

6 BIODIVERSITY

6.1 INTRODUCTION

6.1.1 Background

This chapter of the Environmental Impact Assessment Report (EIAR) assesses the effects of the Development on biodiversity. Furthermore, where negative effects are predicted, the chapter identifies appropriate mitigation strategies therein. The assessment considers the potential effects during the following phases of the Proposed Development:

- Construction of the Proposed Development
- Operation of the Proposed Development
- Decommissioning of the Proposed Development (final phase)

The Proposed Development refers to all elements of the application for the construction and operation of the proposed Derreenacrinnig West Wind Farm (**Chapter 2: Development Description**).

A Construction Environmental Management Plan (CEMP) is appended to the EIAR in **Appendix 2.1**. The CEMP will be further developed post consent/pre-construction once a contractor has been appointed and will cover the construction of the Proposed Development. It will include all of the mitigation recommended within the EIAR (see **Section 6.7**). For the purpose of this application, a summary of the mitigation measures is included in **Appendix 17.1**. In addition, a Habitat Management Plan (Draft HMP) is appended to the EIAR in **Appendix 6.2**.

The potential for the Proposed Development to have adverse effects on the integrity of any designated European Sites has been assessed within a Natura Impact Statement (NIS). Common acronyms used throughout this EIAR can be found in **Appendix 1.4**

This chapter of the EIAR is supported by Figures set out at the end of this chapter, and the following Appendices documents provided in **Volume III** of this EIAR:

- **Appendix 6.1:** Statement of Authority
- **Appendix 6.2:** Habitat Management Plan
- **Appendix 6.3:** Bird Survey Data

6.1.2 Scope

Doherty Environmental Consultants (DEC) Ltd. was commissioned by Jennings O'Donovan (JOD), on behalf of Dreenacreenig West Windfarm Limited to undertake an ecological impact assessment of the Proposed Development to inform the Biodiversity Chapter of an Environmental Impact Assessment Report (EIAR). The scope of this work is set out in

further detail in **Section 6.3**. This Chapter has been prepared by Mr. Pat Doherty, BSC, MSc, MCIEEM of DEC Ltd.

6.1.3 European and International Legislation

6.1.3.1 Council s Directive 92/43/EEC on the conservation of natural habitats and wild fauna and flora (“the Habitats Directive”)

The Habitats Directive provides the basis of protection for Natura 2000 sites, namely Special Protection Areas (“SPAs”) and Special Areas of Conservation (“SACs”). Article 6 of the EU Habitats Directive requires that any proposal that is likely to have a significant effect on any Natura 2000 site in view of its conservation objectives, individually or in combination with other projects must be subject to an Appropriate Assessment. An Appropriate Assessment is required in order to ascertain the potential impact of a proposal on the reasons for which the Site is designated, and thereby ascertain the potential for adverse effect on the integrity of the Site. An NIS has been prepared. This concludes that the Proposed Development will not, adversely affect the integrity of any European Site (Natura 2000 site).

The Habitats Directive also provides for the protection of species listed under Annex IV of the Directive wherever they occur. These species include otter and all bat species.

6.1.3.2 The Habitats Directive is transposed into Irish law inter alia by Part XAB of the Planning and Development Act 2000 as amended. EU Birds Directive

Directive 2009/147/EC on the conservation of wild birds (codified version) (“the Birds Directive”) establishes a system of general protection for all wild birds throughout the European Union. Annex I of the Birds Directive comprises 175 bird species that are rare, vulnerable to habitat changes or in danger of extinction within the European Union. Article 4 establishes clearly that wherever those species occur, they must be the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in the area of distribution. Similar actions must be taken by Member States regarding migratory species, even if they are not listed in Annex I.

6.1.3.3 Bern and Bonn Convention

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982) exists to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries.

6.1.3.4 EU Water Framework Directive 2000/60/EC

The Water Framework Directive (WFD), which was passed by the European Union (EU) in 2000, and came into legal effect in December 2015, is wide-reaching legislation which replaces a number of the other water quality directives (for example, those on Water Abstraction) while implementation of others (for example, The Integrated Pollution Prevention and Control and Habitats Directives) will form part of the 'basic measures' for the Water Framework Directive. The fundamental objective of the Water Framework Directive aims at maintaining "high status" of waters where it exists, preventing any deterioration in the existing status of waters and achieving at least "Good" in relation to all waters by 2027 (WFD).

6.1.3.5 UN Convention on Biological Diversity (CBD)

The CBD entered into force on 29 December 1993. It has 3 main objectives: 1. The conservation of biological diversity. 2. The sustainable use of the components of biological diversity. 3. The fair and equitable sharing of the benefits arising out of the utilization of genetic resources. National Legislation Parties to the CBD are required to submit a National Biodiversity Action Plan and report annually on the status of biodiversity and measures to address and reverse loss of biodiversity. Ireland's National Biodiversity Strategy and Action Plan (2017-2021) was submitted December 2017.

6.1.3.6 The Wildlife Act (1976) as amended and associated Regulations

The Wildlife Act 1976 gives protection to a wide variety of birds, animals and plants in Ireland. It is unlawful to disturb, injure or damage their breeding or resting place wherever these occur without an appropriate licence from National Parks and Wildlife Service (NPWS). The Act (as amended in 2000) protects all birds, their nests and eggs. Wilful destruction of an active nest from the building stage until the chicks have fledged is an offence. The Act also provides a mechanism to give statutory protection to Natural Heritage Areas (NHAs). The amendment in 2000 broadens the scope of the Wildlife Acts to include most species, including the majority of fish and aquatic invertebrate species which were excluded from the 1976 Act.

6.1.3.7 EC (Birds and Natural Habitats) Regulations 2011

The Habitats Directive is transposed into Irish law inter alia through the EC (Birds and Natural Habitats) Regulations 2011.

Annex IV of the Habitats Directive provides protection to a number of named species wherever they occur. These species are protected inter alia under Regulations 27, 29 and 51 of the Habitats Regulations 2011.

6.1.3.8 *Planning and Development Act 2000, as amended*

For the purposes of an application for planning permission the protection of biodiversity is provided for in the 2000 Act, as amended, and the Planning and Development Regulations 2001, as amended, which transpose provisions of the Habitats and Birds Directives.

6.1.3.9 *Flora (Protection) Order (FPO), 2022*

The current list of plant species protected by Section 21 of the Wildlife Act, 1976 is set out in the Flora (Protection) Order, 2022, which supersedes orders made in 1980, 1987, 1999 and 2015.

It is illegal to cut, uproot or damage the listed species in any way, or to offer them for sale. This prohibition extends to the taking or sale of seed. In addition, it is illegal to alter, damage or interfere in any way with their habitats. This protection applies wherever the plants are found and is not confined to sites designated for nature conservation.

6.1.3.10 *The European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. 272 of 2009) and as amended*

The regulations establish legally binding quality objectives for all surface waters and environmental quality standards for pollutants for purposes of implementing provisions of E.U. legislation on protection of surface waters. These regulations clarify the role of public authorities in the protection of surface waters and also concern the protection of designated habitats.

6.1.3.11 *European Union Environmental Objectives (Freshwater Pearl Mussel) (Amendment) Regulations 2009 to 2018*

The purpose of these Regulations is to support the achievement of favourable conservation status for freshwater pearl mussels. To that end, they:

- (a) Set environmental quality objectives for the habitats of the freshwater pearl mussel populations named in the First Schedule to these Regulations that are within the boundaries of a site notified in a candidate list of European sites, or designated as a Special Area of Conservation, under the European Communities (Natural Habitats) Regulations, 1997 (S.I. No. 94/1997).

(b) Require the production of sub-basin management plans with programmes of measures to achieve these objectives.

(c) Set out the duties of public authorities in respect of the sub-basin management plans and programmes of measures.

6.1.4 Policy

6.1.4.1 National Biodiversity Action Plan

Ireland's 4th National Biodiversity Action Plan (NBAP) sets the national biodiversity agenda for the period 2023-2030 and aims to deliver the transformative changes required to the ways in which we value and protect nature.

The 4th NBAP strives for a "whole of government, whole of society" approach to the governance and conservation of biodiversity. The aim is to ensure that every citizen, community, business, local authority, semi-state and state agency has an awareness of biodiversity and its importance, and of the implications of its loss, while also understanding how they can act to address the biodiversity emergency as part of a renewed national effort to "act for nature".

This National Biodiversity Action Plan 2023-2030 builds upon the achievements of the previous Plan. It will continue to implement actions within the framework of five strategic objectives, while addressing new and emerging issues:

- Objective 1 - Adopt a Whole of Government, Whole of Society Approach to Biodiversity
- Objective 2 - Meet Urgent Conservation and Restoration Needs
- Objective 3 - Secure Nature's Contribution to People
- Objective 4 - Enhance the Evidence Base for Action on Biodiversity
- Objective 5 - Strengthen Ireland's Contribution to International Biodiversity Initiatives

Of the above objectives, Objective 3 has particular relevance for planning and development. Outcome 3c sets out a number of actions and targets that aim to facilitate and secure biodiversity's contribution to people. Outcome 3C1 sets out an action for all Public Authorities and private sector bodies to move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure.

6.1.5 Local Policy

The Cork County Development Plan 2022 – 2028 came into effect on the 6th June 2022. Chapter 15: Biodiversity and Environment, of the County Development Plan sets out Policies and Objectives for Biodiversity. The overarching policy set out in the County

Development Plan (County Development Plan) is outlined in Objective BE 15-1: Support and comply with national biodiversity protection policies.

Objective BE 15-2 seeks to protect natural heritage sites which are designated or proposed for designation under European/National legislation and International Agreements. This objective also seeks to protect statutorily protected flora as well as areas of local biodiversity value, ecological corridors and habitats that are features of the County's ecological network. This network includes rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands as well as coastal and marine habitats. It particularly includes habitats of special conservation significance in Cork as listed in Volume 2 of the Plan.

Objective BE 15-6 sets out the provision for the protection and enhancement of biodiversity in the development management process.

6.1.6 Guidance

6.1.6.1 *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Local Authorities (2010)*

The 'Appropriate Assessment of Plans and Projects in Ireland – Guidance for Local Authorities' ("the Appropriate Assessment Guidance")¹ provides methodological and legislative guidance on Appropriate Assessment for any developments that may impact on Natura 2000 sites in Ireland. These guidelines are highly relevant in assessing the potential impact on Natura 2000 sites.

6.1.6.2 *CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal*

The 'CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine'² (the CIEEM Guidelines"), published by the Chartered Institute of Ecology and Environmental Management ("CIEEM"), are the acknowledged reference on ecological impact assessment and reflect the current thinking on good practice in ecological impact assessment across the UK and Ireland. They are consistent with the British Standard on Biodiversity, which provides recommendations on topics such as professional practice, proportionality, pre-application discussions, ecological surveys,

¹ Department of Environment, Heritage and Local Government (2010) Appropriate Assessment of Plans and Projects in Ireland – Guidance for Local Authorities – Available at:

https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf (Accessed March 2023).

² CIEEM (2018 v 1.1) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester. Version 1.1. Updated September 2019 – Available online at: <https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-Sept-2019.pdf> (Accessed March 2023).

adequacy of ecological information, reporting and monitoring. These CIEEM Guidelines have the endorsement of the Institute of Environmental Management and Assessment ("IEMA"), the Chartered Institute of Water and Environmental Management (CIWEM), Northern Ireland Department of the Environment (DoE NI), Scottish Natural Heritage (SNH), The Wildlife Trusts and other leading environmental organisations.

6.1.6.3 Guidelines on the information to be contained in Environmental Impact Assessment Reports

The Environmental Protection Agency (EPA) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports', which were published in 2022, were prepared in accordance with the 1992 Environmental Protection Agency Act (Section 72), which requires the EPA to prepare guidelines on information to be contained in environment impact assessment reports.

The Guidelines have been drafted with the primary objective of improving the quality of EIARs with a view to facilitating compliance with the EIA Directive (Directive 2014/52/EU). By doing so they contribute to a high level of protection for the environment through better informed decision-making processes. They are written with a focus on the obligations of developers who are preparing EIARs.

The Guidelines are also intended to provide all parties in the EIA process, including competent authorities (CAs), with an authoritative reference to be regarded when considering an EIAR.

6.2 OVERVIEW OF THE DEVELOPMENT

The Proposed Development will consist of the following:

- Construction of 3 No. wind turbines with an overall ground to blade tip height of 119.3m with a rotor diameter of 82m and a hub height of 78.3m.
- Construction of 1 no. permanent 20kV electrical, all associated electrical plant and equipment, all associated underground cabling, and all ancillary structures and works.
- Construction of one Temporary Construction Compound with associated temporary site offices, parking areas and security fencing.
- Upgrade and reuse of existing hardstands.
- Upgrade and reuse of existing internal site access roads.
- Provision of Biodiversity Enhancement Area.
- All associated underground electrical and communications cabling connecting the wind turbines to the wind farm Electrical Substation.

- Construction of approximately 10.75 km of 20 kV overhead line (OHL) along the Grid Connection route, the OHL to be constructed consists of c. 157 wood poles (ranging from 9m to 15m above ground) supporting electrical conductor lines and ancillary structures and equipment.
- Installation of approximately 3.3 km of underground cable ducting and associated electrical cabling, and all other ancillary works including joint bays, culverts, marker posts and all associated developments.
- Construction Haul Route works along the L-8767, L-4711, and L-8765.

A 10-year planning permission and 40-year operational life from the date of commissioning of the entire wind farm is being sought. However, part of the Electrical Substation and all of the Grid Connection will be handed over to ESB networks to own and operate. As part of the national grid infrastructure, their life can extend beyond the life of the wind farm. Accordingly, permission is sought for the Grid Connection and Electrical Substation in perpetuity.

6.3 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

Ecology surveys of the Site were undertaken following specific guidelines for habitats and species as outlined in the following sections, and with reference to the legislation and policy outlined in **Section 6.2**.

The importance of the habitats and species present is evaluated using the guidance document Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal, and Marine published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2024 v.1.3). This document outlines an accepted approach for the evaluation of potential impacts from such developments.

6.3.1 Desktop Survey

A desktop assessment was carried out to collate available information on the ecological Baseline of the proposed land-holding and surrounding area. Consultation was undertaken with current landowners as well as relevant statutory and non-statutory agencies. In addition to the above the following research was also undertaken:

- A review of the National Biodiversity Database Centre (NBDC) to identify the presence or otherwise of protected species occurring within close proximity to the proposed Site;
- A review of the NPWS online database to identify the presence or otherwise of designated conservation areas (i.e. SPAs, SACs, NHAs etc.);

- A review of Site-specific Conservation Objectives (SSCO) mapping, published by the NPWS, for SACs and SPAs;
- A review of EPA water quality data, on-line mapping and catchment information;
- A review of relevant Inland Fisheries Ireland (IFI) reports;
- A review of the online Bat Conservation Ireland Batlas;
- A review of the New Atlas of the British and Irish Flora (Preston et al., 2002);
- Review of aerial photography, satellite imagery and historical mapping for the proposed Site.

6.3.1.1 Existing Ecological Records

The NBDC were consulted in order to establish historic records of important and protected species, or the likelihood of their occurrence (through range information).

Important and protected species includes those identified in the Wildlife Act (as amended), listed under the FPO, and in the EU Habitats and Birds Directive.

NBDC collects and manages biodiversity data for the island of Ireland and incorporates data from a number of different sources. The NBDC records were reviewed to inform this assessment. An area of search was used to collate all records held for the Site and a surrounding buffer area of 2 km. A 2 km distance was set as this buffer area will provide adequate coverage for all terrestrial non-volant mammal species, invertebrate species and flora species that may be sensitive to the Proposed Development. For instance, terrestrial mammals species are sensitive to Proposed Development activities to a distance of c. 150m from the source of the activity (NRA, 2007). The area of search is shown on **Figure 6.1**. A wider search area was used to collate records for bat species in the surrounding area. All records for bat species held for the hectad S10 were explored.

6.3.1.2 Consultations

Scoping letters were issued to the list of stakeholders outlined in **Chapter 1: Introduction**. In relation to this Biodiversity chapter, consultation responses have been received from the National Parks and Wildlife Service (NPWS) / Development Applications Unit (DAU), Inland Fisheries Ireland (IFI), the Irish Peatland Conservancy Council (IPCC) and An Taisce. A summary of the responses received is provided in **Table 6.1**. These responses are provided in full in **Appendix 1.3** of this EIAR.

Table 6.1: Biodiversity Consultation Conducted to Inform the Development

Consultee	Response Details
DAU / NPWS	<ul style="list-style-type: none"> • The proposed wind-farm is within the range of the recently re-introduced white-tailed sea eagle, a species listed in Annex I of the EU Birds Directive (Council Directive 2009/147/EC). This species is particularly susceptible to collision with wind turbine blades. Norway, 39 white-tailed eagle deaths were recorded from such collisions at one large wind-farm (Smøla) between 2005-2010. Four deaths due to wind turbine collisions had been recorded in Ireland, representing 10% of total mortality between 2007 and 2014 • The EIAR should give specific consideration to the mobilisation of silt and changes to the stability of soil. • Concerns regarding the potential loss and/or degradation of blanket bog, wet heath, dry heath, Molinia meadows and other peatland habitats arising from the overall wind farm proposal. • Detailed consideration should be given to the potential amount of peat / soil excavated, stored, and disposed/recovered. A detailed plan for the safe storage, disposal and rehabilitation of excavated or disturbed peat /soil would have to form part of the EIAR. • detailed site drainage map would be required and should show all existing watercourses, drainage ditches, flushes, lakes or ponds; new drainage ditches; all outfall points to watercourses or lakes; and all settlement ponds. • The associated impacts of quarrying or extraction should be included among the considerations at the earliest stages of project planning and design, and should be assessed fully in the EIAR. • Reinstatement or restoration plans would be required for any quarries or borrow pits on-site and should be included in the EIAR. • Any tree felling of forested sites should be included as an intrinsic element of the overall Proposed Development, the impacts and implications of which should be assessed fully in the EIAR. • The likely impacts of Grid Connection, particularly for birds, sensitive habitats and surface waters, should be given full consideration at the EIA stage. • Any losses of biodiversity habitat associated with this Proposed Development (including access roads and cabling etc.) such as woodland, scrub, hedgerows and other habitats should be mitigated for. In addition, Annex I habitats which occur outside the Natura 2000 network are

Consultee	Response Details
	<p>important in terms of biodiversity conservation. The presence of any Annex I habitats outside the network should be given due consideration as part of the consideration of biodiversity matters generally for the Proposed Development. The loss of Annex I habitats outside SACs should be avoided. It should be noted in this regard that the Project site contains potential annexed habitat such as the peatland types listed above and in addition assessments of potential effects on the Lakes and rivers (including those proposed for crossing) occurring along the grid route should also evaluate its potential EU Annex I habitat status.</p> <ul style="list-style-type: none"> • Target species for this site include Annex I (Birds Directive) species such as White Tailed Sea Eagle, Merlin, Kingfisher and Peregrine Falcon, and red listed Birds of Conservation Concern (BoCCI) such as Kestrel, Snipe, Woodcock, Meadow Pipit and Red Grouse. • Potential significant effects on the aforementioned target species requiring assessment include collision effects, displacement effects, barrier effects, direct and indirect habitat loss and degradation, in combination effects, cumulative impact effects etc. In combination effects and cumulative impacts assessments must include those arising from the other wind farms in the population areas (as well as from the adjacent windfarms), with data required in terms of best scientific evidence of, for example, the area of displacement/foraging loss through these developments (or others). It should be noted that this point is also applicable in terms of semi-natural habitat loss.

6.3.2 Site Investigations at the Wind farm Site

6.3.2.1 Habitat Survey

Habitat surveys have been carried out at the Site between September 2021 and September 2024. Habitat surveys were carried out to identify, describe, map and evaluate habitats and to verify information gathered at the desk study stage. The habitat surveys were completed on the 18th September, 2021; 8th June 2023; 31st July, 2023; and 30th August 2024.

ArcGIS and ESRI Field Maps were used to collect information on vegetation and habitats during the habitat surveys. A preliminary habitat map was drawn using ArcMap following the completion of the initial habitat survey completed on the 18th September 2021 and again on the 8th June 2023. The preliminary habitat map was then further interrogated during

subsequent habitat and vegetation community surveys between 8th June 2023 and 30th August 2024.

6.3.2.2 Aquatic Surveys

Biological macro-invertebrate surveys were completed at four number locations along two separate watercourses that drain the wind farm site. These streams are the Derreenacrinnig East Stream and an un-named first order tributary of the Meelagh River to the north of the proposed wind farm site. The location of these sampling points is shown on **Figure 6.2**. The biological water quality survey was based on the Biotic Index or Q-value system as outlined by the EPA (McGarrigle, 2002).

Fisheries habitat assessment along these watercourses in the vicinity of the Project site was completed by recording the following parameters along each of the watercourse:

- Stream width and depth
- Substrate type, i.e. relative dominance of large rocks, cobble, gravel, sand, mud etc.
- Flow type, i.e. relative dominance of riffle, glide and pool in the sampling area.
- Dominant bank-side vegetation.
- In-stream vegetation.
- Estimated degree of shade by bank-side vegetation

Salmonid and lamprey habitat quality was assessed taking into account the factors listed above, and the quality of salmonid habitat was evaluated in line with the Department of Agriculture's (Northern Ireland) Fisheries Division Advisory Leaflet "*The Evaluation of Habitat for Salmon and Trout*".

6.3.2.3 Survey for Rare or Protected Flora

Whilst undertaking habitat and vegetation surveys particular attention was paid to searching suitable habitat for rare or protected flora species, to determine whether they were present within, or close to, the Proposed Development. Surveys were conducted during the optimum time of year for these species to occur, in order to assist in ascertaining their presence within, or close to the Site. It is noted that no FPO species were identified on the Site during the surveys completed during the 7 no. rounds of habitat and vegetation surveys between 2021 and 2025.

6.3.2.4 Terrestrial Mammal Surveys

A survey for field signs indicating the presence of terrestrial mammals and particularly otters was undertaken during the field surveys. This survey was undertaken during the daytime

and particular attention was given to habitat features normally associated with otters and other protected terrestrial mammals. Any mammal field signs typical of otter activity were recorded during the surveys. These field signs, as described in Neal & Cheeseman (1996) ⁽³⁾ and Bang & Dahlstrom (1990) ⁽⁴⁾, include:

- mammal breeding and resting places, such as setts, holts, couches, lairs;
- pathways;
- prints;
- spraints and faecal deposits;
- latrines (and dung pits used as territorial markers);
- prey remains and feeding signs (snuffle holes);
- hair; and
- scratch marks

6.3.2.5 Bats

6.3.2.5.1 Bat Activity Surveys

Bat activity surveys were undertaken during the 2024 bat activity season. The 2024 surveys have been informed by the NIEA NED (2021 & 2024) guidance document *Guidance on Bat Surveys, Assessment and Mitigation for Onshore Wind Turbine Developments in Northern Ireland*; the Scottish Natural Heritage (2019) guidance document *Bats and Onshore Wind turbines – survey, assessment and mitigation*; and Bat Conservation Trust (BCT) Guidelines (Collins, 2023). Extended automatic monitoring for bat activity has been undertaken during the spring, summer and autumn season of 2024. Wildlife Acoustics SM4BAT FS and Song Metre Mini (full spectrum) remote bat detectors were used during the 2024 bat surveys. All SM4BAT FS and Song Metre Mini detectors were set to record bat activity in full spectrum (at 192 kHz Stereo). SMX U2 microphones were used with the SM4BAT FS and Song Metre Mini recorders. Fresh branded batteries (e.g. Duracell; Panasonic) were used at the start of each monitoring session.

