NPWS,

2019b). The Riparian woodland (WN5) habitat does not qualify as Annex I due to the poor species diversity and a lack of periodic flooding (Section 5.4.2.1.22). Nevertheless, fragmentation of the Riparian woodland (WN5) has potential to result in similar negative effects, such as the loss of woodland specialists, the loss of genetic diversity, and the loss of resilience to environmental change (NPWS, 2019b). However, poor species diversity was noted within the habitat as well as the lack of a developed canopy with dominance by shrubby willow species. As such, the effect of habitat fragmentation on this presentation of Riparian woodland (WN5) is not likely to be significant at a local geographic scale.

Furthermore, the implementation of the 100m bat buffer to reduce collision risk is considered to provide greater benefit to the conservation of biodiversity than the benefits to foraging and commuting bat species of retaining the 0.06ha Riparian woodland (WN5).

The fragmentation loss of the Riparian woodland (WN5) is considered to have **no likely significant at a local geographic scale**.

5.6.2.3.13.3Mitigation Measures for Habitat Loss

No specific mitigation measures for habitat loss are necessary as no significant effects on Riparian woodland (WN5) are likely as a result of the Proposed Project. The mitigation measures outlined in Section 5.6.2.3.10.3 will be adhered to, in order to avoid any impacts on individual trees which are to be retained.

5.6.2.3.13.4Summary of Significant Effects on Riparian woodland (WN5)

Following the implementation of the mitigation measures outlined above, the Proposed Project there is **no potential for significant residual effects at any geographic scale** on Riparian woodland (WN5).

5.6.2.3.14 Scrub (WS1)

A total of 16.97ha of Scrub (WS1) was recorded in several parcels across the lands within the Survey Area for the proposed Wind Farm Site and a further 2.6ha at POIs along the TDR and is assessed as of local importance (higher value).

The potential impacts from the Proposed Project to Scrub (WS1) habitat are:

- Habitat loss; and,
- Habitat degradation resulting from dust deposition.

5.6.2.3.14.1Habitat loss

The Proposed Project requires the removal of the 0.82ha of Scrub (WS1) for the internal access tracks, and associated oversail areas between T13 and T8, as well as T8 to T5, and T5 to T2, which constitutes a fraction of the total area of the habitat within the Survey Area for the proposed Wind Farm Site. The effect is considered reversible and short-term as the habitat will naturally regenerate within seven years, provided livestock is excluded from these areas.

Furthermore, a loss of 0.5ha of Scrub (WS1) is necessary for the implementation of the bat buffer at T13. A further loss of 0.01ha of Scrub (WS1) is necessary to facilitate the temporary launch pit of the excavation rig at HDD Site 2 (Aquatic Site 22).

In addition, there will be a temporary loss of approximately 0.1ha of Scrub (WS1) at POI 13 and 43 as vegetation trimming will be required to allow for unobstructed passage of turbine components during transport. The broadleaved shrub component of the habitat is likely to

regenerate readily within 5 years, and as such the temporary loss of this habitat is considered to have no likely significant effect at any geographic scale.

The combined direct loss of approximately 1.43ha of Scrub (WS1) is considered to have **no likely significant effect at any geographic scale**.

5.6.2.3.14.2 Habitat Degradation associated with Dust Deposition

Dust deposition arising from construction works have potential to negatively impact the condition of Scrub (WS1) located within 50m of the works corridor (IAQM, 2024), amounting to a significant portion (5.79ha), of the total habitat available within the Survey Area for the proposed Wind Farm Site. The area affected is located along the internal access track which runs north from T13 to T2.

Dust can negatively impact plant fitness by reducing rates of photosynthesis, increasing water stress and increasing susceptibility to pathogens. Due to air turbulence, dust deposition on trees is greater relative to shorter vegetation such as grasslands. Visible impacts include changes in the pigmentation of leaves and reduced vitality (APIS, 2025). The effects of dust deposition are considered reversible and short-term, as they will be restricted to the 24 months duration of the construction phase of the Proposed Project, and following defoliation as shrubs will likely recover within a year.

Habitat degradation associated with dust deposition on 5.79ha of Scrub (WS1) is considered to have **no likely significant effect at any geographic scale**.

5.6.2.3.14.3 Mitigation Measures for Habitat Loss

No specific mitigation measures for habitat loss are necessary as no significant effects on Scrub (WS1) are likely as a result of the Proposed Project. Nevertheless, the mitigation measures outlined in Section 5.6.2.3.10.3 will be adhered to, in order to avoid any impacts on individual trees which are to be retained.

5.6.2.3.14.4 Mitigation Measures for Dust Deposition

No specific mitigation measures for dust deposition are necessary as no significant effects on Scrub (WS1) are likely as a result of the Proposed Project.

5.6.2.3.14.5 Summary of Significant Effects on Scrub (WS1)

Following the implementation of the mitigation measures outlined above, the Proposed Project there is **no potential significant residual effects at any geographic scale** on Scrub (WS1).

5.6.2.3.15 Treelines (WL2)

A total of 867m of Treeline (WL2) is also present within the southern and eastern sections of the Survey Area for the proposed Wind Farm Site. Approximately 283m of this habitat was recorded along the TDR at various POIs, namely; POI 1, 5, 10, 13, 39, 43. A

The potential impacts to Treelines (WL2) habitat are:

- Habitat loss; and
- Habitat degradation resulting from dust deposition.

5.6.2.3.15.1 Habitat loss

The removal of 140m of Treelines (WL2) is necessary to facilitate the construction of T9, inclusive of the turbine base and hardstand, as well as the internal access track and oversail

areas for the southern entrance of the proposed Wind Farm Site. This habitat loss accounts for a significant portion of the total habitat available within the proposed Wind Farm Site. The resulting effects on the function of the habitat as an ecological corridor within Survey Area for the proposed Wind Farm Site are considered significant at a local geographic scale (Section 5.6.2.3.10.1).

Approximately 283m of Treeline (WL2) was recorded along the TDR at various POIs, namely; POI 1, 5, 10, 13, 39, 43. These POIs have been identified as requiring oversail by turbine components during transport and will this require vegetation trimming to allow unobstructed vehicle passage. The combined temporary loss of 283m of Treelines (WL2) along the TDR is considered a significant effect as this will affect the function of the habitat as an ecological corridor at a local level. Although this habitat can regenerate naturally, it takes time mature growth to become re-established. In addition, trees which have been trimmed at the growing point will likely retain a shrubby habitat thereafter. As such, the effect is considered long-term.

The total combined permanent and temporary loss of 432m of Treelines (WL2) as a result of the Proposed Project is considered a **long-term, negative, likely significant effect at a local geographic scale.**

5.6.2.3.15.2Habitat Degradation associated with Dust Deposition

Dust deposition arising from construction works have potential to negatively impact the flora of the Treelines (WL2) located within 50m of the works corridor (IAQM, 2024), which includes 298m of habitat along internal access tracks largely composed of those in the vicinity of the southern entrance. Dust can negatively affect plant fitness by reducing rates of photosynthesis, increasing water stress and increasing susceptibility to pathogens. Due to air turbulence, dust deposition on trees is greater relative to shorter vegetation. Visible effects include changes in the pigmentation of leaves and reduced vitality (APIS, 2025). The effects of dust deposition are considered reversible and short-term, as they will be restricted to the 24 months of the construction phase, and following defoliation broadleaved trees will likely recover within a year

Habitat degradation of 298m of Treelines (WL2) is considered to have **no likely significant effect at a local geographic scale**.

5.6.2.3.15.3Mitigation Measures for Habitat Loss

The direct loss of Treelines (WL2) cannot be avoided as a result of the Proposed Project. The mitigation measures listed in Section 5.6.2.3.10.3 will be adhered to, in order to protect trees which are to be retained (NRA, 2006a). Appropriate compensation measures for direct habitat loss of Treelines (WL2) are presented in Section 5.11.

5.6.2.3.15.4Mitigation Measures for Dust Deposition

No specific mitigation measures are necessary for dust deposition on Treelines (WL2) as no significant effects are anticipated on the habitat.

5.6.2.3.15.5Summary of Significant Effects on Treelines (WL2)

Following the implementation of the mitigation measures outlined above there is **potential for significant residual effects at a local geographic scale** on Treelines (WL2) as a result of the Proposed Project due to habitat loss.

5.6.2.3.16 Upland blanket bog (PB2) corresponding to the priority Annex I habitat type 7130* Blanket bog (active)

Upland blanket bog (PB2) corresponding to the priority Annex I habitat type 7130* Blanket bog (active) identified within the proposed wind farm site in favourable condition is assessed as of National Importance. There will be no direct loss of this habitat type as a result of the Proposed Project.

The potential impacts on Upland blanket bog (PB2) corresponding to the priority Annex I habitat type 7130* Blanket bog (active) are indirect and consists of:

- Habitat degradation associated with drainage;
- Habitat degradation associated with dust deposition; and,
- Habitat degradation associated with surface water run-off.

5.6.2.3.16.1 Habitat degradation associated with Drainage

The effects of drainage on Annex I habitat type 7130 Blanket bog have been discussed in detail in Section 5.6.2.3.2.2. Best practice guidance on impact assessments for developments on peatlands advises using a buffer of 30m when estimating drying effects from drainage for developments on peatlands (NatureScot, 2023). The siting of the of T3, T4 and T10 and the associated haul roads are located >35 m from this habitat. As such, the siting of T3, T4 and T10 constitutes avoidance of drainage effects through embedded design mitigation (CIEEM, 2018).

A combined total of 0.34ha of Upland blanket bog (PB2) corresponding to the priority Annex I habitat type 7130* Blanket bog (active) is located within 30m of pre-existing local roads and access roads within the proposed Wind Farm Site, specifically to the west of the L6184 (Boleyboy) and to the west of the access track running from T12 through the Conifer plantation (WD4) towards Cherrybrook Annex I habitat condition assessments were not conducted at these locations. Following the precautionary principle, these parcels are being assessed here as Upland blanket bog (PB2) corresponding to the priority Annex I habitat type 7130* Blanket bog (active) in favourable condition (CIEEM, 2018).

The hydrology of the Upland blanket bog (PB2) along the L6184 is likely to have already been significantly affected by the construction of the local road and the associated drainage system, and further significant degradation of the habitat from the proposed improvement works to the local road is not anticipated. Therefore, no likely significant effects on the Upland blanket bog (PB2) along the L6184 are anticipated.

The small parcel of Upland blanket bog (PB2) to the west of the access track running from T12 towards Cherrybrook is surrounded on all sides by Conifer plantation (WD4). As such, the hydrology of the habitat is likely to be significantly impaired from the access track as well as the existing drainage network associated with the surrounding Conifer plantation (WD4). The trees themselves are a continued disturbance to peatland hydrological process through subsidence, evapotranspiration, and canopy interception of rainfall (Lindsay *et al.*, 2014b). The effects of forestry on Annex I habitat type 7130 Blanket bog haves been discussed in detail in Section 5.6.2.3.15. Further significant degradation of the habitat from the proposed improvement works to the access track is not anticipated.

Potential drainage impacts on 0.34ha of Upland blanket bog (PB2) corresponding to the priority Annex I habitat type 7130* Blanket bog (active) in favourable condition are considered to have **no likely significant effect at any geographic scale**.

5.6.2.3.16.2Habitat degradation associated with Dust Deposition

The effects of dust deposition arising from construction works on sensitive peatland flora have been discussed in detail in Section 5.6.2.3.2.3. Upland blanket bog (PB2) is considered a highly sensitive receptor to pollutant deposition (APIS, 2025), and. corresponds to the priority Annex I habitat type 7130* Blanket bog (active). The use of the term "active" demonstrates that the habitat supports a "significant area of vegetation that is normally peat forming" (European Commission, 2013). The primary peat forming species are the peat mosses, *Sphagnum* spp. (Perrin *et al*., 2014), which are particularly susceptible to dust deposition (Farmer, 1993). Indeed, amongst the habitats studied, vegetation communities dominated by *Sphagnum* spp. such as active Upland blanket bog (PB2), are considered the ecosystems most sensitive to dust deposition (Farmer, 1993). Alkaline dust, such as that from cement or road chippings, can coat foliage and increase the pH of soils/substrates, ultimately leading to changes in vegetation composition (APIS, 2025). Evidence suggests dust from roads diminishes the photosynthetic rate and chlorophyll content of *Sphagnum* spp (Farmer, 1993). Ultimately, the coverage of peat moses and acidophilous peatland vegetation is likely to be replaced by minerotrophic vegetation in the immediate vicinity (c. 20m) of project infrastructure, such as access roads (Farmer, 1993). In this way, dust deposition impacts the vegetation structure, as well as the peat forming function of the habitat.

Potential likely significant effects from dust deposition on Upland blanket bog (PB2) are limited to where the Upland blanket bog (PB2) habitat lies within 50m of construction activities, namely from works at T4 and along the internal access tracks within the proposed Wind Farm Site. In this way, the potential dust deposition impacts are highly localised, to a total extent of 0.90ha of Upland blanket bog (PB2) corresponding to the priority Annex I habitat type 7130* Blanket bog (active) in favourable condition.

Due to the sensitivity of the Upland blanket bog (PB2) which corresponds to the priority Annex I habitat type 7130* Blanket bog (active), habitat degradation associated with dust deposition is considered a **negative, permanent, irreversible, likely significant effect at a local geographic scale.**

5.6.2.3.16.3Habitat degradation associated with Surface Water Run-off

The proposed construction of T4 has the potential to indirectly affect the Upland blanket bog (PB2) located to the south of the turbine (Site B see Appendix 5-2), if surface water from the Proposed Project infrastructure was to discharge directly into the habitat. This may promote and accelerate peat erosion, which. would negatively affect the condition of the Upland blanket bog (PB2) and/or lead to the permanent indirect loss of habitat, depending on the severity of the surface water flow. Peat erosion is discussed in more detail in Section 5.6.2.3.2.4

Similarly, improvement works along the existing access roads within the proposed Wind Farm Site, specifically to the west of the L6184 (Boleyboy), and to the west of the access track running from T12 through the Conifer plantation (WD4) towards Cherrybrook have potential to affect the volume of surface water run-off into Upland blanket bog (PB2), potentially leading to localised peat erosion, particularly during heavy rainfall. Erosion of peat associated with surface water drainage is considered an irreversible negative effect.

However, as previously discussed (Section 5.4.2.1.4).,embedded SuDS measures will be applied during the construction phase to reduce the quantity of discharge from the proposed Wind Farm Site to pre-development flows. As such, Habitat degradation associated with surface

water run-off on Upland blanket bog (PB2) which corresponds to the priority Annex I habitat type 7130* Blanket bog (active) in favourable condition is considered to have **no significant effect at any geographic scale**.

5.6.2.3.16.4 Mitigation Measures for Drainage

No specific mitigation measures for drainage impacts are necessary as no significant effects are anticipated on Upland blanket bog (PB2) corresponding to the priority Annex I habitat type 7130* Blanket bog (active) in favourable condition.

5.6.2.3.16.5 Mitigation Measures for Dust Deposition

Mitigation measures associated with dust deposition from the construction phase of the Proposed Project are outlined in Chapter 11 - Air Quality, see Section 11.7.2. Mitigation measures relevant to sensitive habitats including Upland blanket bog (PB2) corresponding to the priority Annex I habitat type 7130* Blanket bog (active) in favourable condition are listed in Section 5.6.2.3.4.4.

5.6.2.3.16.6 Mitigation Measures for Surface Water Run-off Impacts

To prevent additional surface water being discharged into the Upland blanket bog (PB2), surface water discharge will be directed to flow into the SuDS, as part of the as part of the embedded mitigation measures (Chapter 2 – Description of Proposed Project, Appendix 2-7 – Surface Water Management Plan). A summary of these measures is provided in Section 5.6.2.3.2.8.

5.6.2.3.16.7 Summary of Significant Effects on Upland blanket bog (PB2)

No residual effects are anticipated as a result of drainage or surface water run-off effects on Upland blanket bog (PB2) corresponding to the priority Annex I habitat type 7130* Blanket bog (active) in favourable condition.

However, in spite of the mitigation measures to be implemented for the avoidance of effects from dust deposition on this habitat, there is **potential for significant residual effects at a local geographic scale** on 0.90ha of Upland blanket bog (PB2) corresponding to the priority Annex I habitat type 7130* Blanket bog (active) in favourable condition.

Appropriate compensation for these residual effects is discussed in Section 5.11

5.6.2.3.17 Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition

Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition is assessed as of County Importance.

The potential impacts from the Proposed Project are:

- Habitat loss;
- Habitat degradation associated with drainage impacts;
- Habitat degradation associated with dust deposition; and,
- Habitat degradation associated with surface water run-off.

5.6.2.3.17.1 Habitat Loss

The permanent direct loss of 0.55ha of Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition is predicted at T3, inclusive of the turbine base, turbine hardstand, cut and fill buffer, and internal access

track. This is the only direct loss of this habitat within the Survey Area for the proposed Wind Farm Site.

The conservation objectives for Annex I habitat type 7130 Blanket bog is to maintain the current range, surface area and function of the habitat type both inside and outside European sites (NPWS, 2019b), and the loss of 0.55ha of Upland blanket bog (PB2) undermines the national conservation objectives for the habitat. Although, the condition of the habitat is unfavourable, best practice guidance cautions against undervaluing a peatland habitat in sub-optimal condition as these peatland habitats are still capable of supporting high biodiversity, and are considered "irreplaceable habitats" (CIEEM, 2018). As such, the direct loss of this habitat is considered an irreversible and permanent effect.

The direct loss of 0.55ha of Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition, is assessed as a **negative, permanent, irreversible, likely significant effect at local geographic scale**.

5.6.2.3.17.2Habitat Degradation associated with Drainage

The effects of drainage on Annex I habitat type 7130 Blanket bog have been discussed in detail in Section 5.6.2.3.2.2. Best practice guidance on impact assessments for developments on peatlands advises using a buffer of 30m when estimating drying effects from drainage for developments on peatlands (NatureScot, 2023).

It is anticipated that the construction of the cut and fill buffer at T4, as well as the infrastructure at T3 (inclusive of the turbine base, turbine hardstand, cut and fill buffer and internal access track) will lead to permanent indirect effects on the hydrology of 2.64ha of the Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition, which lies within 30m of the footprint of the Proposed Project.

The siting of T4 within Conifer planation (WD4) will reduce drainage impacts on Upland blanket bog (PB2) within the immediate vicinity (c. 30m) of the habitat. As previously stated, a series of pre-exiting drainage channels have been excavated throughout the Conifer planation (WD4) to promote establishment (Section 5.6.2.3.2.6). These drainage features have already altered the local hydrology of the Upland blanket bog (PB2) within c. 30m of the Conifer plantation (WD4), and. As such, the significance of drainage impacts on Upland blanket bog (PB2) in the immediate vicinity of T4 is likely to be reduced.

The cover of peat forming species, including *Sphagnum* spp., is not significant within the areas identified as Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition. Nevertheless, further drainage of 2.64ha of Upland blanket bog (PB2) Is considered significant at a local geographic scale.

The indirect habitat degradation as a result of drainage of 2.64ha of Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition is assessed as a **negative, permanent, irreversible, likely significant effect at a local geographic scale.**

5.6.2.3.17.3Habitat Degradation associated with Dust Deposition

The effects of dust deposition on Annex I habitat type 7130 Blanket bog have been discussed in detail in Section 5.6.2.3.2.2. Upland blanket bog (PB2) is considered a highly sensitive receptor to pollutant deposition (APIS, 2025).

Dust deposition arising from construction works, primarily that at T3, T4 and T10 has potential to negatively affect sensitive peatland flora over an area of 4.46ha. However, this peatland habitat has been identified as inactive. If "active" blanket bog is defined as a habitat that supports a "significant area of vegetation that is normally peat forming" (European Commission, 2013), then it follows that inactive blanket bog does not support a significant area of peat forming vegetation. The cover of peat forming species, including *Sphagnum* spp., is not significant within the areas identified as Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition. As such, this habitat is less sensitive to the effects of dust deposition than the active type.

Perennial peatland vegetation is more tolerant of dust deposition than *Sphagnum* spp., with evidence to suggest there will be no visible damage to higher peatland plants (Farmer, 1993). As such, dust deposition within inactive Upland blanket bog (PB2) is not likely to lead to changes in vegetation composition, and the effects of dust deposition on Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition does not undermine the biodiversity of the habitat, nor the peat forming function of the habitat.

The indirect habitat degradation as a result of dust deposition is considered to have **no likely significant effect at any geographic scale on the habitat** on Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition**.**

5.6.2.3.17.4Habitat Degradation associated with Surface Water Run-off

The proposed construction of T3, T4 and T10 has the potential to indirectly affect the surrounding Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) (Site A, Site B, Site C see Appendix 5-2), if surface water from the Proposed Project infrastructure was to discharge directly into the habitat. This may promote and accelerate peat erosion, which. would negatively affect the condition of the Upland blanket bog (PB2) and/or lead to the permanent indirect loss of habitat, depending on the severity of the surface water flow. Peat erosion is discussed in more detail in Section 5.6.2.3.2.4

However, as previously discussed (Section 5.4.2.1.4).,embedded SuDS measures will be applied during the construction phase to reduce the quantity of discharge from the proposed Wind Farm Site to pre-development flows. As such, Habitat degradation associated with surface water run-off on Upland blanket bog (PB2) which corresponds to the priority Annex I habitat type 7130* Blanket bog (active) in favourable condition is considered to have **no likely significant effect at any geographic scale** on Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition.

5.6.2.3.17.5Mitigation Measures for Habitat Loss

The construction phase of the proposed Wind Farm Site will result in the direct loss of 0.55ha of Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive). The construction area surrounding T3 will be fenced off during the construction phase to reduce grazing pressure promote natural regeneration within the habitat. Appropriate compensation measures are discussed in Section 5.11.

5.6.2.3.17.6 Mitigation measures for Drainage

Mitigation measures to reduce the significance of effects on drainage of sensitive peatland habitats are listed in Section 5.6.2.3.2.6.

5.6.2.3.17.7 Mitigation Measures for Dust Deposition

No specific mitigation measures for dust deposition are necessary for Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) as no significant effects on the habitat are likely as a result of the Proposed Project.

5.6.2.3.17.8 Mitigation Measures for Surface Water Run-off

To prevent additional surface water being discharged into the Upland blanket bog (PB2), surface water discharge at T3, T4 and T10 will be directed to flow into the SuDS, as part of the as part of the embedded mitigation measures (Chapter 2 – Description of Proposed Project, Appendix 2-7 – Surface Water Management Plan). A summary of these measures is provided in Section 5.6.2.3.2.8.

5.6.2.3.17.9 Summary of Significant Effects on Upland blanket bog (PB2)

Following the implementation of the mitigation measures outlined above, the Proposed Project there is **potential for significant residual effects at a local geographic scale** as a result of direct loss of 0.55ha of habitat, as well as the indirect degradation of 2.64ha of habitat as a result of drainage impacts on Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition. Appropriate compensation for these residual effects is discussed in Section 5.11.

5.6.2.3.18 Wet heath (HH3) corresponding to Annex I habitat type 4010 Northern Atlantic wet heaths with *Erica tetralix* in favourable condition

Wet heath (HH3) corresponding to the Annex I habitat type 4010 Northern Atlantic wet heaths with *Erica tetralix* in favourable condition is assessed as of National Importance. The closest parcel of Wet heath (HH3) habitat to proposed project infrastructure is located c. 130m to the south of T4 (Figure 5-13). As such, no direct effects on Wet heath (HH3) are likely as a result of the Proposed Project.

As previously stated, a 30m standard buffer is used to estimate drainage impacts on peatlands (NatureScot, 2023) and a 50m buffer is used to estimate dust impacts (IAQM, 2024).Due to the significant separation distances involved (c. 130m) no likely indirect effects associated with drainage and dust deposition.

This habitat does not occur within the immediate vicinity of the proposed GCR or TDR.

The potential impacts from the Proposed Project are:

- Habitat degradation associated with surface water run-off.

5.6.2.3.18.1 Habitat Degradation associated with Surface Water Run-off

The proposed construction of T4 has the potential to indirectly affect the Wet heath (HH3) located c. 130m to the south of the turbine (Site B Appendix 5-2), if surface water from the Proposed Project infrastructure was to discharge directly into the intervening peatland habitats and cause peat erosion. Peat erosion is discussed in more detail in Section 5.6.2.3.2.4

However, as previously discussed (Section 5.4.2.1.4).,embedded SuDS measures will be applied during the construction phase to reduce the quantity of discharge from the proposed Wind Farm Site to pre-development flows. As such, Habitat degradation associated with surface water run-off on Upland blanket bog (PB2) which corresponds to the priority Annex I habitat type 7130* Blanket bog (active) in favourable condition is considered to have **no significant effect at any geographic scale**.

5.6.2.3.18.2Mitigation Measures for Surface Water Run-off

To prevent additional surface water being discharged into the Wet heath (HH3), surface water discharge will be directed to flow into the SuDS, as part of the as part of the embedded mitigation measures (Chapter 2 – Description of Proposed Project, Appendix 2-7 – Surface Water Management Plan). A summary of these measures is provided in Section 5.6.2.3.2.8.

5.6.2.3.18.3Summary of Significant Effectson Wet heath (HH3)

Following the implementation of the mitigation measures outlined above, there is **no potential for significant residual effects at any geographic scale** are predicted as a result of the Proposed Project on Wet heath (HH3).

5.6.2.4 Flora Protection Order Species

FPO species were not identified within the Survey Area for the proposed Wind Farm Site during field surveys (Section 5.4.2.2). However, due to the proximity of known occurrences of the FPO species bristle-leaf and small-white orchid, there is potential for these species to be present within the proposed Wind Farm Site or wider Survey Area for the proposed Wind Farm Site (Section 5.4.2.2). A precautionary approach is taken here, and it is assumed there is potential for these species to be present within the footprint of the proposed Wind Farm Site. If the species are present, the construction phase of the proposed Wind Farm Site could result in direct and/or indirect negative effects on local populations of the species.

There is potential for bristle-leaf to occur within the Non-marine caves (EU1) identified to the south of T7 as well as on as yet unidentified vertical, overhanging and/or shaded sandstone rock (Section 5.4.2.2).

There is potential for small-white orchid to occur to occur within the Wet grassland (GS4) habitat at T6, T7, T9, and T13 as well as road widening works between T6 and T10. Specifically, the Wet grassland (GS4) parcels at T6 and T13 may have more potential to support small-white orchid as they were not noted as being heavily grazed by sheep during field surveys (Section 5.4.2.2). There is also potential for the small-white orchid to be located within the Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) habitat located at T3 (Section 5.4.2.2).

The FPO species bristle-leaf and small-white orchid are valued as of National Importance. Potential impacts on these species consists of:

- Loss of local populations of the species; and,
- Habitat degradation as a result of construction activities.

5.6.2.4.1.1 Loss of Local Populations

All known local populations of bristle-leaf occur within the Dough/Thur Mountains NHA, c. 1.1km from the proposed Wind Farm Site infrastructure at nearest distance (Section 5.4.1.3.1.2). As such there is no potential for likely significant effects on known local populations of bristle-leaf.

The species is known to occur on vertical, overhanging and/or shaded sandstone (Section 5.4.2.2). Non-marine caves (EU1) occur within the Survey Area for the proposed Wind Farm Site, and fit the necessary habitat requirements for the species, although the limestone substrate is likely more basic than required by the species. Nevertheless, Non-marine caves (EU1) are considered potential habitat for the bristle-leaf, as it has been noted to grow "on other soft and crumbly rocks" (Atherton *et al.*, 2025:552), as well as on a limestone substrate within other European populations (Lockhart *et al.*, 2012). As previously stated, the construction phase of the proposed Wind Farm Site will not result in likely significant effects on Non-marine caves (EU1) (Section 5.4.2.1.18). It follows then that the proposed Wind Farm Site will not result in likely significant effects on any as yet unidentified local populations of bristle-leaf within the Non-marine caves (EU1) located within the Survey Area of the proposed Wind Farm Site.

There remains potential for the loss of unidentified local populations of bristle-leaf on vertical, overhanging and/or shaded sandstone within the footprint of the proposed Wind Farm Site. Bedrock outcrops are present across the proposed Wind Farm Site (Chapter 7 - Land, Soils and Geology). Relevant sandstone bedrock formations within the proposed Wind Farm Site include Glenade Sandstone Formation and Mullaghmore Sandstone Formation. The existing population of bristle-leaf in Dough/Thur Mountain NHA is located on Dergvone Shale Formation and as such this bedrock (sandstone and thin shale) also has potential to support local populations of bristle-leaf (Chapter 7 - Land, Soils and Geology, see Section 7.2.5.4).

As such, there is potential for bristle-leaf presence at T5, T7, T8 and T12 as well as in the area of the borrow pits to the south of T8 and the south-west of T13 and the internal access track which connects these borrow pits (Chapter 7 - Land, Soils and Geology). However, with the exception of T7, all of these areas are dominated by Conifer plantation (WD4) making these locations largely unsuitable for the species due to the associated heavy shade. As such, T7 is the most likely area for the identification of the species, within the proposed Wind Farm Site. T7 is c. 1.7km from the known local population of bristle-leaf at Dough/Thur Mountain NHA. No evidence of the species was identified at this location during field surveys. It is unlikely bristle-leaf will be identified at this location during pre-construction confirmatory surveys, given endangered status and disparate distribution nationally.

Bristle-leaf is most likely to occur within the proposed Wind Farm Site at vertical, overhanging and/or shaded sandstone outcrops at T7. The direct loss of unidentified local populations of bristle-leaf is assessed as an **unlikely, negative, permanent, irreversible, significant effect at a national geographic scale.**

All known local populations of small-white orchid occur outside of the Survey Area for the proposed Wind Farm Site, within a Wet grassland (GS4) habitat c. 100m west of T11 (Section 5.4.1.3.1.2). As such, there is no potential for likely significant effects on known local populations of small-white orchid.

There remains potential for the loss of as yet unidentified local populations of small-white orchid within the Wet grassland (GS4) habitat at T6 and T13 (Section 5.4.2.2). However, due to the surrounding dense Conifer plantation (WD4) at these locations, they are likely unsuitable for the species due to the heavy shade associated with the forestry. There is also potential for small-white orchid to occur within the Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) habitat located at T3 as the species can occur in heathland (Section 5.4.2.2). T3 is located c. 1.9km north of the local population of small-white orchid in Faughary townland. No evidence

of the species was identified at this location during field surveys, and it is unlikely that the species will be identified at this location during pre-construction confirmatory surveys.

It is not likely that small-white orchid is located within any other habitat mapped within the proposed Wind Farm Site.

The direct loss of unidentified local populations of small-white orchid is assessed as an **unlikely, negative, permanent, irreversible, significant effect at a national geographic scale.**

5.6.2.4.1.2 Habitat Degradation

The only known locally occurring population of bristle-leaf is located c. 1.1km east of T4 (Section 5.4.1.3.1.2). All known local populations of small-white orchid are located c. 100m west of T11 (Section 5.4.1.3.1.2). As the location of these species is located outside of the proposed Wind Farm Site there is no potential for disturbance from construction machinery. With regard dust deposition, the ZoI is 50m from the proposed Wind Farm Site infrastructure (Section 5.1.4.1). A 50m buffer from the infrastructure at T11, including the turbine hardstand and cut/fill buffer, encompasses the surrounds Conifer plantation (WD4) and does not include the Wet grassland (GS4) habitat supporting small-white orchid which is located on the western side of the public road L-61802. As such, there is no potential for the proposed Wind Farm Site to result in the degradation of habitat which supports small-white orchid.

Due to the separation distances involved, there is **no potential for likely significant effects** on any known populations of FPO species as a result of the degradation of existing supporting habitat.

5.6.2.4.1.3 Mitigation Measures for Loss of Local Populations

If new records of bristle-leaf or small-white orchid are identified during pre-construction confirmatory surveys, as listed in Section 5.12.4.2, then the following mitigation measures will be implemented.

If either bristle-leaf or small-white orchid is identified *within* the footprint of the Proposed Wind Farm Site, consultation with NPWS will be initiated to inform the most appropriate measures to be undertaken, such as avoidance through changes in project design. There will be no direct loss of FPO species or their supporting habitat as a result of the proposed Wind Farm Site.

5.6.2.4.1.4 Mitigation Measures for Habitat Degradation

If either bristle-leaf or small-white orchid is identified *beyond* the footprint of the proposed Wind Farm Site but within the boundary of the proposed Wind Farm Site, then the following appropriate mitigation measures will be implemented to reduce the magnitude of potential impacts such as habitat degradation from disturbance and/or dust (Section 5.6.2.4.1.3).

Mitigation measures associated with dust deposition from the construction phase of the Proposed Project are outlined in Chapter 11 - Air Quality (Section 11.7.2). The mitigation measures relevant to FPO species are listed in Section 5.6.2.3.16.5.

Furthermore, solid screens or barriers will be erected around any newly identified populations of FPO species within 50m of the proposed Wind Farm Site infrastructure to mitigate dust impacts (IAQM, 2024). Screens will be erected under guidance of the ECoW. The ECoW will establish an appropriate distance for the screens to be erected so that the FPO species are not cast into heavy shade.

Any FPO species identified beyond the dust deposition zone but within the proposed Wind Farm Site will be protected from disturbance using exclusion zones. The extent of bounds for the exclusion zones will be clearly demarcated using post-and-wire fencing and appropriate signage (NRA, 2008). The exact delineation of the exclusion zones for FPO species will be decided by the ECoW, with guidance as necessary from the specialist surveyors who will conduct the pre-construction confirmatory surveys (Section 5.12.4.2). The ECoW will supervise the erection of the post-and-wire fencing to prevent trampling of the protected species.

To prevent the degradation of habitat which supports populations of FPO species identified during pre-construction confirmatory surveys within the proposed Wind Farm Site, appropriate habitat management measures will be implemented. These measures will be undertaken in accordance with recommendations outlined in the reports detailing the results of the pre-construction confirmatory surveys (Section 5.12.4.2).

5.6.2.4.1.5 Summary of Significant Effects on FPO Species

Following the implementation of the mitigation measures outlined above, the Proposed Project will result in **no significant residual effects at any geographic scale**.

5.6.2.5 Invasive Non-Native Species

Three INNS listed on the Third Schedule of the European Union (Invasive Alien Species) Regulations 2024 (S.I. 477/2011), were identified within the proposed Wind Farm Site and along the GCR and TDR namely, Himalayan balsam, Japanese Knotweed and Rhododendron. Furthermore, Japanese Knotweed is also regulated under the Second Schedule of S.I. 374/2024, which restricts the movement of vector materials containing these species.

Potential impacts from the Proposed Project consists of:

- Spread of INNS

5.6.2.5.1 Spread of INNS

The Proposed Project has the potential to lead to the spread of INNS within and outside of the Proposed Project site. The spread of these INNS could lead to their accumulation within the wider Proposed Project site and area, which could outcompete native flora species.

Japanese Knotweed have lower invertebrate abundance, species richness and biomass, and lower plant species richness compared to uninvaded sites, which is likely to impact on local fauna that use riparian habitats (INVAS, 2025). The presence of Japanese Knotweed leaf litter in streams has also been shown to have likely significant effects on the species composition of affected streams (INVAS, 2025). Japanese Knotweed rhizomes are highly regenerative and can remain dormant in the soil for up to 20 years (INVAS, 2025). Cut or discarded stems with nodes can also root and produce new plant stands.

Himalayan balsam can lead to the domination of the species within the entire riparian zones, significantly decreasing native plant species richness, which can cause soil erosion and bankside subsidence on riverbanks, as well as affecting instream biotic communities by the addition of nutrient-rich sediment (INVAS, 2025). Himalayan balsam is dispersed solely by seeds from 'explosive' seed heads. If the stem of a plant that is pulled from the ground and not broken or crushed, it may root from any node that comes into contact with the ground, producing a new plant (INVAS, 2025).

Rhododendron is highly prolific in terms of seed production (each flower produces between 3,000 to 7,000 fine powder-like seeds that can persist for up to three years) and are normally spread up to 100m from the parent plant by wind action or along watercourses (INVAS, 2025). Its rapid growth rate and its toxicity, leads to its domination which can significantly affect native floral (and associated faunal) (INVAS, 2025). The leaves contain toxins (free phenols) that result in herbivore avoidance and suppresses regeneration of native understorey species. It is host to *Phytophthora ramorum*, which causes sudden oak death (INVAS, 2025).

The spread of Japanese Knotweed, Himalayan balsam and Rhododendron is assessed as **long-term, negative, likely significant effect at a local geographic scale.**

5.6.2.5.2 Mitigation Measures to Prevent the Spread of INNS

Mitigation measures required to prevent the spread of the aforementioned INNS are presented in detail in the ISMP in Appendix 5-6. A summary of the mitigation measures which will be implemented and are applicable to prevent the spread of INNS within the Proposed Project are:

- Early detection and biosecurity:
    - The ISMP will be strictly adhered to by all site personnel during the construction phase; and
    - In advance of construction work commencing, Site-Specific Management Plans will be prepared for each INNS infestation where any ground works or access is required in these areas and their associated buffer zones;
    - All site personnel which are involved in the control of INNS will have access to cleaning and disinfection facilities, which contain:
        - A detailed guide to proper cleaning and disinfection procedure, and instructions for making the correct disinfection concentration;
        - Clean water and Virkon Aquatic tablets or powder for the disinfection of equipment and PPE;
        - Hard-bristle brush;
        - Disposable non-latex gloves for equipment and personal protective equipment (PPE); and
        - Plastic bags and cable ties (for disposing of IAPS material removed from equipment).
    - Where possible, construction phase works will be scheduled so that uncontaminated areas of the Proposed Project can be accessed before areas that are known or suspected to support INNS;
    - All equipment will be clean and disinfected prior to the commencement of the construction phase;
    - All equipment will be cleaned and disinfected when moving between areas within the Proposed Project; and
    - Suspected INNS will be reported to the ECoW.

Comprehensive breakdown of biosecurity measures which will be implemented are detailed in the ISMP in Appendix 5-6.

- Treatment for Japanese Knotweed
    - Foliar herbicide treatment will be carried out prior to the commencement of the construction phase;

  - Foliar herbicide application using a Glyphosate based product that is approved for use in and near water will be used (refer to Appendix 5-6 for full details);
  - Following herbicide management, all treatment sites and any other possible areas of infestation will be resurveyed for Japanese Knotweed growth for the next three to four years (through to the proposed construction phase). This will be carried out in June/July each year with any required follow up herbicide treatment taking place between August and October of the same year; and
  - Treated plants will be excavated and disposed of off-site, on-site, bunded or screened (see Appendix 5-6 for full details).
- Treatment for Himalayan balsam:
  - A manual control known as 'balsam bashing' will be implemented whereby successful control and eradication can be achieved where a coordinated 3-year Himalayan balsam removal programme is followed, with follow up monitoring;
  - Balsam bashing involves initial manual removal of the plant from the ground when it is about 1m tall and before any flowers or seeds have been produced, normally in May or early June;
  - Once removed, the plant is broken to ensure that it will not flower and set seed. The broken plants can be left *in situ* to decay naturally or can be gathered and brought to a composting facility;
  - A second balsam removal operation will be conducted at the treatment location in July and August of the same year. This reflects the fact that balsam seeds in the soil from the previous year (i.e., seeds that had not yet germinated) will be stimulated to germinate and grow by the removal of the earlier generation of shade-giving Himalayan balsam plants. If not removed, these plants will flower and set seed in autumn, thus further adding to the soil seed reserve;
  - Manual control will be completed the following year (refer to Appendix 5-6 for full details); and
  - If the areas, including buffer zones, where Himalayan balsam are present are accessed by site personnel and machinery, additional measures will be implemented to prevent any unintentional movement of Himalayan balsam material. This will include excavation and disposal off-site or on-site whereby Himalayan balsam infested soil is excavated to a depth of 300m and the soil either disposed of to a licenced landfill (subject to an NPWS licence for soil movement) or deep burial in an on-site containment burial pit (refer to Appendix 5-6 for full details).
- Treatment for Rhododendron will be carried out via either:
  - Prior to the commencement of the construction phase, the sapling growth of the Rhododendron will be targeted and spot sprayed with suitable glyphosate-based herbicide solution; or
  - All mature growth will be flailed or uprooted with a mechanical digger or excavator and removed to a designated area where it will be mulched and rendered suitable for removal to a licenced landfill or through deep burial on-site.
  - Monitoring will be carried out in the areas where works took place 12 months after the completion of mechanical removal; or
  - Herbicide application combined with manual methods have proven highly successful in the management of Rhododendron. Rhododendron plants should

be left in-situ with basal damage to the outer layer caused by hatchets or saws. This should be immediately followed by the targeted application of the herbicide solution. Monitoring should be carried out 6-8 weeks post treatment, with a second round of combined management scheduled for that time.

5.6.2.5.2.1 Summary of Significant Effects of INNS

Following the implementation of the mitigation measures outlined above the Proposed Project will result in **no potential for significant residual effects at any geographic scale from the spread of INNS**.

5.6.2.6 Amphibians and Reptiles

5.6.2.6.1 Common frog

Common frog was recorded on two locations in (FW4) Drainage ditches within the Survey Area for the proposed Wind Farm Site. The species is assessed as of Local Importance (higher value).

The potential impacts on common frog consist of:

- Incidental mortality;
- Habitat loss; and,
- Habitat degradation as a result of water quality degradation.

5.6.2.6.1.1 Incidental Mortality

The Proposed Project has the potential to cause incidental mortality to adults, juveniles and their eggs, especially if the construction phase occurs within suitable habitat for the species. For example, the direct loss of Drainage ditches (FW4) will reduce the breeding and spawning habitat for common frog within the Survey Area for the proposed Wind Farm Site.

The loss of Drainage ditches (FW4) will reduce the connectivity of the landscape for aquatic and semi-aquatic flora. Within the Survey Area for the proposed Wind Farm Site, a total of 22,974m of Drainage ditch (FW4) habitat is currently available. The total loss of 4,325m of Drainage ditch (FW4) habitat constitutes a significant loss of the total habitat available across the Survey Area for the proposed Wind Farm Site.

The loss of this habitat has potential to result in incidental mortality of common frog especially if this work is carried out during the breeding season (late January-February). The effect is assessed as not significant at local geographic scale because no conservation objectives have been identified for the species (NPWS, 2019a). In addition, no significant threats/pressures have been identified for common frog within Ireland, and the national population is seemingly unaffected by disturbance and pollution events (NPWS, 2019a).

The incidental mortality of common frog is considered to have **no likely significant effect at any geographic scale.**

5.6.2.6.1.2 Habitat Loss

The direct loss of c. 4,325m of Drainage ditches (FW4) will reduce the breeding and spawning habitat for common frog within the Survey Area for the proposed Wind Farm Site significantly. However, the common frog is a widespread, abundant, and highly adaptable species (NPWS, 2019a). In spite of widespread changes in the agricultural landscape over the past 125 years including drainage of wetlands and ponds, the common frog remains an abundant species seemingly unaffected by widespread habitat loss (NPWS, 2019a). Considering the embedded

mitigation measures SuDS, new drainage ditches will be constructed during the construction phase and as such the loss of breeding habitat for common frog is temporary and reversible. Considering the availability of alternative suitable habitat in the Survey Area for the proposed Wind Farm Site, the temporary loss of spawning habitat for common frog is likely not significant at a local geographic scale.

The loss of potential breeding and spawning habitat is considered to have **no likely significant effect at any geographic scale.**

5.6.2.6.1.3 Habitat Degredation as a Result of Water Quality Degradation

Construction phase activities have potential to negatively affect water quality of Drainage ditches (FW4), which is the spawning and breeding habitat for common frog. Deterioration of water quality can occur through contamination events, sedimentation, and acidification. Common frog is a widespread species which is seemingly unaffected by pollution (NPWS, 2019a).

The degradation of breeding and spawning habitat as a result of water quality degradation is considered to have **no likely significant effect at any geographic scale.**

5.6.2.6.1.4 Mitigation Measures for Incidental mortality

Following the pre-construction confirmatory surveys (Section 5.12.4.4), if frog spawn is identified within the construction footprint of the proposed Wind Farm Site, a derogation license under Sections 9, 23 and 43 of the Wildlife Acts will be sought from NPWS. Frog spawn will be removed under license and translocated to the nearest area of available suitable habitat, beyond the ZoI of the Proposed Project. The derogation license, if required, will detail specific measures to translocate the frogs and spawn to suitable nearby habitat.