The bat monitoring surveys were completed in accordance with the NIEA Natural Environment Division guidelines “*Guidance on Bat Surveys, Assessment & Mitigation for Onshore Wind Turbine Developments – Version 1.1*” August 2021 and March 2024. The monitoring surveys completed meet the requirements set out in these guidelines for the completion for monitoring at low-risk sites. The NIEA guidelines require a minimum of 10

(3) Neal, E., & Cheeseman, C., (1996). 'Badgers'. Poyser Natural History, London.

(4) Bang, P., & Dahlstrom, P., 'Animal Tracks and Signs'. Oxford University Press, Oxford.

nights monitoring per season to be completed at low-risk sites at each turbine for a wind farm of a size comprising 4 turbines. This would amount to a total of 30 nights monitoring during a bat activity season at each turbine. It is noted that bat activity monitoring was completed for greater than 10 nights during each season (see **Table 6.2**) and as such the monitoring completed meets and exceeds the recommendations set out in the NIEA guidelines.

All automatic bat detectors were mounted at least 2m above ground level. The location of each automatic monitoring point was positioned adjacent to the proposed turbine locations as shown on **Figure 6.3**. Each detector was set to record nightly from 30 minutes before sunset and 30 minutes after sunrise.

Table 6.2 provides information on the monitoring completed during the 2024 bat activity season.

Table 6.2: Details of Automatic Monitoring

MP No.	Turbine No.	Dates	No Monitoring Nights	Season	Detector Type
T1	T1	30/04/2024 – 17/05/2024	18	Spring	SM4 Bat FS
		24/07/2024 – 12/08/2024	19	Summer	SM4 Bat FS
		02/09/2024 – 14/09/2024	13	Autumn	SM Mini Bat 2 FS
T2	T2	30/04/2024 – 17/05/2024	18	Spring	SM Mini Bat 2 FS
		24/07/2024 – 12/08/2024	19	Summer	SM Mini Bat 2 FS
		02/09/2024 – 14/09/2024	13	Autumn	SM Mini Bat 2 FS
T3	T3	30/04/2024 – 17/05/2024	18	Spring	SM Mini Bat 2 FS
		24/07/2024 – 12/08/2024	19	Summer	SM Mini Bat 2 FS
		02/09/2024 – 14/09/2024	13	Autumn	SM Mini Bat 2 FS

The habitats occurring at each of the monitoring points shown in **Figure 6.3** are described in **Table 6.3** below.

Table 6.3: Description of Automatic Detector Locations

No.	Habitat	Habitat Category	Description
MP1	Open Upland Acid Grassland/Heath	Open	The microphone was mounted onto the stay wire of an electricity pole a short distance (i.e. 50m) to the west of T1.
MP2	Open Acid Grassland/Heath and Artificial Surface Edge	Open	The microphone was mounted onto the top of a pole at a height of approximately 2m at the edge of the existing hardstand area.
MP3	Open Acid Grassland/Heath and Artificial Surface Edge	Open	The microphone was mounted onto the top of a pole at a height of approximately 2m at the edge of the existing hardstand area.

In addition to the automatic surveys, manual activity surveys have also been undertaken at the proposed wind farm. The manual surveys have been completed in accordance with the Bat Conservation Trust Guidelines for Onshore Wind Farms. A night-time manual activity survey, involving a foraging transect along the proposed wind farm layout and along the edge of conifer plantation to the north was completed. Surveys were completed on the 17th May, 24th July and 14th September 2024. The transect used is shown on **Figure 6.3**. Transect surveys commenced at sunset and took approximately 2 hours to complete. An Echometer Pro bat detector was used during the manual transect surveys.

6.3.2.5.2 Bat Roost Surveys

No structures occur within the Proposed Development boundary or within 200m of the boundary. As such no roost surveys of structures were required or completed for the Project. No mature trees with potential for support roosting bats occur within the Proposed Development site. Trees occurring within the vicinity of the Project site are thin stemmed Sitka Spruce plantation trees to the north which do not support preferred roost features and are no suitable for supporting roosting bats.

6.3.2.6 Bird Surveys

6.3.2.6.1 Guidance

The methodology for this appraisal has been devised in consideration of the following relevant guidance published by the Environmental Protection Agency (EPA) '*Guidelines on the information to be contained in Environmental Impact Assessment Reports*' (EPA, 2022) and '*Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*' (DoHPLG, 2018) and the Chartered Institute of Ecology and Environmental Management (CIEEM) '*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Version 1.1)*' (CIEEM, 2024).

Additional guidance available from the EU such as '*Guidance document on wind energy developments and EU nature legislation*' (2020) and '*Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment*' (2013) has also been considered.

Relevant guidance from Scottish Natural Heritage (SNH) in relation to birds such as SNH '*Recommended bird survey methods to inform impact assessment of onshore windfarms* (2017).

6.3.2.6.2 Desktop Study

The main sources of general information relating to bird that were used as part of the desktop study comprise:

- The journal, Irish Birds, published by BirdWatch Ireland
- Records from the NPWS website (www.npws.ie)
- Records from the National Biodiversity Data Centre website (www.biodiversityireland.ie)
- The Atlas of Breeding Birds in Britain and Ireland (Sharrock, 1976)
- The Atlas of Wintering Birds in Britain and Ireland (Lack, 1986)
- The New Atlas of Breeding Birds in Britain and Ireland 1988-1991 (Gibbons *et al.* 1993)
- Bird Atlas 2007-2011. The breeding and wintering birds of Britain and Ireland (Balmer *et al.* 2013)

In addition to the above, a thorough review of the findings of bird surveys for other wind farm projects occurring in the wider surrounding area was also undertaken. Of particular relevance in this regard are the findings of Baseline bird surveys completed for the Gortloughra Wind Farm, located approximately 6 km to the northwest.

6.3.2.6.3 Vantage Point Survey

The primary objective of the bird surveys completed for the proposed wind farm is to:

- Establish the presence and behaviour of raptors (and in particular hen harrier and merlin) over the wind farm site;
- Obtain data on the movements of target species (hen harrier and merlin) which would facilitate an analysis of foraging activity and collision risk;
- Identify any nest sites or winter roost sites used by hen harriers or other raptors;
- Identify any flight paths used by non-breeding waterfowl.

The bird surveys involved vantage point surveys of the proposed turbine locations and existing operational wind turbines. The methodology adopted for the vantage point surveys was derived from the Scottish Natural Heritage (SNH) *Recommended bird survey methods to inform impact assessment of onshore wind farms* (2017). SNH guidance for surveys at wind farms recommend that field surveys focus on those species of high nature conservation value for which there is potential for impacts to occur. These target species in Ireland are derived from the following sources:

- Bird species listed on Annex 1 of the EC Birds Directive;
- Special conservation interest bird species of the SPAs that occur within the zone of influence of a project; and
- those species that are of medium (amber) and high (red) conservation concern (i.e. Red Listed species).

The list of target species applicable to the Derreenacrinnig West Wind Farm has been refined following the results of the Baseline field surveys and the species, falling into the above listed sources, that were recorded during surveys and identified as key ornithological receptors for the Derreenacrinnig West Wind Farm.

Where species that are listed under the above listed sources were recorded during Vantage Point surveys the following information was to be recorded:

- The number of individuals of each target species in flight;
- The length of time the target species was viewed in flight;
- The estimated flight height of each target species recorded during Vantage Point surveys. The flight height is estimated by placing the flight into one of three height bands: >125m; 35m to 130m; and <35m⁵; and
- The behaviour of the target species.

⁵ The flight bands are based on the minimum and maximum height (i.e. 35m and 125m respectively) of the rotor blade sweep of typical commercial wind turbines.

SNH guidance (SNH, 2017) outlines specific survey methodologies for onshore wind farm developments. These guidelines recommend that vantage point surveys should be completed across all calendar months when the species is present or likely to be so.

Two vantage points (**VP1** and **VP2**) were used for monitoring of the proposed wind farm and surrounding area. The location of these vantage points are shown on **Figure 6.4**.

The vantage points were selected following a viewshed analysis of the proposed wind farm site, turbine's locations and the 500m buffer area surrounding the three no. turbines (i.e. the flight Survey Area (FSA)). The viewshed analysis was completed using QGIS software and is based on an observer height of 1.6m and an observable viewshed from the observer point at a height of 25m. The viewshed afforded from VP1 and VP2 is shown on **Figure 6.4**. The flights Survey Area (FSA) is also shown on **Figure 6.4**.

Surveys commenced in November 2022 and were continued monthly until March 2025, providing over 2 years of vantage point surveys. Surveys were completed during both the breeding and non-breeding seasons.

VP1 provided views over the proposed wind farm site and turbine positions from the southwest and the surrounding hinterland on the south facing side of Derreenacrinnig West hill sides. VP2 provides views over the proposed wind farm and the turbine positions from the northeast and the surrounding hinterland on the north facing side of Derreenacrinnig West hill sides.

A minimum of 36 hours surveying was completed at both VP1 and VP2 during each breeding and non-breeding season between November 2022 and March 2025.

A total number of 342 Hours (or 1,231,200 seconds) of vantage point surveying was completed from VP1 and VP2.

6.3.2.6.4 Transect Surveys

Transect surveys were completed during the 2023 and 2024 breeding seasons and during the 2022/2023 and 2023/2024 non-breeding season. During the breeding season the transect surveys were completed monthly between April and July inclusive. During the non-breeding season three no. repeat transect surveys were completed between the months of October to March.

The methodology used was a combination of the Brown and Shepherd (1993), Moorland Bird Survey (MBS) and Common Bird Census techniques. Surveys were undertaken in suitable weather conditions, avoiding times of heavy and persistent rain and strong winds. Birds were recorded in four distance categories, measured at right angles to the transect line (within 25 m, between 25 m - 100 m and over 100 m from the transect line) and those seen in flight only. Recording birds in distance bands gives a measure of bird detectability and allows relative population densities to be estimated if required (BTO, 2018). For the general wintering bird survey, the method utilised was the same as for the breeding bird transects, except it was undertaken in the winter season.

The breeding status of birds was determined using the criteria set out by Gibbons et al (1993). For example, birds were considered to be breeding if nests with eggs or young birds were seen or probably breeding if they were apparently holding territory, giving alarm calls etc. Other species seen or heard were recorded as present or possibly breeding, if in suitable habitat. Species were mapped using standard BTO registrations.

The location of transect surveys are shown on **Figure 6.5**.

6.3.2.6.5 Hinterland Bird Surveys

Hinterland surveys were carried out between November 2022 and March 2025. The hinterland vantage point locations are shown on **Figure 6.4**. The hinterland surveys from each of the hinterland vantage points were completed three time per season in line with the recommended number of visits to determine the presence and distribution of populations as set out by Gilbert et al. (2011). Timing and details of hinterland surveys are detailed in **Appendix 6.3**.

6.3.2.7 Kerry Slug

Given that the hardstand and access track footprint for the proposed wind farm is existing Kerry Slug surveys for the Proposed Development focused on the footprint of the proposed Grid Connection route. The approach to the Kerry Slug surveys along the proposed Grid Connection route within the wind farm site and between the wind farm site and the Electrical Substation at Bantry are set out in **Section 6.3.3** below.

6.3.2.8 Herpetofauna

Incidental records of herpetofauna were noted during all field surveys undertaken between 2021 and 2024.

6.3.2.9 Other species

Incidental observations of other species such as terrestrial invertebrates were recorded during field surveys.

6.3.3 Site Investigations along the Grid Connection Route

6.3.3.1 Habitat Survey

Habitat surveys were carried out on the 6th and 7th March 2017, 14th May 2017 and 19th, 22nd and 26th October 2018; 10th September 2021; 2nd & 3rd February 2022; 8th & 9th March 2022; 30th & 31st May 2024 to identify, describe, map and evaluate habitats and to verify information gathered at the desk study stage. The basis of the surveys undertaken on the above dates comprised ground truthing of the preliminary habitat map prepared during the desktop assessment and targeted Phase 1 Habitat surveys in areas identified as being representative of semi-natural habitats. The Phase 1 Habitat Survey of semi-natural habitats was completed with regard to the Heritage Council's publication Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011).

Ground truthing of "improved" habitats, such as improved grassland and artificial built surfaces, was undertaken by visually assessing land cover from points along the Grid Connection route. Points along public roads intersecting the route and at vantage points overlooking the proposed route were used to ground truth the improved habitats mapped during the preliminary habitat mapping exercise.

Further ground-truthing surveys of the habitat surveys completed in 2017 and 2018 were undertaken in September 2021.

In this report, scientific and common names for higher plants follow those in the Botanical Society of the British Isles (BSBI) standard list, published on its website www.bsbi.org.uk. Scientific and common names for bryophytes follow Smith (2004). Scientific and common names of mammals follow Whilde (1993).

6.3.3.2 Terrestrial Mammals

A survey for protected ground dwelling mammals, particularly badgers, was completed along proposed underground sections of the Grid Connection route. Surveys were completed on the 14th May 2017. The survey for ground-dwelling mammals along the underground section of the proposed Grid Connection route were repeated during surveys on the 10th September 2021. The mammal survey involved walking either side of hedgerows and other field boundaries bisected by or parallel to the proposed underground

sections of the Grid Connection route. These field signs, as described in Neal & Cheeseman (1996) and Bang & Dahlstrom (2006), include:

- mammal breeding and resting places, such as setts, holts, lairs;
- pathways;
- prints;
- faecal deposits;
- latrines (and dung pits used as territorial markers);
- feeding signs (snuffle holes);
- hair; and
- Scratch marks.

6.3.3.3 Kerry Slug

6.3.3.3.1 Suitable Habitat along the Proposed Grid Connection Route

Suitable habitat occurs along the proposed Grid Connection route and within adjacent to the wind farm site boundary, in areas that are dominated by open heathland habitat with frequent outcropping of sandstone rocks. The area of suitable habitat occurring within/adjacent to the wind farm site is located outside of the footprint of the proposed wind farm. Given that the footprint of the proposed wind farm will utilise existing infrastructure and there will be no disturbance to areas of suitable habitat within the wind farm site, no dedicated Kerry Slug habitats were completed within the boundary of the proposed wind farm. Potential suitable habitat that was targeted for dedicated Kerry slug surveys comprised areas of blanket bog, wet heath, and dry heath along the proposed Grid Connection route corridor. In addition to these habitats the areas of humid acid grassland occurring along the proposed Grid Connection route corridor were also surveyed for their potential to function as suitable Kerry slug habitat. The location of suitable Kerry Slug habitat occurring along the proposed Grid Connection route and within/adjacent to the wind farm site boundary are shown on **Figure 6.6**. These locations include the sections of the proposed Grid Connection route between:

- pole set location 21 to 27 and associated access route surveyed on the 3rd February 2022.
- pole set location 37 to 53 and associated access route surveyed on the 9th March 2022.
- pole set location 63 to 81 and associated access route surveyed on the 9th March 2022.
- pole set location 112 to 113 and associated access route surveyed on the 3rd February 2022.
- pole set location 120 to 127 and associated access route surveyed on the 2nd February 2022.

- pole set location 135 to 157 and associated access route surveyed on the 2nd February 2022.

6.3.3.4 Daytime & Night-time Surveys

The surveys involved a walked transect along the proposed Grid Connection route, at all pole set locations within these habitats and along the access routes to be used to access pole set locations within these areas. Each of these areas were searched for the presence of Kerry slug and the suitability of habitat occurring within these areas to support Kerry slug was recorded.

Details recorded at poles sets and along the transect line of the proposed Grid Connection route and associated access routes included vegetation type, sward height and the presence of rock outcrop.

Areas identified during the daytime habitat suitability survey as being of suitable habitat potential for Kerry slug were targeted for night-time searches. Night-time Kerry slug searches were completed on the 3rd and 9th March 2022. The areas identified for targeted night-time surveys and Kerry Slug searches were between the following pole set locations:

- pole set location 21 to 27 and a transect survey offline of the proposed Grid Connection route to the north of pole set location 24, surveyed on the 3rd February 2022;
- pole set location 39 to 49 and survey transects offline in areas of exposed sandstone outcrops to the west of pole set location 42, 43 and 44, surveyed on the 9th March 2022;
- pole set location 66; 72 to 75 surveyed on the 9th March 2022; and
- pole set location 148 to 157; areas of exposed sandstone outcrops to the west of pole set location 155 and 156; a survey transect offline of the proposed Grid Connection route orientated west to east between pole set location 157 and the farm gate at the public road at grid reference location 510815 551080, surveyed on the 9th March 2022.

Conditions during the surveys were good for Kerry Slug surveys with rain and damp conditions preceding and/or occurring during the surveys.

6.3.3.4.1 Turbine Delivery Route Surveys

The Turbine Delivery Route (TDR) will be restricted to the existing public road corridor between the Port of Cork and the Site. It is proposed to provide road widening for turbine deliveries along the section of the route between Castledonavan Castle and the entrance to the wind farm site. A habitat survey of proposed widening locations has been completed as part of the habitat surveys. The Level 3 habitat occurring at these locations and the vegetation associated with these habitats was recorded during the surveys.

6.3.3.5 Limitations and Coverage

Limitations can arise during the course of ecological assessments. These limitations may be foreseen, whilst others will not present themselves until the assessment is underway. The limitations can be associated with methods, equipment and health and safety considerations.

Habitat surveys were completed throughout the year, during the optimum growing season as well as outside of the growing season. Habitat surveys were completed during optimum weather conditions, with low winds and dry and bright conditions prevailing.

Limitations noted during bat surveys, analysis and assessment include:

- Difficulties inherent in assigning all bat calls to species level;
- The sensitivity of bat detector equipment to the calls of different bat species, with calls of some species more easily detected (e.g. Leisler's bat) than others (e.g. brown long-eared bat).

6.3.4 Impact Assessment Methodology

6.3.4.1 Establishing the Potential Zone of Influence (Zoi) of the Development

The 'zone of influence' for a development is the area over which ecological features may be subject to significant impacts as a result of the Proposed Development and associated activities. The Zone of Influence (Zoi), or distance over which a likely significant effect may occur will differ across the Ecological Receptors identified for the Proposed Development, depending on the potential impact pathway(s). The results of both the desk study and the suite of ecological field surveys undertaken have established the habitats and species present at and surrounding the Site. The Zoi is then informed and defined by the sensitivities of each of the ecological receptors present, in conjunction with the nature and potential impacts associated with the Proposed Development.

The Zoi of the Proposed Development in relation to terrestrial habitats is generally limited to the footprint of the Proposed Development, and the immediate environs. Disturbances to the hydrological regime of wetland/aquatic habitats from impact sources can often result in impacts occurring at distances beyond the immediate adjacent areas of the impact source. With regard to hydrological impacts, the distances over which aqueous pollutants are likely to remain at concentrations that have potential to result in perturbations to water quality and associated freshwater habitats is difficult to quantify. The potential for such effects to occur are also highly site-specific and related to the predicted magnitude of any pollution event.

The impact of a pollution event will depend on the volumes of discharged waters, concentrations and types of pollutants (in the case of the Proposed Development these being comprised of sediment, hydrocarbons, cement-based products and other related construction solutions), volumes of receiving waters, and the sensitivity of the ecology of the receiving waters. With respect to the Proposed Development, this includes all freshwater habitat and ecological receptors downstream of the Proposed Development that have been identified as ecological receptors.

The Zol for other terrestrial mammals in terms of potential impacts to breeding and resting places is 150 m from the Proposed Development. This distance is in line with the maximum distance for potential disturbance to terrestrial mammals (otters and badgers) as specified by TII guidance documentation (NRA, 2009 a & b).

The Zol for herpetofauna is considered to be limited to the direct habitat loss arising from the Proposed Development.

6.3.4.2 *Evaluating Ecological Features within the Zone of Influence*

The nature conservation value of habitats and ecological sites occurring within the Site are based upon an established geographic hierarchy of importance as outlined by the National Roads Authority (NRA, 2009). The outline of this geographic hierarchy is provided below and this has been used to determine ecological value in line with the ecological valuation examples provided by the NRA (see NRA, 2009). The geographic evaluation hierarchy is as follows:

- International Sites (Rating A)
- National Importance (Rating B)
- County Importance (Rating C)
- Local Importance (higher value) (Rating D)
- Local Importance (lower value) (Rating E)

Table 6.4: Geographic frame of reference used to determine value of ecological resources⁶

Importance	Criteria
International Importance (Rating A)	<ul style="list-style-type: none"> • 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation. • Proposed Special Protection Area (pSPA). • Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). • Features essential to maintaining the coherence of the Natura 2000 Network. • Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. • Resident or regularly occurring populations (assessed to be important at the national level) of the following: <ul style="list-style-type: none"> ○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or, ○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. • Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). • World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). • Biosphere Reserve (UNESCO Man & The Biosphere Programme). • Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). • Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). • Biogenetic Reserve under the Council of Europe. • European Diploma Site under the Council of Europe.

⁶ Adapted from CIEEM 2018 v 1.1 - Available online at: <https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-Sept-2019.pdf> and NRA 2009 - Available at: <http://www.tii.ie/technical-services/environment/planning/Guidelines-for-Assessment-of-Ecological-Impacts-of-National-Road-Schemes.pdf> [Accessed March 2023].

Importance	Criteria
	<ul style="list-style-type: none"> Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
National Importance (Rating B)	<ul style="list-style-type: none"> Site designated or proposed as a Natural Heritage Area (NHA). Statutory Nature Reserve. Refuge for Fauna and Flora protected under the Wildlife Acts. National Park. Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park. Resident or regularly occurring populations (assessed to be important at the national level) of the following: <ul style="list-style-type: none"> Species protected under the Wildlife Acts; and/or, Species listed on the relevant Red Data list. Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.
County Importance (Rating C)	<ul style="list-style-type: none"> Area of Special Amenity. Area subject to a Tree Preservation Order. Area of High Amenity, or equivalent, designated under the County Development Plan. Resident or regularly occurring populations (assessed to be important at the County level) of the following: <ul style="list-style-type: none"> Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.

Importance	Criteria
	<ul style="list-style-type: none"> • County important populations of species; or viable areas of semi-natural habitats; or natural heritage features identified in the National or Local BAP; if this has been prepared. • Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. • Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local Importance (Higher Value) (Rating D)	<ul style="list-style-type: none"> • Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared. • Resident or regularly occurring populations (assessed to be important at the Local level) of the following: <ul style="list-style-type: none"> • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; • Species protected under the Wildlife Acts; and/or • Species listed on the relevant Red Data list. • Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality. • Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
Local Importance (Lower Value) (Rating E)	<ul style="list-style-type: none"> • Sites containing small areas of semi-natural habitat that are of some local importance for wildlife. • Sites or features containing non-native species that is of some importance in maintaining habitat links.