5.6.2.6.1.5 Mitigation Measures for Habitat Loss

No specific mitigation measures for habitat loss and fragmentation are necessary as the effect is assessed as not significant.

5.6.2.6.1.6 Mitigation Measures for Habitat Degradation

No specific mitigation measures to prevent habitat degradation as a result of water quality degradation are necessary as the effect is assessed as not significant.

5.6.2.6.1.7 Summary of Significant Effects on Common Frog

It is anticipated that there will be **no potential for significant residual effects at any geographic scale** on common frog as a result of the Proposed Project.

5.6.2.6.2 Smooth newt

Smooth newt is assessed as of **Local Importance (higher value).** Records of the species exists within the Survey Area for the proposed Wind Farm Site, but no evidence of the species was recorded during field surveys.

The potential impacts on smooth newt as a result of the proposed Wind Farm Site consists of:

- Incidental mortality; and,
- Habitat loss.
- Habitat degredation;

5.6.2.6.2.1 Incidental mortality

The Proposed Project has the potential to cause incidental mortality to adults, juveniles and the eggs of smooth newt during the removal of c. 4,325m of Drainage ditches (FW4), particularly if this is done during the breeding season and egg laying season (late January-June). No specific conservation objectives exist for the species.

No national conservation objectives exist for the species and as such effects are not considered significant at any geographic scale.

The incidental mortality of smooth newt as a result of the Proposed Project is considered a to have **no likely significant effect at any geographic scale**.

5.6.2.6.2.2 Habitat Loss

Adult smooth newts spend the majority of their lives in terrestrial habitats adjacent to wetlands, including wet grassland, woodland, and scrub (NRA 2008a). The loss of these habitats as well as the loss of the aforementioned Drainage ditches (FW4) habitats will likely have an indirect effect on the local population of smooth newt.

The loss of potential smooth newt habitat is considered to have **no likely significant effect at any geographic scale**.

5.6.2.6.2.3 Habitat Degradation as a Result of Water Quality Degradation

Construction phase activities have potential to negatively affect water quality of Drainage ditches (FW4), which smooth newt can use as breeding habitat. Deterioration of water quality can occur through contamination events, sedimentation, and acidification.

The degradation of breeding habitat for smooth newt as a result of water quality effects considered to have **no likely significant effect at a local geographic scale.**

5.6.2.6.2.4 Mitigation Measures for Incidental Mortality

No specific mitigation measures for incidental mortality are necessary as the effect is assessed as not significant .

5.6.2.6.2.5 Mitigation Measures for Habitat Loss and Fragmentation

No specific mitigation measures for habitat loss and fragmentation are necessary as the effect is assessed as not significant.

5.6.2.6.2.6 Mitigation Measures for Habitat Degradation as a Result of Water Quality

No specific mitigation measures to prevent habitat degradation as a result of water quality effects are necessary as the effect is assessed as not significant.

5.6.2.6.2.7 Summary of Significant Effects on Smooth Newt

It is anticipated that there will be **no potential significant residual effects at any geographic scale** on smooth newt as a result of the Proposed Project.

5.6.2.6.3 Common Lizard

Common lizard is assessed as of **Local Importance (higher value).** Records of the species exists within the Survey Area for the proposed Wind Farm Site, but no evidence of these species presence was recorded during field surveys.

The potential impacts on common lizard as a result of the Proposed Wind Farm consists of:

- Incidental mortality; and,
- Habitat loss.

5.6.2.6.3.1 Incidental mortality

Common lizard can be found in a wide range of habitats, including some of those identified within the Survey Area for the proposed Wind Farm Site: Dry siliceous heath (HH1) and Cutover bog (PB4) (NRA, 2008a). During the construction phase of the Proposed Project, as topsoil is removed and excavations take place within these habitats at T3, there is potential for incidental mortality of common lizard to occur.

The incidental mortality of common lizard as a result of the Proposed Project is considered a **no likely significant effect at any geographic scale**.

5.6.2.6.3.2 Habitat Loss

The direct loss of suitable habitat for common lizard, such as Dry siliceous heath (HH1) and Cutover bog (PB4), is likely to occur during the construction phase of T3. However, considering the affinity of the species to a wide variety of habitats, coupled with the availability of alternative suitable habitat in the surrounding area the effects on common lizard are considered imperceptible at a local geographic scale.

The loss of common lizard habitat as a result of the Proposed Project is considered to have **no likely significant effect at any geographic scale**.

5.6.2.6.3.3 Mitigation Measures for Incidental mortality

No specific mitigation measures for incidental mortality are necessary as the effect is assessed as not significant.

5.6.2.6.3.4 Mitigation Measures Habitat Loss

No specific mitigation measures for habitat loss are necessary as the effect is assessed as not significant.

5.6.2.6.3.5 Summary of Significant Effects on Common Lizard

It is anticipated that there will be **no potential for significant residual effects at any geographic scale** on common lizard as a result of the Proposed Project.

5.6.2.7 Terrestrial Mammals Species

5.6.2.7.1 European otter

European otter is designated as a QI for the Lough Gill SAC, which is intersected by the GCR, and the site boundary includes the river waterbodies Bonet_030, Bonet_040, and Bonet_050, where European otter activity was frequently recorded during surveys. This activity indicates recent visitation, including several locations where the GCR will cross the Bonet River, specifically at Aquatic Site 15, 17, and 19.

The potential impacts on European otter consists of:

- Habitat loss;
- Degradation of water quality; and,
- Disturbance/displacement.

5.6.2.7.1.1 Habitat Loss

Suitable foraging, commuting and resting habitat was identified at Aquatic Site 8, 10, 13, 14, 15, 16, 17, 19, 21, 22, 24 and 28 along the GCR. Suitable habitat included riparian vegetation, wet woodland and scrub habitat, which provides cover. Removal of Scrub (WS1) at Site 22 to facilitate the HDD Site 2 will lead to the loss of 0.01ha of potential foraging and commuting habitat in the form of Scrub (WS1) for European otter. Similarly, at Aquatic Site 15 there will be a loss of 0.01ha of (Mixed) broadleaved woodland (WD1) to facilitate HDD Site 1. The loss of this habitat will be temporary and reversible as through natural regeneration the cover of trees and shrubs will revegetate the over the short-term following the construction phase.

Suitable habitat for European otter was also identified within the proposed Wind Farm Site foraging, commuting and resting habitat was identified at Aquatic Site at Aquatic Site 2, 3, 4, 5, 6, and 7 but as previously stated no NBDC records for the species exist within the Survey Area for the proposed Wind Farm Site and no evidence of European otter was identified through extensive surveys of the watercourses within he Survey Area for the proposed Wind Farm Site over multiple years.

The loss of potential foraging and commuting habitat for European otter is considered to have **no likely significant effect at any geographic scale.**

5.6.2.7.1.2 Degradation of Water Quality

Construction phase activities pose a risk to watercourses within the proposed Wind Farm Site and along the GCR, through sedimentation from earth works and habitat removal, acidification of watercourses from soil erosion, and contamination through toxic materials entering a watercourse. These impacts can contribute to the deterioration of water quality downstream and physical alteration to the habitat.

The extent of the potential likely significant effects resulting from deterioration in water quality is inclusive of the distance from the proposed Wind Farm Site to the hydrologically connected SACs within the ZoI for which European otter is a QI, including Lough Gill SAC, Lough Melvin SAC and Glenade Lough SAC. Ben Bulben, Gleniff and Glenade SAC, and Unshin River SAC.

A deterioration of water quality could also affect prey sources for European otter. Chanin (2003) notes that "*European otters are not directly affected by water quality and will forage in conditions that seem extremely unpleasant to humans, however, where deterioration in water quality leads to a deterioration in food supply there will clearly be an indirect effect*'."

European otter opportunistically feed on a wide variety of aquatic species including salmon and eel, as well as seasonal reliance on white-clawed crayfish and frogs. While the varied diet suggests some resilience to change, diffuse point-source pollution of freshwater is likely to affect European otters indirectly through changes to prey abundance (NPWS, 2019b).

In terms of duration, the potential for negative effects on water quality is relevant for the duration of construction phase (24 months - Chapter 2 –Project Description). As this time frame has the potential to extend over two European otter breeding seasons, the effect on the county population as a result of deterioration to water quality is significant. These effects would likely be reversible over the medium term. However, effects over the short term have potential to be irreversible, depending on the extent and duration of the water quality deterioration, as well as the nature of the pollutants involved.

In the absence of mitigation, the negative effects on food supply for European otter as a result of deterioration in water quality have potential to result in significant indirect effects on European otter populations in downstream SACs, namely Lough Gill SAC, Lough Melvin SAC, Unshin River SAC.

However, likely significant effects on European otter are not anticipated considering the embedded mitigation measures for the protection of water quality (Section 5.5) which consist of;

- the SuDS measures to be implemented within the proposed Wind Farm Site;
- the avoidance of instream works;
- the installation of silt fences at the 11 watercourse crossings within the proposed Wind Farm Site and the two GDD Sites along the GCR;
- the two hydrocarbon interceptors to be installed within the proposed Wind Farm Site;
- the avoidance of karst features; and,
- the use of sediment traps, silt fences, and bunded fuel storage.

Considering the embedded mitigation measures, **no likely significant effects at any geographic scale** are anticipated on European otter arising from water quality degradation as a result of the Proposed Project.

5.6.2.7.1.3 Disturbance/Displacement

Disturbance and displacement is likely to occur during the construction phase of the Proposed Project primarily along the GCR through the construction on watercourse crossings, inclusive of clear span bridges, culvert extensions, and HDD.

Increased human presence and/or noise and vibration associated with construction works has the potential to displace European otter, particularly at Aquatic Site 14, 15, 17, 19, 21 and 22, where evidence of European otter activity has been identified.

The National European otter Survey of Ireland states: "*Whilst there is a general perception that European otters are negatively affected by poor water quality, there has been little published evidence demonstrating any consistent relationship with pollution or human disturbance*" (Reid *et al.* 2013:9).

Disturbance/displacement is likely to have the greatest impact at Aquatic Site 15 and 22 where HDD Site 1 and 2 are proposed due to the noise and vibrations and vegetation clearance associated with drilling. The likely significance effects at these locations, as well as Aquatic Site 17 and 19, have been considered under Section 5.6.2.1.3.2 as they occur within the boundaries of Lough Gill SAC.

In the absence of mitigation, disturbance and displacement to European otter within Lough Gill SAC as a result of the proposed GCR is considered **a negative, short-term, reversible, likely significant effect on European otter at a local geographical scale.**

5.6.2.7.1.4 Mitigation Measures for Habitat Loss

No specific mitigation measures are necessary as no significant habitat loss for European otter will take place along the GCR.

5.6.2.7.1.5 Mitigation Measures for Water Quality

The additional mitigation measures for the protection of water quality which will be implemented are listed in Section 5.6.2.1.4.

5.6.2.7.1.6 Mitigation Measures for Disturbance/Displacement

The mitigation measures for the disturbance/displacement of European otter which will be implemented are listed in Section 5.6.2.1.5.

5.6.2.7.1.7 Summary of Significant Effects on European Otter

Considering the embedded mitigation measures, **no likely significant effects at any geographic scale** are anticipated on European otter arising from disturbance/displacement as a result of the Proposed Project.

5.6.2.7.2 Badger

Badger is assessed as of Local Importance (higher value). Badger activity within the Survey Area for the proposed Wind Farm Site is low (consisting of scat and snuffle holes), with only one inactive outlier sett identified to the south-west of T14 c. 125m from the proposed works corridor, where the road improvement works are proposed along the public road at the western entrance of the proposed Wind Farm Site.

Potential impacts on badger consists of:

- Habitat loss; and,
- Disturbance and displacement.

5.6.2.7.2.1 Habitat Loss

The loss of potential foraging habitat for badger within the Survey Area for the proposed Wind Farm Site consists of 31m of Hedgerows (WL1), 140m of Treelines (WL2), 1.32ha of Scrub (WS1), 5.89ha of Wet Grassland (GS4) and 133.3ha of Conifer plantation (WD4) (NRA, 2008a). It is important to note that no known badger sett will be removed as part of the Proposed Project and as such commuting and foraging sites are only considered to be affected.

Due to the availability of alternative habitat in the surrounding area inclusive of the 546.3ha of Conifer plantation (WD1) to be retained within the proposed Wind Farm Site, the loss of suitable resting and/or foraging sites for badger will **not result in significant effects** on the conservation status of the local badger population at any geographical scale.

5.6.2.7.2.2 Disturbance/Displacement

Although, no badger setts were identified within the proposed Wind Farm Site or along the GCR or TDR, the potential remains for disturbance to badger breeding and resting places during the construction phase of the Proposed Project. This is of particular relevance to the proposed Wind Farm Site as 133.3ha Conifer plantation (WD4) will be removed along with 1.43ha Scrub (WS1), 0.56ha (Mixed) broadleaved woodland (WD1), and 3.4ha of (Mixed) broadleaved/conifer woodland (WD2). Site clearance has potential to disturb badger breeding or resting places with potential for abandonment of setts.

There are no national conservation objectives for the species. Badger is considered a mobile species that can forage over long distances with territories up to 50km (NRA, 2008a). As such potential disturbance effects are considered significant at a local scale.

Disturbance to badger setts is considered a **permanent, negative, likely significant effect at a local geographic scale**

5.6.2.7.2.3 Mitigation Measures for Habitat Loss

No specific mitigation measures are necessary as no likely significant effects were identified on badger as a result of habitat loss associated with the Proposed Project.

5.6.2.7.2.4 Mitigation Measures for Disturbance and Displacement

These measures are designed to mitigate effects on badger and their resting places, in compliance with the Wildlife Act (as amended).

Suitable habitat for badger identified within the proposed Wind Farm Site and GCR and TDR is inclusive of but not limited to (NRA, 2006b):

- Scrub (WS1),
- Hedgerow (WL1),
- Treelines (WL2),
- Conifer plantation (WD4);
- (Mixed) broadleaved woodland (WD1;)
- (Mixed) broadleaved/conifer woodland(WD2); and
- Riparian woodland (WN5).

In the event of a suspected badger sett being identified by a construction worker during vegetation clearance or construction activities, the ECoW will be informed immediately. Within the badger breeding season (December-June) a temporary stop works order will be implemented within 50m of the sett, and this will be extended to 150m for blasting/piling works (NRA, 2006b). Outside of the breeding season (July-November) the use of heavy machinery in the local vicinity (30m) of the suspected sett will be halted and work with light machinery in the immediate vicinity (20m) will be halted, and no work of any kind will take place within 10m of the suspected sett, following best practice guidance (NRA, 2008b). Exclusion zones will be implemented, clearly marking the prohibition of works and all construction works will be informed of the relevant procedures.

The ECoW will inspect the suspected sett to determine if it is active. Trail cameras will be deployed for a minimum of 7 days to confirm activity (NRA, 2006b). If the sett is determined by the ECoW to be inactive within the period between July-November, the sett will then be 'soft-blocked', i.e. the sett entrance will be lightly blocked with vegetation and a light application of soil. If after a minimum of five days the vegetation and soil have not been moved, the sett will be destroyed using a mechanical digger and under the supervision of the ECoW.

If the sett is deemed active during the period between July-November, then the sett will need to be evacuated and destroyed. Where the destruction of active badger setts cannot be avoided exclusion and destruction will be carried out under the supervision of an appropriately qualified ECoW. Evacuation and destruction will be undertaken from 1 July to 30 November. One-way gates will be tied open for three days before being set to exclude and then monitored for a period of at least 21 days before the sett is deemed inactive and destroyed immediately following the 21-day period. If at any time during the monitoring period the sett becomes active, the exclusion process/programme must commence again from day one of the 21-day monitoring period. For inactive setts, entrances will be soft-blocked (lightly blocked with vegetation and soil) and, if all entrances remain undisturbed for a period of five days, the sett will be destroyed immediately. This can be undertaken at any time of the year for inactive setts.

Destruction of a successfully evacuated badger sett will only be carried out under the supervision of a suitably qualified and experienced ECoW. The possibility of badgers remaining within a sett will always be considered.

If the set is confirmed as active and used for breeding (December-June), then the temporary stop works order will be effective for the duration of the breeding season (NRA, 2006b). The following June, trail cameras will be deployed to confirm activity and one of the procedures detailed above will be followed.

A method statement will be prepared and made available to the contractor and the competent authority, detailing survey/monitoring methods, if required, and the relevant mitigation to be applied.

5.6.2.7.2.5 Summary of Significant Effects on Badger

Following the implementation of the mitigation measure outlined above, there is **no potential for significant residual effects** will arise at any geographic scale.

5.6.2.7.3 Red Deer

Deer droppings were recorded during field surveys, and previous records exist for the species within the Survey Area for the proposed Wind Farm Site . While it is likely that this species frequents the Survey Area for the proposed Wind Farm Site , the droppings may be from other invasive non-native deer species, such as fallow deer and sika deer.

Potential impacts on red deer consists of:

- Loss of habitat; and
- Disturbance/displacement.

5.6.2.7.3.1.1 Loss of Habitat

Red deer generally utilise upland and woodland habitats (NRA, 2008a). The Proposed Project will result in the loss of 133.3ha of Conifer plantation (WD4), 0.56ha (Mixed) broadleaved woodland (WD1), 3.4ha of (Mixed) broadleaved/conifer woodland (WD2), 1.32ha of Scrub (WS1), 0.55ha of Upland blanket bog (PB2), and 0.89ha of Cutover bog (PB4). Whilst habitat within the proposed Wind Farm Site will be lost, suitable alternative habitat in the wider surrounding area is available for red deer, inclusive of the 546.3ha of Conifer plantation (WD1) to be retained within the proposed Wind Farm Site.

There is no national conservation status for the species. Red deer are considered a highly mobile species that can travel long distances. They show a preference for upland areas, being found in woodlands and heathlands (NRA, 2008a). As such, the loss of habitat is not considered significant on the conservation status of the species at any geographic scale.

The habitat loss will result in **no significant effects at any geographic scale** on red deer at any geographical scale.

5.6.2.7.3.2 Disturbance/Displacement

Increased human presence and/or noise and vibration associated with construction works has the potential to disturb and/or displace red deer from the proposed Wind Farm site. However, as deer are mobile species, they are likely to move to alternative foraging sites during the construction phase, which exist in abundance within the wider landscape inclusive of the 546.3ha of Conifer plantation (WD1) to be retained within the proposed Wind Farm Site.

There is no national conservation status for the species. Red deer are considered a highly mobile species that can travel long distances. They show a preference for upland areas, being found in woodlands and heathlands (NRA, 2008a). As such, the disturbance/displacement to the species is not considered significant on the conservation status of the species at any geographic scale.

Disturbance impacts to red deer during the construction phase will result in **no significant effects at any geographical scale.**

5.6.2.7.3.3 Mitigation Measures for Habitat Loss

No specific mitigation measures are necessary as no likely significant effects were identified on red deer as a result of habitat loss associated with the Proposed Project.

5.6.2.7.3.4 Mitigation Measures for Disturbance and Displacement

No specific mitigation measures are necessary as no likely significant effects were identified on red deer as a result of disturbance/displacement associated with the Proposed Project.

5.6.2.7.3.5 Summary of Significant Effects on Red Deer

As a result of the Proposed Project, **no potential for significant residual effects at any geographic scale** on red deer are anticipated at any geographic scale.

5.6.2.7.4 Pine Marten

Pine marten scat was recorded within the south-west section of the Survey Area for the proposed Wind Farm Site and previous records of the species exist(Table 5-5 and Section 5.4.2.4.4). Pine marten is assessed as of Local Importance (higher value).

Potential impacts on pine marten consists of:

- Habitat Loss; and
- Disturbance/displacement.

5.6.2.7.4.1 Habitat Loss

Pine marten are typically associated with woodland habitats (NRA, 2008a). The loss of suitable habitat for pine marten within the Survey Area for the proposed Wind Farm Site includes 133.3ha of Conifer plantation (WD4), 0.56ha (Mixed) broadleaved woodland (WD1), 3.4ha of (Mixed) broadleaved/conifer woodland (WD2), and 1.32ha of Scrub (WS1).

In Ireland, pine marten has shown adaptability to a variety of habitats but show a preference for woodlands (NRA, 2008a). As such, the effects of habitat loss are not considered significant at any geographic scale.

Considering the availability of alternative Conifer plantation (WD4) within the the Survey Area for the proposed Wind Farm Site for the proposed Wind Farm Site, the loss suitable resting/foraging habitat will **not result in significant effects** on pine marten population at any geographical scale.

5.6.2.7.4.2 Disturbance/Displacement

Increased human presence and/or noise and vibration associated with the construction phase has the potential to displace pine marten from the surrounding area.

There is no national conservation status for the species. Pine marten is a highly mobile species and have been recorded travelling up to 5-8km while foraging (NRA, 2008a). As such, the effects of disturbance/displacement are not considered significant at any geographic scale.

Disturbance/displacement impacts to pine marten during the construction phase **will not result in significant effects** on the conservation status of the local pine marten population at any geographical scale.

5.6.2.7.4.3 Mitigation Measures for Disturbance/Displacement

No specific mitigation measures are necessary as no likely significant effects were identified on pine marten as a result of disturbance/displacement associated with the Proposed Project.

5.6.2.7.4.4 Mitigation Measures for Loss of Habitat

No specific mitigation measures are necessary as no likely significant effects were identified on pine marten as a result of habitat loss associated with the Proposed Project.

5.6.2.7.4.5 Summary of Significant Effects on Pine Marten

As a result of the Proposed Project, **no potential for significant residual effects at any geographic scale** on pine marten are anticipated at any geographic scale.

5.6.2.7.5 Other Small Mammals

Other small mammals (e.g. red squirrel, hedgehog, pygmy shrew) are valued as of Local Importance (higher value). Records of small mammals exist within the Survey Area for the proposed Wind Farm Site (Table 5-5), but no evidence of these species were recorded during field surveys.

The potential impact to other small mammals consists of:

- Incidental mortality; and,
- Habitat loss.

5.6.2.7.5.1 Incidental Mortality

The Proposed Project has the potential to cause incidental mortality to small mammals, especially where the construction phase occurs within suitable habitat, such as; 133.3ha of Conifer plantation (WD4), 0.56ha (Mixed) broadleaved woodland (WD1), 3.4ha of (Mixed) broadleaved/conifer woodland (WD2), and 1.32ha of Scrub (WS1).

Any incidental mortality of small mammals is likely to be limited in extent to individuals lost during vegetation clearance along with a smaller number lost through vehicle collision. In addition, incidental mortality will be limited in duration to the 24 months of construction phase. As such, these impacts are not likely to undermine the conservation status of small mammal species at a local geographic scale.

Given the widespread distribution of other small mammals within Ireland and their lack of conservation status for the group, incidental mortality as a result of vegetation clearance works associated with the Proposed Project is not considered significant at any geographic scale.

The direct loss of individuals of the local populations of small mammal is considered to have **no likely significant effect any geographical scale.**

5.6.2.7.5.2 Habitat Loss

The direct loss of suitable habitat for other small mammals is likely to occur as a result of the Proposed Project. As previously outlined, 1.32ha Scrub (WS1), 3.4ha Mixed broadleaved/conifer woodland (WD2), 0.56ha (Mixed) broadleaved woodland (WD1), 0.06ha

Riparian woodland (WN5), and 133.3ha Conifer plantation (WD4) will be permanently lost as a result of the Proposed Project.

However, considering the availability of alternative suitable habitat to be retained in the surrounding area, inclusive of the 546.3ha of Conifer plantation (WD1) to be retained within the proposed Wind Farm Site, the loss of suitable habitat for other small mammals **will not result in significant effects** on the conservation status of other small mammals at any geographical scale.

5.6.2.7.5.3 Mitigation Measures for Incidental Mortality

Pre-construction confirmatory surveys will be carried out by the ECoW (Section 5.12.1.) where construction phase activities are to take place within supporting habitat, such as Mixed broadleaved/conifer woodland (WD2), Hedgerows (WL1), Treelines (WL2), Scrub (WS1) and Conifer plantation (WD4). If the breeding/resting place of small mammal species are found to be present during the confirmation surveys, demarcation of the area will be done under guidance and supervision of the ECoW and no works will take place until it is deemed safe to do so by the ECoW. Where avoidance is not possible, any works will be carried out only under the direct supervision of the ECoW.

5.6.2.7.5.4 Mitigation Measures for Habitat Loss

No specific mitigation measures are necessary as no likely significant effects were identified on pine marten as a result of habitat loss associated with the Proposed Project.

5.6.2.7.5.5 Summary of Significant Effects on Small Mammals

Following the implementation of the mitigation measures outlined above, there is **no potential for significant residual effects** on other small mammals at any geographical scale.

5.6.2.8 Bat Species

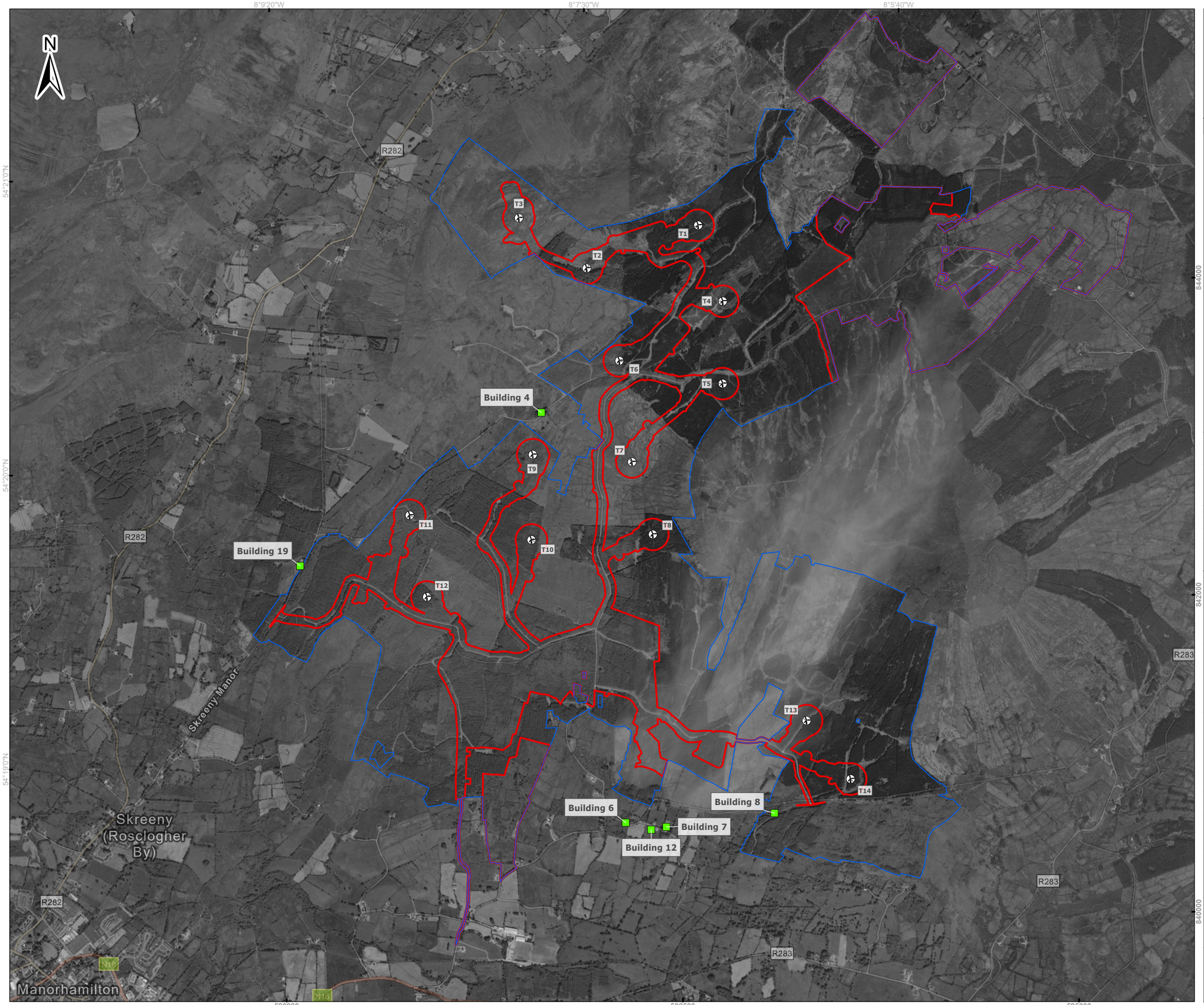
Seven bat species of bat were identified within the the Survey Area for the proposed Wind Farm Site namely:

- Leisler's bat;
- Natterer's bat;
- Nathusius' pipistrelle;
- Daubenton's bat;
- Brown long-eared bat;
- Common pipistrelle; and,
- Soprano pipistrelle.

Potential impacts on bats during the construction phase of the proposed Wind Farm Site include (Appendix 5-5):

- Disturbance and displacement; and,
- Loss of commuting and foraging habitat.

The proposed Wind Farm Site does not necessitate the removal of any known roosts identified during survey work, including the buildings where bat roosts were confirmed and the mature trees supporting potential bat roosts features of moderate value (Section 5.4.2.5) (Appendix 5-5).



Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Turbine Locations
- Confirmed Bat Roosts

0 0.5 1
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

Copyrights:
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community,

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A	23/02/2026	First issue	S.P	S.R

Client: Ireland FuturEnergy

Project:
Lissinagroagh Wind Farm

Title:
Figure 5-35:
Location of confirmed bat roosts identified in 2024

Scale @ A3: 1:22,000

Prepared by:	Checked by:	Date:
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Map Ref: 10955-080-C.Bat.ROO-P.App.BO-TOB-A

Draft: A

5.6.2.8.1 Disturbance/Displacement

Activities associated with the construction phase which result in the increase in noise level and/or use of artificial lighting, have the potential to disturb/dissuade bats from foraging within the surrounding habitats, primarily if the works are undertaken at night and/or around dusk and dawn when bats are active. Construction phase lighting has the potential to attract certain bat species and displace others, and floodlighting can be a significant source of disturbance to bat species when foraging and commuting (BCI, 2010).

No trees or structures supporting significant numbers of bats or a maternity colony were identified within the areas for clearance of bat buffers. There will be no removal of bat roosts identified within the Survey Area for the proposed Wind Farm Site. As such, the disturbance and displacement to bats will not result in significant effects on the conservation status of the species at any geographic scale.

No PRFs were identified along the Hedgerows (WL1), Treelines (WL2) and (Mixed) broadleaved woodland (WD1) surveyed.

The disturbance and displacement of individuals and populations of bats during the construction phase is considered to have **no likely significant effect at any geographic scale.**

5.6.2.8.2 Loss of Habitat

The proposed Wind Farm Site is located within the Core Sustenance Zone for the following bat species: common pipistrelle, soprano pipistrelle, Natterer's bat and brown long-eared bat identified as roosting within Buildings 4, 6, 7, 8, 12, and 19 (Appendix 5-5).

A loss of potential foraging habitat for bats is necessary to facilitate the construction phase of the proposed Wind Farm Site consisting of the removal of a combined total of; 0.56ha (Mixed) broadleaved woodland (WD1), 3.4ha (Mixed) broadleaved/conifer woodland (WD2), 133.3ha of Conifer plantations (WD4), 0.06ha Riparian woodland (WN5), 1.32ha Scrub (WS4), 31m of Hedgerows (WL1), and 140m of Treelines (WL2) (Roche *et al*., 2014). Broadleaved woodland is the habitat type universally preferred by all Irish species (Bat Conservation Ireland, 2025). Conifer plantation (WD4) and Mixed) broadleaved/conifer woodland (WD2) are considered a lower value foraging habitat for bat species, as these habitats are dominated by coniferous species.

As such, a total of 1.94ha of higher value foraging habitat and 170m of linear commuting/foraging habitat for bat species will be lost during the construction phase of the proposed Wind Farm Site.

In addition, the loss of 1,066m of Hedgerow (WL1), 283m of Treeline (WL2), 0.1ha of Scrub (WS1) and 0.2ha of (Mixed) broadleaved woodland will be removed to facilitate delivery of abnormal indivisible loads along the TDR. As such, a further 1,349m of linear commuting/foraging habitat for bat species and 0.3ha of higher value foraging habitat for bat species, will be removed along the TDR. The launch pits along the GCR will result in a loss of c. 10m of Hedgerow (WL1), 0.01ha of (Mixed) broadleaved woodland and 0.01ha of Scrub (WS1).

In total, the Proposed Project will result in a total loss of 2.26ha and 1,529m of potential commuting/foraging habitat for bat species.

Suitable foraging habitat will also be retained within the Survey Area for the proposed Wind Farm Site, and these habitats are readily available within the wider landscape.

No threats/pressures to common pipistrelle or soprano pipistrelle have been identified and they are considered widespread species (NPWS, 2019c). Similarly, Leisler's is one of the most common and widespread species of bat in Ireland. Wind farms are however listed as a threat/pressure to the conservation status of Nathusius' pipistrelle and Leisler's bat (NPWS, 2019c).

The loss of foraging and commuting habitat during the construction phase will result in **long-term, negative, likely significant effect at a local geographical scale.**

5.6.2.8.3 Mitigation Measures for Disturbance/Displacement

Building 3 is located within the 100 m buffer zone of T9 (Figure 5-36). Consequently, if bat species were to use this building as a roosting feature, there would be a high risk of collision with the turbine. However, no evidence of bat roosts was recorded within Building 3 during the field surveys.

Therefore, as a precautionary mitigation measure, Building 3 will be removed pre-construction to prevent roosting by bat species to eliminate the potential for roost establishment and to avoid any associated collision risk. Prior to demolition, pre-construction confirmatory bat surveys of the Building 3 and surrounding trees will be carried out by a suitably qualified expert.

The absence of roosting bats in identified PRFs will be confirmed immediately prior to the removal of these trees and Building 3, with an internal inspection of the potential roost features by a licensed bat ecologist following best practice guidelines *Bat Surveys for Professional Ecologists* (Collins, 2023). Based on the results of the detailed baseline surveys undertaken to date, no destruction or removal of confirmed bat roosts is anticipated and, therefore, Regulation 54 derogation licences are not required. If confirmatory pre-construction surveys or checks identify a change in the baseline environment, such as the establishment of a new bat roost, a derogation licence will be obtained as required in advance of any tree-felling or removal works. A report detailing the methods, actions, and relevant issues will be submitted to NPWS to fulfil the derogation license obligations. The pre-construction confirmatory survey works, and any mitigation required will be implemented prior to starting site clearance and any construction works.

Construction operations within the proposed Wind Farm Site will take place during the hours of daylight in as far as possible to minimise disturbances to bats and other wildlife. It is recognised that key works such as turbine delivery and erection may require night-time working. Where working at night is required the reduction of light levels or application of motion sensor lights will be used where bat foraging habitat is present. All construction phase lighting systems will be designed to minimise nuisance through light spillage and follow ILP (2023) guidance. Shielded, downward directed lighting will be used wherever possible, and all non-essential lighting will be switched off during the hours of darkness.

Directional lighting will be used to prevent overspill on to forestry/woodland edges, riparian zones or other habitat features of importance to bats. This will be achieved with the use of covers and shields (baffles, hoods or louvres) to reduce light spill and direct lighting to the intended area only. Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats. Only luminaires with an upward light ratio of 0% and with good optical control will be used. Luminaires will be mounted on the horizontal, i.e. no upward tilt.

Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Turbine Locations
- Site layout footprint
- Building Survey Locations

0 50 100
Metres

Spatial Reference
Datum: IRENET95
EPSG: 2157

Copyrights:
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Rev	Date	Description	By	Chkd.
A	23/02/2026	First issue	S.P	S.R

Client: FuturEnergy Ireland

Project:
Lissinagroagh Wind Farm

Title:
Figure 5-36:
Building 3 to be demolished as mitigation measure during the construction phase

Scale @ A3: 1:2,000

Prepared by:	Checked by:	Date:
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Map Ref: 10955-081-T9-Shed-TOB-A

Draft: A

5.6.2.8.4 Mitigation Measures for Loss of Habitat

Appropriate compensation measures for the loss of suitable foraging habitat available for bat species within the proposed Wind Farm Site are detailed in Section5.11.

5.6.2.8.5 Summary of Significant Effects

Following the implementation of mitigation measures, it is anticipated that there is **potential for significant residual effects at a local geographic scale** on bat species as a result of habitat loss associated with the Proposed Project.

5.6.2.9 Invertebrates

A total of two larval webs of marsh fritillary were identified during the 2025 survey season, with suitable habitat identified in the south-west and south of the Survey Area for the proposed Wind Farm Site in the form of Dry meadows and grassy verges (GS2) with abundant devil's-bit scabious. A total of 2.82ha of marsh fritillary habitat is available within the Survey Area for the proposed Wind Farm Site.

Potential impacts from the Proposed Project on marsh fritillary consists of:

- Risk of mortality;
- Habitat loss; and,
- Habitat degradation associated with dust deposition.

5.6.2.9.1.1 Risk of Mortality

A total of two larval webs were identified within the proposed Wind Farm Site during the 2025 survey season. However, as the location of breeding Marsh Fritillary during the construction phase of the Proposed Project may vary in its location and extent, the areas presently occupied by Dry meadows and grassy verges (GS2) that overlap the proposed works extents are considered to present the risk of direct larval mortality if the proposed works in these areas are to be carried out over areas populated with Marsh Fritillary larvae.

The direct larval mortality will diminish the species reproductive capacity and genetic diversity of the local population, making it less resilient to stochastic events, such as climate change. The effects are determined to be long-term, as the local population re-establishes itself within the proposed Wind Farm Site. Periodic local extinction events are a common place occurrence for the species and as such it relies on a metapopulation for re-colonisation events (Phelan *et al.* 2021).

National trends show the species range and population is stable and increasing over the short-term (NPWS, 2019c). As such, the overall conservation status for the species is improving (NPWS, 2019c) However, the overall conservation status is assessed as inadequate due to the future prospects for the species over the next 12 years as a result of predicted habitat loss (NPWS, 2019c).

Due to the proximity of the works corridor within 1m of known locations of larval webs, and the potential for future larval webs to be present elsewhere on suitable habitat within the proposed Wind Farm site, the mortality of marsh fritillary larvae during the construction phase of the Proposed Project will result in **long-term, negative, likely significant effect on the conservation status of the local marsh fritillary population at a local geographical scale.**

5.6.2.9.1.2 Loss of habitat

The proposed Wind Farm Site will result in the direct loss of suitable marsh fritillary habitat [i.e. Dry meadows and grassy verges (GS2)] through construction phase works and activities. Approximately 1.77ha of suitable marsh fritillary habitat will be permanently lost within the proposed Wind Farm site, during the 24 months of the construction phase. The persistence of the marsh fritillary population within the proposed Wind Farm Site is dependent upon the extent of the 1ha of retained habitat.

This loss of marsh fritillary habitat will result in **long-term, negative, likely significant effect on the conservation status of the local marsh fritillary population at a local geographical scale.**

5.6.2.9.1.3 Habitat degradation associated with Dust Deposition

As previously discussed in Section 5.6.2.3.5.3, dust deposition arising from construction phase activities and vehicular access is likely to affect Dry meadows and grassy verges (GS2) due to the tendency of the habitat to occupy roadside verges within the proposed Wind Farm site. A total of 1.97ha of suitable marsh fritillary habitat is located within 50m of the proposed infrastructure and will likely be impacted by dust (IAQM, 2024). Although, 1.77ha of this will be permanently lost as a result of the proposed Wind Farm Site and is accounted for under habitat loss Section 5.6.2.9.1.5. As such, 0.2ha of suitable marsh fritillary habitat will be subject to dust deposition as a result of the proposed Wind Farm Site during the construction phase.

Dust will coat foliage which reduces photosynthetic rates and causes stomatal occlusion, ultimately impairing plant fitness. However, the effects of dust deposition on grassland vegetation are likely to be short-term and reversible (Farmer, 1993).

Dust impacts on invertebrate communities are not well understood, despite evidence suggesting changes in invertebrate population can occur as a result of dust deposition (Farmer, 1993). As uncertainty remains, following the precautionary principle, the effects of dust deposition on local marsh fritillary populations are assessed here as significant.

This effects of dust deposition will result in **long-term, negative, likely significant effect on the conservation status of the local marsh fritillary population at a local geographical scale** .

5.6.2.9.1.4 Mitigation Measures for Risk of Mortality

The two known locations of marsh fritillary webs are located in close proximity (c. 1m) to the western entrance of the proposed Wind Farm Site. Following pre-construction confirmatory surveys (Section 5.12.4.3), the exact location of marsh fritillary webs will be determined in the months preceding the construction phase.

Where avoidance of marsh fritillary larval webs is not possible, all larval webs identified within the footprint of the proposed Wind Farm Site will be translocated. This is likely to be the case within the footprint of the western entrance of the proposed Wind Farm Site.

A Code of Practice for invertebrate translocation was in the British Journal of Entomology and Natural History, which states:

> "*There are divergent views for and against translocation, which partly reflect 'philosophical' attitudes for or against human intervention in natural processes. In this context, an important rationale for intervention is that it is designed to mitigate a situation that is considered to be an 'unnatural' result of human activity…It is therefore recommended that no specific proposal*

for invertebrate translocation be condemned or approved without full discussion and consideration (Invertebrate Link, 2010)."

It should be noted that for the purposes of these mitigation measures the term 'translocation' refers to the transport of the marsh fritillary larval webs from within the footprint of project infrastructure to locations outside of the footprint, while remaining within the mapped extent of suitable marsh fritillary habitat.

The translocation of larval webs will be conducted during the month of April, following pre-construction confirmatory surveys. This avoids disturbance to the species during the hibernation period (winter), which is prohibited under the Bern Convention. In late April the Marsh Fritillary caterpillars disperse from the larval web and pupate, existing as a chrysalis for 2-4 weeks (DAERA, n.d.). Ideally, the translocations will take place before the caterpillars pupate into a chrysalis.

Translocations will be conducted under direct supervision of the ECoW. Prior to the translocations the ECoW and the contractor will agree a suitable route for the contractor to take while operating within the marsh fritillary habitat and while transporting turves/sods containing the webs to the receiving site. The receiving site will be within the mapped area of suitable marsh fritillary habitat within the proposed wind farm site. Abundance of devils bit scabious is vital for the larvae as they are monophagous, meaning they only feed on the one plant species (Phelan *et al.* 2021). As such, the receiving habitat is limited to the 1ha of Dry meadows and grassy verges (GS2) to be retained within the proposed Wind Farm Site (Figure 5-37). The locations where each turve is to be deposited will also be pre-determined and clearly mapped. The nearest suitable location will be chosen to reduce disturbance during transportation.

A skilled contractor will be employed to operate a tractor and bucket. Following the pre-agreed route the contractor will arrive at the mapped locations within the receiving marsh fritillary habitat. The contractor will remove turves from these locations up to a depth of 0.5m and deposit them within the surrounding Dry meadows and grassy verges (GS2) habitat. This may encourage the proliferation of Devil's-bit scabious beyond the suitable marsh fritillary habitat. Selected turves for removal from the receiving Dry meadows and grassy verges (GS2) will not contain abundant Devil's-bit scabious, as reducing the cover of the plant will further diminish the suitability of the habitat for the marsh fritillary larvae. Turves will be deposited vegetation side up. Every effort will be made to keep the turve intact during removal, transportation and deposition.

The contractor will then arrive at the temporary fencing demarcating a marsh fritillary web located within the footprint of the proposed wind farm. The contractor will allow the ECoW to confirm the presence of the pupae within the turve, if necessary, and to remove the temporary fencing. The contractor will remove the supporting turve and transport it to the pre-agreed receiving site, which will be located within the suitable marsh fritillary habitat beyond the footprint of the proposed Wind Farm Site. This process will be repeated until all identified webs are located beyond the footprint of the proposed Wind Farm Site, inclusive of the works corridor.

5.6.2.9.1.5 Mitigation Measures for Loss of Habitat

Following pre-construction confirmatory surveys , exclusion zones will be established along the roadside verges where potential marsh fritillary habitat is identified beyond the footprint of the

proposed Wind Farm Site (Figure 5-37). These areas constitute 1ha of potential marsh fritillary habitat.

The exact delineation of the habitat exclusion zones will be decided with guidance from the ECoW, allowing for the maximum extent of mapped marsh fritillary habitat to be retained. The extent of bounds for the exclusion zones shall be clearly demarcated with post-and-wire fencing, as well as appropriate signage (NRA, 2008). Light weight mechanical machinery, such as an All-Terrain Vehicle (quad bike) will be used as necessary to erect the post and wire fencing.