The Ecological Receptors of the Proposed Development are those features which are within the Zol and are evaluated as being of Local Importance or greater.

6.3.4.2.1 Identification & Evaluation of Bird Receptors

The approach to evaluating the conservation importance of bird species recorded during Baseline studies follows that outlined by Percival (2003). Percival sets out the conservation importance of bird species in terms of their “sensitivity”. Species sensitivity is ranked on a scale from very high to low. The criteria used to rank species sensitivity is outlined in **Table 6.5**.

Table 6.5: Criteria for Ranking Bird Sensitivity

Sensitivity	Determining Factor
Very High	Species listed as qualifying interests for SPAs and other statutorily protected nature conservation areas.
High	Species that contribute to the integrity of an SPA but which are not listed as qualifying interests for which the Site is designated. Ecologically sensitive species including the following: Divers; common scoter; hen harrier; golden eagle; red-necked phalarope; roseate tern; and chough. Species present in nationally important numbers (>1% Irish population).
Medium	Species on Annex 1 of the EC Birds Directive Species present in regionally important numbers (>1% regional (county) population) Other species on BirdWatch Ireland’s red list of Birds of Conservation Concern
Low	Any other species of conservation interest, including species of BirdWatch Ireland’s amber list of Birds of Conservation Concern not covered above.

6.3.4.3 Identification and Characterisation of Effects

When describing the magnitude or scale of ecological impacts reference should be made to the following characteristics:

- Positive or negative
- Extent: the size of the affected area/habitat and/or the proportion of a population affected by the effect
- Duration: the period of time over which the impact will occur. The EPA’s guidelines on information to be included in Environmental Impact Assessment Reports (EPA, 2022)

sets out the following terms for defining the duration of an impact: Momentary Effects - effects lasting from seconds to minutes; Brief Effects - effects lasting less than a day; Temporary Effects - effects lasting less than a year; Short-term Effects - effects lasting one to seven years; Medium-term Effects - effects lasting seven to fifteen years; Long-term Effects - effects lasting fifteen to sixty years; Permanent Effects - effects lasting over sixty years.

- Frequency & Timing: how often the effect will occur; particularly in the context of relevant life-stages or seasons; and,
- Reversibility: will the effect be permanent or temporary. Will an impact reverse, either spontaneously or as a result of a specific action.

The assessment describes those characteristics relevant to understanding the ecological effect and determining the significance, and as such it does not need to incorporate all stated characteristics (CIEEM, 2023 v.1.3).

6.3.4.3.1 Identification and Characterisation of Effects for Birds

Once the species/populations in the study area have been evaluated in terms of their sensitivity, as per **Table 6.5** above, the next step is to determine the magnitude of the possible impacts that may occur on those species/populations. The impact magnitude is based on the scale of loss or alteration to key elements/features of the Baseline conditions. It is noted that the assessment of impact magnitude and associated impact significance has been based on the maximum turbine parameters as set out in **Chapter 2**. Impact magnitude is ranked on a five-point scale from very high to negligible. **Table 6.6** outlines the criteria for determining the impact magnitude of wind farm developments.

Table 6.6: Criteria for Determining the Impact Magnitude

Magnitude	Description
Very high	Total loss or very major alteration to key elements/ features of the Baseline conditions such that the post development character/ composition/ attributes will be fundamentally changed and may be lost from the Site altogether. <i>Guide: < 20% of population / habitat remains</i>
High	Major loss or major alteration to key elements/ features of the Baseline (pre-development) conditions such that post development character/ composition/ attributes will be fundamentally changed. <i>Guide: 20-80% of population/ habitat lost</i>

Magnitude	Description
Medium	Loss or alteration to one or more key elements/features of the Baseline conditions such that post development character/composition/attributes of Baseline will be partially changed. <i>Guide: 5-20% of population/ habitat lost</i>
Low	Minor shift away from Baseline conditions. Change arising from the loss/alteration will be discernible but underlying character/composition/attributes of Baseline condition will be similar to pre-development circumstances/patterns. <i>Guide: 1-5% of population/ habitat lost</i>
Negligible	Very slight change from Baseline condition. Change barely distinguishable, approximating to the "no change" situation. <i>Guide: < 1% population/ habitat lost</i>

6.3.4.4 Significant Effects on Important Ecological Features

For the purpose of Ecological Impact Assessment, a 'significant effect', is an effect to an ecological feature from an impact, that either supports or undermines biodiversity conservation objectives for those ecological features which have been identified as important. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy). As such, effects can be considered significant in a wide range of geographic scales from international to local. Consequently, 'significant effects' should be qualified with reference to the appropriate geographic scale (CIEEM, 2024 v.1.3).

In order to predict likely ecological impacts and effects, the assessor must take account of the relevant aspects of the ecosystem structure and function, which include (CIEEM, 2024 v.1.3):

- The resources available (e.g. territory, prey availability, habitat connectivity etc.);
- Environmental processes (e.g. eutrophication, drought, flooding etc.);
- Ecological processes and relationships (e.g. population / vegetation dynamics, food webs etc.);
- Human influences (e.g. fertilisation, turbary, grazing, burning etc.);
- Historical context (natural range, trends etc.);
- Ecosystem properties (e.g. the carrying capacity, fragility etc.); as well as; and
- Other environmental influences such as air quality, hydrology, water quality, nutrient inputs and salinity etc.

The determination of significance is made in line with the terminology set out in the EPA's guidelines on information to be included in Environmental Impact Assessment Reports. These criteria are as follows:

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

6.3.4.4.1 Integrity

The integrity of an ecological receptor refers to the coherence of the ecological structure and function that enables the ecological receptor to be sustained (NRA, 2009). The term 'integrity' is most often used when determining impact significance in relation to designated areas for nature conservation (e.g. SACs, SPAs or pNHA/NHAs) but can often be the most appropriate method to use for non-designated areas of biodiversity value where the component habitats and/or species exist with a defined ecosystem at a given geographic scale.

An impact on the integrity of an ecological site or ecosystem is considered to be significant if it moves the condition of the ecosystem away from a favourable condition: removing or changing the processes that support the Sites' habitats and/or species; affect the nature, extent, structure and functioning of component habitats; and/or, affect the population size and viability of component species.

6.3.4.4.2 Conservation Status

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status.

As per the definitions provided in the EU Habitats Directive, the conservation status of a habitat is favourable when:

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

The conservation status of a species is favourable when:

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

According to the TII/CIEEM methodology, if it is determined that the integrity and/or conservation status of an ecological feature will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (i.e. local, county, national, international). 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. For example, a particular impact may not be considered likely to have a negative effect on the overall conservation status of a habitat which is considered to be internationally important. However, an impact may occur at a lower geographic scale on this internationally important habitat. Under such a scenario, such an impact on an internationally important habitat is considered to be significant only at the lower scale e.g. local, county, rather than international scale.

6.3.4.5 Method for Assessing Impact Significance to Birds

The determination of impact significance is carried out by assessing together the predicted magnitude of impact and the sensitivity of the local bird community. **Table 6.7** below outlines the impact significance matrix used for assessing the impact significance of the proposed larger turbines and meteorological mast to bird species.

Table 6.7: Impact Significance Matrix for Assessing Impacts to Bird Species

Significance		Sensitivity			
		Very High	High	Medium	Low
Magnitude	Very High	Very high	Very high	High	Medium
	High	Very high	Very high	Medium	Low
	Medium	Very high	High	Low	Very low
	Low	Medium	Low	Low	Very Low
	Negligible	Low	Very Low	Very Low	Very Low

6.3.4.6 Method for Assessing Potential Risk to Bats

The NatureScot (2021) guidelines provide a method for assessing the overall risk of a wind farm development to bats. This overall risk is based on assessing the Site level risk alongside the activity outputs recorded for each species during site surveys.

The Site level risk is based upon an evaluation of the Project’s size and the habitats occurring within the Project site. Wind farm projects are ranked from small to medium to large in size. Habitat risk increases with an increase in the present of habitats known to be relied upon by bats. **Table 6.8** details the approach to calculating site level risk using the size of the Project and the habitat risk present at the Project site.

Table 6.8: Site Risk Assessment

Site Risk Level (1 – 5)*		Project Size		
		Small	Medium	Large
Habitat Risk	Low	1	2	3
	Moderate	2	3	4
	High	3	4	5
Green (1-2) = lowest/low site risk Amber (3) = medium site risk Red (4 – 5) = high/highest site risk				
Habitat Risk	Description			
Low	Small number of potential roost features, of low quality. Low quality foraging habitat that could be used by small numbers of foraging bats. Isolated site not connected to the wider landscape by prominent linear features.			
Moderate	Buildings, trees or other structures with moderate-high potential as roost sites on or near the Site. Habitat could be used extensively by foraging bats. Site is connected to the wider landscape by linear features such as scrub, tree lines and streams.			
High	Numerous suitable buildings, trees (particularly mature ancient woodland) or other structures with moderate-high potential as roost sites on or near the Site, and/or confirmed roosts present close to or on the Site. Extensive and diverse habitat mosaic of high quality for foraging bats. Site is connected to the wider landscape by a network of strong linear features such as rivers, blocks of woodland and mature hedgerows. At/near edge of range and/or on an important flyway. Close to key roost and/or swarming site			
Project Size	Description			
Small	Small scale development (≤10 turbines). No other wind energy developments within 10 km. Comprising turbines <50m in height			
Medium	Larger developments (between 10 and 40 turbines). May have some other wind developments within 5 km. Comprising turbines 50-100m in height.			
Large	Largest developments (>40 turbines) with other wind energy developments within 5 km. Comprising turbines >100m in height.			

Table 6.9 illustrates the approach to identifying the overall risk level to each bat species/genus recorded at the proposed wind farm site.

Table 6.9: Overall Risk Assessment

Site Risk	Activity Category					
	Nil (0)	Low (1)	Low-moderate (2)	Moderate (3)	Moderate – high (4)	High (5)
Lowest (1)	0	1	2	3	4	5
Low (2)	0	2	4	6	8	10
Medium (3)	0	3	6	9	12	15
High (4)	0	4	8	12	16	20
Highest (5)	0	5	10	15	20	25
Green (0 -4) = Low Risk Amber (5 – 12) = medium risk Red (15 - 25) = high risk						

6.3.4.7 Assessment of Residual Effects

After characterising the potential impacts of the Proposed Development and assessing the potential effects of these impacts on the 'Important ecological features', mitigation measures are proposed to avoid and / or mitigate the identified ecological effects. Once measures to avoid and mitigate ecological effects have been finalised, assessment of the residual impacts and effects should be undertaken to determine the significance of their effects on the 'Important ecological features'.

6.3.4.8 Assessment of Cumulative Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM, 2024 v.1.3). Different types of actions can cause cumulative impacts and effects. As such, these types of impacts may be characterised as;

- Additive/incremental – in which multiple activities/projects (each with potentially insignificant effects) add together to contribute to a significant effect due to their proximity in time and space (CIEEM, 2024 v.1.3); and,
- Associated/connected – a development activity ‘enables’ another development activity e.g. phased development as part of separate planning applications. Associated developments may include different aspects of the Project which may be authorised under different consent processes. It is important to assess the potential impacts of the ‘project’ as a whole and not ignore impacts that fall under a separate consent process (CIEEM, 2024 v.1.3).

6.4 BASELINE DESCRIPTION

Baseline conditions represent a summary of the existing environment within the Site before the commencement of the Proposed Development. This section of the report provides information regarding these Baseline conditions.

6.4.1 General Site Description

6.4.1.1 Wind Farm Site

The proposed wind farm site is located within an agricultural and forested landscape, between Goulanes, Castledonovan, in Co. Cork. The nearest settlement is the village of Drimoleague which is situated 5.1 km to the southeast of the Site. The Site is located 10.5 km north-east of Bantry, Co. Cork and 10.9 km west of Dunmanway. The Site is 14.2 km south-east the county boundary between Cork and Kerry and is 59 km west of Cork City.

The Site is located within the townland of Derreenacrinnig West. The Grid Connection development traverses the townlands of Derreenacrinnig West, Barnagowlane West, Glanareagh, Gortnacowly, Ards Beg, Ardrah, Laharanshermeen, Maulraha, Maulikeeve, Derryarkane, Cappanaboul, Skahanagh, Gortroe, Shandrum Beg, Shandrum More, Dromloughlin, Ballylicky, Crossoge, in Co. Cork (“the Proposed Development Site”).

Temporary works will be required to accommodate the delivery of the turbine components. These temporary works are included as part of this application and are located in the townlands of Castledonovan, Derreenacrinnig East, and Derreenacrinnig West. The Site extends to approximately 104 ha.

6.4.1.2 Grid Connection Route

Originating at the Derreenacrinnig West Wind Farm, the proposed overground electrical cable route travels uphill across an area of wet heath occurring on the south-facing slopes

of the ridge at Derreenacrinnig West. Descending from the crest of the ridge, the route cuts through 300m of first and second rotation forestry before passing through an area dominated by rough unenclosed grazing and wet heath. The route then travels west along the Mealagh River valley, predominantly through areas of improved pasture and wet grassland. The route turns northwest at Glanareagh hill and crosses the Mealagh River 1 km southeast of Ardrah Bridge, before rising up the north side of the valley to Ardrah townland. From here, the route turns southwest again and descends steadily towards Shandrum, crossing areas of improved and unimproved grassland with occasional areas of heath and mature coniferous forestry. Between Shandrum and Ballylickey Electrical Substation, the route environs are dominated by improved grassland and grassy verge along the margins of the public road in which the underground section of the route will be laid.

6.4.1.3 Review of Historical Mapping

The first edition 6-inch map of 1841 and the last edition 6-inch map from 1904 shows the Site to be unenclosed. Large scale field enclosure is shown on the first edition 6-inch map to the north of the wind farm site, while a patch work of small field size enclosures are depicted to the south. Further field enclosures are shown on the last edition 6-inch map to the north of the wind farm site.

A comparison of the aerial imagery between 1995 and current google satellite imagery shows little change in land cover at and surrounding the wind farm site.

The 1995 and 1999 orthophotography shows the presence conifer plantation to the north and east of the wind farm site. The forestry bounding the wind farm site to the north appears to be immature on the 1999, with a block of more mature forestry further north. An access track leading east from the L-8767-0 Local Road into immature forestry is shown to the north of the wind farm site.

Google Earth imagery from 2016 depicts the commencement of forestry felling of the mature block of forestry to the north of the wind farm site. This continued into 2017 with the presence of a forestry track and full clearance of the forestry. Further forestry felling is also shown on the 2022 Google Earth imagery within the block of conifer plantation to the east of wind farm site.

Google Earth imagery from 2018 shows the presence of the existing wind farm access track, along with 5 no. hardstand for the previously approved wind farm at the Site, as well as borrow pits and associated access tracks.

6.4.2 Designated Areas

6.4.2.1 Designated sites within the potential Zone of Influence of the Development

Table 6.10 below outlines the designated sites within the wider region surrounding the Proposed Development and examines which, if any, of these designated sites are located within the Zone of Influence of the Proposed Development (see also **Figure 6.7** to **Figure 6.9**; and the **Screening Report for Appropriate Assessment (DEC Ltd. 2025)**).

Table 6.10: European Sites, NHAs & pNHAs

Designated Site	Brief Description	Qualifying interests (Qis)	Distance (Km)	Zone of influence
Bandon River SAC	Wet broadleaved semi-natural woodland is found in an undisturbed area of braided river channels and islands below Dunmanway. The river channels are well defined and the islands appear solid. Canopy dominants are Hazel (<i>Corylus avellana</i>) and Sessile Oak (<i>Quercus petraea</i>), with scattered Downy Birch (<i>Betula pubescens</i>), Ash (<i>Fraxinus excelsior</i>), Rusty Willow (<i>Salix cinerea</i> subsp. <i>oleifolia</i>) and Alder (<i>Alnus glutinosa</i>). There is a very sparse understorey composed of Hawthorn (<i>Crataegus monogyna</i>), Holly (<i>Ilex aquifolium</i>) and saplings of Hazel and Sessile Oak. Epiphytes are abundant on trees, including species such as Ivy (<i>Hedera helix</i>), Honeysuckle (<i>Lonicera periclymenum</i>) and bryophytes such as <i>Isothecium myosuroides</i> . The	[3260] Floating River Vegetation [91E0] Alluvial Forests* [1029] Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>) [1096] Brook Lamprey (<i>Lampetra planeri</i>)	12 km from the proposed wind farm and Grid Connection route	This SAC is located within a separate surface water catchment to the Project. There are no pathways connecting the wind farm to this SAC and its qualifying interests. This SAC is not located within the zone of influence of the Derreenacrinnig West Wind Farm. It is further noted that this SAC is not designated for terrestrial mobile species and no terrestrial mobile species (i.e. lesser horseshoe bats, marsh fritillary) pathway connects the wind farm site to this SAC.

Designated Site	Brief Description	Qualifying interests (Qis)	Distance (Km)	Zone of influence
	<p>ground flora is dominated by Ramsons (<i>Allium ursinum</i>), Wood Anemone (<i>Anemone nemorosa</i>) and Ivy, along with Lesser Celandine (<i>Ranunculus ficaria</i>) and Irish Spurge (<i>Euphorbia hyberna</i>). Goldilocks Buttercup (<i>Ranunculus auricomus</i>), a very rare plant in Co. Cork, has been recorded from this woodland.</p> <p>Floating river vegetation is found along the length of the river and is dominated by water-crowfoots (<i>Ranunculus</i> spp). Other aquatic plants found include Alternate Water-milfoil (<i>Myriophyllum alterniflorum</i>), Broad-leaved Pondweed (<i>Potamogeton natans</i>) and at least four water-starwort species (<i>Callitriche</i> spp.). Mosses present on rocks and attached to tree roots include <i>Fontinalis antipyretica</i> in slack flow areas, and</p>			

Designated Site	Brief Description	Qualifying interests (Qis)	Distance (Km)	Zone of influence
	<p>Fontinalis squamosa, Rhynchostegium riparioides and Amblystegium riparium in moderate flows. The landward fringe of deep pools supports Yellow Water-lily (Nuphar lutea), Bogbean (Menyanthes trifoliata), Marsh-marigold (Caltha palustris), Water Mint (Mentha aquatica) and Fool's Water-cress (Apium nodiflorum). Shoreweed (Littorella uniflora) and Six-stamened Waterwort (Elatine hexandra) are two species of local importance which are found in the river. In moderate current flow below the Long Bridge, the larger stones are covered by the moss Brachythecium rivulare and the liverwort Chiloscyphus polyanthos var. polyanthos. Boulders covered in Nostoc algae are probably of local occurrence in Ireland. The liverwort Riccardia chamaedryfolia and the</p>			

Designated Site	Brief Description	Qualifying interests (Qis)	Distance (Km)	Zone of influence
	moss Fissidens crassipes found under the Long Bridge are considered to be rare in Ireland.			
Barley Cove to Ballyrisode Point SAC	<p>This site is situated on the Mizen Head peninsula in the extreme south-west of Co. Cork.</p> <p>While rocky heath is the dominant habitat, the Site is most important for the sand dunes and related habitats which occur at Barley Cove. The dune system is of moderate size and relatively intact. The rare bryophyte Petalwort (Petalophyllum ralfsii) has been recorded in this dune system. The dunes merge with a substantial area of saltmarsh which displays characters of both Atlantic and Mediterranean salt meadows. A fringe of glasswort (Salicornia spp.) occurs at the lowermost part of the saltmarsh and above the tidal rive</p>	<p>[1140] Tidal Mudflats and Sandflats [1220] Perennial Vegetation of Stony Banks [1310] Salicornia Mud [1330] Atlantic Salt Meadows [1410] Mediterranean Salt Meadows [2120] Marram Dunes (White Dunes) [2130] Fixed Dunes (Grey Dunes)* [4030] Dry Heath [1395] Petalwort (Petalophyllum ralfsii).</p>	33 km from the proposed wind farm and Grid Connection route.	<p>This SAC is located within the Owvane-Mealagh-Glengarriff-Coastal catchment. The Meelagh River, the highest order watercourse connected to the Project within this catchment is not connected to this SAC. No other watercourses draining the Project site and eventually draining to the Meelagh River are connected to this SAC.</p> <p>As such there is no hydrological pathway connecting the Project to this SAC and this SAC does not occur within the zone of influence of the Project.</p>
Caha Mountains SAC	The Caha Mountains consist of Old Red Sandstone and form part of the	3110] Oligotrophic Waters containing very few	18 km from the proposed wind	This SAC is located within the Owvane-Mealagh-Glengarriff-

Designated Site	Brief Description	Qualifying interests (Qis)	Distance (Km)	Zone of influence
	<p>dramatic backbone of the Beara Peninsula, between Turner's Rock (on the Glengarriff/Kenmare Road) and the Healy Pass.</p> <p>The best examples of blanket bog in the Site occur on the Glenlough plateau and in the saddle to the east of Knockastumpa. Wet heath is frequent at the Site and occurs as a mosaic, often in association with blanket bog and upland grassland, whilst alpine occupies the summits of the SAC. Lakes, the majority of which are dystrophic lakes, are frequent throughout the Site and especially on the Glenlough Mountain plateau. The Site contains Killarney Fern (Trichomanes speciosum).</p>	<p>minerals [3160] Dystrophic Lakes [4010] Wet Heath [4030] Dry Heath [4060] Alpine and Subalpine Heaths [6230] Species-rich Nardus Grassland* [7130] Blanket Bogs (Active)* [8110] Siliceous Scree [8210] Calcareous Rocky Slopes [8220] Siliceous Rocky Slopes [1024] Kerry Slug (Geomalacus maculosus) [1421] Killarney Fern (Trichomanes speciosum)</p>	<p>farm; 8 km from the proposed Grid Connection route.</p>	<p>Coastal catchment. The Meelagh River, the highest order watercourse connected to the Project within this catchment is not connected to this SAC. No other watercourses draining the Project site and eventually draining to the Meelagh River are connected to this SAC.</p> <p>As such there is no hydrological pathway connecting the Project to this SAC and this SAC does not occur within the zone of influence of the Project.</p>
<p>Cloonee and Inchiquin Loughs, Uragh Wood SAC</p>	<p>Cloonee and Inchiquin Loughs, Uragh Wood SAC is located in a large U-shaped glacial valley on the northern side of the Caha Mountain</p>	<p>[3110] Oligotrophic Waters containing very few minerals [4010] Wet Heath [4030] Dry Heath [8220]</p>	<p>27 km from the proposed wind farm; 17 km from the</p>	<p>This SAC is located within the Owvane-Mealagh-Glengarriff-Coastal catchment. The Meelagh River, the highest order</p>