During the construction phase, access to the exclusion zones will be prohibited for vehicles and contractors. There will be no materials, equipment, or side-casting of material within the exclusion zones. The exclusion zone will remain in place until the construction phase is complete. This approach will limit any unnecessary disturbance and confine habitat loss to the extent essential for delivering the proposed Wind Farm Site.

The ECoW will supervise all works within suitable marsh fritillary habitat during construction activities.

5.6.2.9.1.6 Mitigation Measures for Dust Deposition

Mitigation measures associated with dust deposition from the construction phase of the Proposed Project are outlined in Chapter 11 - Air Quality (Section 11.7.2). The mitigation measures relevant to FPO species are listed in Section 5.6.2.3.16.5.

Furthermore, solid screens or barriers will be erected around any identified breeding populations of marsh fritillary within 50m of the proposed Wind Farm Site infrastructure to mitigate dust impacts (IAQM, 2024). The erection of these screens will be done under guidance of the ECoW. The ECoW will establish an appropriate distance for the screens to be erected so that the larval webs are not cast into heavy shade. The marsh fritillary larvae bask in the sun to raise body temperature and facilitate movement and digestion (Phelan, *et al.* 2021).

5.6.2.9.1.7 Summary of Significant Effects on Invertebrates

Following the implementation of the mitigation measures outlined above, there is **potential for significant residual effects at a local geographic scale** on marsh fritillary arising from habitat loss and dust impacts associated with the Proposed Project. Appropriate compensation measures to offset the significant residual effects are listed in Section 5.7.

8°9'20"W
8°7'30"W
8°5'40"W
54°21'0"N
54°20'0"N
54°19'0"N
844000
842000
840000
590000
592500
595000
R282
R283
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
T13
T14
Skreeny Manor
Skreeny (Rosclogher By)
N16

Legend

- proposed Wind Farm Site
- Survey Area of the proposed Wind Farm Site
- Enhancement lands
- Turbine Locations
- Marsh Fritillary: confirmed larval webs
- Marsh Fritillary: Suitable Habitat

0 0.5 1
Kilometers

Spatial Reference
Datum: IRENET95
EPSG: 2157

Rev	Date	Description	By	Chkd.
A	23/02/2026	First issue	S.P	S.R

Client: FuturEnergy Ireland

Project: Lissinagroagh Wind Farm

Title: Figure 5-37: Location of confirmed marsh fritillary larval webs and suitable marsh fritillary habitat

Scale @ A3: 1:22,000

Prepared by:	Checked by:	Date:
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Map Ref: 10955-050-MF.HAB-P.App.BO-TOB-A

Draft: A

5.6.2.10Aquatic Ecology

One culvert extension is proposed for Aquatic Site 3, crossing an unnamed river (EPA Code: 35_2909) adjacent to the substation compound in the proposed Wind Farm Site. No instream works are necessary to facilitate the extension of this culvert.

All other watercourse crossings within the proposed Wind Farm Site will be constructed with clear span bridges at Aquatic Sites 1, 2, 4, 5, 6, 7, 8, 9, 10 and 11. As such, there is no instream works required at these locations.

No instream works are proposed along the GCR or along the TDR. Two HDD sites are located along the GCR to cross the Bonet River; HDD Site 1 is located at Aquatic Site 15 (Bonet_030) and HDD Site 2 is located at Aquatic Site 22 (Bonet_050).

5.6.2.10.1 Atlantic Salmon

There is potential for significant effects to this species of International Importance, as the population occurs within Lough Gill SAC, for which salmon is a Qualifying Interest.

The potential impacts on salmon consists of:

- Degradation of water quality.

5.6.2.10.1.1Degradation of Water Quality

Salmon may be affected by a decrease in water quality anywhere where machinery will be working and groundworks are taking place both within the proposed Wind Farm Site and along the GCR. All Aquatic Sites have the potential to either directly or indirectly impact on salmon and their spawning habitat by releasing sediment and/or contaminants.

Aquatic Site 1 to 12 within the proposed Wind Farm Site have low to negligible potential as salmon habitat and will be most likely prone to degradation of water quality in the absence of mitigation as the proposed construction of the infrastructure and vegetation clearance in the immediate vicinity of these watercourses will result in the sedimentation and acidification of watercourses and has potential for contamination from chemical spills.

Along the GCR, Aquatic Site 15, 17, 22, 24 and 27 are located on rivers that have high suitability for salmon, and salmon was confirmed present at Aquatic Site 15. Aquatic Site 15 corresponds to HDD Site 1 and is located within the boundaries of Lough Gill SAC. There is no potential for deterioration of water quality from the drilling at Aquatic Site 15, as it avoids instream works. As the vegetation removal to facilitate the temporary launch pits for HDD is located >50m from any watercourses, there is no potential for siltation and/or sedimentation of watercourses.

All Aquatic Sites along the GCR can act as a vector for a pollution or sediment runoff incident which will cause likely significant effects on salmon habitat. An accidental pollution event of a sufficient magnitude or the release of sediment- laden water and/or hydrocarbons into the river during the construction phase could affect the water quality downstream of the Proposed Project and affect salmon by smothering spawning grounds with silt and affecting respiration. One of the most important factors for salmon egg survival is oxygen supply, which is dependent on dissolved oxygen concentration and inter-gravel flow. High concentrations of suspended solids in the river are undesirable as they are likely to result in infilling of the gravel pores with fine material (Cowx and Fraser, 2003). Chemical contaminants could physically damage salmon and cause mortality as a result of toxic effects.

Likely significant effects on Atlantic salmon are not anticipated considering the embedded mitigation measures for the protection of water quality (Section 5.5) which consist of;

- the SuDS measures to be implemented within the proposed Wind Farm Site;
- the avoidance of instream works;
- the installation of silt fences at the 11 watercourse crossings within the proposed Wind Farm Site and the two HDD Sites along the GCR;
- the two hydrocarbon interceptors to be installed within the proposed Wind Farm Site;
- the avoidance of karst features; and,
- the use of sediment traps, silt fences, and bunded fuel storage.

In addition, spawning grounds for Atlantic Salmon and Brown trout are noted in the Ballagh River (Ballagh_010) (Table 5-1). However, no likely significant effects are anticipated along this WFD waterbody as it is not hydrologically connected to the Survey Area for the proposed Wind Farm Site.

Considering the embedded mitigation measures, **no likely significant effects at any geographic scale** are anticipated on Atlantic salmon arising from water quality degradation as a result of the Proposed Project.

5.6.2.10.1.2 Mitigation Measures for Water Quality

The additional mitigation measures for the protection of water quality which are to be implemented are listed in Section 5.6.2.1.4.

5.6.2.10.1.3 Summary of Significant Effects on Atlantic Salmon

Following the implementation of the mitigation measures outlined above, there is **no potential for significant residual effects at any geographic scale** on Atlantic Salmon as a result of the Proposed Project.

5.6.2.10.2 Brown Trout

Trout was observed and confirmed present at the following Aquatic Sites: 8, 15, 18, 19, 22 and 27. There is potential for significant effects on this sensitive species of local importance (higher value).

The potential impacts on brown trout consists of:

- Degredation of water quality.

5.6.2.10.2.1 Degredation of Water Quality

Brown trout may be affected by a decrease in water quality anywhere where machinery will be working and groundworks are taking place. Aquatic Site 1 to 12 within the proposed Wind Farm Site channels will be most prone to degradation in water quality as the construction of the hardstands and roads will have significant excavation requirements. Except for Aquatic Site 8 and 10, the Aquatic Sites within the proposed Wind Farm Site have low to negligible potential as trout habitat. However, Aquatic Sites 1 to 12 all can act as a vector for a pollution or sediment runoff incident, which may cause likely significant effects on trout habitat located downstream.

Along the GCR, Aquatic Sites 15, 17, 19, 24 and 27 are located on rivers that have high suitability for brown trout. All other Aquatic Sites along the GCR can act as a vector for a pollution or sediment runoff incident, which will cause likely significant effects on trout habitat located on

the River Bonet (Bonet_030, Bonet_040, and Bonet_050). Aquatic Site 15, 17 and 19 are locate within the boundaries of Lough Gill SAC.

Aquatic Site 15 is the proposed location for off-road HDD Site 1. The HDD is proposed as embedded design stage mitigation to protect water quality at this location, as it avoids in-stream works. As the vegetation removal to facilitate the temporary launch pits for HDD is located >50m from any watercourses, there is no potential for siltation and/or sedimentation of watercourses.

An accidental pollution event of a sufficient magnitude, or the release of sediment- laden water and/or hydrocarbons into the river during the construction phase could affect the water quality downstream of the Proposed Project, and affect trout by smothering spawning grounds with silt, and affecting respiration. One of the most important factors for trout egg survival is oxygen supply, which is dependent on dissolved oxygen concentration and inter-gravel flow. High concentrations of suspended solids in the river are undesirable as they are likely to result in infilling of the gravel pores with fine material (Cowx and Fraser, 2003). Chemical contaminants could physically damage trout and cause mortality as a result of toxins.

However, likely significant effects on Brown trout are not anticipated considering the embedded mitigation measures for the protection of water quality (Section 5.5) inclusive of;

- the SuDS measures to be implemented within the proposed Wind Farm Site;
- the avoidance of instream works;
- the installation of silt fences at the 11 watercourse crossings within the proposed Wind Farm Site and the two GDD Sites along the GCR;
- the two hydrocarbon interceptors to be installed within the proposed Wind Farm Site;
- the avoidance of karst features; and,
- the use of sediment traps, silt fences, and bunded fuel storage.

In addition, spawning grounds for Atlantic Salmon and Brown trout are noted in the Ballagh River (Ballagh_010). However, no likely significant effects are anticipated along this WFD waterbody as it is not hydrologically connected to the Survey Area for the proposed Wind Farm Site. Considering the embedded mitigation measures, **no likely significant effects at any geographic scale** are anticipated on Brown trout arising from water quality degradation as a result of the Proposed Project.

5.6.2.10.2.2 Mitigation Measures for Water Quality

The additional mitigation measures for the protection of water quality which will be implemented are listed in Section 5.6.2.1.4.

5.6.2.10.2.3 Summary of Significant Effects on Brown Trout

Following the implementation of the mitigation measures outlined above, there is **no potential for significant residual effects at any geographic scale** on brown trout as a result of the Proposed Project.

5.6.2.10.3 Sea Lamprey, River Lamprey and Brook Lamprey

Within the proposed Wind Farm Site habitat suitability for lamprey spp. was negligible at Aquatic Site 12, moderate at Aquatic Site 8 and 9, and low at all remaining Aquatic Sites. No incidental mortality of Lamprey spp. or loss of habitat is considered likely within the proposed

Wind Farm Site as the use of 10 clear span bridges and one bottomless culvert is proposed for all watercourse crossings.

The potential impacts on lamprey species consists of:

- Degradation of water quality.

5.6.2.10.3.1 Degradation of Water Quality

Lamprey spp. may be affected by a decrease in water quality anywhere where machinery will be working and groundworks are taking place. Aquatic Site 1 to 12 within the proposed Wind Farm Site channels will likely be the most prone to adverse water quality effects as the construction of the hardstands and roads will have significant excavation requirements.

Except for Aquatic Site 8 and 9, the Aquatic Sites within the proposed Wind Farm Site have low to negligible potential as lamprey habitat. However, Aquatic Sites 1 to 12 all can act as vectors for a pollution or sediment runoff which in the absence of mitigation will cause likely significant effects on lamprey habitat located downstream on the Owenmore [Manorhamilton]_020.

Along the GCR Aquatic Site 17, 19, 21 and 22 are located on rivers that have high suitability for Lamprey spp. All other Aquatic Site 17, 19, and 22 are all located within the boundaries of Lough Gill SAC. All Aquatic Sites along the GCR can act as a vector for a pollution or sediment runoff incident, which will cause likely significant effects on lamprey spp. habitat located on the River Bonet (Bonet_030, Bonet_040, and Bonet_050).

Aquatic Site 22 is located within Lough Gill SAC and is the proposed locations for off-road HDD Site 2. The HDD is proposed as embedded design stage mitigation to protect water quality at this location, as it avoids in-stream works. As the vegetation removal to facilitate the temporary launch pits for HDD is located >50m from any watercourses, there is no potential for siltation and/or sedimentation of watercourses.

An accidental pollution event of a sufficient magnitude could affect the water quality downstream of the Proposed Project and impact lamprey spp. by smothering spawning grounds with silt and affecting respiration. High concentrations of suspended solids in the river are undesirable as they are likely to result in infilling of the gravel pores with fine material (Cowx and Fraser, 2003) and particles can abrade (damage) lamprey gills. Chemical contaminants could physically damage lamprey and cause mortality as a result of toxins.

However, likely significant effects on Lamprey spp. are not anticipated considering the embedded mitigation measures for the protection of water quality (Section 5.5) inclusive of;

- the SuDS measures to be implemented within the proposed Wind Farm Site;
- the avoidance of instream works;
- the installation of silt fences at the 11 watercourse crossings within the proposed Wind Farm Site and the two GDD Sites along the GCR;
- the two hydrocarbon interceptors to be installed within the proposed Wind Farm Site;
- the avoidance of karst features; and,
- the use of sediment traps, silt fences, and bunded fuel storage.

Considering the embedded mitigation measures, **no likely significant effects at any geographic scale** are anticipated on Lamprey spp. arising from water quality degradation as a result of the Proposed Project.

5.6.2.10.3.2 Mitigation Measures for Water Quality

The additional mitigation measures for the protection of water quality which will be implemented are listed in Section 5.6.2.1.4.

5.6.2.10.3.3 Summary of Significant Effects on Lamprey spp.

Following the implementation of the mitigation measures outlined above, there is **no potential for significant residual effects at any geographic scale** on Lamprey spp. as a result of the Proposed Project.

5.6.2.10.4 European Eel

Within the proposed Wind Farm Site, habitat suitability for eel was negligible. Along the GCR Aquatic Sites 13 to 22, 24, 27 and 28 have moderate to good habitat suitability for eel.

There is potential for significant effects on this sensitive species of local importance (higher value).

The potential impacts on eel consists of:

- Degradation of water quality.

5.6.2.10.4.1 Degradation of Water Quality

European eel may be affected by a decrease in water quality anywhere where machinery will be working and groundworks are taking place. Aquatic Site 1 to 12 within the proposed Wind Farm Site will be most prone to adverse water quality deterioration in the absence of mitigation. Aquatic Sites 1 to 12 all can act as vectors for a pollution or sediment runoff incident which will cause likely significant effects on eel habitat located on the Owenmore [Manorhamilton]_020.

All sites along the GCR (Aquatic Site 13 to 28) can act as a vector for a pollution or sediment runoff incident which will cause likely significant effects on eel habitat located on the River Bonet (Bonet_030, Bonet_040, and Bonet_050). An accidental pollution event of a sufficient magnitude could affect the water quality downstream of the Proposed Project and impact eel by smothering suitable habitat. Chemical contaminants could physically damage eel and cause mortality as a result of toxins. However, eel can tolerate high levels of sedimentation and low oxygen levels.

However, likely significant effects on European eel are not anticipated considering the embedded mitigation measures for the protection of water quality (Section 5.5) inclusive of;

- the SuDS measures to be implemented within the proposed Wind Farm Site including
- the avoidance of instream works;
- the installation of silt fences at the 11 watercourse crossings within the proposed Wind Farm Site and the two GDD Sites along the GCR;
- the two hydrocarbon interceptors to be installed within the proposed Wind Farm Site,
- the avoidance of karst features; and,
- the use of sediment traps, silt fences, and bunded fuel storage.

Aquatic Site 22 is located within Lough Gill SAC and is the proposed locations for off-road HDD Site 2. The HDD is proposed as embedded design stage mitigation to protect water quality at this location, as it avoids in-stream works. As the vegetation removal to facilitate the temporary launch pits for HDD is located >50m from any watercourses, there is no potential for siltation and/or sedimentation of watercourses.

Considering the embedded mitigation measures, **no likely significant effects at any geographic scale** are anticipated on European eel arising from water quality degradation as a result of the Proposed Project.

5.6.2.10.4.2 Mitigation Measures for Water Quality

The additional mitigation measures for the protection of water quality which will be implemented are listed in Section 5.6.2.1.4.

5.6.2.10.4.3 Summary of Significant Effects on European Eel

Following the implementation of the mitigation measures outlined above, there is **no potential for significant residual effects at any geographic scale** on European eel as a result of the Proposed Project.

5.6.2.10.5 White-clawed Crayfish

Within the proposed Wind Farm Site habitat suitability for crayfish was negligible to low. Along the GCR, at Aquatic Site 14, 15, 17, 19, 21, 22 and 24 crayfish habitat suitability was good to high, and crayfish remains or live specimens were positively identified at Aquatic Site 14, 15, 17, 19 and 21.

There is potential for significant effects on this sensitive species of local importance (higher value).

The potential impacts on White-clawed crayfish consists of:

- Degradation of water quality.

5.6.2.10.5.1 Degradation of Water Quality

White-clawed crayfish may be affected by a decrease in water quality anywhere where machinery will be working and groundworks are taking place. The proposed Wind Farm Site channels (Aquatic Site 1 to 12) will be most prone to adverse water quality effects as the construction of the hardstands and roads will have significant excavation requirements. Aquatic Sites 1 to 12 all can act as a vector for a pollution or sediment runoff incident which will cause likely significant effects on crayfish habitat located on the Owenmore [Manorhamilton]_020.

All Aquatic Sites along the GCR (Aquatic Site 13 to 28) can act as a vector for a pollution or sediment runoff incident, which will cause likely significant effects on crayfish habitat located on the River Bonet (Bonet_030, Bonet_040, and Bonet_050). An accidental pollution event of a sufficient magnitude could affect the water quality downstream of the Proposed Project and affect crayfish by smothering suitable habitat and impair their breathing apparatus. Chemical contaminants could physically damage crayfish and cause mortality as a result of toxins. Aquatic Sites 14, 15, 17, 19, 21, 22 and 24 are especially vulnerable to these effects. Aquatic Sites 15, 17, 19, 22 and 24 are located within Lough Gill SAC.

Aquatic Site 15 and 22 are the proposed locations for off-road HDD Site 1 and 2 respectively. The HDD is proposed as embedded design stage mitigation to protect water quality at these locations, as it avoids in-stream works. As the vegetation removal to facilitate the temporary launch pits for HDD is located >50m from any watercourses, there is no potential for siltation and/or sedimentation of watercourses.

Crayfish can tolerate higher levels of sedimentation and lower oxygen levels than, for example, salmonids, and during the day they are likely to be resting under refugia, or in their burrows,

possibly escaping the worst of the potential effects. However, preventing water quality effects is essential to prevent this vulnerable species from further decline.

However, likely significant effects on White-clawed crayfish are not anticipated considering the embedded mitigation measures for the protection of water quality (Section 5.5) inclusive of;

- the SuDS measures to be implemented within the proposed Wind Farm Site including
- the avoidance of instream works;
- the installation of silt fences at the 11 watercourse crossings within the proposed Wind Farm Site and the two GDD Sites along the GCR;
- the two hydrocarbon interceptors to be installed within the proposed Wind Farm Site,
- the avoidance of karst features; and,
- the use of sediment traps, silt fences, and bunded fuel storage.

Considering the embedded mitigation measures, **no likely significant effects at any geographic scale** are anticipated on White-clawed crayfish arising from water quality degradation as a result of the Proposed Project.

5.6.2.10.5.2 Mitigation Measures for Water Quality

The additional mitigation measures for the protection of water quality which will be implemented are listed in Section 5.6.2.1.4.

5.6.2.10.5.3 Summary of Significant Effects on White-Clawed Crayfish

Following the implementation of the mitigation measures outlined above, there is **no potential for significant residual effects at any geographic scale** on white-clawed crayfish as a result of the Proposed Project.

5.6.3 Operational Phase

The Operational Phase of the Proposed Project will last approximately 35 years.

It is anticipated that there will be no significant effects on the IEFs considered in this section. This conclusion is based on several factors: there will be no major construction activities or excavation; disturbed areas will be promptly restored, leaving minimal exposed soil; and overall onsite activities will be limited, with only occasional maintenance operations. These conditions collectively reduce the potential for likely significant effects.

5.6.3.1 European Sites

For each phase of development including the operational phase, the protection of water quality and prevention of pollution events requires a sustained and concentrated input from the Contractor/Operator with regard to the provision and maintenance of mitigation measures for the protection of water quality. The water quality mitigation measures outlined in Section 5.5 and Section 5.6.2.1.4 will ensure the protection of the European sites during the operational phase. Furthermore, following the completion of the construction phase, disturbed areas are expected to have fully revegetated. Consequently, the presence of exposed soil will be minimal, and the associated risk of siltation and sedimentation to adjacent habitats will be reduced to negligible.

During the operational phase of the Proposed Project, it is anticipated that there will be **no likely significant effects on European sites at any geographic scale.**

5.6.3.1.1 Mitigation Measures

The mitigation measures to protect surface water quality (Section 5.6.2.1.4.1) will remain in place during all phases of the Proposed Project.

5.6.3.1.2 Summary of Significant Effects on European Sites

Following the implementation of the mitigation measures listed above, there is **no potential for significant residual effects at any geographic scale** on any European site, inclusive of QI habitats and species, and/or on the overall integrity of any European site, nor in the attainment of the specific conservation objectives of any European site.

5.6.3.2 Other Sites of Conservation Importance

During the operational phase of the Proposed Project, it is anticipated that there will be **no likely significant effects** on Dough Mountain NHA and Lough Melvin ASSI, or any other nationally important site.

5.6.3.2.1 Mitigation Measures

No specific mitigation measures are required for Dough Mountain NHA during the operational phase of the Proposed Project. The mitigation measures to protect surface water quality (Section 5.6.2.1.4.1) for downstream receptors, such as Lough Melvin ASSI, will remain in place through all phases of the Proposed Project.

5.6.3.2.2 Summary of Significant Effects on Other Sites

Following the implementation of the mitigation measures listed above, there is **no potential for significant residual effects at any geographic scale** during the operational phase as a result of the Proposed Project on any nationally important site inclusive of Dough/Thur Mountain NHA and Lough Melvin ASSI.

5.6.3.3 Terrestrial Habitats

During the operational phase of the Proposed Project, it is anticipated that there will be **no potential for likely significant effects** on habitats, inclusive of Annex I habitats, are anticipated. During the operational phase of the Proposed Project, it is anticipated that there will be **no potential for likely significant effects** on managed Scrub (WS1) habitat within the bat buffer zones.

5.6.3.3.1 Mitigation Measures

During the operational phase of the Proposed Project, it will be necessary to control the regrowth of scrub within 100m bat buffer zones surrounding each Turbine (Section 5.6.3.8.1.1). This will involve the clearance of scrub every 1-2 years, outside of the bird breeding season (March 1st -September 1st), in compliance with Section 40 of the Wildlife Act (as amended). With ongoing management, the Scrub (WS1) habitat will not mature and as such the effects of removal will not be significant.

Any mature scrub which becomes established in this time will be surveyed by a suitably qualified ecologist for resting places of terrestrial mammals before works begin, do reduce the likelihood of significant effects to negligible.

5.6.3.3.2 Summary of Significant Effects on Terrestrial Habitats

Following the implementation of the above mentioned mitigation measures, there is **no potential for significant residual effects at any geographic scale** as a result of the Proposed Project during the operational phase on any terrestrial habitats.

5.6.3.4 FPO Species

During the operational phase of the Proposed Project, it is anticipated that there will be **no likely significant effects** on FPO species.

5.6.3.4.1 Mitigation Measures

No specific mitigation measures are necessary as no likely significant effects were identified during the operational phase on FPO species.

5.6.3.4.2 Summary of Significant Effects on FPO Species

During the operational phase of the Proposed Project, there is **no potential for significant residual effects at any geographic scale** on any FPO species.

5.6.3.5 Control of Invasive Non-Native Species

The presence of Third Schedule (S.I. 477/2011) listed species within the proposed Wind Farm Site, inclusive of Japanese knotweed, will necessitate continued control and monitoring over the operational lifetime of the Proposed Project to mitigate risk of spread. This is of particular concern at the borrow pit located to the south of the proposed Wind Farm Site, where a stand of Japanese knotweed is located c. 10m from the proposed works corridor. Proximity to project infrastructure and access roads will likely increase the likelihood of spread and transmission. As such, invasive species located within the proposed Wind Farm Site will be monitored and controlled following the procedures detailed in Appendix 5-6.

In the absence of mitigation measures, potential effects of the spread of Japanese knotweed and Rhododendron during the operational phase are as **long-term, negative, likely significant effects at a local geographic scale.**

5.6.3.5.1 Mitigation Measures

The continued implementation of mitigation measures listed in Section 5.6.3.5 will control the spread on INNS within the proposed Wind Farm Site.

5.6.3.5.2 Summary of Significant Effects on INNS

During the operational phase of the Proposed Project, there is **no potential for significant residual effects at any geographic scale** as a result of the spread of INNS.

5.6.3.6 Amphibians and Reptiles

During the operational phase of the Proposed Project, it is anticipated that there will be **no likely significant effects** on amphibians and reptiles.

5.6.3.6.1 Mitigation Measures

No specific mitigation measures are necessary as no likely significant effects were identified during the operational phase on amphibians and reptiles.

5.6.3.6.2 Summary of Significant Effects on Amphibians and Reptiles

During the operational phase of the Proposed Project, there is **no potential for significant residual effects at any geographic scale** on amphibians and reptiles.

5.6.3.7 Terrestrial Mammals

During the operational phase, noise and/or vibration generated by turbine operation may disturb and affect the distribution of terrestrial non-volant mammals. The available literature resources do not report significant effects associated with turbine noise and/or vibration. Reviews by Schöll and Nopp-Mayr (2021) and Tolvanen *et al.*, (2023) refer to a total of five studies reporting on potential effects of wind farms on small mammals. Except for the displacement of European Hare (*Lepus europaeus*) of up to 700m from operating turbines reported in one study in Poland (Łopucki *et al.*, 2017; cited by Tolvanen *et al.*, 2023), no significant differences on distribution metrics (e.g. abundance, diversity, evenness) have been found. Therefore, it is generally accepted that the disturbance effect of wind turbine noise on small non-volant mammals can be assumed to be limited (e.g. Swedish Environmental Protection Agency - Helldin *et al.*, 2012). The effects of the proposed Wind Farm Site on non-volant mammals during its operational phase are considered to have **no likely significant effect at any geographic scale**.

5.6.3.7.1 Mitigation Measures

No specific mitigation measures are necessary as no likely significant effects were identified during the operational phase on terrestrial mammals.

5.6.3.7.2 Summary of Significant Effects on Terrestrial Mammals

During the operational phase of the Proposed Project, there is **no potential for significant residual effects at any geographic scale** on any terrestrial mammals.

5.6.3.8 Bats

The effects of the Proposed Development on local bat populations have been assessed in detail in Appendix 5-5. Four species identified within the Proposed Wind Farm Site are considered a species at high risk of collision with wind farm sites, namely: Leisler's bat, common pipistrelle, soprano pipistrelle, nathusius' pipistrelle (Nature Scot, 2021).

Potential effects on bat species during the operational phase consists of:

- Collision risk.

5.6.3.8.1 Collision Risk

This assessment includes an evaluation of project size (i.e. number and size of turbines), bat activity (i.e. bat encounter records), the habitat (e.g. habitat type, roosting features), and a classification of the 14 turbine locations of the proposed wind farm as having a low (T1, T2, T3, T4, T5, T8, T14), medium (T9, T10, T12) and high risk (T6, T7, T11, T13) to local bat populations. In the absence of mitigation, T6, T7, T11, and T13 pose a high risk to local populations of Leisler's bat, common pipistrelle, soprano pipistrelle, and nathusius' pipistrelle.

The collision risk effects of T6, T7, T9, T10, T11, T12 and T13 on local bat populations, specifically Leisler's bat, common pipistrelle, soprano pipistrelle, and nathusius' pipistrelle is assessed as a **likely significant effect over the long-term at a local geographic scale.**

5.6.3.8.1.1 Mitigation Measures for Collision Risk

The risk of bat collisions with turbines will be significantly reduced through mitigation measures, including management of the turbine cut-in speeds and the feathering of blades. To reduce bat collisions at high (T6, T7, T11, and T13) and medium (T9, T10, T12) risk turbines, the turbine cut-in speed will be increased to 5.5 m/s from 30 minutes prior to sunset and to 30 minutes after sunrise, when temperatures are above 10°C. Increasing the cut-in speed means turbines do not start spinning during low-wind conditions, which is when collisions are more likely. The feathering of blades during low wind conditions restricts the rotation of blades as much as possible below the manufacturers cut-in speed.

The results (including acoustic surveillance and carcass searches) of post-construction compliance monitoring over the first three years will be used to adjust mitigation measures as necessary to improve effectiveness (Nature Scot, 2021). Further details on surveillance and monitoring are listed in Appendix 5-5.

A 100m bat buffer will be implemented at each turbine location. This area will be cleared of tall woody vegetation including: 0.5ha of Scrub (WS1), 31.7ha of Conifer plantation (WD4), 0.23ha of (Mixed) broadleaved woodland, 0.06ha of Riparian woodland, and 1.5ha of (Mixed) broadleaved/conifer woodland. This vegetation clearance will reduce the favourability of the area for foraging bats and reduce the risk of collision. Vegetation growth will be managed so that tall scrub does not encroach into the bat buffer within the lift-time of the Proposed Project. Vegetation clearance will be completed at a minimum of 6 months before the installation of turbines. Full details are presented in Appendix 5-5.

5.6.3.8.2 Summary of Significant Effects on Bats

Following the implementation of the mitigation measures outlined above, there will be **no significant residual effects are anticipated at any geographic scale** during the operational phase of the Proposed Project.

5.6.3.9 Invertebrates

During the operational phase of the Proposed Project, it is anticipated that there will be **no likely significant effects** on marsh fritillary.

5.6.3.9.1 Mitigation Measures

No specific mitigation measures are necessary as no likely significant effects were identified during the operational phase on marsh fritillary.

5.6.3.9.2 Summary of Significant Effects on Invertebrates

During the operational phase of the Proposed Project, there is **no potential for significant residual effects at any geographic scale** on marsh fritillary.

5.6.3.10 Aquatic Ecology

The operational phase of the Proposed Project is considered to have **no likely significant effect at any geographic scale** on aquatic ecology.

5.6.3.10.1 Mitigation Measures

The mitigation measures to protect surface water quality (Section 5.6.2.1.4.1) will remain in place during all phases of the Proposed Project.

5.6.3.10.2 Summary of Significant Effects on Aquatic Ecology

During the operational phase of the Proposed Project, there is **no potential for significant residual effects at any geographic scale** on aquatic ecology.

5.6.4 Decommissioning Phase

The Proposed Project is expected to be operational for 35 years and then the site will be decommissioned.

Turbine foundations will remain in place underground and along with hardstands will be allowed to revegetate naturally. Leaving the turbine foundations and hardstands in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete and stone from the ground could result in potential effects such as disturbance to species and dust deposition on habitats. There would be no real environmental benefit from removing the foundations, as the concrete is underground, stable and inert if untouched. The site roadways will be in use for additional purposes to the operation of the wind farm (e.g. for forest/agricultural access) by the time the decommissioning of the project is to commence, and therefore it is more appropriate to leave the site roads in situ for future use. All site entrances will remain in place during decommissioning as they will form part of the site access infrastructure for ongoing forestry and agricultural activities.

The decommissioning phase will not require any significant works that will impact on the drainage network, as the drainage system will remain in place to serve the access roads.

The on-site substation and 110kV grid connection (GCR) will not be removed at the end of the useful life of the wind farm project as it will form part of the national electricity network. Therefore, the substation will be retained as a permanent structure and will not be decommissioned. Therefore, there is **no potential for significant effects** during the decommissioning phase associated with the GCR.

The decommissioning phase for the project would not require the use of the TDR as the turbine components would be cut up on site to sizes that would fit on standard articulated trucks, in order to mitigate potential for likely significant effects. Therefore, there is **no potential for significant effects** during the decommissioning phase associated with the TDR.

Decommissioning phase effects are expected to be of a similar type and magnitude to those anticipated during the construction phase, but generally of a shorter duration and scale.

Activities associated with decommissioning are activities associated with the decommissioning phase are predicted to be of a substantially lower intensity than those during the construction phase. Furthermore, in most cases, the effects are expected to be of a similar type and magnitude to those anticipated during the operational phase.

The potential impact of habitat loss will no longer be applicable as the turbine hardstands and internal access tracks will remain in place. Hardstands will be allowed to revegetate naturally, likely supporting Dry meadows and grassy verges (GS2) habitat before ecological succession proceeds to Scrub (WS1). There is potential for this habitat to support devil's-bit scabious and local populations of marsh fritillary.

In addition, the need for the maintenance of bat buffers will cease. It is likely these areas will return to commercial forestry [Conifer plantation (WD4)] following the decommissioning phase.

5.6.4.1.1 European Sites

The SuDS measures will remain in place to protect downstream water quality inclusive of European sites. As there will be no significant vegetation removal during the decommissioning phase, then sedimentation is not an anticipated effect. With increased vehicle access on-site during the decommissioning phase there is potential for a contamination event through re-fuelling. Such an event will likely be small-scale in nature as SuDS measures will mitigate the significance of effects to a local geographic scale. As such, contamination of watercourses during the decommissioning phase is considered a **short-term, negative, likely significant effect at a local geographic scale.**

5.6.4.2 Mitigation Measures

The mitigation measures implemented during the construction phase, will be applied during the decommissioning works, inclusive of Section 5.6.2.1.4.1.2 which lists the management of pollutants, consisting of refuelling at bunded areas only, the implementation of an accidental spillage emergency plan and spill response protocols (Section 5.6.2.1.4.1.2).

The protection of water quality and prevention of pollution events requires a sustained and concentrated input from the Contractor inclusive of the decommissioning phase with regard to the provision and maintenance of sediment control structures as detailed in the CEMP (EIAR Appendix 2-4 – Construction and Environmental Management Plan) and SWMP (EIAR Appendix 2-7 – Surface Water Management Plan).

5.6.4.2.1 Summary of Significant Effects on European Sites

Following the implementation of the above listed mitigation measures, there will be **no potential for significant residual effects at any geographic scale** on European sites, during the decommissioning phase of the Proposed Project.

5.6.4.3 Other Sites of Conservation Importance

During the decommissioning phase of the Proposed Project, it is anticipated that there will be **no likely significant effects** on Dough Mountain NHA and Lough Melvin ASSI, or any other nationally important site.

5.6.4.3.1 Mitigation Measures

No specific mitigation measures are required for Dough Mountain NHA during the decommissioning phase of the Proposed Project. The mitigation measures to protect surface water quality (Section 5.6.2.1.4.1) for downstream receptors, such as Lough Melvin ASSI, will remain in place for all phases of the Proposed Project.

5.6.4.3.2 Summary of Significant Effects on Other Sites

Following the implementation of the mitigation measures listed above, there is **no potential for significant residual effects at any geographic scale** during the operational phase as a result of the Proposed Project on any nationally important site inclusive of Dough/Thur Mountain NHA and Lough Melvin ASSI.

5.6.4.4 Terrestrial Mammals

There is potential for disturbance/displacement to European otter along the TDR at POI 25 near Ben Bulben, Gleniff and Glenade SAC during the decommissioning phase, where the trimming of Hedgerow (WL1) is necessary to facilitate the delivery of abnormal indivisible

loads (5.6.2.1.3.2). In the absence of mitigation, disturbance constitutes potential for **likely significant effects on the integrity of Ben Bulben, Gleniff and Glenade SAC**, during the decommissioning phases of the Proposed Project by undermining the conservation objectives for the Annex II species 1355 European otter.

There is no potential for disturbance to European otter within Lough Gill SAC during the decommissioning phase, as the GCR will remain in-situ.

5.6.4.5 Mitigation Measures

Upon decommissioning of the proposed Wind Farm Site, the wind turbines will be disassembled in reverse order to how they were erected. All above ground turbine components will be separated, cut up to allow them to fit on a standard articulated lorry and removed off-site for recycling.

5.6.4.5.1 Summary of Significant Effects on Terrestrial Mammals

Following the implementation of the above listed mitigation measures, there will be **no potential for significant residual effects at any geographic scale** as a result of disturbance/displacement to terrestrial mammals during the decommissioning phase of the Proposed Project.

5.6.4.6 Control of Invasive Non-Native Species

The presence of Third Schedule (S.I. 477/2011) listed species within the proposed Wind Farm Site, inclusive of Japanese knotweed, will necessitate continued control and monitoring over the operational lifetime of the Proposed Project to mitigate risk of spread. This is of particular concern at the borrow pit located to the south of the proposed Wind Farm Site, where a stand of Japanese knotweed is located c. 10m from the proposed works corridor. Proximity to project infrastructure and access roads will likely increase the likelihood of spread and transmission. As such, invasive species located within the proposed Wind Farm Site will be monitored and controlled following the procedures detailed in Appendix 5-6.

In the absence of mitigation measures, potential effects of the spread of Japanese knotweed and Rhododendron during the decommissioning phase are as **long-term, negative, likely significant effects at a local geographic scale.**

5.6.4.7 Mitigation Measures

Mitigation measures for the control of invasive alien species are listed in Section 5.6.3.5 and Appendix 5-6 and will be implemented during the decommissioning phase as necessary.

5.6.4.7.1 Summary of Significant Effects on INNS

Following the implementation of the above listed mitigation measures, it is anticipated that there will be **no potential for significant residual effects at any geographic scale** as a result of the spread of INNS, during the decommissioning phase of the Proposed Project.

5.7 Compensation Measures

Following the implementation of the mitigation measures outlined in Section 5.6, there is potential for significant residual effects on the following IEF habitats and species within the Survey Area for the proposed Wind Farm Site:

- Direct loss of 1,107m of Hedgerow (WL1);
- Direct loss of 423m of Treelines (WL2);
- Direct loss of 0.89ha Cutover bog (PB4) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition;
- Indirect habitat degradation of 0.90ha of Upland blanket bog (PB2) corresponding to the priority Annex I habitat type 7130* Blanket bog (active) in favourable condition;
- Direct loss of 0.55ha of Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition;
- Indirect habitat degradation through drainage of 2.64ha of Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition;
- Direct loss of 0.45ha of Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) mosaic corresponding to Annex I habitat type 4030 European dry heaths in unfavourable condition;
- Direct loss of 1.77ha of suitable marsh fritillary habitat / Dry meadows and grassy verges (GS2);
- Indirect habitat degradation resulting from dust deposition on 0.2ha of suitable marsh fritillary habitat / Dry meadows and grassy verges (GS2);
- Direct loss of 2.26ha of higher value foraging habitat for bat species within the proposed Wind Farm Site, and along the TDR and GCR.

Appropriate compensation measures have been designed to offset these potential residual effects on IEFs, and consists of:

- Planting of 1.53km of Hedgerows (WL1)/Treelines (WL2) habitat;
- Management of 5.4ha of Upland blanket bog (PB2) and Wet heath (HH3) for biodiversity;
- Management of 2ha of Wet grassland (GS4) for marsh fritillary;
- Planting of 2.3ha of (Mixed) broadleaved woodland (WD1) for to compensate for loss of suitable foraging habitat for bat species.

These compensation measures will be implemented within the Enhancement Lands (Figure 1), with the exception of the 10m of Hedgerows (WL1) and 0.01ha of (Mixed) broadleaved woodland (WD1) along the GCR, which will be re-instated in situ. Details on the implementation of the listed compensation measures are contained in EIAR Chapter 6 – Ornithology, Appendix 6-13 Outline Biodiversity Management Plan).

5.8 Residual Effects

Following the implementation of the compensation measures outlined in Section 5.7 and allowing for the required establishment time for the listed habitats, **no significant residual effects at any geographic scale** on IEFs and their conservation objectives are likely as a result of the Proposed Project.

5.9 SUMMARY OF SIGNIFICANT EFFECTS

A summary of likely significant effects, mitigation measures, compensation measures and overall residual effects is provided for each IEF included in the impact assessment in Table 5-24. Compensatory measures are provided for IEFs where a potential for significant residual effects post-mitigation is identified.

Table 5-24: Summary of Likely Significant Effects, Proposed Mitigation, Potential Residual Effects, Proposed Compensation Measures and Overall Residual Effects

Ecological Feature	Likely Significant Effects	Proposed Mitigation	Potential Significant Residual Effects Post-Mitigation	Proposed Compensation	Significant Overall Residual Effects Post-Enhancement	Means of Delivering Proposed Enhancement
European Sites						
Aroo Mountain SAC	No likely significant effects at any geographic scale	Embedded water quality mitigation measures (Section 5.5); Additional mitigation measures for the protection of groundwater quality (Section 5.6.2.1.4.2).	No significant residual effect at any geographic scales	N/A	N/A	N/A
Ballysadare Bay SAC	No likely significant effects at any geographic scale	Embedded water quality mitigation measures (Section 5.5); Additional mitigation measures consisting of management of sedimentation and pollution (Section 5.6.2.1.4).	No significant residual effect at any geographic scales	N/A	N/A	N/A
Ben Bulben, Gleniff, and Glenade SAC	No likely significant effects at any geographic scale	Embedded water quality mitigation measures (Section 5.5); Additional mitigation measures for the protection of groundwater quality (Section 5.6.2.1.4.2).	No significant residual effect at any geographic scales	N/A	N/A	N/A
Cummeen Strand/ Drumcliff Bay (Sligo Bay) SAC	No likely significant effects at any geographic scale	Embedded water quality mitigation measures (Section 5.5); Additional mitigation measures consisting of management of sedimentation and pollution (Section 5.6.2.1.4).	No significant residual effect at any geographic scales	N/A	N/A	N/A
Glenade Lough SAC	No likely significant effects at any geographic scale	Embedded water quality mitigation measures (Section 5.5); Additional mitigation measures for the protection of groundwater quality (Section 5.6.2.1.4.2).	No significant residual effect at any geographic scales	N/A	N/A	N/A
Lough Gill SAC	Disturbance/displacement to European otter is considered a negative short-term reversible likely significant effect on European otter at a local geographical scale	Embedded water quality mitigation measures (Section 5.5); Additional mitigation measures consisting of management of sedimentation and pollution (Section 5.6.2.1.4); Temporary speed limit; Exclusion zones; Avoidance of breeding holts; Avoidance of works along GCR at dusk/dawn,	No significant residual effect at any geographic scales	N/A	N/A	N/A
Lough Melvin SAC	No likely significant effects at any geographic scale	Embedded water quality mitigation measures (Section 5.5); Additional mitigation measures consisting of management of sedimentation and pollution (Section 5.6.2.1.4).	No significant residual effect at any geographic scales	N/A	N/A	N/A
Lough Melvin SAC (NI)	No likely significant effects at any geographic scale	Embedded water quality mitigation measures (Section 5.5); Additional mitigation measures consisting of management of sedimentation and pollution (Section 5.6.2.1.4).	No significant residual effect at any geographic scales	N/A	N/A	N/A
Unshin River SAC	No likely significant effects at any geographic scale	Embedded water quality mitigation measures (Section 5.5); Additional mitigation measures consisting of management of sedimentation and pollution (Section 5.6.2.1.4).	No significant residual effect at any geographic scales	N/A	N/A	N/A

Ecological Feature	Likely Significant Effects	Proposed Mitigation	Potential Significant Residual Effects Post-Mitigation	Proposed Compensation	Significant Overall Residual Effects Post-Enhancement	Means of Delivering Proposed Enhancement
Other Sites of Conservation Interest						
Dough/Thur Mountains NHA	Peat instability is considered a moderate, long-term, irreversible likely significant effect at a national geographic scale.	Peat stability measures (Section 5.6.2.2.1.4)	No significant residual effect at any geographic scales	N/A	N/A	N/A
Lough Melvin ASSI	No likely significant effects at any geographic scale	Embedded water quality mitigation measures (Section 5.5); Additional mitigation measures consisting of management of sedimentation and pollution (Section 5.6.2.1.4).	No significant residual effect at any geographic scales	N/A	N/A	N/A
Habitats						
Cutover bog (PB4) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition	0.89ha of habitat loss.	Defined works corridor; Use of Bog mats; Re-instate excavated areas.	Potential for significant residual effect at a local geographic scale	Management of 0.89ha of Wet heath (HH3) for biodiversity	No significant overall residual effects.	OBMP and monitoring
Depositing/lowland rivers (FW2)	N/A	N/A	N/A	N/A	N/A	N/A
Drainage ditches (FW4)	The degradation of 3,754m of habitat degradation as a result of dust deposition is considered a negative, short-term, reversible, likely significant effect at a local geographic scale.	Embedded water quality mitigation measures (Section 5.5); Dust mitigation measures (Section 5.6.2.3.4.4).	No significant residual effect at any geographic scales	N/A	N/A	N/A
Dry meadows and grassy verges (GS2)	N/A	N/A	N/A	N/A	N/A	N/A
Dry siliceous heath (HH1) corresponding to Annex I habitat type	N/A	N/A	N/A	N/A	N/A	N/A