Designated Site	Brief Description	Qualifying interests (Qis)	Distance (Km)	Zone of influence
	<p>range, to the west of Kenmare, Co. Kerry. The Site is a Special Area of Conservation (SAC) selected for the following habitats and/or species:</p> <p>The water of the lakes at this site is acidic and support Slender Naiad (<i>Najas flexilis</i>). Uragh Wood is a fine example of an oceanic, semi-natural oak woodland.</p>	<p>Siliceous Rocky Slopes [91A0] Old Oak Woodlands [1024] Kerry Slug (<i>Geomalacus maculosus</i>) [1303] Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) [1421] Killarney Fern (<i>Trichomanes speciosum</i>) [1833] Slender Naiad (<i>Najas flexilis</i>)</p>	<p>proposed Grid Connection route.</p>	<p>watercourse connected to the Project within this catchment is not connected to this SAC. No other watercourses draining the Project site and eventually draining to the Meelagh River are connected to this SAC.</p> <p>As such there is no hydrological pathway connecting the Project to this SAC and this SAC does not occur within the zone of influence of the Project.</p>
Derryclogher (Knockboy) Bog SAC	<p>Derryclogher (Knockboy) Bog SAC is situated under the summit of Knockboy Mountain (707 m) in Co. Cork.</p> <p>The areas of active mountain blanket bog occur as a complex mosaic with other upland habitats, namely grassland, heath, stream flushes and exposed rock. The bogs are mostly small (1-2 ha) but they occur with regularity on a series of</p>	<p>[7130] Blanket Bogs (Active)*</p>	<p>13 km from the proposed wind farm; 5.5 km from the proposed Grid Connection route.</p>	<p>This SAC is located within the Owvane-Mealagh-Glengarriff-Coastal catchment. The Meelagh River, the highest order watercourse connected to the Project within this catchment is not connected to this SAC. No other watercourses draining the Project site and eventually draining to the Meelagh River are connected to this SAC.</p>

Designated Site	Brief Description	Qualifying interests (Qis)	Distance (Km)	Zone of influence
	gently sloping shelves across the mountainside.			As such there is no hydrological pathway connecting the Project to this SAC and this SAC does not occur within the zone of influence of the Project.
Glanmore Bog SAC	Glanmore Bog is situated 3 km north-west of Hungry Hill, Co. Cork and 8 km southwest of the village of Lauragh, Co. Kerry.	[3110] Oligotrophic Waters containing very few minerals [3260] Floating River Vegetation [4010] Wet Heath [6230] Species-rich Nardus Grassland* [7130] Blanket Bogs (Active)* [1029] Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>) [1421] Killarney Fern (<i>Trichomanes speciosum</i>)	36 km from the proposed wind farm; 36 km from the proposed Grid Connection route.	This SAC is located within the Owvane-Mealagh-Glengarriff-Coastal catchment. The Meelagh River, the highest order watercourse connected to the Project within this catchment is not connected to this SAC. No other watercourses draining the Project site and eventually draining to the Meelagh River are connected to this SAC. As such there is no hydrological pathway connecting the Project to this SAC and this SAC does not occur within the zone of influence of the Project.
Glengarriff Harbour and Woodland SAC	Located to the south and north-west of Glengarriff Village in west Cork,	[91A0] Old Oak Woodlands [91E0] Alluvial Forests*	16 km from the proposed wind	This SAC is located within the Owvane-Mealagh-Glengarriff-

Designated Site	Brief Description	Qualifying interests (Qis)	Distance (Km)	Zone of influence
	<p>this site consists of a glacial valley opening out into a sheltered bay with rocky islets. The Site is a Special Area of Conservation (SAC) selected for the following habitats and/or species:</p> <p>Glengarriff woodland consists of a sizeable area of broadleaved semi-natural woodland whilst wet woodland occurs along parts of the Canrooska and Glengarriff rivers. In addition to the woodlands, the harbour is of great interest.</p>	<p>[1024] Kerry Slug (Geomalacus maculosus) [1303] Lesser Horseshoe Bat (Rhinolophus hipposideros) [1355] Otter (Lutra lutra) [1365] Common (Harbour) Seal (Phoca vitulina</p>	<p>farm; 6 km from the proposed Grid Connection route.</p>	<p>Coastal catchment. The Meelagh River, the highest order watercourse connected to the Project within this catchment is not connected to this SAC. No other watercourses draining the Project site and eventually draining to the Meelagh River are connected to this SAC.</p> <p>As such there is no hydrological pathway connecting the Project to this SAC and this SAC does not occur within the zone of influence of the Project.</p>
<p>Lough Hyne Nature Reserve And Environs</p>	<p>This is a large coastal site (>400 ha) situated just east of Roaringwater Bay. It includes Lough Hyne Nature Reserve on its western end, Ballyally Lough, the adjacent marshland area along the Bealariree Stream and the coastline eastwards to Gokane Point, including Tragumna Bay. The Site therefore encompasses a range</p>	<p>Large shallow inlets and bays [1160] Reefs [1170] European dry heaths [4030] Submerged or partially submerged sea caves [8330]</p>	<p>20 km from the proposed wind farm and Grid Connection route.</p>	<p>This SAC is located within a separate surface water catchment to the Project. There are no pathways connecting the wind farm to this SAC and its qualifying interests. This SAC is not located within the zone of influence of the Derreenacrinnig West Wind Farm.</p>

Designated Site	Brief Description	Qualifying interests (Qis)	Distance (Km)	Zone of influence
	of both marine and terrestrial habitats.	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [91E0]		It is further noted that this SAC is not designated for mobile species and no mobile species pathway connects the wind farm site to this SAC.
Maulagowna Bog SAC	Maulagowna Bog is located in Co. Kerry on the north-western slopes of the Cahal Mountains, overlooking the Kenmare River inlet. The blanket bog is largely intact.	[7130] Blanket Bogs (Active)*	26 km from the proposed wind farm; 16 km from the proposed Grid Connection route.	This SAC is located within the Owvane-Mealagh-Glengarriff-Coastal catchment. The Meelagh River, the highest order watercourse connected to the Project within this catchment is not connected to this SAC. No other watercourses draining the Project site and eventually draining to the Meelagh River are connected to this SAC. As such there is no hydrological pathway connecting the Project to this SAC and this SAC does not occur within the zone of influence of the Project.

Designated Site	Brief Description	Qualifying interests (Qis)	Distance (Km)	Zone of influence
Roaring water Bay And Islands	Roaringwater Bay, Co. Cork, is a wide, shallow bay located on the south-west coast of Ireland. The SAC includes the immediate coastline on the mainland from Long Island to Baltimore, together with the whole bay and most of the islands. Some of the larger islands included are Sherkin Island, Cape Clear Island, Heir Island, Horse Island, Castle Island and Long Island. These reefs emerge to form the islands on the south side of the bay and within the bay. Generally, the coast is low-lying but the southern edge rises, in line with the hills behind Baltimore, to culminate in a summit of 160 m on Cape Clear.	Large shallow inlets and bays [1160] Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030] Submerged or partially submerged sea caves [8330] Phocoena phocoena (Harbour Porpoise) [1351] Lutra lutra (Otter) [1355] Halichoerus grypus (Grey Seal) [1364]	17 km from the wind farm and Grid Connection route.	The Ilen River, to which there is a hydrological pathway from the Project site, discharges to the Ilen Estuary which is not designated as part of this SAC. The nearest point of this SAC to the mouth of the Ilen River is approximately 3 km. In view of the significant distance separating the mouth of the Ilen River to the coastal waters in which this SAC is situated, this SAC is not located within the zone of influence of the Project. It is also noted that this SAC is not designated for terrestrial mobile species and no terrestrial mobile species (i.e. lesser horseshoe bats, marsh fritillary) pathway connects the wind farm site to this SAC. In view of the above no hydrological pathway or mobile species pathway (with respect to

Designated Site	Brief Description	Qualifying interests (Qis)	Distance (Km)	Zone of influence
				<p>otters and indeed coastal seal populations) is identified as connecting the wind farm to this SAC and its qualifying interests. This SAC is not located within the zone of influence of the Derreenacrinnig West Wind Farm.</p>
<p>Sheep's Head SAC</p>	<p>Sheep's Head in Co. Cork is a narrow peninsula with a north-east to south-west orientation, bounded on the northern side by Bantry Bay and on the southern side by Dunmanus Bay.</p> <p>he rocky parts of the peninsula are covered by dry heath. Where water accumulates, especially in the depressions between the ridges of sandstone, peat develops more thickly and here wet heath or even small pockets of blanket bog are found.</p> <p>The Site is of note for holding a population of Kerry Slug.</p>	<p>[4010] Wet Heath [4030] Dry Heath [1024] Kerry Slug (Geomalacus maculosus).</p>	<p>23 km from the proposed wind farm; 14 km from the proposed Grid Connection route.</p>	<p>This SAC is located within the Owvane-Mealagh-Glengarriff-Coastal catchment. The Meelagh River, the highest order watercourse connected to the Project within this catchment is not connected to this SAC. No other watercourses draining the Project site and eventually draining to the Meelagh River are connected to this SAC.</p> <p>As such there is no hydrological pathway connecting the Project to this SAC and this SAC does not occur within the zone of influence of the Project.</p>

Designated Site	Brief Description	Qualifying interests (Qis)	Distance (Km)	Zone of influence
<p>Beara Peninsula SPA</p>	<p>The Beara Peninsula SPA is a coastal site situated on the west coast of Co. Cork, south-west of the town of Kenmare. The Site supports an internationally important population of breeding Chough: 58 breeding pairs were recorded within the Site in the 1992 survey and 54 in the 2002/03 survey. The Site also holds a nationally important population of Fulmar (575 pairs), and populations of other breeding seabirds including: Shag (12 pairs), Herring Gull (20 pairs), Lesser Black-backed Gull (4 pairs), Razorbill (5 pairs) and Black Guillemot (87 individuals in 1999) – all seabird data from 2000. The Site is also used by Peregrine (4 pairs in 2002).</p> <p>The Beara Peninsula SPA is one of the most important sites in the country for Chough, with a breeding</p>	<p>Chough Fulmar</p>	<p>40 km from the proposed wind farm; 30 km from the proposed Grid Connection route.</p>	<p>This SPA is located within the Owvane-Mealagh-Glengarriff-Coastal catchment. The Meelagh River, the highest order watercourse connected to the Project within this catchment is not connected to this SPA. No other watercourses draining the Project site and eventually draining to the Meelagh River are connected to this SPA.</p> <p>As such there is no hydrological pathway connecting the Project to this SPA and this SPA does not occur within the zone of influence of the Project.</p>

Designated Site	Brief Description	Qualifying interests (Qis)	Distance (Km)	Zone of influence
	population of international importance occurring.			
Sheep's Head to Toe Head SPA	The Sheep's Head to Toe Head SPA is large site situated on the south-west coast of Co. Cork. It encompasses the high coast and sea cliffs from Sheep's Head to Mizen Head, Brow Head and Crookhaven in the west and from Baltimore to Tragumna Bay, Gokane Point and the Toe Head peninsula in the east. The Site supports an internationally important population of breeding Chough: 82 breeding pairs were recorded from the Site in the 1992 survey and 73 in the 2002/03 survey. The Mizen Head cliffs hold some of the highest concentrations of breeding pairs in Ireland. The Site supports a nationally important Peregrine population (7 pairs in 2002)	Peregrine Chough	21 km from the proposed wind farm and Grid Connection route.	This SPA is located within the Owvane-Mealagh-Glengarriff-Coastal catchment. The Meelagh River, the highest order watercourse connected to the Project within this catchment is not connected to this SPA. No other watercourses draining the Project site and eventually draining to the Meelagh River are connected to this SPA. As such there is no hydrological pathway connecting the Project to this SPA and this SPA does not occur within the zone of influence of the Project.

6.4.3 Desktop study for recorded rare, threatened and/or protected species

The results of the desk study are provided in **Table 6.11** below:

Table 6.11: Rare, threatened or protected Species Recorded within 2 km of the Site (10 km for bat records)⁷

Species	Scientific Name	Habitats Dir. (Annex II / IV)	Birds Dir. (Annex I)	Wildlife Acts (as amended)	Red List Status	Flora Protection Order	Birds of Conservation Concern (2021–2026)	Likelihood on the Site	Likelihood within 2 km	Most recent record	Record Source
Mammals											
Otter	<i>Lutra lutra</i>	Y	-	Y	LC	-	-	3	1	2010	NBDC & NPWS
Badger	<i>Meles meles</i>	-	-	Y	LC	-	-	3	1	2018	NBDC & NPWS
Red squirrel	<i>Sciurus vulgaris</i>	-	-	Y	LC	-	-	3	2	2015	NBDC
Irish hare	<i>Martes martes</i>	-	-	Y	LC	-	-	4	1	2021	NBDC
Irish stoat	<i>Cervus elaphus</i>	-	-	Y	LC	-	-	2	1	2015	NBDC
Hedgehog	<i>Erinaceus europaeus</i>	-	-	Y	LC	-	-	3	1	2013	NBDC
Pine Martin	<i>Martes martes</i>	-	-	Y	LC	-	-	3	1	2012	NBDC
Pygmy Shrew	<i>Sorex minutus</i>	-	-	Y	LC	-	-	3	1	2015	NBDC
Bats (within 10 km)											
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	Y	-	Y	LC	-	-	1	1	2018	NBDC
Daubenton's bat	<i>Myotis daubentonii</i>	Y	-	Y	LC	-	-	3	1	2018	NBDC
Leisler's bat	<i>Nyctalus leisleri</i>	Y	-	Y	LC	-	-	1	1	2018	NBDC
Brown long-eared bat	<i>Plecotus auritus</i>	Y	-	Y	LC	-	-	1	1	2022	NBDC
Brown long-eared bat	<i>Plecotus auritus</i>	Y	-	Y	LC	-	-	1	1	2022	NBDC
Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>	Y	-	Y	LC	-	-	1	1	1999	NBDC
Herpetofauna											
Common frog	<i>Rana temporaria</i>	-	-	Y	Vulner-able	-	-	2	1	2018	NBDC
Common lizard	<i>Zootoca vivipara</i>	-	-	Y	Vulner-able	-	-	2	1	2020	NBDC
Invertebrates											
Kerry Slug	<i>Geomalacus maculosus</i>	Y	-	Y	-	-	-	1	1	2021	NBDC
Marsh fritillary	<i>Euphydryas aurinia</i>	Y	-	Y	-	-	-	4	1	2015	NBDC
Wall	<i>Lasiommata megera</i>)	-	-	-	Endangered	-	-	4	1	2023	NBDC
Gatekeeper	<i>Pyronia tithonus</i>)	-	-	-	Near threatened	-	-	4	1	2023	NBDC
Grayling	<i>Hipparchia semele</i>)	-	-	-	Near threatened	-	-	4	1	2021	NBDC
Small Heath	<i>Coenonympha pamphilus</i>)	-	-	-	Near threatened	-	-	2	1	2018	NBDC
Dark Green Fritillary	<i>Argynnis aglaja</i>)	-	-	-	Vulnerable	-	-	4	1	2018	NBDC
Large Red Tailed Bumble Bee	<i>Bombus (Melanobombus) lapidarius</i>)	-	-	-	Near threatened	-	-	2	1	2022	NBDC

⁷ (Sources: NPWS, NBDC & BCI databases) – Please note the below list is not an exhaustive species list for the area.

Species	Scientific Name	Habitats Dir. (Annex II / IV)	Birds Dir. (Annex I)	Wildlife Acts (as amended)	Red List Status	Flora Protection Order	Birds of Conservation Concern (2021–2026)	Likelihood on the Site	Likelihood within 2 km	Most recent record	Record Source
Megachile (Megachile) centuncularis	<i>Megachile (Megachile) centuncularis</i>	-	-	-	Near threatened	-	-	4	1	2022	NBDC
Moss Carder-bee	<i>Bombus (Thoracombus) muscorum</i>	-	-	-	Near threatened	-	-	3	1	2023	NBDC
Plants											
Green Hoar-moss	<i>Hedwigia integrifolia</i>	-	-	-	Vulner-able	Y	-	3	1	2014	NBDC
Awl-leaved Swan-neck Moss	<i>Campylopus subulatus</i>	-	-	-	Vulner-able	-	-	2	1	2009	NBDC
Broadleaf Grimmiid	<i>Schistidium platyphyllum</i>	-	-	-	Vulner-able	-	-	2	1	2009	NBDC
String Grimmiid	<i>(rimmia funalis</i>	-	-	-	Near threaten-ed	-	-	2	1	2009	NBDC
Invasive Species											
Butterfly bush	<i>Buddleja davidii</i>	-	-	-	-	-	-	2	1	2018	NBDC
Rhododendron	<i>Rhododendron ponticum</i>	-	-	-	-	-	-	1	1	2003	NBDC
Cherry laural	<i>Prunus laurocerasus</i>	-	-	-	-	-	-	1	1	2004	NBDC
Field penny-cress	<i>Thlaspi arvense</i>	-	-	-	-	-	-	3	1	2004	NBDC
Giant rhubarb	<i>Gunnera tinctoria</i>	-	-	-	-	-	-	3	1	2009	NBDC
Japanese Knotweed	<i>Fallopia japonica</i>	-	-	-	-	-	-	1	1	2006	NBDC
Sycamore	<i>Acer pseudoplatanus</i>	-	-	-	-	-	-	1	1	2018	NBDC
Three-cornered garlic	<i>Allium triquetrum</i>	-	-	-	-	-	-	1	1	2004	NBDC
Virginia-creeper	<i>Parthenocissus quinquefolia</i>	-	-	-	-	-	-	3	1	2004	NBDC
Jenkin's spire snail	<i>Potamopyrgus antipodarum</i>	-	-	-	-	-	-	3	1	2012	NBDC
American mink	<i>Mustela vison</i>	-	-	-	-	-	-	2	1	2012	NBDC
Bank vole	<i>Myodes glareolus</i>	-	-	-	-	-	-	2	1	2012	NBDC
Brown rat	<i>Rattus norvegicus</i>	-	-	-	-	-	-	2	1	2011	NBDC
Rabbit	<i>Oryctolagus cuniculus</i>	-	-	-	-	-	-	1	1	2015	NBDC
Fallow deer	<i>Dama dama</i>	-	-	-	-	-	-	1	1	2015	NBDC
Feral ferret	<i>Mustela furo</i>	-	-	-	-	-	-	2	1	2006	NBDC

Key to likelihood of species presence: 1 = Confirmed; 2 = Likely; 3 = Possible; 4 = Unlikely

6.4.3.1 *Flora Protection Order Species*

No records are held for FPO species in the wider area surrounding the Proposed Development.

6.4.3.2 *Marsh fritillary*

There are no marsh fritillary records held by the NBDC for marsh fritillary within the area of search as shown on **Figure 6.10**. There are records for the presence of marsh fritillary within the hectad W15 within which the Site is located. The nearest record for marsh fritillary in the wider surrounding area is from the 100 m square W169 595 in the townland of Torreen, located approximately 9 km to the northeast of the Project.

6.4.4 *Article 17 Habitats*

Under Article 17 of the EU Habitats Directive, Ireland is required to report to the European Commission every six years on the status of habitats and species listed in the Annexes of the Directive. The latest Article 17 Report prepared for Ireland were published by the NPWS in 2019. Article 17 Reports provide estimates for the area of Annex 1 habitats occurring in Ireland. This area calculation is based upon the overall area of these habitats occurring within the country, as mapped by the NPWS. As part of the Article 17 publication, the digital mapping dataset for the location of Annex 1 habitats has also been made publicly available. This dataset was reviewed to identify the presence of any area of Annex 1 habitat occurring within or adjacent to the Proposed Development that forms part of the current national area of these habitats. **Figure 6.10** shows the location of Annex 1 habitats that form part of the national area of these habitats within/or surrounding the Site.

The Article 17 mapping for Annex 1 habitats has been used by the NPWS to establish the favourable conservation range (FCR) of these habitats nationally.

Examples of Annex 1 Alpine and Sub-Alpine heath (4060) are mapped as occurring within and adjacent to the proposed Site. **Figure 6.10** shows the extent of the mapped area of Article 17 Alpine and Sub-Alpine heath with respect to the Site. The area of mapped Annex 1 Alpine and Sub-Alpine heath occurring at and surrounding the Site is referenced by the NPWS as being sourced from the backing documents for the 2007 Article 17 reporting (see NPWS, 2007). The area of Alpine and Sub-Alpine heath occurring at Derreenacrinnig West Wind Farm within and surrounding to the Site is representative of an indicative area of this habitat. The criteria for mapping the indicative natural range and potential distribution of this Annex 1 habitat was based on the following three factors:

- elevation above 350m

- uplands areas above 350m with a slope of >40°
- areas of ridges and summits which were identified using a curvature index of >65°

The NPWS have used a "certainty rating" to rate the accuracy of data with respect to the distribution mapping of Alpine and Sub-Alpine heath. The Certainty rating ranges from 1 to 3 with 1 being 'least certain' and 3 being 'certain'. The NPWS have assigned a Certainty rating of 1 – least certain – to the 2007 mapping data used to map the example of this habitat at and surrounding the proposed Derreenacrinnig West Wind Farm.

The NPWS recognised in the 2013 Article 17 reporting that the 2007 indicative natural range and potential distribution, at best overestimated the extent of this habitat occurring in Ireland and as such used only 5% of these areas for the purposes of mapping the national range and extent of this habitat in Ireland.

The extent of the area of Article 17 Alpine and Sub-Alpine heath associated with the Article 17 mapping at and surrounding the Project site, shown on **Figure 6.10** amounts to c. 49 Ha, with 5% of this area amounting to c. 2.5 Ha. It is noted that no examples of Alpine and Sub-Alpine heath habitat occur within the footprint of the proposed wind farm, given that the proposed footprint will utilise existing access tracks and hardstands associated with the previously approved 5 turbine wind farm at the Project site.

6.5 EXISTING ECOLOGICAL BASELINE

6.5.1 Designated Sites with Potential Ecological / Hydrological Connections with the Development

Designated Sites are referred to above in **Table 6.3** in **Section 6.4.2**.

A Screening Report for Appropriate Assessment has been prepared for the Proposed Development (DEC, 2025) which examines whether or not the Project will have the potential to result in likely significant effects to European Sites. As such, this EIAR Chapter focusses on the potential for impacts upon National and Local Sites of Ecological Importance and does not re-examine impacts upon European Sites. The findings of the Screening Report for Appropriate Assessment are nonetheless referred to within this Chapter.

The European Sites occurring in the wider area surrounding the Site are shown on **Figure 6.7** and **6.8**. No European Sites are hydrologically connected to the Project.

6.5.2 Habitats occurring at the proposed wind farm site

6.5.2.1 Level 3 Fossitt Habitats

A description of the Level 3 Habitats, as per the Guide to Habitats in Ireland, occurring within the Project site is provided below. The extent and distribution of these habitats within the Site are shown on **Figure 6.11: Sheet 1 to Sheet 12**. The habitats occurring at the wind farm site, along the proposed Grid Connection route and along the proposed Turbine Delivery Route are described below.

6.5.2.1.1 Habitats within the Wind farm site

The Site consists predominantly of exposed or thinly covered bedrock and a mosaic of wet heath/upland blanket bog. Areas of dry heath are found on elevated areas with exposed rock. A large conifer plantation occurs in the northern part of the Site. An elevated ridge runs across the centre of the Site in a north-east to south-west direction. Below this ridge the Site slopes off steeply to the south with more shallow peat soil. Vegetation along this slope indicates that there is a calcareous influence mostly likely due to the presence of glacial deposits. Peat depth across the majority of the Site is >0.5m deep in particular on the southern slope. Blanket bog only occurs where the peat is >0.5m. This is mostly confined to the northern half of the Site where deep peat is found in pockets.