Ecological Feature	Likely Significant Effects	Proposed Mitigation	Potential Significant Residual Effects Post-Mitigation	Proposed Compensation	Significant Overall Residual Effects Post-Enhancement	Means of Delivering Proposed Enhancement
4030 European dry heaths in unfavourable condition						
Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) corresponding to Annex I habitat type 4030 European dry heaths in unfavourable condition	0.45ha of habitat loss is considered a negative, permanent, irreversible, likely significant effect at a local geographic scale.	Defined works corridor; Use of Bog mats.	Potential for significant residual effects at a local geographic scale.	Management of 0.45ha of Wet heath (HH3) for biodiversity.	No significant overall residual effects.	OBMP and monitoring
Eroding/upland rivers (FW1)	N/A	N/A	N/A	N/A	N/A	N/A
Exposed calcareous rock (ER2) corresponding to the priority Annex I habitat type 8240* Limestone Pavements in unfavourable condition	0.01ha of habitat loss constitutes a negative, permanent, long term, likely significant effect at a local geographic scale.	Defined works corridor; Fencing to exclude livestock at T3.	No significant residual effect at any geographic scales	N/A	N/A	N/A
Hedgerows (WL1)	1,107m of habitat loss is considered a long-term, reversible, negative effect which is a likely significant effect at a local geographic scale.	No clearance of shrubs within the bird breeding season; Follow best practice guidance retention trees (NRA, 2006a)	Potential for significant residual effects at a local geographic scale.	Planting of 1,107m of Hedgerows (WL1)/ Treelines (WL2)	No significant overall residual effects.	OBMP and monitoring
Treelines (WL2)	423m of habitat loss is considered a long-term, permanent, negative, likely significant effect at a local geographic scale.	No clearance of shrubs within the bird breeding season; Follow best practice guidance retention trees (NRA, 2006a)	Potential for significant residual effects at a local geographic scale.	Planting of 423m of Treelines (WL2)/ Hedgerows (WL1)	No significant overall residual effects.	OBMP and monitoring
(Mixed) broadleaved woodland (WD1)	0.56ha of habitat loss is considered a negative, long-term, reversible, likely significant effect at a local geographic scale.	No clearance of shrubs within the bird breeding season; Follow best practice guidance retention trees (NRA, 2006a)	Potential for significant residual effects at a local geographic scale.	Planting of 0.56 ha of (Mixed) broadleaved woodland (WD1)	No significant overall residual effects.	OBMP and monitoring

Ecological Feature	Likely Significant Effects	Proposed Mitigation	Potential Significant Residual Effects Post-Mitigation	Proposed Compensation	Significant Overall Residual Effects Post-Enhancement	Means of Delivering Proposed Enhancement
Riparian woodland (WN5)	N/A	No clearance of shrubs within the bird breeding season; Follow best practice guidance retention trees (NRA, 2006a)	N/A	N/A	N/A	N/A
Scrub (WS1)	N/A	No clearance of shrubs within the bird breeding season; Follow best practice guidance retention trees (NRA, 2006a)	No significant residual effect at any geographic scales	N/A	N/A	N/A
Upland blanket bog (PB2) corresponding to the priority Annex I habitat type 7130* Blanket bog (active) in favourable condition	0.9ha of habitat degradation is considered a negative, permanent, irreversible, likely significant effect at a local geographic scale.	Dust mitigation measures.	Potential for significant residual effects at a local geographic scale.	Management of 0.9ha of Upland blanket bog (PB2) for biodiversity.	No significant overall residual effects.	OBMP and monitoring
Upland blanket bog (PB2) corresponding to the non-priority Annex I habitat type 7130 Blanket bog (inactive) in unfavourable condition	0.55ha of habitat loss and 2.64ha of habitat degradation is considered negative, permanent, irreversible, likely significant effect at a local geographic scale.	Defined works corridor; Use of bog mats; Fencing to exclude livestock at T3; Re-instate excavations.	Potential for significant residual effects at a local geographic scale.	Management of 3.19ha of Wet heath (HH3) for biodiversity.	No significant overall residual effects.	OBMP and monitoring
Flora Protection Order Species						
Bristle-leaf	Loss of local populations; Habitat degradation.	Avoidance of FPO species and habitat, Consultation with NPWS, Exclusion zones, Dust mitigation measures.	No significant residual effect at any geographic scales	N/A	N/A	N/A
Small white orchid	Loss of local populations; Habitat degradation.	Avoidance if FPO species and habitat, Consultation with NPWS, Exclusion zones, Dust mitigation measures.	No significant residual effect at any geographic scales	N/A	N/A	N/A
Invasive Non-Native Species						
Himalayan balsam	Spread of invasive species	Early detection and biosecurity; Manual control.	No significant residual effect at any geographic scales	N/A	N/A	N/A
Japanese Knotweed	Spread of invasive species	Early detection and biosecurity; Foliar herbicide Treatment.	No significant residual effect at any geographic scales	N/A	N/A	N/A

Ecological Feature	Likely Significant Effects	Proposed Mitigation	Potential Significant Residual Effects Post-Mitigation	Proposed Compensation	Significant Overall Residual Effects Post-Enhancement	Means of Delivering Proposed Enhancement
Rhododendron	Spread of invasive species	Manual control; Herbicide application	No significant residual effect at any geographic scales effects	N/A	N/A	N/A
Amphibians and Reptiles						
Common frog	N/A	N/A	No significant residual effect at any geographic scales	N/A	N/A	N/A
Smooth newt	N/A	N/A	No significant residual effect at any geographic scales	N/A	N/A	N/A
Common lizard	N/A	N/A	No significant residual effect at any geographic scales	N/A	N/A	N/A
Mammals						
Badger	Disturbance and displacement	Avoidance of active breeding/resting places during the breeding season. In non-breeding season if necessary, exclusion under supervision from ECoW.(Section 5.6.2.8.3)	No significant residual effect at any geographic scales	N/A	N/A	N/A
Red deer	N/A	N/A	N/A	N/A	N/A	N/A
Pine marten	N/A	N/A	N/A	N/A	N/A	N/A
Other small mammals	N/A	N/A	N/A	N/A	N/A	N/A
Bat species						
All species	2.5ha Habitat loss is considered long-term, negative, likely significant effects at a local geographical scale. Collision risk. Is considered a likely significant effect over	Turbine cut-in speeds 5.5m/s 30mins dusk/dawn; Feathering of blades; 100m Bat buffers; Removal of building 3.	Potential for significant residual effects at a local geographic scale.	Planting of 2.5ha of (Mixed) broadleaved woodland (inclusive of the 0.56ha of WD1 listed above)	N/A	OBMP and monitoring

Ecological Feature	Likely Significant Effects	Proposed Mitigation	Potential Significant Residual Effects Post-Mitigation	Proposed Compensation	Significant Overall Residual Effects Post-Enhancement	Means of Delivering Proposed Enhancement
	the long-term at a local geographic scale					
Invertebrates						
Marsh fritillary	Risk of mortality, habitat loss of 1.77ha, and habitat degradation of 0.2ha is considered long-term, negative, likely significant effects on the conservation status of the local marsh fritillary population at a local geographical scale.	Exclusion zones; Translocation of larval webs, Use of solid screens and dust mitigation measures.	Potential for significant residual effects at a local geographic level as a result of habitat loss and degradation.	Management of 2ha of Wet grassland (GS4) for the target species marsh fritillary	N/A	OBMP and monitoring
Aquatic Species						
European otter	Disturbance/ displacement.is considered a negative short-term reversible likely significant effect on European otter at a local geographical scale.	Temporary speed limit; Exclusion zones; Avoidance of breeding holts; Avoidance of works along GCR at dusk/dawn, Embedded water quality mitigation measures (Section 5.5)	No significant residual effect at any geographic scales	N/A	N/A	N/A
Atlantic salmon	N/A	Embedded water quality mitigation measures (Section 5.5);	N/A	N/A	N/A	N/A
Brown trout	N/A	Embedded water quality mitigation measures (Section 5.5);	N/A	N/A	N/A	N/A
Lamprey species	N/A	Embedded water quality mitigation measures (Section 5.5);	N/A	N/A	N/A	N/A
European eel	N/A	Embedded water quality mitigation measures (Section 5.5);	N/A	N/A	N/A	N/A

Ecological Feature	Likely Significant Effects	Proposed Mitigation	Potential Significant Residual Effects Post-Mitigation	Proposed Compensation	Significant Overall Residual Effects Post-Enhancement	Means of Delivering Proposed Enhancement
White-clawed crayfish	N/A	Embedded water quality mitigation measures (Section 5.5);	N/A	N/A	N/A	N/A

5.10 CUMULATIVE EFFECTS

Legislation, policy, and guidance (Section 5.1.6) require that cumulative effects with other projects and plans are considered for the assessment of likely significant effects with the proposed development.

Information on the relevant projects within the vicinity of the Proposed Project is described in Chapter 1 - Introduction. The information was sourced from a search of the local authorities planning registers (LCC, 2025), the EIA portal (EIA, 2025), planning applications (MyPlan, 2025), and the Northern Ireland Planning Register (Planning Portal, 2025). The identification of potential environmental effects was collated from EIAR documents and planning drawings. A 10km radius was used for the ZoI for cumulative effects for the proposed Wind Farm Site. A reduced 0.5km ZoI for cumulative effects was identified for the TDR and GCR due to the localised magnitude of the potential effects associated with these components of the Proposed Project. As planning permissions generally lapse after 5 years for standard projects, and 10 years for large scale developments including wind farms, the search is limited to this timeframe.

The search excluded retention applications (i.e. typically local-scale residential or commercial developments where an impact has already occurred), incomplete, withdrawn, and refused applications which have passed the period for appeal. The search also excluded individual private dwellings, as well as agricultural sheds (and ancillary works) outside of the catchment and beyond 50m of watercourses, as the impact of these developments are likely below the threshold of significance to be considered during Environmental Impact Assessments. The cumulative assessment therefore focuses on plans or projects with the potential to act in combination with the Proposed Project to result in likely significant effects on the IEFs via shared pathways for potential effects.

Based on the criteria set out above, the types of projects that have potential to result in cumulative effects is considered to comprise of other wind farms (both operational and planning approved), the harvesting of conifer plantations within the relevant catchments, quarry activity within the relevant catchments, and any other large-scale development which may lead to significant deterioration of water quality within the relevant catchments, the loss of Annex I habitat types, peat instability in upland areas, disturbance to the QI European otter in Lough Gill SAC. All projects with the potential for cumulative effects are described further below (Table 5-25).

5.10.1 Forestry

The implementation of the Proposed Project necessitates the felling of 133.3ha of Conifer plantation (WD4). The proposed method of removal is clear-fell, as standard forestry practice in Ireland. The removal of this forestry during the construction phase has the potential to cause siltation and acidification of watercourses.

Felling and re-planting associated with the commercial forestry operations will continue throughout the lifetime of the Proposed Project throughout the rest of the Survey Area for the proposed Wind Farm Site. Of the 609.4ha of Conifer plantation (WD4) currently occupying the Survey Area for the proposed Wind Farm Site, the vast majority (i.e. 590ha, equating to 90% of the area), will be harvested during the 35-year lifetime of the Proposed Project, as per the Forestry Licence (Forestry License Viewer, n.d.). These operations are separate to the Proposed Project.

In the absence of mitigation, the effect of clear-felling and replanting operations over the lifetime of the Proposed Project will likely contribute to cumulative effects through the acidification and siltation of downstream waterways. As previously stated, the proposed Wind Farm Site is located within an upland area. The high rainfall and peaty soil make this site susceptible to acidification of waterways (Giller *et al.* 2002). Tree removal promotes surface run-off pathways and soil leaching (Nisbet and Evans, 2014), and one of the main consequences of increased acidity is the leaching out of aluminium found to be toxic to fish (including salmonids) and macroinvertebrates (Giller *et al.* 2002). It is important to note that the effects of clear felling on acidification are complex and can be difficult to discern at a catchment level (Forestry Commission, 2014). Nevertheless, it is relevant to consider cumulative effects on water quality between the Proposed Project and the harvest schedule for forestry within the Survey Area for the proposed Wind Farm Site. The potential likely significant effects on downstream aquatic ecology extend to QI species for Lough Gill SAC and Lough Melvin SACs.

Forestry operations are subject to their own impact assessments and licensing processes, ensuring that likely significant effects are considered and mitigated (DAFM, 2024). Standard forestry practices include mitigation measures for water quality protection consisting of (DAFM, 2024):

- Set back distances from watercourses;
- Silt control measures including silt traps; and
- Maintenance of silt traps to prevent overflow.

These mitigation measures are expected to reduce, but not eliminate, cumulative pressures along this pathway. While the Proposed Project, in combination with ongoing forestry operations within the Survey Area for the proposed Wind Farm Site, has the potential to contribute to cumulative effects on downstream water quality, these effects are not anticipated to exceed measurable thresholds for likely significant effects over the 35 year lifetime of the Proposed Project, particularly with the industry standard water protection mitigation measures in place.

The current forestry operations operating within the Survey Area of the proposed Wind Farm Site drain into the Owenmore (Manorhamilton)_020, Brackary_010, and Latone 35_010. These WFD river waterbodies have received a "*good*" water quality status (Table 5-9). This demonstrates the effectiveness of current water protection mitigation measures implemented within the within the Survey Area of the proposed Wind Farm Site as part of the current forestry operations.

No additional mitigation measures are required beyond what is outlined for the Proposed Project alone, to avoid the potential for likely significant effects on IEFs, as a consequence of the Proposed Project acting in-combination with this 'other' project.

Therefore, there is no potential for the Proposed Project to act cumulatively with the other forestry operations within the Survey Area for the Proposed Wind Farm Site to result in adverse effects on the integrity of Lough Gill SAC, Lough Melvin SAC, and Lough Melvin SAC (NI) or any other downstream IEFs inclusive of aquatic ecology.

5.10.2 Wind Farms

5.10.2.1Derrykillew, Ballyshannon, Co. Donegal.

Planning permission for the 5 turbine Wind Farm at Derrykillew, Ballyshannon, Co. Donegal was granted 18/03/2016. The Wind Farm is outside of the ZoI of the Proposed Project and does not share hydrological pathways (An Bord Pleanala, 2015). As such, there is no potential for cumulative effects with the proposed Project.

5.10.2.2Faughary Wind Farm

There is one operational wind farm located west of the proposed Project, namely Faughary Wind Farm containing three (3) 119-metre high Enercon wind turbines. The nearest turbine is located 530m west of T6 of the proposed Wind Farm Site. The Wind Farm was established in 2015 and as such, any effects arising from the construction and operation of Faughary Wind Farm are established and contribute to the current baseline conditions. The wind farm does not give rise to ongoing construction-related pressures, and its operational footprint is limited in scale.

The Faughary Wind Farm is drained by the Owenmore (Manorhamilton)_020. This WFD river waterbody is a shared potential pathway within the proposed Wind Farm Site to Lough Gill SAC. The Owenmore (Manorhamilton)_020 has received a "*good*" water quality status (Table 5-9). This demonstrates the effectiveness of current water protection mitigation measures implemented within Faughary Wind Farm. The Proposed Project will also implement water quality mitigation measures as described in Section 5.6.2.1.4.These measures comprise standard best-practice water quality mitigation, widely implemented in comparable developments and demonstrated to be effective in avoiding adverse effects on receiving waterbodies.

Therefore, there is no potential for the Proposed Project to act cumulatively with Faughary Wind Farm to result in adverse effects on the integrity of Lough Gill SAC or any other downstream IEFs inclusive of aquatic ecology.

No additional mitigation measures are required beyond what is outlined for the Proposed Project alone, to avoid the potential for likely significant effects on IEFs, as a consequence of the Proposed Project acting in-combination with this 'other' project.

5.10.2.3Carrickeeny Wind Farm

Carrickeeny Wind Farm (ACP ref. 312895) is located approximately 8km to the west of the proposed Wind Farm Site. Carrickeeny Wind Farm is upstream and hydrologically connected to Lough Gill SAC via the Shanvaus_010. This constitutes a shared pathway for cumulative effects with the Proposed Project. However, Carrickeeny Wind Farm has been operational since 2014, and any effects arising from its construction and operation contribute to the existing ecological baseline within the ZoI of the Carrickeeny Wind Farm. The scheme represents a small-scale development with a limited operational footprint and does not give rise to ongoing construction-related pressures.

There is a potential pathway for cumulative effects on Lough Gill SAC due to the shared hydrological pathway between Carrickeeny Wind Farm and the Proposed Project via the Shanvaus_010. The Shanvaus_010 has received a "*good*" water quality status (Table 5-9). This

demonstrates the effectiveness of current water protection mitigation measures implemented within Carrickeeny Wind Farm.

The Proposed Project will also implement water quality mitigation measures as described in Section 5.6.2.1.4. These measures comprise standard best-practice water quality mitigation, widely implemented in comparable developments and demonstrated to be effective in avoiding adverse effects on receiving waterbodies.

Therefore, there is no potential for the Proposed Project to act in-combination with Carrickeeny Wind Farm to result in adverse effects on the integrity of Lough Gill SAC or any other downstream IEFs inclusive of aquatic ecology.

No additional mitigation measures are required beyond what is outlined for the Proposed Project alone, to avoid the potential for likely significant effects on IEFs, as a consequence of the Proposed Project acting in-combination with this 'other' project.

5.10.2.4Tullynamoyle Wind Farm

Tullynamoyle Wind Farm is located approximately 10 km to the south of the Proposed Project and consists of 15 turbines with planning for a 4 turbine extension and ancillary works.

Belhavel Lough is located downstream of Tullynamoyle Wind Farm (Jennings O'Donovan, 2015a). The AA concluded that significant effects are unlikely on Lough Gill SAC as it is located further downstream of Belhavel Lough. The suitability of habitat at Belhavel Lough and Annagh River for European otter was noted (Jennings O'Donovan, 2015b). Potential for peat instability was considered insignificant at Tullynamoyle Wind Farm (Jennings O'Donovan, 2015a). Due to the 10km separation distance involved there is no potential for cumulative effects of peat instability between the Proposed Project and Tullynamoyle Wind Farm.

No significant cumulative effects resulting from Tullynamoyle Wind Farm extension and the Proposed Project have been identified. Belhavel Lough is a depositional waterbody located between Tullynamoyle Wind Farm and the River Bonet and Lough Gill SAC. As such, Belhavel Lough will intercept and reduce the potential likely significant effects on Lough Gill SAC and its QIs. This negates the potential for cumulative effects on water quality with the Proposed Project.

No additional mitigation measures are required beyond what is outlined for the Proposed Project alone, to avoid the potential for likely significant effects on IEFs, as a consequence of the Proposed Project acting in-combination with this 'other' project.

5.10.3 Other

5.10.3.1Quarry at Cornmore and Carrickoghil

Kerrigan Quarries Carrickoghil, Killarga (Planning Ref: 15176) is located c. 10km south of the proposed Wind Farm Site. The quarry discharges into Bonet_050 (EPA Stream Orcusconny 35017). This constitutes hydrological connectivity with Lough Gill SAC as well as a shared hydrological pathway with the proposed Wind Farm Site.

Contamination and siltation were considered potential likely significant effects on water quality as a result of the quarry extension (ESPI, 2015a). Subsequent effects on European otter species as a result of reduction in food resources, following deterioration of water quality were also considered (ESPI, 2015b).

As the planning application was granted in 25/01/2016, any effects arising from its construction and operation contribute to the existing ecological baseline within the ZoI of the quarry extension.

The Bonet_050 has received a "*good*" water quality status (Table 5-9). This demonstrates the effectiveness of current water protection mitigation measures implemented within Kerrigan Quarries. It was concluded in the Appropriate Assessment Screening Report for the quarry extension that compliance with the mitigation measures on water quality will avoid the occurrence of significant effects (ESPI, 2015a).

The Proposed Project will also implement water quality mitigation measures as described in Section 5.6.2.1.4. These measures comprise standard best-practice water quality mitigation, widely implemented in comparable developments and demonstrated to be effective in avoiding adverse effects on receiving waterbodies.

Therefore, there is no potential for the Proposed Project to act in-combination with Kerrigan Quarries Carrickoghil, Killarga to result in adverse effects on the integrity of Lough Gill SAC or any other European site.

No additional mitigation measures are required beyond what is outlined for the Proposed Project alone, to avoid the potential for likely significant effects on IEFs, as a consequence of the Proposed Project acting in-combination with this 'other' project.

5.10.3.2Flood Relief Scheme, Dromahair

The proposed Flood Relief Scheme at Dromahair, Co. Leitrim (ACP. Ref 322018) has potential for adverse effects on the integrity of Lough Gill SAC, as identified during the NIS as a hydrological pathway with this development exists via the Bonet_050 (TOBIN, 2024a). This constitutes hydrological connectivity with Lough Gill SAC as well as a shared hydrological pathway with the proposed Wind Farm Site.

Following the implementation of mitigation measures it was concluded that there will be no significant effects on water quality or QI species and habitats as a result of the Flood Relief Scheme at Dromahair (TOBIN, 2024a). Mitigation measures for the Flood Relief Scheme also include those for disturbance/displacement of European otter as well as an invasive species management plan for Japanese Knotweed and Himalayan balsam.

The Proposed Project will also implement water quality mitigation measures as described in Section 5.6.2.1.4. These measures comprise standard best-practice mitigation measures for water quality, disturbance/displacement of European otter, as well as the control of invasive species.

Therefore, there is no potential for the Proposed Project to act in-combination with Flood Relief Scheme at Dromahair, Co. Leitrim to result in adverse effects on the integrity of Lough Gill SAC or any other European site.

No additional mitigation measures are required beyond what is outlined for the Proposed Project alone, to avoid the potential for likely significant effects on IEFs, as a consequence of the Proposed Project acting in-combination with this 'other' project.