Wet heath HH3

The majority of the Site is characterised by wet heath habitat. Purple moor-grass (*Molinia caerulea*) is the dominant species with abundant Cotton grass (*Eriophorum vaginatum*.) also present. Stands of low-growing Western gorse (*Ulex gallii*), cross-leaved heather (*Erica tetralix*) and Ling (*Calluna vulgaris*) are also abundant in places. Moss cover is high in places and includes *Polytricum commune*, *Aulacomnium palustre* and *Sphagnum* species. Sedges including *Carex nigra* and *C. flacca* are also present. Other species include marsh lousewort (*Pedicularis palustris*), milkwort (*Polygala vulgaris*). Stands of rushes (*Juncus effuses*) are also abundant throughout this habitat. On the southern slope black bog rush (*schoenus nigrans*) is abundant in places, indicating a calcareous influence. At the bottom of the slopes some localised areas of flush occur in wetter areas.

In parts of the Site where peat depth is greater than 0.5m, wet heath grades into small pockets of habitat more characteristic of upland blanket bog (PB2). Vegetation is dominated by hares tail cotton grass, deergrass (*Scirpus cespitosus*) and ling. Cover of sphagnum mosses including *Sphagnum papillosum* and *S. capillifolium* is high in patches, particularly in a wet area. Such patches occur as discrete units within the overall wet heath habitat that

dominates the land cover within the wind farm site not under the footprint of the existing wind farm infrastructure.

Dry siliceous heath (HH1)

Wet heath grades to dry siliceous heath habitat on elevated parts of the Site where exposed rock is present and peat soil is more free draining. The vegetation is dominated by ling (*Calluna vulgaris*) and bell heather (*Erica cinerea*) and grasses such as mat grass (*Nardus stricta*), sweet vernal (*Anthoxanthum odoratum*), couch grass (*Elymus sp.*) and meadow foxtail (*Alopecurus pratensis*), such patches occur as discrete units within the overall wet heath habitat that dominates the land cover within the wind farm site not under the footprint of the existing wind farm infrastructure.

Conifer plantation (WD4)

A large conifer plantation occurs in the northern part of the Site. It is a commercial forest consisting mostly of mature Sitka spruce (*Picea sitchensis*).

Upland rivers (FW1)

Two upland streams (FW1) drain the Site to the north and south. Both streams are characteristic of an upland eroding river channel with a substrate of bedrock and very little aquatic vegetation. These are described further under the **Section 6.5.7** below.

Buildings and artificial surfaces (BL3)

Buildings and artificial surfaces occur within the wind farm site and comprises of the existing wind farm access track and hardstand areas. The existing wind farm infrastructure on site was constructed during 2017 and 2018 as part of the consented wind farm development at the time. This habitat is artificial in nature and is generally devoid of vegetation.

6.5.2.1.2 Habitats Along the Proposed Grid Connection Route

The following sections provide a description of the habitats occurring within and immediately adjacent to the proposed Grid Connection route. The habitats occurring along the Grid Connection route corridor are illustrated in **Appendix 6.2: Habitat Map Sheets 1 to 12**.

Eroding Upland Watercourses (FW1)

The grid route passes through three separate surface water catchments, the Ilen River Catchment to the east of the alignment; the Mealagh River Catchment along the majority of the alignment and the Owvane River Catchment to the west of the alignment. Eroding upland (FW1) watercourses intersect the route corridor at various locations along the route.

The route crosses the Mealagh River at one location in the townland of Ards Beg towards the east of the route corridor. Aside from this, only minor watercourses are crossed by the route corridor.

Drainage Ditches (FW4)

Numerous drainage ditches occur within the route corridor study area. The ditches occurring within the Site are either bare, having been cut to bedrock level below the overlying peat deposit or have become colonised by a range of grasses and rushes such as *Deschampsia flexuosa*, *Agrostis capillaris*, *Agrostis caninia* and *Juncus effusus*.

Wet Willow Woodland (WN6)

Four examples of wet willow woodland occur within the route corridor. The first is located on the bankside of a meandering section of the Mealagh River in the townland of Ards Beg. The extent of this example of wet woodland is limited, being approximately 0.8 acres in size. Historical 6-inch and 25-inch maps of this area indicate the presence of wet pasture at this location. The meander of the Mealagh River has become more pronounced since the publication of these historical maps and it is likely that this wet woodland developed on the "tongue" of land between the meander.

The two other examples of wet woodland habitat occur in the townland of Drumloughlin towards the west of the route corridor. These two patches are separated by a small block of conifer plantation. They occur on sloping ground in a low depression. The 6-inch and 25-inch historical maps labelled the footprint of both patches of wet woodland as rough pasture, suggesting that this woodland is of recent origin. The combined extent of both patches occurring within the route corridor amounts to approximately 1 hectare.

The final example of this habitat occurs in the vicinity of the Ballylickey sub-station at the western end of the Grid Connection route.

Coniferous Plantation (WD4)

Commercially planted Sitka spruce (*Picea sitchensis*) occurs immediately to the north and west of the Grid Connection route. The block of forestry to the north of the wind farm site was planted prior to 1995, while the other two blocks to the west of the Grid Connection route are of older origin. The patches of forestry to the north of the wind farm site is representative of a first rotation, closed-canopy thicket (age-class 2 as per Coillte's age classification system for plantation forestry). Floral diversity within the conifer plantation is

low with high levels of shading and acidic conditions arising from the slow decomposition of fallen needles limiting the potential for the ground layer to support a range of herb species.

Scrub (WS1)

The examples of scrub occurring along the route corridor are dominated by spreading patches of *Ulex europeaus* with *Rubus fruticosus* agg. Minor patches of immature willow (*Salix* sp.) scrub also occur. The examples of scrub habitat occur alongside watercourses, in marginal areas dominated by heavy, poorly drained soils or in association with unimproved wet heath habitat.

Recently Felled Woodland (WS5)

Recently felled conifer plantation occurs along the proposed route to the north of the wind farm site in the townland of Derreenacrinnig West. This habitat currently supports little vegetation with mosses such as *Rhytidiadelphus loreus*, *Hylocomium splendens*, *Pleurozium scheberi*, *Hypnum jutlandicum* and *Thuidium tamariscinum* dominating the cover.

Hedgerows & Treelines (WL1/2)

A network of hedgerows occurs throughout the lands along the Grid Connection route. The principal species occurring along hedgerows and treelines are *Fraxinus excelsior*, *Crataegus monogyna*, *Prunus spinosa*, *Acer pseudoplatanus*, *Rosa canina*, *Sambuca nigra*, *Rubus fruticosus* agg. and *Ulex europeaus*.

Herbs occurring along hedgerows and treelines include *Urtica dioica*, *Galiium aparine*, *Heracleum sphondylium*, *Vicia cracca*, *Vicia sepium*, *Hypericum perforatum*, *Viola riviana*, *Geranium robertianum*, *Phyllitis scolopendrium*, *Polystichum setiferum*, *Ranunculus repens* and *Pteridium aquilinum*.

Improved agricultural grassland (GA1)

Improved agricultural grassland dominates the land cover at lower elevations throughout the route corridor. This habitat is intensively managed for cattle grazing and silage. Species indicative of high nutrient conditions in the habitat were noted throughout the land holding. These species include an abundance of *Lolium perenne*, *Holcus lanatus*, *Alopecurus pratensis*, *Ranunculus repens*, *R. acris*, *Trifolium repens*, *Trifolium pratense*, *Cirsium arvense*, *Cirsium vulgare* and *Urtica dioica*.

Overall, the improved agricultural grassland is species-poor and widespread on a local to national scale. This habitat plays a limited function in supporting wildlife although it does provide foraging and dispersal habitat for badgers and can support a limited range of invertebrates.

Amenity Grassland (GA2)

Examples of amenity grassland occurring within the route corridor are associated with domestic garden lawns. This is a species poor habitat likely to support a range of similar grass species such as *Festuca rubra*, *Agrostis stolonifera*, *Alopecurus pratensis* and *Holcus lanatus* and a limited range of herb species such as *Ranunculus repens*, *Ranunculus acris*, *Bellis perennis*, *Cerastium fontanum*, *Trifolium pratense*, *Trifolium repens* and *Taraxacum officinale* agg.

Humid Acid Grassland (GS3)

This unimproved grassland habitat occurs at higher elevations, generally above the 150m contour throughout the route corridor. It occurs in association with wet heath, which it frequently grades into. The dominant species of this habitat include *Agrostis stolonifera*, *Agrostis capillaris*, *Anthoxanthum odoratum*, *Nardus stricta*, *Deschampsia flexuosa* and *Festuca ovina*. Other species frequently occurring include *Juncus squarrosus*, *Carex panicea*, *Carex binervis*, *Carex echinata*, *Pedicularis sylvatica*, *Succisa pratensis*, *Potentilla erecta* and *Galium saxatile*. The bryophyte layer is dominated by *Hylocomium splendens*, *Rhytidiadelphus squarrosus*, *Rhytidiadelphus loreus* and *Polytrichum commune*. *Sphagnum recurvum* and *Sphagnum tenellum* are frequent in wetter depressions where this habitat grades into wet heath.

Wet Grassland (GS4)

Examples of wet grassland occur on poorly drained soils throughout the route corridor. Species poor examples of this habitat dominated by *Juncus effusus* are frequent on heavy waterlogged soils in more improved areas to the west of the corridor. Towards the east, and along the Mealagh River valley the wet grassland is dominated by a mix of *Juncus acutiflorus* and *Juncus effusus*. This wet grassland often grades into *Molinia caerulea* dominated wet heath. Other species occurring in association with the *Juncus acutiflorus* wet grassland include *Succisa pratensis*, *Deschampsia flexuosa*, *Deschampsia cespitosa*, *Hydrocotyle vulgaris*, *Galium palustre*, *Ranunculus flammula* and *Cardamine pratensis*.

Wet Heath (HH1)

Wet heath is the dominant peatland habitat occurring along the route corridor. Peats are thin throughout the route corridor at less than 0.5m in depth and exposed rock, indicating the shallow nature of the peat, is associated with all examples of wet heath habitat. The wet heath habitat occurring along the route corridor is generally restricted to elevated areas, above 150m. The exception to this is along the Mealagh River valley in the townland of Ards Beg. Throughout the route corridor this habitat is dominated by *Molinia caerulea* and occurs on thin peats at less than 0.5m in depth. To the east of the Site in the vicinity of the wind farm the wet heath habitat is dominated by stands of species poor *Molinia caerulea*. Other species occurring in association with these species poor examples of wet heath include *Schoenus nigrans*, *Erica tetralix*, *Erica cinerea*, *Potentilla erecta* and *Calluna vulgaris*. The sward height consists of tall, tussocky *Molinia caerulea* to a height of greater than 25cm. Other more species-rich examples of wet heath habitat occur along the route. Examples of this are in the townland of Ards Beg along the Mealagh River valley and the townlands of Laharanshermeen and Cappanaboul. Here the wet heath is again dominated by *Molinia caerulea*, but the sward heights are lower generally at 25cm or less. Signs of grazing were evident in these areas and it is likely that the low-level grazing occurring is restricting the dominance of *Molinia caerulea* and promoting diversity. *Succisa pratensis* is abundant in these areas along with *Trichophorum germanicum*, *Schoenus nigrans*. *Pedicularis palustre*, *Osmunda regalis*, *Potentilla erecta*, *Eriophorum angustifolium*, *Carex panicea*, *Carex echinata*, *Juncus squarrosus*, *Rhytidiadelphus loreus*, *Sphagnum capillifolium*, *Sphagnum papillosum*, *Sphagnum tenellum*, and *Breutelia chrysocoma* are all frequent in these areas of wet heath. *Erica tetralix* and *Calluna vulgaris* are occasional to rare.

Dry Heath (HH3)

Examples of dry heath are restricted to more elevated and/or exposed areas associated with exposed rock and very thin peat substrate. Two examples were noted during field surveys. These occur at the wind farm site in the townland of Derreenacrinnig to the east of the route corridor and also at an exposed location with rocky outcrops and thin peat in the townland of Derryarkane to the west of the route corridor. The dry heath is dominated by *Calluna vulgaris* and *Racomitrium lanuginosum*. Other species occurring frequently to abundantly include *Rhytidiadelphus loreus*, *Hypnum jutlandicum*, *Nardus stricta*, *Deschampsia flexuosa*, *Anthoxanthum odoratum* and *Juncus squarrosus*.

Dense Bracken (HD1)

Areas of dense bracken occur in association with previously felled conifer plantation. This habitat is comprised of mono-specific stands of *Pteridium aquilinum*.

Buildings & Artificial Surface (BL3)

Residential dwelling, farm buildings and paved surfaces make up the buildings and artificial habitats within the route corridor.

Habitats Occurring at Proposed Underground Electrical Cable Sections of the Grid Connection Route

A total of 6 no. sections of underground electrical cable will be installed along the proposed Grid Connection route as part of the overall route. The locations of these 6 sections of proposed underground cable are shown on **Figure 6.12** of this EIAR. A description of each of these locations is provided below in order of sequence moving from the wind farm west along the proposed Grid Connection route to the Electrical Substation at Bantry.

Location 1

This section of proposed underground cable is located within the constructed Derreenacrinnig West Wind Farm site. It connects the Electrical Substation, the footprint of which is constructed to pole set 157. This section of the proposed underground cable crosses existing artificial surfaces (BL3) before crossing a short section of disturbed wet heath habitats at the interface of the wet heath and the artificial surface habitat. The dominant vegetation of this habitat is *Molinia caerulea* and *Juncus effusus* occurring on thin peat and less than 0.5m in depth. In places siliceous rock is exposed at the surface. Other species occurring in association within the wet heath in the vicinity of this section of the underground cable route include *Schoenus nigrans*, *Eriophorum vaginatum*, *Erica tetralix*, *Erica cinerea*, *Polygala serpyllifolia*, *Potentilla erecta* and *Calluna vulgaris*. The sward height consists of tall, tussocky *Molinia caerulea* to a height of greater than 25cm. Patches of grassland dominated habitat occur along the route to pole set 157. These are dominated by acid grass such as *Deschampsia flexuosa*, *Anthoxanthum odoratum* and *Festuca ovina*. The habitats occurring under the footprint of this section of the proposed underground cable are characterised by artificial, disturbed and intensively grazed areas that are of low ecological value.

No non-volant mammals were identified as occurring at this location during field survey for the proposed Wind Farm in 2010 and again during surveys in May 2017, October 2018, September 2021 February and March 2022 and August 2024. In general, due to the thin peats soils at and in the vicinity of this section of the cable route the habitats, do not provide suitable conditions for burrowing mammals such as badgers.

The exposed nature of the Site, combined with the paucity of mature deciduous trees and suitable buildings, makes the Site unsuitable for roosting bats.

Low densities of skylarks and meadow pipit have been recorded in the vicinity of this section of the underground cable route. The habitat occurring at this location also offers suitable habitat for snipe. However, none were recorded during previous surveys in 2010 or during surveys in May 2017, October 2018, September 2021, February and March 2022; and during bird surveys completed between November 2022 and March 2024.

The wet heath habitat with patches of exposed siliceous rock along with the minor gully passing through this section of the underground cable route provide suitable habitat for common frog and common lizard. However, it is noted that no evidence either species was recorded within this area during field surveys.

The presence of suitable habitat for Kerry Slug within the area surrounding this section of the underground cable route was identified during the ecological assessment for the Derreenacrinnig Wind Farm. A detailed survey for the presence of Kerry Slug was completed within the vicinity of this section of the underground cable route in 2011 (Dixon Brosnan, 2011). Survey sites no. 1, 5, 6, 22 and 23 were located in the vicinity of this section of the underground cable route. No evidence of the presence of Kerry slug was recorded in the vicinity of this section of the underground cable route during these surveys.

Location 2

This section of the proposed underground cable is located between the proposed pole set 113 and 114. It is approximately 1.02 km in length. The first circa 70m of the route from pole set 113 is located at the southern edge of an area identified as wet heath habitat on Habitat Map Sheet 5. This section of wet heath habitat is dominated by a tall sward of *Juncus effusus* with *Molinia caerulea* also occurring. *Ulex europeaus* is also frequent along the route. *Molinia caerulea* is more abundant in this area of wet heath to the west and north, while *Juncus effusus* is dominant along the line of the proposed underground cable in this habitat. The proposed underground cable then crosses into amenity grassland habitat to the south of the wet heath habitat for approximately 40m before merging with the public road. The remaining 910m of the proposed underground cable is located along the public road which is representative of artificial surfaces (BL3).

The Glanareagh Stream is located at the eastern end of this section of the underground cable route. This is a direct tributary stream of the Meelagh River, the confluence of which

is located approximately 800m downstream and to the north. The Glanareagh Stream is a minor upland watercourse with low fisheries potential. It is excessively tunnelled by dense hedgerow along the riparian zone to the north and south of the exist L4717 bridge crossing. It also offers low value foraging habitat for otters.

Towards the eastern end of this section of the underground cable route the road is bounded by a vegetated earth bank to the south and a hedgerow to the north. A minor strip of grassy verge habitat occurs either side of the roadway. The hedgerow to the north of the road is dominated by *Rubus fruticosus agg.*, *Pteridium aquilinum* and *Ulex europaeus*. Some *Salix* species also occur. The vegetated earth bank support *Pteridium aquilinum* which is dominant in places along with herbs and grasses such as *Anthriscus sylvestris*, *Vicia sepium*, *Alopecurus pratensis*, *Anthoxanthum odoratum*, *Filipendula ulmaria*, *Taraxacum officinale agg.* and *Urtica dioica*.

Further west a *Fushsia* hedgerow dominates the verge along with *Pteridium aquilinum*. Some *Sambucus nigra*, *Crataegus monogyna* and *Fraxinus excelsior* occur along the verge to the north and south of the road.

Improved agricultural grassland dominates the land cover to the south and north of the local road, with patches of dense bracken also occurring.

No evidence of ground dwelling mammals such as badgers was noted adjacent to this section of the proposed underground cable route. The roadside margins and particularly the sections with hedgerow vegetation provide nesting habitat for birds and foraging habitat for bats. Commonly occurring passerine species are likely to be supported by the roadside habitats. The structures occurring to the north and south of the road provide roosting habitat for bats. The bridge over the Glanareagh Stream is a low span bridge with low clearance from the stream bed. This low level of clearance is likely to limit the potential for this bridge to support roosting bats.

The habitats occurring at the margins of the public road and adjacent to the public road along the extent of this section of underground cable route will not be lost to or physically disturbed by the installation of the underground cable route.

Location 3

This section of the proposed underground cable is located between the proposed pole set 101 and 102. It is approximately 116m in length. This section of proposed underground

cable is located at the edge of an improved agricultural grassland field. It will be installed along the edge of this field between Pole set 101 and 102. A hedgerow, which will be retained during the trenching and installation of the duct and cable, is located to the west of this section.

No evidence of burrowing mammals such as badgers was identified along this section of the underground cable route during field surveys completed between 2017 and 2024. The pasture grassland in which the proposed underground cable route will be located does not provide suitable habitat for protected fauna species. The hedgerow to the west of the route provides suitable habitat for commonly occurring passerine bird species and may also provide commuting and foraging habitat for bats.

Location 4

This section of the proposed underground cable is located between the proposed pole set 17 and 18. It is approximately 1.08 km in length. The initial 55m of this section of proposed underground cable is located in improved agricultural grassland field. It then meets an existing public road and continues along this public road for the next 1.05 km. This is a narrow local road and is bounded on both sides by hedgerows dominated by *Crataegus monogyna*, *Fraxinus excelsior* and *Salix* species. The habitat to be disturbed under the footprint of this section of the underground route will be confined to artificial surface (BL3) in the form of the road surface.

The route turns east at this point and crosses approximately 20m of improved agricultural grassland before meeting Pole set 18. The proposed underground cable will cross a vegetated bank colonised by *Pteridium aquilinum*, *Rubus fruticosus agg.*, *Ulex europeaus*, *Prunus spinosa* and *Crataegus mongyna* that bounds the public road from the final section of the proposed underground cable in the improved agricultural grassland field.

No evidence of ground dwelling mammals such as badgers was noted adjacent to this section of the proposed underground cable route. The roadside margins and particularly the sections with hedgerow vegetation provide nesting habitat for birds and foraging habitat for bats. Commonly occurring passerine species are likely to be supported by the roadside habitats.

The habitats occurring at the margins of the public road and adjacent to the public road along the extent of this section of underground cable route will not be lost to or physically disturbed by the installation of the underground cable route.

Location 5

This section of the proposed underground cable is located between the proposed pole set 7 and 8. It is approximately 625m in length. At pole set 7, the proposed underground cable will cross through an existing hedgerow. The hedgerow is comprised of *Crataegus mongyna* and *Prunus spinosa* with *Fraxinus excelsior* also occurring to the north and south of the proposed underground cable crossing point. The proposed underground cable will be installed along the public road for approximately 130m. The proposed underground cable then turns east. It crosses a roadside hedgerow consisting of *Salix cinerea*, *Salix aurita*, *Crataegus mongyna* and *Prunus spinosa*. It then continues east of improved agricultural grassland habitat for the remaining approximate 500m to pole set 8. After crossing the public road hedgerow the proposed underground cable crosses through a further 4 field boundaries. The proposed underground cable will cross through the first field boundary to the east of the public road via an existing farm gate entrance. It will cross through hedgerow at the second field boundary to the east of the public road. Trees occurring along the hedgerow include *Salix cinerea*, *Sambuca nigra* and *Crataegus mongyna*. It will cross through a gappy hedgerow consisting of *Crataegus mongyna* at the third field boundary to the east of the public road. It finally crosses a low hedgerow field boundary dominated by *Prunus spinosa* before merging with pole set 8.

Location 6

Location 6 is located in the townland of Ballylicky and bounds the existing Electrical Substation. It is approximately 200m in length. This section of the underground cable route will be situated along the rock fill slopes that form the foundation of the existing Electrical Substation to the west and north of the route. The dominant habitat occurring under the underground cable route is artificial surface in the form of the rock fill foundations of the sub-station. A minor area of scrub habitat that has colonised this area will be disturbed by the cable route adjacent to the northeast corner of the existing Electrical Substation. Scrub habitat has also colonised some of the low slopes of the Electrical Substation foundation to the east and south of the Electrical Substation adjacent to the proposed underground cable route.

No evidence of ground dwelling mammals such as badgers was noted adjacent to this section of the proposed underground cable route. The scrub habitat to be severed by the proposed underground cable route provide nesting habitat for birds and foraging habitat for bats. No trees of high bat roost potential occur within the scrub habitat along this section of underground cable route. Commonly occurring passerine species are likely to be supported by the scrub habitat.

6.5.2.1.3 Habitats occurring along the proposed Turbine Delivery Route

The Turbine Delivery Route will require the widening of the existing local road between Castledonovan and the wind farm site entrance. Widening will be required at 6 no. locations along the route. The 6 no. widening locations and the habitats occurring at each of them are shown on **Figure 6.13 Sheet 1 – Sheet 4**. The habitats occurring at each of the widening locations are described below.

Widening Location No. 1

Widening location no. 1 is situated to the west of Castledonovan National School (see **Figure 6.13 Sheet 1**). It comprises a small linear stretch of area along the verge of the local road approximately 25m in length with a maximum width of c. 1.5m. The habitats occurring at this location comprise dry meadows and grassy verge. Commonly occurring grasses and herbs along with prostrate bramble occur along the verge.

Widening Location No. 2

Widening location no. 2 is situated at the junction of local roads to the west of Castledonovan National School (see **Figure 6.13 Sheet 1**). It comprises a small wedge at the junction amounting to c. 40m². The habitats occurring at this location comprise improved agricultural grassland and a c. 25m length of box cut *Crataegus monogyna* hedgerow.

Widening Location No. 3

Widening locations no. 3 is situated along the local road between Castledonovan and the wind farm site entrance (see **Figure 6.13 Sheet 2**). It comprises a linear stretch of land along the verge of the road approximately 80m in length with a maximum width of c. 3m. A small area along the east side of the road is also included. The habitat occurring within these widening locations is dominated by dense bracken with buildings and artificial surfaces in the form of existing road edge also occurring.

Widening Location No. 4

Widening locations no. 4 is situated along the local road between Castledonovan and the wind farm site entrance (see **Figure 6.13 Sheet 3**). It comprises a linear stretch of land along the verge of the road approximately 35m in length with a maximum width of c. 4m. The habitat occurring within this widening location consists of scrub dominated by *Salix aurita* with *Crataegus monogyna* also occurring frequently.

Widening Location No. 5

Widening locations no. 5 is situated along the local road between Castledonovan and the wind farm site entrance (see **Figure 6.13 Sheet 3**). It comprises a linear stretch of land along the verge of the road approximately 60m in length with a maximum width of c. 5m. The habitat occurring within this widening location consists of improved agricultural grassland and wet grassland. The improved agricultural grassland is dominated by a ryegrass and bent sward, whilst the wet grassland comprises a species-poor *Juncus effusus* sward of low local ecological value.

Widening Location No. 6

Widening locations no. 6 is situated along the local road between Castledonovan and the wind farm site entrance (see **Figure 6.13 Sheet 4**). It comprises a linear stretch of land along the verge of the road approximately 200m in length with a maximum width of c. 7m. The habitat occurring within this widening location consists of improved agricultural grassland, buildings and artificial surfaces and hedgerow. The hedgerow is dominated by dense Fushia with patches of *Salix aurita* also occurring.

6.5.2.2 Annex I Habitats

The Annex 1 habitats identified as occurring within the Redline Boundary of the Project site are listed in **Table 6.12** below.

It is noted that the footprint of the proposed project is not located within examples of these habitats occurring within the Redline Boundary of the Project site.

Table 6.12: Primary Associated EU Annex I Habitat Types

Annex I Code	Annex I Short Name in this report	Corresponding Level 3 Fossitt Habitat	Annex I Full Title Interpretations of these Annex I habitats in a European context are available from European Commission 2013 (EUR28).
			<i>EU Annex I habitats marked by an asterisk (*) are deemed to be priority habitats that are in danger of disappearing within the EU territory.</i>
4030	Dry heath	Dry heath HH1	European dry heath
4010	Wet heath	Wet heath HH3	North Atlantic Wet heath with Erica Tetralix
4060	Alpine and Sub-Alpine heath	Montane heath HH4	Alpine and Boreal heaths

6.5.3 Results of the Aquatic Habitat Survey

The Site straddles two WFD catchments / hydrometric areas; No. 20 (Bandon-Ilen) and No. 21 (Dunmanus-Bantry-Kenmare). Hydrometric area No. 20 includes the surface catchment drained by the rivers Bandon and Ilen and all streams entering tidal water between Templebreedy Battery and Mizen Head, County Cork. Hydrometric area No. 21 includes the surface catchment drained by all streams entering tidal water in Dunmanus, Bantry and Kenmare Bays between Mizen Head and Glanearagh Head, County Kerry. The southern part of the wind farm infrastructure is located in the Ilen_010 WFD river sub-basin. This sub-basin is drained by the Derreenacrinnig East Stream, which joins the Ilen River approximately 780 m to the south of the wind farm entrance. The Ilen River flows generally in a southerly direction to Skibbereen, where it turns west / southwest discharging to the Ilen Estuary. The northern most parts of the wind farm are located in the Mealgh_SC_010 WFD sub-catchment. The Owvane River sub-catchment is also crossed by the proposed Grid Connection route. All three sub-catchments occur within catchment that are listed as a *Margaritifera* Sensitive Areas.

The Ilen, Mealagh and Owvane Rivers are important salmon rivers providing suitable habitat for all age classes of Atlantic salmon. Tributaries of these rivers are also important for spawning and for juvenile fish. Good salmonid spawning habitat consists of a mix of cobbles, gravels and finer material, free of silt and detritus in fast flowing riffles to ensure that there is an adequate flow of water and oxygen through the substrate.

Two number watercourses drain the proposed wind farm, the Derreenacrinnig East Stream and an un-named watercourse to the north of the wind farm site. Artificial site drains and upland gullies drain to both of these streams. **Figure 6.2** shows the locations of streams and drains within the wind farm site and its environs. This figure also indicates the locations used for Aquatic Monitoring Points (WQ 1 – 2). The results of aquatic surveys are summarised in **Table 6.13** below.

Table 6.13: Summary Results of the Aquatic Surveys that were undertaken at the Site (WQ1-WQ2)

Water Quality Site	WQ1	WQ2
River/Stream Name	Derreenacrinnig West Stream	Un-named Stream
River Sub-basin	llen sub-catchment	Meelagh sub-catchment
River/Stream Order	1 st Order	1 st Order
<i>Margaritifera</i> sensitive area	Yes	Yes
EPA code	None Provided	20D25
EPA Q-Value	Not assigned	Not assigned
Q-Value	Q4 – 5	Q4 – 5
WFD Class	A	A
WFD Status	Good	Good
Salmonid Suitability	Marginal salmonid spawning and nursery habitat.	Important salmonid spawning and nursery channel.

The two principal watercourses draining the Project site, the Derreenacrinnig East Stream and the un-named first order tributary draining the northern section of the wind farm site to the Meelagh catchment, are of a similar character and are first order streams that are representative of the Eroding Upland River (FL2) habitats. Both of the watercourses are representative of upland spate streams characterised by fast water flow and incised banks. The morphology of the streams are representative of high-gradient upland B-type zones (Rosgen, 1996) which are characterised by high gradients, boulder strewn beds with cobbles and gravels and a straight profile. The streams are generally free of macrophyte growth with the principal species recorded instream being *Fontinalis antipyretica*. Instream conditions are similar throughout with boulders, cobbles and gravels occurring throughout. Stream width is generally 1m or less. High levels of shading occur along sections of the northern un-named stream as it flows through conifer plantation. The Derreenacrinnig East Stream flows through open land cover, albeit shading occurs in place where dense and tufted *Molinia caerulea* fringing the stream bankside.

Water quality in each of the streams is unpolluted. The macroinvertebrate assemblages recorded at each of the sampling points along the two streams was indicative of Q4-5/Q5 conditions.

The habitat rating of each of the four watercourses is provided in **Table 6.14**. This rating has been undertaken in line with the guidance outlined in Department of Agriculture's (Northern Ireland) Fisheries Division Advisory Leaflet "*The Evaluation of Habitat for Salmon and Trout*".

Table 6.14: Assessment of Fishery Habitat

Habitat	Parameter	Derreenacrinnig East Stream	Un-Named Stream
Spawning	Water Depth 150 – 700mm	Depths variable to <150mm and between 150 and 700mm.	Depths variable to <150mm and between 150 and 700mm.
	70% substrate 30 – 80mm diameter	Substrate generally greater than this range.	Substrate generally greater than this range.
	Gravel depth 50 – 500mm	Gravel depths <50mm.	Gravel depths <50mm.
	Grade	4	4

Habitat	Parameter	Derreenacrinnig East Stream	Un-Named Stream
Nursery	20 – 250mm depth	Depths variable and subject to frequent change	Depths variable and subject to frequent change
	0.5 – 8% Gradient	Gradient > than this range.	Gradient > than this range.
	Stable cobble/ boulder substrate >70%	Substrate unstable and subject to erosion during spate flows.	Substrate unstable and subject to erosion during spate flows.
	Adequate cover provided	Limited cover provided.	Limited cover provided.
	Grade	4	4
Holding	Minimum depth – 1m	Absent	Absent
	Stable bankside and substrate	Absent	Absent
	Grade	4	4

As outlined in **Table 6.14** above, the two primary streams draining the Project site do not support conditions that are representative of suitable nursery habitat for salmonids. They also limited spawning habitat for salmonids but do not support suitable holding habitat for older fish.

6.5.4 Non-Volant Fauna

6.5.4.1 Terrestrial Mammals – Badger and Otter

The lower sections of the Derreenacrinnig East Stream and the un-named stream downstream of the Site provide suitable foraging habitat for otters. The upper sections of these streams, near their sources adjacent to and within the wind farm site provide limited foraging habitat for otters owing to the spate conditions and variable flow rates in these upper sections, with limited fisheries resource.

No evidence indicating the presence of otters, their holts or couches were observed along the stretch of the Derreenacrinnig East Stream and un-named stream downstream of the wind farm site.

No badgers or their setts were observed during field surveys within the Site. The upland habitat on thin layers of soil and peat with rock at or close to the surface limits the suitability of the Site to support badgers and their setts.

No evidence of other mammal species such as fox, pine marten, Irish stoat, red squirrel, hedgehog and pygmy shrew were recorded during surveys. However, these species are likely to occur in the surrounding area.

6.5.4.2 Herpetofauna

Common frog (*Rana temporaria*) was frequently recorded within the Site. This species was recorded breeding in pooling water in depressions and in flushed habitat. Common lizard or smooth newt were not recorded during field surveys. However, the upland habitat with exposed rock within the Site provides suitable habitat for both these species and they are likely to occur within and surrounding the Site.

6.5.4.3 Kerry Slug

Kerry Slug occur within the landholding having been recorded on exposed siliceous rock habitat during torch light searches of suitable habitat along transects perpendicular to the proposed Grid Connection route. Aside from the recording of this species in the vicinity of the proposed wind farm site, no specimens were recorded during the nighttime torch surveys at other areas of suitable habitat along the proposed Grid Connection route.

6.5.4.4 Protected Terrestrial Invertebrates

The food plant of the marsh fritillary larvae *Succisa pratensis* occurs rarely at the proposed wind farm site and as such the proposed wind farm site does not offer suitable habitat for supporting this species.

Marsh fritillary has been recorded in the wider surrounding area with records for this species held of the townland of Torreen, approximately 9 km to the northeast of the proposed wind farm.

6.5.5 Bats

6.5.5.1 Scale of the Project

The Project size has been identified by examining the proposed wind farm against the Project size criteria detailed in **Table 6.8** above. **Table 6.15** provides the details for evaluating the Project size in the line with the criteria referenced in NatureScot Guidelines.

Table 6.15: Evaluation of the Project Size

Evaluation Criteria	Individual Criteria Project Size Representativeness	Overall Project Size
Small-scale development (less than 10 no. turbines)	Small	Medium
Other wind farm developments occur within 5 km of the Project	Medium	
The Project comprises turbines >100m in height	Large	

6.5.5.2 *Habitat Suitability Risk*

The proposed wind farm is situated between an altitude of 200m to 402m and is located within open moorland habitat. The Site is identified as being of low habitat suitability risk due to the absence of roosting opportunities; and the presence (within a 200m radius of the rotor swept areas of the proposed turbine positions) of low-quality foraging habitat.

6.5.5.3 *Potential Roost Sites*

Given the absence of any structures and trees with preferred roost features within the proposed wind farm site and within a 200m buffer area of the proposed turbine locations, no potential roosting opportunities for bats occur.

6.5.5.4 *Manual Activity Surveys*

Manual bat activity surveys were completed along a transect within the Project site. The transect was completed along a route within the wind farm site that included the location of the four wind turbines. The location of the transect is shown on **Figure 6.3**. Weather conditions during the manual transects were ideal for bat activity with calm, dry and mild conditions prevailing.

During the manual transects in the vicinity of all turbines, bat activity was very low during all transects with only a low number of Common pipistrelle, Soprano pipistrelle and Leisler's bat being recorded (i.e. less than 10 bat passes recorded for each species during the manual transect surveys).

6.5.5.5 *Automatic Surveys*

Static detector surveys were completed during the 2024 bat activity season. As detailed in **Section 6.3** above Wildlife Acoustics static bat detectors were installed at each of the three

turbine locations during the spring, summer and autumn seasons of the 2024 bat activity season.

Nightly monitoring was completed at all three static detectors (one at each proposed turbine location) during the spring, summer and autumn 2024, as specified in **Table 6.2** above. Monitoring during the 2024 season significantly exceeds the recommended monitoring effort for a proposed 3-turbine wind farm at a low value site. The requirement for such a site is 30 nights of monitoring during the season with 10 nights being completed during spring, summer and autumn. A total of 50 nights surveying was completed at each turbine location during the 2024 bat activity season. A total of 150 monitoring nights was completed at the wind farm site during the 2024 activity season.

The following bat species were recorded during the automatic static bat detector surveys during the 2024 summer session:

- Myotis species;
- Leisler's bat;
- Soprano pipistrelle;
- Common pipistrelle;
- Nathusius pipistrelle;
- Brown long-eared bat

The total number of bat passes recorded during monitoring are presented in **Table 6.16** below while **Table 6.17** presents the number of bat passes recorded at each monitoring point during each of the seasonal monitoring sessions. As can be seen in **Table 6.16** and **Table 6.17** activity was overwhelmingly dominated by Leisler's bat, which accounted for approximately 72% of all activity recorded. Common pipistrelle accounted for approximately 23% of all activity recorded, while Soprano pipistrelle, Myotis species and brown long-eared bat accounted for the remaining circa 5% of activity.

Table 6.16: Total No. Passes/Species Recorded during 2024 Bat Activity Surveys

Species	Passes (No.)	Percentage of Total (%)
Leisler's bat	1,798	71.66
Soprano pipistrelle	62	2.47
Common pipistrelle	580	23.12
Myotis species	50	1.99

Species	Passes (No.)	Percentage of Total (%)
Brown long-eared bat	19	0.76
Total	2,509	100.00

Table 6.17: Total No. Bat Passes Recorded at Each Monitoring Point

Season	Turbine	MYOSPP	NYCLEI	PIPIPI	PIPPYG	PLEAUR	Totals
Spring	T1	0	847	67	6	6	926
	T2	0	564	188	6	0	758
	T3	0	158	129	22	0	309
Summer	T1	0	0	0	0	0	0
	T2	41	70	19	7	5	142
	T3	1	20	100	17	2	140
Autumn	T1	0	0	0	0	0	0
	T2	8	120	10	1	5	144
	T3	0	19	67	3	1	90

MYOSPP = Myotis species; NYCLEI = Leisler's bat; PIPNAT = Nathusius pipistrelle; PIPPIPI = Common pipistrelle; PIPPYG = Soprano pipistrelle; PLEAUR = brown long-eared bat
As described in **Section 6.3** above the number of bat passes recorded per hour provides a metric against which activity levels can be assigned. Kepel (2011) has assigned the number of passes per hour to three activity categories. These activity categories are as follows:

- Pipistrelle species and Leisler's bat: Low = <3.5 passes per hour; Moderate = 3.6 – 6.5 passes per hour; High = >6.5 passes per hour;
- All Other Bat species: Low = <4.0 passes per hour; Moderate 4.1 to 10 passes per hour; High = >10 passes per hour.

The median bat species pass per hour per night for each of the monitoring sessions at each monitoring point/turbine has been used to assign bat activity levels in line with the Kepel approach. As per Lintott & Matthews (2018), median bat pass per hour per night is used during this analysis as it is recognised as providing a more accurate representation of activity, as bat activity levels between nights can be highly variable and thus the median provides a more reliable value than the mean or maximum. In addition, given the high variability of bat activity between nights the data set is unlikely to be normally distributed, therefore the median is the most appropriate metric to use when quantifying bat activity. The median bat species pass per hour per night for each species for all nights (including nights when bats were absent) for each recording session was calculated. **Table 6.13** lists

the median bat pass per hour per night for each species and assigns each median value to a bat activity category following the Kepel approach described above.

As can be seen on **Table 6.18** below the median bat activity levels recorded were consistently low during monitoring.

Table 6.18: Activity Categorisation of Median Bat Passes per Hour as per Kepel (2011): Kepel Activity Categories – Green = Low

Season	MP No.	MYOSPP	NYCLEI	PIPIP	PIPPYG	PLEAUR
Spring	MP1	0	0.35	0.12	0	0
	MP2	0	0	0.35	0	0
	MP3	0	0	0	0	0
Summer	MP1	0	0	0	0	0
	MP2	0	0	0.25	0	0
	MP3	0	0	0	0	0
Autumn	MP1	0	0	0	0	0
	MP2	0	0.07	0	0	0
	MP3	0	0	0	0	0

Table 6.19: Summary of Seasonal Bat Activity Levels per Species and Overall Activity Levels during the 2024 Bat Activity Season

Species	Season	Overall Activity Level
Leisler's bat	Spring	Low
	Summer	Low
	Autumn	Low
	Overall	Low
Common pipistrelle	Spring	Low
	Summer	Low
	Autumn	Low
	Overall	Low
Soprano pipistrelle	Spring	Low
	Summer	Low
	Autumn	Low

Species	Season	Overall Activity Level
	Overall	Low
Nathusius pipistrelle	Spring	Low
	Summer	Low
	Autumn	Low
	Overall	Low
Myotis Species	Spring	Low
	Summer	Low
	Autumn	Low
	Overall	Low
Brown long-eared	Spring	Low
	Summer	Low
	Autumn	Low
	Overall	Low

6.5.6 Birds

6.5.6.1 Review of the Bird Sensitivity Mapping Tool

BirdWatch Ireland have developed a sensitivity mapping tool for onshore wind energy development in Ireland (McGuinness *et al.* 2015). The mapping tool layer is hosted by the NBDC. lands within Ireland have been classified according to the sensitivity of bird species to wind energy development. The categories included in the mapping tool range from No Data – Low Sensitivity – Medium Sensitivity – High Sensitivity – Highest Sensitivity. The mapping tool layer shows No Data for the area at and surrounding the eastern section of the Derreenacrinnig West Wind Farm site and proposed turbine locations T2 and T3. The western portion of the proposed wind farm site including the proposed turbine T1 fall into an area mapped at medium sensitivity to wind energy. The medium sensitivity mapping relates to barn owl and red grouse.

6.5.6.2 Bird Records

There are a total of 86 no. records held by the National Biodiversity Data Centre for all birds, regardless of statutory protection status or conservation status within a 2 km radius of the Project. Of these records, 38 are for species that are listed on Annex 1 of the EC Birds Directive and/or are Red-Listed or Amber-Listed species of high and medium conservation concern respectively. These species, their status and the date of the record are listed in Table below.

Table 6.20: Bird species that are Protected and/or of conservation concern occurring within a 2 km distance of the Project

Common Name	Latin Name	Date of Record	Conservation Status	Legal Status
Barn Owl	Tyto alba	08/02/2018	Red	Wildlife Act
Barn Swallow	Hirundo rustica	31/12/2011	Amber	Wildlife Act
Black-headed Gull	Larus ridibundus	31/12/2011		Wildlife Act
Common Grasshopper Warbler	Locustella naevia	31/12/2011	Amber	Wildlife Act
Common Greenshank	Tringa nebularia	31/12/2011	Amber	Wildlife Act
Common Kestrel	Falco tinnunculus	31/12/2011	Amber	Wildlife Act
Common Kingfisher	Alcedo atthis	31/12/2011	Amber	Annex 1; Wildlife Act
Common Linnet	Carduelis cannabina	31/12/2011	Amber	Wildlife Act
Common Redshank	Tringa totanus	31/12/2011	Red	Wildlife Act
Common Snipe	Gallinago gallinago	31/12/2011	Amber	Wildlife Act
Common Starling	Sturnus vulgaris	31/12/2011	Amber	Wildlife Act
Common Wood Pigeon	Columba palumbus	31/12/2011		Wildlife Act
Eurasian Curlew	Numenius arquata	24/12/2024	Red	Wildlife Act
Eurasian Oystercatcher	Haematopus ostralegus	31/12/2011	Amber	Wildlife Act
Eurasian Wigeon	Anas penelope	31/12/2011	Amber	Wildlife Act
Eurasian Woodcock	Scolopax rusticola	31/12/2019	Amber	Wildlife Act

Common Name	Latin Name	Date of Record	Conservation Status	Legal Status
Goosander	Mergus merganser	31/12/2011	Amber	Wildlife Act
Great Black-backed Gull	Larus marinus	31/12/2011	Amber	Wildlife Act
Great Cormorant	Phalacrocorax carbo	31/12/2011	Amber	Wildlife Act
Great Northern Diver	Gavia immer	14/11/2021	Amber	Annex 1; Wildlife Act
Herring Gull	Larus argentatus	31/12/2011	Amber	Wildlife Act
House Martin	Delichon urbicum	31/12/2011	Amber	Wildlife Act
House Sparrow	Passer domesticus	31/12/2011	Amber	Wildlife Act
Little Egret	Egretta garzetta	20/11/2021		Annex 1; Wildlife Act
Mallard	Anas platyrhynchos	31/12/2011	Amber	Wildlife Act
Mute Swan	Cygnus olor	31/12/2011	Amber	Wildlife Act
Northern Wheatear	Oenanthe oenanthe	21/05/2016	Amber	Wildlife Act
Red Grouse	Lagopus lagopus	05/03/2023	Red	Wildlife Act
Red-billed Chough	Pyrrhocorax pyrrhocorax	20/05/2016	Amber	Annex 1; Wildlife Act
Red-breasted Merganser	Mergus serrator	31/12/2011	Amber	Wildlife Act
Ringed Plover	Charadrius hiaticula	31/12/2011	Amber	Wildlife Act
Sand Martin	Riparia riparia	31/12/2011	Amber	Wildlife Act
Short-eared Owl	Asio flammeus	20/08/2018	Amber	Annex 1; Wildlife Act
Sky Lark	Alauda arvensis	11/05/2019	Amber	Wildlife Act

Common Name	Latin Name	Date of Record	Conservation Status	Legal Status
Spotted Flycatcher	Muscicapa striata	31/12/2011	Amber	Wildlife Act
White-tailed Eagle	Haliaeetus albicilla	21/05/2016	Red	Annex 1; Wildlife Act
Yellowhammer	Emberiza citrinella	31/12/2011	Red	Wildlife Act

6.5.6.3 Field Survey Results

6.5.6.3.1 Vantage Point Surveys

Table 6.21 provides details for all target species recorded during the Vantage Point Surveys undertaken at Derreenacrinnig West Wind Farm between November 2022 and March 2025.