5.10.3.3Wastewater treatment plant, Rossinver

The upgrade of the existing wastewater treatment plant (WWTP) in Rossinver (ACP. Ref 320024) is located 1.4km south of Lough Melvin SAC (TOBIN, 2024b). The proposed WWTP

will discharge treated effluent to the Ballagh_010 and Lough Melvin, both part of the Lough Melvin SAC. The northern shores of Lough Melvin are located within Lough Melvin SAC (NI).

The proposed Wind Farm Site will also drain into Lough Melvin SAC and Lough Melvin SAC (NI) via the Ballagh_010 and as such this constitutes a shared pathway for potential adverse effects,

The Ballagh_010 received a "*good*" water quality status (Table 5-9). This demonstrates the effectiveness of current water protection mitigation measures implemented within the WWTP.

The NIS assesses the potential for adverse effects on the following QIs of Lough Melvin SAC and Lough Melvin SAC (NI):

- [3130] Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea
- [1106] Atlantic salmon (Salmo salar); and,
- [1355] European otter (Lutra lutra) [QI for Lough Melvin SAC only].

Following the implementation of mitigation measures, it was concluded that there is no residual, direct or indirect effects that could adversely affect the integrity of Lough Melvin SAC (TOBIN, 2024b).

The Proposed Project will also implement water quality mitigation measures as described in Section 5.6.2.1.4. These measures comprise standard best-practice water quality mitigation, widely implemented in comparable developments and demonstrated to be effective in avoiding adverse effects on receiving waterbodies.

Therefore, there is no potential for the Proposed Project to act in-combination with WWTP in Rossinver to result in adverse effects on the integrity of Lough Gill SAC or any other European site.

No additional mitigation measures are required beyond what is outlined for the Proposed Project alone, to avoid the potential for likely significant effects on IEFs, as a consequence of the Proposed Project acting in-combination with this 'other' project.

5.10.3.3.1 Plans

Leitrim County Development Plan 2023-2029 includes objectives and policies which are associated with the protection of the natural environment, European sites and watercourses (NH Policy 1 - NH Policy 5, and NH Objectives 1 – NH Objectives 6) (Leitrim Co. Co., 2025a). All new plans and projects proposed within the county must adhere to the above-mentioned policies and objectives. Adherence to the Council's policies and objectives will therefore ensure that all plans and projects proposed will not result in significant effects on biodiversity and European sites, and includes the requirement that any future proposed plans or projects to be subject to Screening for AA to examine and assess their effects on European sites, alone and in-combination with other plans and projects. There is no potential for negative cumulative effects between the Leitrim County Development Plan 2023-2029 and the Proposed Project.

The Co. Leitrim Biodiversity Action Plan 2022-2027 lists the eight SACs within the county (Leitrim Co. Co., 2022). The newly issued Draft Biodiversity Action Plan 2025-2030 for Co. Leitrim aims to "record, conserve, restore and promote biodiversity" (Leitrim Co. Co., 2025). During the public consultation process, it was revealed that the main concern of participants was habitat loss The main threats to biodiversity in Leitrim were identified as climate change, habitat loss and invasive alien species. The Draft Plan makes reference to a range of ecological

features present in Leitrim including: uplands, peatlands, limestone pavements, woodlands, hedgerows, and FPO species. No specific objectives for these features were identified in the Draft Plan. Objectives listed in the Draft Plan relevant to this Biodiversity assessment include:

- **Objective 2:** Protect and restore natural habitats and native species; and,
- **Objective 3:** Tackle and raise awareness of Invasive Alien Species (IAS).

There is no potential for negative cumulative effects between the Co. Leitrim Biodiversity Action Plan 2022-2027 and the Proposed Project. Leitrim County Development Plan 2023-2029 and Co. Leitrim Biodiversity Action Plan 2022-2027 screen out at this stage.

Table 5-25: Summary of Projects with potential for Cumulative Assessment with the Proposed Project

Forestry License/ Planning Ref.	Brief Description of Development	Distance	Significant Effects Post-Mitigation	Summary of Cumulative Effects of Development	Potential for Cumulative Effects with Lissinagroagh WF	Date Granted
LM06-FL0164 LM06-FL0157 LM06-FL0173 LM06-FL0159 LM06-FL0192 LM06-FL0159 LM06-FL0175 LM06-FL0180 LM03-FL0058 LM03-FL0052	Coilte Clearfell Licensing within Proposed Wind Farm Site	0m	No significant residual effects on aquatic ecology.	Potential cumulative effects from siltation and acidification of watercourses over 35-year lifetime of the Proposed Project.	No potential for cumulative effect with the Proposed Project.	Various
2157 (ACP ref. 312895)	Tullynamoyle Wind Farm A three-turbine extension to a permitted wind farm development consisting of twelve (12) electricity generating wind turbines. The Planning Application is accompanied by an Environmental Impact Statement and Natura Impact Statement.	8.9km south	No significant residual effects identified within EIS or AA.	Potential cumulative effects were avoided as no clear felling will take place during the construction or decommissioning phases of the Tullynamoyle Wind Farm development.	No potential for cumulative effect with the Proposed Project.	04/04/2025
15176	Cornamarve & Carrickoghil, Killarga, Co Leitrim 4.5 hectare extension to an existing quarry which will be subject to extraction and processing of rock by drilling, blasting, crushing,	10km south	No significant residual effects identified within EIS or AA.	No significant adverse effects to the area are likely.	No potential for cumulative effect with the Proposed Project.	25/01/2016

Forestry License/ Planning Ref.	Brief Description of Development	Distance	Significant Effects Post-Mitigation	Summary of Cumulative Effects of Development	Potential for Cumulative Effects with Lissinagroagh WF	Date Granted
	screening over a 35 year period. Application is accompanied by an Environmental Impact Statement					
ACP. Ref 322018	Proposed Flood Relief Scheme at Dromahair, Co. Leitrim. Application relates to Protected Structures	0.5km south of GCR	No significant residual effects identified within inspectors report.	No cumulative effects no arising cumulatively with any other plans or projects which would be of significance.	No potential for cumulative effect with the Proposed Project.	21/08/2025
ACP. Ref 320024	Proposed Development of Rossinver Wastewater Treatment Plant, Co. Leitrim.	3.8km north	No adverse effects identified within AA.	No adverse effects on the integrity of Lough Melvin SAC or other European sites.	No potential for cumulative effect with the Proposed Project.	Live Case

5.11 TRANSBOUNDARY EFFECTS

Annex IV of the Environmental Impact Assessment Directive (2011/92/EU) as amended implements the Espoo and Aarhus Conventions in the EU, and as such mandates a description of transboundary effects (European Commission, 2025). Transboundary effects are defined as likely significant effects on the environment within the territory of another European Economic Area Member States (EEA States) (Planning Inspectorate, 2025).

At nearest distance, the proposed Wind Farm Site is located 3.6km south of the border with Northern Ireland. Accordingly, the potential for transboundary effects has been considered, with particular regard to shared hydrological pathways and IEFs.

The WFD river waterbody Lattone 35_010 (WFD Code: IE_NW_35L660960), constitutes a potential pathway for likely significant effects between the proposed Wind Farm Site and Lough Melvin NI SAC (NI) (UK0030047), Northern Ireland as well as Lough Melvin ASSI (Section 5.4.1.1.1). The potential for likely significant effects on Lough Melvin SAC (NI) are considered in Section 5.6.2.1.1.5, while the potential for likely significant effects on Lough Melvin ASSI are considered in Section 5.6.2.2.2.

Embedded mitigation measures (Section 5.5), including the avoidance of instream works through the use of clear span bridges for the 3 watercourse crossings along the WFD river waterbody Lattone 35_010, are designed to protect water quality and downstream IEFs. There are no significant residual effects anticipated on the QIs of the SAC (NI) nor ASSI nor the overall integrity of these sites as a result of the Proposed Project.

Database searches for NBN Atlas and CEDAR returned results of several species of conservation importance, including red squirrel and pine marten, within 10km of the proposed Wind Farm Site (Table 5-5). However, based on distance from construction activities these records were ultimately not considered to be within the ZoI of the Proposed Project and no transboundary population-level effects are predicted.

On this basis, while potential transboundary pathways have been identified and assessed, there are **no transboundary residual effects** anticipated on IEFs as a result of the Proposed Project.

5.12 MONITORING

A contractor will be appointed to be responsible for all works and activities associated with the Construction Phase of the Proposed Project, and the contractor will provide a suite of specialists, including the Ecological Clerk of Works (ECoW), as part of their delivery team.

5.12.1 Core Responsibilities of Ecological Clerk of Works

The role of the ECoW is defined by British Standard BS 42020:20131 as the 'person who has the ecological qualifications, training, skills and relevant experience to undertake appropriate monitoring and to provide specialist advice to "development" site personnel on necessary working practices required to:

- Safeguard ecological receptors on site; and,
- Aid compliance with any consents and relevant wildlife legislation related to the works.' The requirements of the ECoW role will be fulfilled by a single individual with support and assistance provided by technical specialists and senior colleagues when required. The ECoW (individual or team of individuals) must therefore have appropriate qualifications, training and experience to meet the requirements of the role and in addition, where needed, can access support from senior ecologists within the company with the required qualifications, training and experience.

The ECoW will have the power to 'Stop Works' at any time they deem it necessary to do so.

The ECoW will be responsible for monitoring compliance with the mitigation measures and construction phase monitoring requirements relating to ecology/biodiversity as set out in the project EIAR, CEMP, and further supporting documentation. The ECoW will be responsible for the day-to-day management and interaction with the project Environmental Manager. The ECoW will have authority over the content of routine reports and will act independently in determining instances of non-compliance with the consents and licenses or any breaches of environmental legislation.

The role of the ECoW includes tasks such as, but not limited to, the following:

- Pre-construction confirmatory surveys for bats, badger, European otter, common frog and other small mammals;
- Monitoring and exclusion of badger setts;
- Monitoring and exclusion of European otter holts;
- Monitoring of marsh fritillary larval webs and suitable habitat;
- Relocation of amphibians;
- Nest checks during bird breeding season;
- Supervision of works as required to ensure compliance with environmental legislation and the requirement of the schedule of works and EIAR;
- Preparation of Method Statements for ecological tasks such as those described above;
- Input to, and review of, construction method statements to ensure adequate protection of biodiversity is addressed during works; and
- Updating the Biodiversity Management Plan during the lifetime of the project.

The ECoW will also document activities using photographs and record information to registers/logs. The Environmental Manager and ECoW will work as a team and are expected to be in contact daily with the ECoW relaying any identified concerns or issues on site to the Environmental Manager.

5.12.2 Surface Water Monitoring

Pre-construction, construction and post-construction phase surface water monitoring will be carried out. All surface water features will be monitored in order to record any variations in the quality of the local surface water environment related to the proposed project. The main water parameters in terms of their potential to cause damage to aquatic life, ecosystems and water quality in the receiving waters are outlined in the SWMP (Chapter 2 – Description of Proposed Project, Appendix 2-7 – Surface Water Management Plan).

5.12.3 Groundwater Monitoring

The dewatering operations will be inspected once each day when dewatering is taking place to ensure that dewatering treatment controls are working correctly and to evaluate whether there are observable indicators of sediment discharges. Where any issues are encountered, action will be undertaken to correct any problems at the proposed project or with the dewatering controls that may have contributed to the discharges.

Regular monitoring of groundwater (levels and quality) will take place using existing monitoring boreholes (Chapter 8 – Hydrology and Hydrogeology, Figure 8-12) during the construction phase. The existing groundwater monitoring wells on site will be monitored on site during construction and for a period following cessation of construction activities (to be agreed with the relevant authorities).

5.12.4 Pre-construction Confirmatory Surveys

The pre-construction confirmatory surveys will be carried out in suitable habitat, in advance of the construction works by the appointed ECoW.

5.12.4.1Derogation Licenses

NPWS derogation licences (under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011) apply only to species listed on Annex IV of the Habitats Directive. Based on the results of the detailed baseline surveys undertaken to date, no destruction to the breeding sites and/or resting places of Annex IV species is anticipated, and therefore Regulation 54 derogation licences are not required.

Based on the results of the assessment it is concluded that a derogation licence under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 is not required. If confirmatory pre-construction surveys or checks identify a change in the baseline environment, such as the establishment of a new bat roost or otter holt, a derogation licence will be obtained as required

5.12.4.2 FPO Species

The pre-construction confirmatory surveys for FPO species will be carried out in suitable habitat, a maximum of 12-18 months in advance of the construction works.

A suitably qualified ecologist will be employed to conduct the pre-construction confirmatory surveys for small-white orchid. The ecologist must be able to demonstrate sufficient experience in the identification of the Orchidaceae family. The surveys will be carried out during the flowering season (mid-May to mid-July) to maximise opportunity for locating local populations and to ensure reliable identification of the species (Walker, 2014). Surveys will be concentrated within the footprint of the proposed Wind Farm Site, specifically within the Wet grassland (GS4) at T6 and T13 and the Dry siliceous heath (HH1)/Dry humid acid grassland (GS3) habitat located at T3, which have been identified here as the most likely sites within the proposed Wind Farm Site to support suitable habitat. However, the survey area may be extended as appropriate following the professional expertise of the surveyor.

A suitably qualified ecologist will be employed to conduct the pre-construction confirmatory surveys for bristle-leaf. The ecologist must be able to demonstrate sufficient experience in the identification of Irish mosses and familiarity with bristle-leaf. Surveys will be concentrated within the footprint of the proposed Wind Farm Site specifically any sandstone outcrop associated with the Glenade Sandstone Formation, Mullaghmore Sandstone Formation, and Dergvone Shale Formation. This encompasses vertical, overhanging and/or shaded sandstone at T5, T7, T8 and T12 as well as in the area of the borrow pits to the south of T8 and the south-west of T13 and the internal access track which connects these borrow pits (Chapter 7 - Land, Soils and Geology). With the exception of T7, all of these areas are dominated by Conifer plantation (WD4) making these locations largely unsuitable for the species. As such, T7 is the most likely area for the identification of the species, within the proposed Wind Farm Site. However, the survey area may be extended as appropriate following the professional expertise of the surveyor.

Following pre-construction confirmatory surveys for FPO species, the surveyors will issue reports listing findings and the ECoW will make this report available to the Competent Authorities. The report will include the location of any identified populations of bristle-leaf and small-white orchid as well as the mapped extent of any habitat which is confirmed to support these species. Additional relevant information will also be included, such as any identified threats to the species or recommendations for habitat management.

If either bristle-leaf or small-white orchid is identified within the proposed Wind Farm Site during the pre-construction confirmatory surveys, the mitigation measures listed in Section 5.6.2.4.1.3 will be adhered to.

5.12.4.3Marsh fritillary

Pre-construction confirmatory surveys to identify the locations of marsh fritillary larval webs will be conducted during the optimum survey season within suitable habitat, which has potential to be affected by the Proposed Project.

5.12.4.4Common Frog

Based on the Irish Wildlife Manual statement, it is considered necessary to establish that common frog are not within the footprint of the development before construction begins.

The Irish Wildlife Manual: National Frog Survey of Ireland 2010/11 states *'Common frogs are among the earliest amphibians to breed as winter gives way to spring. Adults migrate to breeding ponds*

(unless they hibernated there) usually in February or early March, depending on latitude, altitude and local weather conditions'.

Pre-construction confirmatory surveys for common frog will be conducted during the spring season (1st March – 31st June, inclusive) in advance of any works at drainage ditches, slow flowing streams and pools where there is potential for the common frog to spawn. Suitable breeding habitat such as drainage ditches within the Proposed Project were noted during the baseline surveys and will inform where the pre-construction confirmatory surveys are to be carried out.

The mitigation measures outlined in Section 5.6.2.6.1 will be followed if frog spawn is located within the footprint of the proposed Wind Farm Site.

5.12.4.5Badger

A pre-construction confirmatory badger survey will be carried out by a suitably qualified ecologist prior to site clearance or works commencing and no more then 10-12 months in advance of construction, following best practice guidance (NRA, 2006b). Surveys will be conducted in suitable habitat within 150m of the footprint of the proposed Wind Farm Site infrastructure and along the GCR and over sail areas along the TDR (Section 5.6.2.7.1).

5.12.4.6European otter

A pre-construction confirmatory European otter survey will be undertaken no more than 10—12 months in advance of the construction works, following best practice guidelines as listed in *Guidelines for the Treatment of European otters prior to the Construction of National Roads Schemes* (NRA, 2008b). Surveys will be carried out during the winter months when vegetation is less dense making identification of European otter holts and couches easier (NRA, 2008b). Surveys will take place in suitable habitat along the river banks for 150m inclusive of Aquatic Site 14, 15, 17, 19 and 21 where there is evidence of European otter activity. In the event that a holt is identified during pre-construction confirmatory surveys within 150m of the works corridor, mitigation measures for European otter will be carried out as outlined in Section 5.6.2.1.5.

5.12.4.6.1 Pre-construction Confirmatory Bat Survey

Pre-construction confirmatory surveys will be carried out by a suitably qualified licensed bat ecologist following Collins (2003). This survey aims to identify the need for further surveys for bats, confirming that previously identified tree features are present as well as identifying new PRFs that may have formed in the interim. If required, the mitigation measures listed in Section 5.6.2.8.3 will be followed.

5.12.4.7Monitoring

5.12.4.7.1 Annex I Habitat Condition Assessment

To facilitate post-construction compliance monitoring, a series of permanent quadrats will be established within Annex I habitat types in the immediate vicinity (c. 150m) of T3. The quadrat data can be used to identify the floristic community of these habitats according to the Irish Vegetation Classification (IVC). Annex I habitat condition assessments will be carried out to evaluate on-going threats to the integrity of the habitat, which may inform future actions under the BEMP. The quadrats can be assessed and reported on in year 1, 2, 3, 5, and 10 post-construction.

5.12.4.7.2 Post-construction Bat Monitoring

Operational bat monitoring will be undertaken for a minimum of three years from the first year of operation. This will aim to determine the effectiveness of the curtailment program and an adaptive mitigation strategy through the windfarm's operation. Monitoring will include bat activity monitoring following the methodology outlined in Section 5.6.3.8. In addition to this carcass searches will be carried out to measure the success of the curtailment and mitigation in place. These will be undertaken following best practice guidance as outlined in NatureScot, 2021 utilising suitably trained and experience carcass search teams that utilise dog searches.

5.12.4.7.3 Curtailment Monitoring

If, following the initial three years of post-construction surveys, bat activity increases above the baseline and/or remains consistently high and carcass searches indicate fatalities are occurring, increased cut-in speeds will continue. This will subsequently be monitored in years 5, 7, 10, 15, 20, 25 and 30 with further review after each monitoring period.

Alternatively, if it is found that the results of bat activity surveys and fatality searches confirm that the level of bat activity at turbine locations is low then consent will be sought from Leitrim County Council (in consultation with NPWS) for the cessation in the requirement for these cut-in speeds/curtailment measures, or a reduction on the timing restrictions for these measures.

Where post construction acoustic surveys are undertaken as part of the operational phase monitoring, they will utilise full spectrum automatic detectors deployed, as a minimum, for one complete bat activity season.

An assessment of static data gathered during operational surveillance will be completed using the online analysis tool Ecobat as recommended by SNH (2021) as a minimum, or other equivalent guidance as dictated by up-to date standards and practices.

5.12.4.7.4 Bat Fatality Monitoring

Curtailment will be monitored for bat fatalities for the first three years of operation (post-construction surveys) and subsequently in years 5, 7, 10, 15, 20, 25 and 30 as part of the additional curtailment monitoring schedule. A comprehensive onsite fatality monitoring programme will be undertaken following published best practice (e.g., SNH 2021 or equivalent at the time of operation). Turbines T6, T7, T9, T10, T11, T12, T13 will be included in all searches (where bat activity is recorded as moderate and high).

Bat fatality monitoring will be carried out as follows:

- Carcass removal trials to establish levels of predator removal of possible fatalities. This will be done following best recommended practice and with due cognisance of published effects such as predator swamping, whereby excessive placement of carcasses increases predator presence and consequently skews results. At the time of writing (2025), predation trials set using trail cameras following guidance set out in (Smallwood, 2010) provides the most accurate results;
- Turbine searches for fatalities will be undertaken with the use of conservation dogs following best practice in terms of search area (minimum radius hub height) and at intervals selected to effectively sample fatality rates as determined by carcass removal trials. At the time of writing (2025), the typical search area surrounding the turbine

bases follow (Edkins, 2014) *Impacts Of Wind Energy Developments On Birds And Bats: Looking Into The Problem*, who recommends the 'search width should be equal to the maximum rotor tip height', e.g., turbines at the proposed project have a max tip height of 185 m thus the spread of searched area, as a rectangle, square or circle, should be 92.5 m in either direction form the turbine base;

- Search intervals will follow SNH (2021) guidance;
- Recorded fatalities will be calibrated against known predator removal rates to provide an estimate of overall fatality rates; and
- Monitoring report will be submitted annually to Leitrim County Council and the NPWS.

5.13 CONCLUSIONS

This Chapter presents an evaluation of the potential ecological effects of the Proposed Project on biodiversity, including potential likely significant effects on Important Ecological Features (IEFs) inclusive of European sites. Embedded mitigation as well as additional appropriate mitigation measures have been identified to reduce the magnitude of the significance of potential effects and the geographic context of importance at which these effects are likely to take place. Compensation measures have been identified to offset any residual effects following the implementation of mitigation.

The impact assessment has considered all elements of the Proposed Project in full, inclusive of the TDR and GCR as well as the design flexibility in relation to turbine models. The collision risk model for bat species uses the largest parameters within the design envelope, thereby representing a worst-case scenario that encompasses the collision risk associated with smaller turbine models. No other IEF considered within the biodiversity chapter will be impacted by the design flexibility for turbine models.

The potential for transboundary effects has been assessed and, taking account of the proposed mitigation measures, no likely significant effects on IEFs within Northen Ireland or any other neighbouring jurisdictions are anticipated.

The cumulative effects assessment, concludes that the Proposed Project, either individually or cumulatively with other projects, is not anticipated to result in likely significant effects on any of the identified IEFSs.

In summary, while potential pathways for likely significant effects exist, the combination of the proposed project design, mitigation measures, and compensation measures ensure that the Proposed Project is anticipated to result in **no significant overall residual effects** on the conservation objectives of IEFs.

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