A total of eleven no. target species were recorded. These comprise:

- Buzzard (total flight time observed = 3,585 seconds)
- Chough (total flight time observed = 1,410 seconds)
- Greater Black-Backed Gull (total flight time observed = 660 seconds)
- Hen Harrier (total flight time observed = 300 seconds)
- Kestrel (total flight time observed = 1,800 seconds)
- Lesser Black-backed Gull (total flight time observed = 3,300 seconds)
- Mallard (total flight time observed = 420 seconds)
- Merlin (total flight time observed = 420 seconds)
- Peregrine (total flight time observed = 210 seconds)
- Sparrowhawk (total flight time observed = 165 seconds)
- Snipe (total flight time observed = 165 seconds)

Table 6.21 provides data for the total flight time for each target species flight recorded during the surveys. The proportion of time associated with each flight that occurred within the flight Survey Area (FSA) and the rotor swept area (RSA) is provided for each target species flight record. All flight lines associated with target species listed in **Table 6.21** are mapped on **Figure 6.14 to 6.30**.

Table 6.21: Details of Target Species Flights Recorded during VP Surveys

Flight Record Date	Flight ID	Species	No Birds	Flight Time (Sec)	FSA Time (Sec)	RSA Time (Sec)
22/11/2022	BZ1	Buzzard	2	120	0	0
23/11/2022	BZ2	Buzzard	1	45	45	0
31/01/2023	BZ3	Buzzard	2	60	0	0
31/01/2023	BZ4	Buzzard	1	30	0	0
04/04/2023	BZ5	Buzzard	1	30	30	0
16/05/2023	BZ6	Buzzard	1	45	0	0
05/06/2023	BZ7	Buzzard	1	90	90	0
06/06/2023	BZ8	Buzzard	1	150	0	0
31/07/2023	BZ9	Buzzard	1	90	90	0
31/07/2023	BZ10	Buzzard	1	120	0	0
28/08/2023	BZ11	Buzzard	1	90	90	0
20/10/2023	BZ12	Buzzard	1	135	0	0
20/10/2023	BZ13	Buzzard	1	45	0	0
21/11/2023	BZ14	Buzzard	1	30	30	0
21/02/2024	BZ15	Buzzard	1	45	0	0
21/02/2024	BZ16	Buzzard	1	120	120	0
28/03/2024	BZ17	Buzzard	1	45	0	0
29/03/2024	BZ18	Buzzard	1	240	0	0
29/03/2024	BZ19	Buzzard	1	240	0	0
29/03/2024	BZ20	Buzzard	1	75	0	0
29/03/2024	BZ21	Buzzard	1	60	0	0
29/03/2024	BZ22	Buzzard	2	150	0	0
30/04/2024	BZ23	Buzzard	1	45	45	45
01/05/2024	BZ24	Buzzard	1	240	240	0
01/05/2024	BZ25	Buzzard	1	45	45	0
01/05/2024	BZ26	Buzzard	1	195	0	0
01/05/2024	BZ27	Buzzard	1	45	45	0
19/05/2024	BZ28	Buzzard	1	45	45	0
30/09/2024	BZ29	Buzzard	1	45	45	0
16/10/2024	BZ30	Buzzard	1	90	90	90
09/12/2024	BZ31	Buzzard	1	60	0	0
09/12/2024	BZ32	Buzzard	1	240	0	0

Flight Record Date	Flight ID	Species	No Birds	Flight Time (Sec)	FSA Time (Sec)	RSA Time (Sec)
16/01/2025	BZ33	Buzzard	1	45	45	0
07/02/2025	BZ34	Buzzard	1	105	105	0
31/01/2023	CF1	Chough	1	30	0	0
31/01/2023	CF2	Chough	1	45	0	0
28/03/2023	CF3	Chough	2	90	0	0
28/03/2023	CF4	Chough	2	90	0	0
28/03/2023	CF5	Chough	1	30	0	0
28/03/2023	CF6	Chough	2	90	0	0
04/03/2025	CF7	Chough	2	60	0	0
09/05/2023	CF8	Chough	2	30	0	0
31/07/2023	CF9	Chough	2	60	0	0
04/03/2024	CF10	Chough	2	30	0	0
12/03/2024	CF11	Chough	1	45	0	0
12/03/2024	CF12	Chough	2	90	0	0
29/03/2024	CF13	Chough	2	60	0	0
29/03/2024	CF14	Chough	2	90	0	0
29/03/2024	CF15	Chough	2	30	0	0
29/03/2024	CF16	Chough	2	90	0	0
04/04/2023	CF17	Chough	2	60	0	0
19/05/2024	CF18	Chough	2	90	0	0
11/06/2024	CF19	Chough	1	15	0	0
14/07/2024	CF20	Chough	1	15	0	0
30/08/2024	CF21	Chough	2	60	0	0
10/06/2024	CF22	Chough	2	60	0	0
11/06/2024	CF23	Chough	1	30	0	0
11/06/2024	CF24	Chough	1	15	0	0
04/03/2025	CF25	Chough	2	30	0	0
28/03/2025	CF26	Chough	2	60	0	0
28/03/2025	CF27	Chough	1	15	0	0
03/12/2022	GB1	Greater Black-Backed Gull	3	405	405	0
09/05/2023	GB2	Greater Black-Backed Gull	3	180	0	0

Flight Record Date	Flight ID	Species	No Birds	Flight Time (Sec)	FSA Time (Sec)	RSA Time (Sec)
23/01/2024	GB3	Greater Black-Backed Gull	1	45	0	0
19/05/2024	GB4	Greater Black-Backed Gull	1	30	0	0
31/01/2023	HH1	Hen Harrier	1	150	0	0
14/11/2023	HH2	Hen Harrier	1	150	0	0
22/11/2022	K1	Kestrel	1	60	60	0
23/11/2022	K2	Kestrel	1	60	60	0
23/11/2022	K3	Kestrel	1	30	0	0
04/04/2023	K4	Kestrel	1	45	45	0
09/05/2023	K5	Kestrel	1	30	0	0
15/05/2023	K6	Kestrel	1	30	0	0
16/05/2023	K7	Kestrel	1	135	0	0
06/06/2023	K8	Kestrel	1	30	30	0
06/06/2023	K9	Kestrel	1	30	30	0
19/10/2023	K10	Kestrel	1	60	60	60
19/12/2023	K11	Kestrel	1	135	135	
22/02/2024	K12	Kestrel	1	15	0	0
20/10/2023	K13	Kestrel	1	90	0	0
29/03/2024	K14	Kestrel	1	30	30	0
29/03/2024	K15	Kestrel	1	30	30	0
30/04/2024	K16	Kestrel	1	75	75	0
01/05/2024	K17	Kestrel	1	30	30	0
01/05/2024	K18	Kestrel	1	240	240	0
19/05/2024	K19	Kestrel	1	45	45	0
19/05/2024	K20	Kestrel	1	75	75	0
19/05/2024	K21	Kestrel	1	30	30	0
10/06/2024	K22	Kestrel	1	105	0	0
16/10/2024	K23	Kestrel	1	225	0	0
16/01/2025	K24	Kestrel	1	45	0	0
16/01/2025	K25	Kestrel	1	75	0	0
31/01/2025	K26	Kestrel	1	45	0	0

Flight Record Date	Flight ID	Species	No Birds	Flight Time (Sec)	FSA Time (Sec)	RSA Time (Sec)
28/03/2023	LB1	Lesser Black-backed Gull	4	420	0	0
05/06/2023	LB2	Lesser Black-backed Gull	2	120	0	0
05/06/2023	LB3	Lesser Black-backed Gull	1	30	0	0
05/07/2023	LB4	Lesser Black-backed Gull	2	210	0	0
14/11/2023	LB5	Lesser Black-backed Gull	3	270	0	0
12/03/2024	LB6	Lesser Black-backed Gull	1	90	90	0
24/04/2024	LB7	Lesser Black-backed Gull	1	75	75	0
30/04/2024	LB8	Lesser Black-backed Gull	1	45	45	0
01/05/2024	LB9	Lesser Black-backed Gull	3	720	720	0
19/05/2024	LB10	Lesser Black-backed Gull	2	60	60	0
19/05/2024	LB11	Lesser Black-backed Gull	1	30	30	0
31/05/2024	LB12	Lesser Black-backed Gull	2	90	90	0
31/05/2024	LB13	Lesser Black-backed Gull	1	75	75	0
31/05/2024	LB14	Lesser Black-backed Gull	4	360	0	0
10/06/2024	LB15	Lesser Black-backed Gull	1	30	30	0
30/08/2024	LB16	Lesser Black-backed Gull	2	120	120	0

Flight Record Date	Flight ID	Species	No Birds	Flight Time (Sec)	FSA Time (Sec)	RSA Time (Sec)
11/11/2024	LB17	Lesser Black-backed Gull	1	135	135	0
07/02/2025	LB18	Lesser Black-backed Gull	2	180	180	0
07/02/2025	LB19	Lesser Black-backed Gull	1	120	0	0
28/03/2025	LB20	Lesser Black-backed Gull	1	30	30	0
28/03/2025	LB21	Lesser Black-backed Gull	2	90	0	0
09/05/2023	MA1	Mallard	2	60	0	0
05/07/2023	MA2	Mallard	3	135	0	0
25/09/2023	MA3	Mallard	2	150	0	0
21/11/2023	MA4	Mallard	1	75	0	0
14/11/2023	ML1	Merlin	1	45	0	0
19/10/2023	PE1	Peregrine	1	75	75	0
19/05/2024	PE2	Peregrine	1	30	0	0
30/08/2024	PE3	Peregrine	1	75	75	0
30/08/2024	PE4	Peregrine	1	30	30	0
03/12/2022	SH1	Sparrowhawk	1	75	0	0
05/06/2023	SH2	Sparrowhawk	1	45	0	0
22/02/2024	SH3	Sparrowhawk	1	15	0	0
07/02/2025	SH4	Sparrowhawk	1	30	0	0
23/11/2022	SN1	Snipe	1	45	0	0
03/12/2022	SN2	Snipe	3	90	0	0
19/10/2023	SN3	Snipe	1	15	0	0
21/11/2023	SN4	Snipe	1	15	0	0

As shown in **Table 6.21** above, a total of 131 target species flights were observed during the vantage point surveys. **Table 6.22** provides a detail of the total flight time for each species recorded within the flight Survey Area and the rotor swept area. The percentage time each target species was recorded within both the flight Survey Area and the rotor swept

area in the context of all vantage point survey time (i.e. 1,231,200 seconds) is also provided in **Table 6.22**.

Table 6.22: Details of Target Species Flight Times Recorded within the Flight Survey Area & the Rotor Swept Area

Species	Flight Time (Seconds)	FSA Time (Seconds)	% of All VP Survey Time in FSA	RSA Time (Seconds)	% of All VP Survey Time in RSA
Buzzard	3255	1200	0.097	135	0.011
Chough	1410	0	0.000	0	0.000
Greater Black-Backed Gull	660	405	0.033	0	0.000
Hen Harrier	300	0	0.000	0	0.000
Kestrel	1800	975	0.079	60	0.005
Lesser Black-backed Gull	3300	1680	0.136	0	0.000
Mallard	420	0	0.000	0	0.000
Merlin	420	0	0.000	0	0.000
Peregrine	210	180	0.015	0	0.000
Sparrowhawk	165	0	0.000	0	0.000
Snipe	165	0	0.000	0	0.000

In terms of the seasonal distribution of target species flights recorded, 70 of the flights were recorded during the three non-breeding seasons of 2022/2023; 2023/2024 and 2024/2025 whilst 61 of the flights were recorded during the two breeding seasons of 2023 and 2024.

Summary of Non-Breeding Season Flights

The species recorded during the non-breeding season vantage point surveys comprised:

Buzzard (20 no. flights);

Chough (16 no. flights);

Greater Black-Backed Gull (2 no. flights)

Hen harrier (2 no. flights)

Kestrel (12 no. flights)

Lesser Black-backed Gull (8 no. flight);
Mallard (1 no flight_
Merlin (1 no. flight)
Peregrine (1 no. flight)
Snipe (4 no. flights)
Sparrowhawk (3 no. flights).

No evidence indicating the presence of winter roost sites for the above species was recorded during the vantage point surveys. Buzzard is likely to roost in the wider surrounding countryside, whilst the low activity records for Kestrel and Lesser Black-backed Gull, indicates the absence of any roosting of this species in the vicinity of the Derreenacrinnig West Wind Farm site.

Summary of Breeding Season Flights

The species recorded during the breeding season vantage point surveys comprised:

Buzzard (14 no. flights);
Chough (10 no. flights);
Greater Black-Backed Gull (2 no. flights)
Kestrel (12 no. flights)
Lesser Black-backed Gull (12 no. flight);
Mallard (4 no flight_
Peregrine (3 no. flight)
Sparrowhawk (1 no. flights).

Buzzard were observed foraging in the vicinity of the proposed wind farm site during the breeding season with both pairs and individuals recorded circling, commuting and foraging. Buzzards were frequently observed being mobbed by corvids, particularly raven.

Chough were observed to be breeding to the southeast of VP1 and were observed flying to and from the breeding site. They were observed foraging in short sward pasture to the south of Derreenacrinnig West Wind Farm hillside. Chough were not observed flying over or foraging on the ground within the wind farm site. Ground conditions within the wind farm site do not provide suitable foraging habitat for chough.

Kestrel was recorded foraging in the area, with approximately 50% of the flight activity observed recorded within the flight Survey Area.

Lesser Black-backed Gull and Greater Black-Backed Gull were observed commuting through the area whilst the former was also observed loafing on pasture to the southwest of the hillside as well as on acid grassland habitat at the foot of the south facing hillside of Derreenacrinnig.

Mallard, Peregrine and Sparrowhawk were rarely recorded during the breeding season vantage point surveys of these three species only Peregrine was recorded within the flight Survey Area.

Peregrine were observed infrequently commuting in the wider area surrounding the proposed wind farm site.

One flight of a Sparrowhawk was observed foraging to the north of the wind farm site.

6.5.6.3.2 Transect Surveys

The results of the transect surveys completed during the breeding season with the breeding status of each species indicated as per the BTO breeding status codes are provided in **Table 6.23** below. The presence of species recorded during winter season transect surveys is also indicated in **Table 6.23**. A total of 38 species were recorded during all transect surveys across five separate seasons, comprising three breeding seasons and two non-breeding seasons. Meadow pipit was the only red-listed species of high conservation concern recorded during the transect surveys. A total of 8 amber-listed species of medium conservation concern were recorded, whilst the remaining 29 green-listed species are of low conservation concern.

No evidence indicating the presence of sensitive breeding bird species such as golden plover or red grouse were observed during the breeding season transect surveys in 2019, 2020 or 2022.

Table 6.23: Target species and species of conservation concern recorded during transect surveys

Species	BoCC I	Annex I	Breeding 2023	Breeding 2024	Non-breeding 22/23	Non-breeding 23/24	Non-breeding 24/25
			Breeding Status	Breeding Status	Breeding Status	Present (✓)	Present (✓)
Blackbird	Green	No	PB	PB	✓	✓	✓
Blue Tit	Green	No	PB	PB	✓	✓	✓
Bullfinch	Green	No		PB			
Buzzard	Green	No		NB			
Chaffinch	Green	No	PB	PB	✓	✓	✓
Chiffchaff	Green	No	PB	PB			
Coal Tit	Green	No	PB	PB	✓	✓	✓
Crossbill	Green	No	PB	PB			
Dunnock	Green	No	PB	PB	✓	✓	✓
Fieldfare	Green	No			✓	✓	
Goldcrest	Amber	No	PB		✓	✓	✓
Goldfinch	Green	No	PB	PB	✓	✓	✓
Great Tit	Green	No	PB	PB	✓	✓	✓
Hooded Crow	Green	No	NB	NB	✓	✓	✓
House Sparrow	Amber	No	PBr		✓	✓	✓
Jackdaw	Green	No	NB	NB	✓	✓	✓
Jay	Green	No	NB	NB	✓	✓	✓
Lesser Redpoll	Green	No	PBr		✓	✓	✓
Linnet	Amber	No	PBr				✓
Magpie	Green	No	NB	NB	✓	✓	✓
Mallard	Amber	No					

Species	BoCC I	Annex I	Breeding 2023	Breeding 2024	Non-breeding 22/23	Non-breeding 23/24	Non-breeding 24/25
			Breeding Status	Breeding Status	Breeding Status	Present (✓)	Present (✓)
Meadow Pipit	Red	No	CB	CB	✓	✓	✓
Pheasant	Green	No	PBr	PBr	✓	✓	✓
Pied Wagtail	Green	No	PB	PB	✓	✓	✓
Raven	Green	No	NB	NB	✓	✓	
Robin	Green	No			✓	✓	✓
Rook	Green	No	NB	NB	✓	✓	✓
Siskin	Green	No	PBr	PBr	✓	✓	✓
Skylark	Amber	No	CB	CB	✓	✓	✓
Snipe	Amber	No			✓	✓	✓
Song Thrush	Green	No	PB	PB	✓	✓	✓
Starling	Amber	No	PBr		✓	✓	✓
Stonechat	Green	No	CB	CB	✓	✓	✓
Swallow	Amber	No	NB	NB			
Willow Warbler	Amber	No	CB	CB			
Woodpigeon	Green	No	CB	CB	✓	✓	✓
Wren	Green	No	CB	CB	✓	✓	✓

CB = Confirmed Breeding; PB = Probably Breeding; PBr = Possibly Breeding; NB = Not Breeding

6.5.7 Aquatic Fauna

6.5.7.1 Fisheries

The upper sections of the Derreenacrinnig East Stream and the un-named stream draining the proposed wind farm site are of low fisheries potential owing to their upland 1st-order character with variable flow rates, subject to both flood and drying out. Downstream of the

wind farm site, both streams provide suitable spawning habitat for salmonids and lamprey habitat.

The Ilen, Mealagh and Owvane Rivers downstream of the proposed wind farm site and crossed by the overhead line sections of the proposed Grid Connection route are important salmon rivers providing suitable habitat for all age classes of Atlantic salmon. Suitable lamprey habitat is also available throughout these watercourses.

6.5.7.2 Freshwater Pearl Mussel

The Proposed Development and Grid Connection Route Options are located within three WFD sub-catchments. These include the Ilen_010 sub-catchment, the Mealgh_SC_010 & Mealagh_020 sub-catchment, and Owvane (Cork)_030 sub-catchment and the Coomhola_SC_010 sub catchment. These sub-catchments occur within catchments that are listed as a *Margaritifera* Sensitive Areas. Freshwater pearl mussel are known to occur downstream of the proposed wind farm site and the proposed Grid Connection route along higher order watercourses of the catchment. No freshwater pearl mussel were recorded within the first order streams draining the Project site and conditions along these streams at the wind farm site are unsuitable for freshwater pearl mussel.

6.5.8 Herpetofauna

Common frog (*Rana temporaria*) was frequently recorded within the Site. This species was recorded breeding in pooling water in depressions and in flushed habitat. Common lizard or smooth newt were not recorded during field surveys. However, the upland habitat with exposed rock within the Site provides suitable habitat for both these species and they are likely to occur within, and surrounding the Site.

6.5.9 Invasive Alien Species (IAS)

No non-native invasive species were identified within the Proposed Development site. *Rhododendron ponticum* occurs in the surrounding area. There are records for the presence of *Impatiens glandulifera*, *Fallopia japonica* and *Hyacinthoides hispanica* in the surrounding area.

Records for the following non-native fauna have been recorded within the 2 km buffer zone of the Project site: Mink, Bank Vole, Rabbit and Jenkin's Spire Snail.

6.6 ASSESSMENT OF POTENTIAL ENVIRONMENTAL EFFECTS

6.6.1 Identification & Evaluation of Ecological Receptors

Table 6.24 below lists and evaluates the non-avian ecological features identified as occurring within the Zol of the Proposed Development and identifies those which are considered to be ecological receptors following the methodology previously described within **Section 6.3**.

Table 6.24: Evaluation of Ecological Features Identified at and surrounding the Proposed Development

Ecological Feature	Evaluation	Ecological Receptor?
Habitats		
Wet heath	<p>The condition of wet heath habitat on site is variable with examples of this habitat varying from the more dominant species-poor <i>Molinia caerulea</i> dominated swards not representative of Annex 1 habitat and patchier cover of <i>Calluna vulgaris</i> dominated wet heath cover representative of Annex 1 habitat. No examples of wet heath occur under the footprint of the Proposed Development.</p> <p>Along the proposed Grid Connection route more species rich examples of wet heath habitat such as that occurring along the Mealagh River valley at Ards Beg, at Laharansharmeen and at Cappanaboul have links to the Annex 1 habitat 'Molinia meadows on calcareous, peaty or clayey-silt-laden soils (6410)'. The examples of wet heath occurring within the route corridor are dominated throughout by <i>Molinia caerulea</i> with dwarf shrub heathers</p>	<p>Yes – local importance (higher value) (Rating D) to County Importance (Rating C)</p>

Ecological Feature	Evaluation	Ecological Receptor?
	occurring only occasionally to frequently. As such they are not considered to be representative of the Annex habitat "Northern Atlantic wet heaths with <i>Erica tetralix</i> (4010)".	
Wet heath/Blanket bog	Wet heath cover grades into patches of blanket bog in places where peat depth is greater than 0.5m. Peat at depths greater than 0.5m are patchy within the wind farm site being restricted to undulations in the bedrock. The majority of the Site is underlain by a thin peat cover with exposed siliceous rock occurring within the wet heath habitat.	Yes – local importance (higher value) (Rating D) to County Importance (Rating C)
Dry heath	Patches of dry heath occur in very thin peat substrate over bedrock to the west of the wind farm site and along the proposed Grid Connection route. This habitat has links to the Annex 1 habitat dry heath but is confined in its extent within the Project site.	Yes –County Importance (Rating C)
Wet Willow Woodland	Patches of wet willow woodland occur along the Grid Connection route. This habitat provides woodland diversity along the route and the otherwise dominance of open grassland and heathland habitats.	Yes – County Importance (Rating C)
Dry acid grassland	This habitat has been overgrazed by livestock. It represents a preferred location for sheep and	Yes - (local importance (higher value) (Rating D)

Ecological Feature	Evaluation	Ecological Receptor?
	cattle to graze within the Site. It is of limited nature conservation value.	
Wet grassland	The wet grassland habitat occurring within the proposed wind farm site are generally species poor being dominated by stands of <i>Molinia caerulea</i> and <i>Juncus effusus</i> . However, they provide cover and habitat for fauna species and are therefore considered to be of local value.	Yes - Local importance (higher value) (Rating D)
Scrub	Scrub dominated principally by patches of bramble and gorse occur along the proposed Grid Connection route.	No - Local importance (lower value) (Rating E)
Improved agricultural grassland	This is an intensively managed habitat that supports low flora diversity and is of low value for fauna.	No - Local importance (lower value) (Rating E)
Exposed siliceous rock	The exposed siliceous rock habitat occurs as a micro-habitat within the broader heathland habitats dominating the wind farm site. They are represented by outcrops of siliceous rock. Exposed siliceous rock provides suitable habitat for Kerry Slug and support a typical suite of epilythic and endolithic lithophytes. This habitat has links to the Annex 1 habitat Siliceous Rocky slopes with Chasmophytic Vegetation (8220) but the overall confined nature of	Yes - (local importance (higher value) (Rating D)

Ecological Feature	Evaluation	Ecological Receptor?
	this habitat within the wind farm site limits its overall evaluation.	
Habitats occurring along the TDR widening locations	Hedgerow	Yes - Local importance (higher value) (Rating D)
	Dry meadows and grassy verges; wet grassland; improved agricultural grassland; dense bracken	No - Local importance (lower value) (Rating E)
Species		
Otters	While no otter resting places or signs of foraging otters were observed during field surveys the Meelagh River, crossed by the proposed Grid Connection route provides suitable for otters and this species is known to occur along this river. The sections of the upland eroding watercourse draining the wind farm site do not provide suitable habitat for otters.	Yes - International Importance (Rating C)
Bats	All bat species in Ireland are protected under national and European legislation. Up to seven species of bats were recorded at the proposed wind farm site during bat monitoring surveys.	Yes - local importance (higher value) (Rating D)
Badgers	No evidence of badgers was recorded at the Site. The thin substrates over bedrock and abundance of bedrock outcropping are not considered to offer suitable habitat for badgers and this species is not identified as a potential ecological receptor.	Yes - local importance (higher value) (Rating D)

Ecological Feature	Evaluation	Ecological Receptor?
Irish hare	Whilst not recorded during field surveys, the habitats within the proposed wind farm site provide suitable habitat for this species and, following a precautionary approach, this species is included as an ecological receptor.	Yes - local importance (higher value) (Rating D)
Irish stoat	Whilst not recorded during field surveys, the habitats within the proposed wind farm site provide suitable habitat for this species and, following a precautionary approach, this species is included as an ecological receptor.	Yes - local importance (higher value) (Rating D)
Hedgehog	Whilst not recorded during field surveys, the habitats within the proposed wind farm site provide suitable habitat for this species and, following a precautionary approach, this species is included as an ecological receptor.	Yes - local importance (higher value) (Rating D)
Pygmy Shrew	Whilst not recorded during field surveys, the habitats within the proposed wind farm site provide suitable habitat for this species and, following a precautionary approach, this species is included as an ecological receptor.	Yes - local importance (higher value) (Rating D)
Herpetofauna	Common frog were encountered within the wind farm site. The Site also provides suitable habitat for common lizard and smooth newt.	Yes - local importance (higher value) (Rating D)
Kerry Slug	The habitat occurring within and adjacent to the Proposed Development site and in the	Yes – County Importance (Rating C)

Ecological Feature	Evaluation	Ecological Receptor?
	vicinity of the overground electrical cable sections of the Grid Connection route support areas of exposed siliceous rock representative of high value Kerry Slug habitat.	
Marsh fritillary	The nearest record for this species is approximately 9 km to the northeast of the Project site. Stands of <i>Succisa pratensis</i> are limited within the wind farm site and as such there is limited potential for the habitats occurring within the wind farm site to support colonies of marsh fritillary.	N/A - no suitable habitat present in the Proposed Development footprint.
Invertebrates	Other species of local importance are likely to be supported by the Site.	Yes - local importance (higher value) (Rating D)
Fisheries	The sections of the upland eroding streams draining the wind farm site do not provide important salmonid spawning and nursery river and do not support suitable habitat for brook lamprey. The Meelagh River crossed by the proposed Grid Connection route is an important salmonid and lamprey river.	Yes – local importance (lower value) (Rating E) to County Importance (Rating C)
Freshwater pearl mussel	Freshwater pearl mussel does not occur in the high energy, higher order spate streams draining the wind farm site. This species is known to occur within the Meelagh, Ilen and Owvane catchments downstream of the wind farm site	Yes – National Importance (Rating B)

Ecological Feature	Evaluation	Ecological Receptor?
	and proposed Grid Connection route.	

**Assessment of impacts upon European Sites is provided within the Natura Impact Statement*

The evaluation of the avifauna interest of the Site is based on identifying the importance of the Site and 500m surrounding buffer area (i.e. the flight Survey Area) for sensitive target species.

The results of the field surveys indicate that no target species recorded rely on the flight Survey Area for breeding or roosting.

For the purposes of the impact assessment the bird species identified as representing key sensitive receptors to be assessed further for potential impacts are identified in **Table 6.25**. The identification of key sensitive receptors and the associated sensitivity assigned follows the criteria outlined in **Table 6.7** above. Only bird species that have been included as target species or that have been identified during the Baseline description above that fall into one of the four sensitivity categories set out in **Table 6.7** are included for consideration as Key Ornithological Receptors.

Table 6.25: Key Ornithological Receptors

Species	Annex 1 Species	Status	Key sensitive receptor	Sensitivity	KOR
Barn Swallow (<i>Hirundo rustica</i>)		Amber	Historically recorded in the surrounding hectad. Recorded during transect surveys and as a non-target species during vantage point surveys. Foraging on site. Not breeding on site. Included as a key ornithological receptors	Low	Yes
Buzzard		Green	Recorded as a target species during vantage point surveys. Included as a Key Ornithological Receptor (KOR)	Low	Yes
Common Kestrel (<i>Falco tinnunculus</i>)		Red	Historically recorded in the surrounding hectad. Recorded as a target species during vantage point surveys. Included as a KOR	Medium	Yes
Common Starling (<i>Sturnus vulgaris</i>)		Amber	Historically recorded in the surrounding hectad. Recorded as a target species during vantage point surveys. Included as a KOR	Low	Yes
Eurasian Curlew (<i>Numenius arquata</i>)	Yes	Red	Historically recorded in the surrounding hectad. Not recorded during Baseline surveys. Not included as a KOR	High	No

Species	Annex 1 Species	Status	Key sensitive receptor	Sensitivity	KOR
Eurasian Woodcock (<i>Scolopax rusticola</i>)		Red	Historically recorded in the surrounding hectad. Not recorded during Baseline surveys. Not included as a KOR	Medium	No
Eurasian Oystercatcher (<i>Haematopus ostralegus</i>)		Amber	Historically recorded in the surrounding hectad. Not recorded during Baseline surveys. Not included as a KOR	Low	No
Goldcrest		Amber	Recorded during breeding season transect survey. Included as a KOR	Low	Yes
Golden Plover (<i>Pluvialis apricaria</i>)	Yes	Red	Historically recorded in the surrounding hectad. Not recorded during Baseline surveys. Not included as a KOR	Medium	No
Greater Black-Backed Gull		Amber	Historically recorded in the surrounding hectad. Recorded as a target species during vantage point surveys. Included as a KOR	Low	Yes

Species	Annex 1 Species	Status	Key sensitive receptor	Sensitivity	KOR
Great Cormorant		Amber	Historically recorded in the surrounding hectad. Not recorded during Baseline surveys. Not included as a KOR	Low	No
Great Northern Diver (<i>Gavia immer</i>)	Yes	Amber	Historically recorded in the surrounding hectad. Not recorded during Baseline surveys. Not included as a KOR	High	No
Hen Harrier (<i>Circus cyaneus</i>)	Yes	Amber	Historically recorded in the surrounding hectad. Recorded as a target species during vantage point surveys. Included as a KOR	High	Yes
Herring Gull (<i>Larus argentatus</i>)		Amber	Historically recorded in the surrounding hectad. Not recorded during Baseline surveys. Not included as a KOR	Low	No
House Martin (<i>Delichon urbicum</i>)		Amber	Historically recorded in the surrounding hectad. Not recorded within the FSA during Baseline surveys. Not included as a KOR	Low	No

Species	Annex 1 Species	Status	Key sensitive receptor	Sensitivity	KOR
House Sparrow (<i>Passer domesticus</i>)		Amber	Historically recorded in the surrounding hectad. Recorded during Baseline transect surveys. Included as a KOR	Low	Yes
Little Egret (<i>Egretta garzetta</i>)	Yes		Historically recorded in the surrounding hectad. Not recorded during Baseline surveys. Not included as a KOR	High	No
Lesser Black-backed Gull (<i>Larus fuscus</i>)		Amber	Historically recorded in the surrounding hectad. Recorded as a target species during vantage point surveys. Included as a KOR	Low	Yes
Mallard		Amber	Recorded during vantage point surveys as a target species and during transect surveys. Included as a KOR	Low	Yes
Meadow Pipit (<i>Anthus pratensis</i>)		Red	Historically recorded in the surrounding hectad. Recorded during Baseline transect surveys. Included as a KOR	Medium	Yes
Peregrine (<i>Falco peregrinus</i>)	Yes	Green	Historically recorded in the surrounding hectad. Recorded as a target species during vantage point surveys. Included as a KOR	High	Yes

Species	Annex 1 Species	Status	Key sensitive receptor	Sensitivity	KOR
Red Grouse		Red	Historically recorded in the surrounding hectad. Not recorded during Baseline surveys. Not included as a KOR	Medium	No
Red-billed Chough (<i>Pyrrhocorax pyrrhocorax</i>)	Yes	Amber	Historically recorded in the surrounding hectad. Recorded as a target species during vantage point surveys. Included as a KOR	Medium	No
Red-breasted (Merganser <i>Mergus serrator</i>)		Amber	Historically recorded in the surrounding hectad. Not included as a KOR	Low	No
Ringed Plover (<i>Charadrius hiaticula</i>)		Amber	Historically recorded in the surrounding hectad. Not included as a KOR	Low	No
Sky Lark (<i>Alauda arvensis</i>)		Amber	Historically recorded in the surrounding hectad. Recorded during Baseline transect surveys. Included as a KOR	Low	Yes
Snipe		Red	Historically recorded in the surrounding hectad. Recorded as a target species during vantage point surveys. Included as a KOR	Medium	Yes

Species	Annex 1 Species	Status	Key sensitive receptor	Sensitivity	KOR
Sparrowhawk		Green	Not recorded historically. Recorded once during vantage point surveys outside the flight Survey Area. Not included as a KOR	Low	Yes
White-tailed Sea Eagle (<i>Haliaeetus albicilla</i>)	Yes		Historically recorded in the surrounding hectad. Not recorded during Baseline surveys. Not included as a KOR	High	No
Whooper Swan (<i>Cygnus cygnus</i>)	Yes	Amber	Historically record in the surrounding hectad. Not recorded during Baseline surveys. Not included as a KOR	High	No
Willow Warbler		Amber	Recorded during breeding season transect survey in 2019. Included as a KOR	Low	Yes
Yellowhammer (<i>Emberiza citrinella</i>)		Red	Historically recorded in the surrounding hectad. Not recorded during Baseline surveys. Not included as a KOR	Medium	No

6.6.2 The 'Do-Nothing' Impact

Land use activities at the Site comprise livestock grazing in the form of sheep and cattle grazing. Buildings and artificial surfaces in the form of an existing wind farm access track and Turbine Hardstand occur at the Project site.

These lands will continue to be used for agricultural purposes in line with current agricultural policies for the rearing of livestock. The continued implementation of current grazing regimes on site will maintain grazing pressure on heath land habitats occurring within the wind farm site. The existing wind farm site access track will continue to be used as an agricultural access track to assist with the management of livestock.

6.6.3 Potential Effects of the Construction Phase

The construction phase will involve disturbance to existing vegetation during the construction activities. This will be largely in the form of excavation and removal of habitats to facilitate the construction of the wind farm site infrastructure comprising the Site access tracks, Turbine Hardstand areas and Turbine Foundations and Onsite Electrical Substation and Control Building. A section of electrical cable will be undergrounded within the proposed access track. Vegetation clearance and minor excavations will also be required for temporary infrastructure required for the construction phase of the Proposed Development. The temporary construction phase infrastructure comprises the Temporary Construction Compound, blade set-down areas and Turbine Hardstands.

The provision of the electrical cable will result in localised excavations at turbine poleset locations and along the 6 no. sections of underground electrical cable between the wind farm site and the Electrical Substation at Bantry.

The TDR from the Port of Cork to the Site will require temporary widening at 6 no. locations to allow a load bearing surface. The widening locations are situated along the L8767 local road between Castledonovan and the wind farm site entrance.

6.6.3.1 Direct Effects

Potential sources of direct impacts during the construction phase include:

- Clearance of vegetation, soil and peat substrate and rock for the construction of the Site infrastructure as listed above;
- Creation of temporary infrastructure within the Site as listed above;
- Deposition of spoil material arising from infrastructure works; and

- Access by construction equipment, including access away from the proposed infrastructure location (compaction and other damage).

6.6.3.1.1 Potential Direct Effects on Designated Areas During the Construction and Decommissioning Phase

No elements of the Site permanent or temporary infrastructure are located within the boundary of any European Sites, NHAs or pNHAs. There will be no direct effects, in terms of direct habitat loss, damage or disturbance on any designated conservation area as a result of the construction phase of the Proposed Development; the provision of the Grid Connection cable between the Site and the 110kV Electrical Substation at Bantry; or the provision of the temporary widening areas along the TDR.

6.6.3.1.2 Potential Direct Effects to Article 17 Annex 1 habitats

Turbines T01, T02, and T03 and associated hardstands and approximately 1.2 km of the existing access track are located within the NPWS generated Article 17 mapping polygon for Alpine and Sub-Alpine heath. As noted in **Section 6.4.4**, above this polygon has been mapped using desk-based criteria and has not been informed by primary site survey information. No examples of montane heath and corresponding Alpine and Sub-Alpine Annex 1 heath habitat have been mapped as occurring within the footprint of the proposed wind farm as part of the Baseline habitat and vegetation surveys. On the basis of these surveys no example of Alpine and Sub-Alpine heath habitat occurs under the footprint of the Project.

As such there will be no loss of Article 17 Alpine and Sub-Alpine heath as a result of the Project.

6.6.3.1.3 Potential Direct Effects on Habitats During the Construction and Decommissioning Phase

Direct Effects Arising from the Proposed Wind Farm Site

Typically, proposed wind farm developments will result in the loss and disturbance of green field habitats and in many instances areas of semi-natural habitat. However, given that the entire footprint of the proposed Derreenacrinnig West Wind Farm will be situated within the footprint of buildings and artificial surfaces created for the previously approved wind farm there will be no loss of greenfield or semi-natural habitats to the footprint of the proposed wind farm.

Direct Effects Arising from the Proposed Grid Connection Route Options

Overground Electrical Cable Installation

The provision of the overground electrical cable will require the installation of a total of 157 no. polesets. **Table 6.26** below lists the poles to be installation and the habitats that they are located in and provides an evaluation of the impact of the installation operations to these habitats.

Table 6.26: Impact Assessment of Pole Installation to Habitats

Pole No.	Habitat	Impact of Removal Operations
1, 2, 5, 6, 36 - 39, 48 - 52, 57, 64 - 68, 76 - 79, 120 - 127, 135 - 142	Humid Acid Grassland	The installation of poles within this habitat will involve the movement of one low ground bear pressure tracked vehicle to the pole set location. The pole sets will be installed using the tracked pole-installation vehicle. Only one pass of the machinery in this habitat will be required during the installation of the poles. Once the pole is installed topsoil from the surrounding area will be reinstated at the pole location. The reinstated vegetation surrounding the pole set will be allowed to colonise with vegetation from the existing seed bank and will over time colonise the surface surrounding the pole location with humid acid grassland habitat. The installation of poles within this habitat will represent a short-term imperceptible disturbance to this habitat of local biodiversity value and will represent an impact of imperceptible significance.
3, 4, 7, 8, 9, 13 – 20, 30 – 35, 53, 54, 56, 60 – 63, 69 – 71, 82 – 97, 99 – 106, 110, 111, 114 – 119, 132 - 134	Improved agricultural grassland	The installation of poles within this habitat will involve the movement of one low ground bear pressure tracked vehicle to the pole set location. The pole sets will be installed using the tracked pole-installation vehicle. Only one pass of the machinery in this habitat will be required during the installation of the poles. Once the pole is installed topsoil from the surrounding area will be reinstated at the pole location. The

Pole No.	Habitat	Impact of Removal Operations
		<p>reinstated vegetation surrounding the pole set will be allowed to colonise with vegetation from the existing seed bank and will over time colonise the surface surrounding the pole location with improved agricultural grassland habitat.</p> <p>The installation of poles within this habitat will represent a short-term imperceptible disturbance to this habitat of low biodiversity value and will represent an impact of imperceptible significance.</p>
9 – 12, 98	Scrub	<p>The installation of poles within this habitat will involve the movement of one low ground bear pressure tracked vehicle to the pole set location. The pole sets will be installed using the tracked pole-installation vehicle. Only one pass of the machinery in this habitat will be required during the installation of the poles. Once the pole is installed topsoil from the surrounding area will be reinstated at the pole location. The reinstated vegetation surrounding the pole set will be allowed to colonise with vegetation from the existing seed bank and will over time colonise the surface surrounding the pole location with scrub habitat.</p> <p>The installation of poles within this habitat will represent a short-term imperceptible disturbance to this habitat of low biodiversity value and will represent an impact of imperceptible significance.</p>
21, 55, 58, 59, 80, 128 - 131	Wet grassland	<p>The installation of poles within this habitat will involve the movement of one low ground bear pressure tracked vehicle to the pole set location. The pole sets will be installed using the tracked pole-installation vehicle. Only one pass of the machinery in this habitat will be required</p>

Pole No.	Habitat	Impact of Removal Operations
		<p>during the installation of the poles. Once the pole is installed topsoil from the surrounding area will be reinstated at the pole location. The reinstated vegetation surrounding the pole set will be allowed to colonise with vegetation from the existing seed bank and will over time colonise the surface surrounding the pole location with grassland habitat.</p> <p>The installation of poles within this habitat will represent a short-term imperceptible disturbance to this habitat of low biodiversity value and will represent an impact of imperceptible significance.</p>
<p>22 – 29, 40 – 45, 72 – 75, 107 – 109, 112 – 113, 149 - 157</p>	<p>Wet heath</p>	<p>The installation of poles within this habitat will involve the movement of one low ground bear pressure tracked vehicle to the pole set location. The pole sets will be installed using the tracked pole-installation vehicle. Only one pass of the machinery in this habitat will be required during the installation of the poles. Once the pole is installed topsoil from the surrounding area will be reinstated at the pole location. The reinstated vegetation surrounding the pole set will be allowed to colonise with vegetation from the existing seed bank and will over time colonise the surface surrounding the pole location with wet heath habitat.</p> <p>The installation of poles within this habitat will represent a short-term imperceptible disturbance to this habitat of county biodiversity value and will represent an impact of minor significance.</p>
<p>46, 47, 148</p>	<p>Dry heath</p>	<p>The installation of poles within this habitat will involve the movement of one low ground bear pressure tracked vehicle to the pole set location. The pole sets will be installed using the</p>

Pole No.	Habitat	Impact of Removal Operations
		<p>tracked pole-installation vehicle. Only one pass of the machinery in this habitat will be required during the installation of the poles. Once the pole is installed topsoil from the surrounding area will be reinstated at the pole location. The reinstated vegetation surrounding the pole set will be allowed to colonise with vegetation from the existing seed bank and will over time colonise the surface surrounding the pole location with dry heath habitat.</p> <p>The installation of poles within this habitat will represent a short-term imperceptible disturbance to this habitat of county biodiversity value and will represent an impact of minor significance.</p>

Underground Electrical Cable Installation

Along the 6 no. sections of underground electrical cable to be installed along the Grid Connection route the cabling works will result in the temporary disturbance to and loss of the following habitat receptors:

- a short section of wet heath habitat between the Derreenacrinnig Wind Farm Electrical Substation and pole set 157; and
- a short section of amenity grassland and wet heath habitat approaching pole set location 113.
- Hedgerows will be severed by the underground electrical cable at the following locations:
 - Adjacent to the northeastern terminus of the underground electrical cable Section No. 4 where the cable exists the field to the public road; and
 - At 5 points along underground electrical cable Section 5 where the underground electrical cable crosses existing hedgerows.

Wet heath habitat between the Derreenacrinnig Wind Farm Electrical Substation and pole set 157

This section of the underground electrical cable is approximately 69m in length. It connects the wind farm Electrical Substation to Pole set 157. The section crosses an area of degraded wet heath of low local nature conservation value. The vegetation at this location

has been subject to past ground disturbance, drainage and overgrazing. The installation of the underground electrical cable at this location will result in the temporary removal of existing vegetation at this location. The temporary removal of vegetation associated with this area of degraded wet heath will represent an impact of temporary, slight significance. As per the mitigation measures set out in **Section 6.7** below, the vegetation along this section of the underground electrical cable will be removed as turves. Once the electrical cable is installed and the ducting is complete, the trench will be backfilled and capped with the original turves saved from this section of the underground electrical cable. This will provide for the Reinstatement of wet heath habitat along the underground electrical cable. The replacement of turves will ensure that no loss of wet heath habitat will arise resulting in a permanent neutral impact to wet heath habitat.

Wet heath habitat approaching pole set location 113

This section of the underground electrical cable occurring within wet heath habitat is approximately 45m in length. The section crosses an area of wet heath at unfavourable inadequate status of high local nature conservation value. The installation of the underground electrical cable at this location will result in the temporary removal of existing vegetation at this location. The temporary removal of vegetation associated with this area of wet heath will represent an impact of temporary, slight significance. As per the mitigation measures set out in **Section 6.7** below, the vegetation along this section of the underground electrical cable will be removed as turves. Once the electrical cable is installed and the ducting is complete, the trench will be backfilled and capped with the original turves saved from this section of the underground electrical cable. This will provide for the Reinstatement of wet heath habitat along the underground electrical cable. The replacement of turves will ensure that no loss of wet heath habitat will arise resulting in a permanent neutral impact to wet heath habitat.

TDR Widening Locations

The TDR widening locations will result in the temporary disturbance to and loss of the following habitat receptors:

Hedgerow habitat at TDR widening locations no. 2 & 6: the hedgerow habitat occurring at widening location no. 2 is dominated by *Crataegus monogyna*. It is approximately 25m in length and is well managed and box cut to a height of approximately 2m. The hedgerow occurring at widening location no. 6 is approximately 200m in length and is dominated by non-native *Fuchsia magellanica*, a species endemic to the West Cork region. Both hedgerows are of limited ecological value. The temporary loss of both hedgerows to the widening locations will represent an impact of temporary, slight negative significance. It is

noted that the hedgerows at both locations will be reinstated as per the details set out in **Section 6.7** below.

6.6.3.1.4 Potential Direct Effects on Watercourses, Fisheries, Freshwater Pearl Mussel and Associated Aquatic Fauna during the Construction and Decommissioning Phase

The Proposed Development comprises 4 no. existing crossings of 4 no. drains. No new crossings will be required for the proposed wind farm development. As such there will be no direct physical impacts to drains or watercourses as a result of the proposed wind farm. Notwithstanding the absence of direct physical impacts, plant movements along the existing access track, turbine and electrical cable installation and the provision of the wind farm Electrical Substation will pose a risk of the loss of contaminants, such as suspended solids, hydrocarbons or cementitious materials, to drains and the 2 no. headwater streams draining the wind farm site. The loss of such contaminants to this watercourse are representative of an indirect impact and are considered further in **Section 6.6.3.2.2**.

Whilst the Proposed Development is located within freshwater pearl mussel sensitive catchments it will not result in any works within watercourses or the riparian zone of watercourses that support populations of freshwater pearl mussel. As such, there will be no potential for the Project to result in direct effects on freshwater pearl mussel. The potential for the construction phase of the Project to result in indirect effects to freshwater pearl mussel through the release of contaminated waters downstream to receiving watercourses that support freshwater pearl mussel is set out in **Section 6.6.3.2.2** below.

The second of underground electrical cable will cross the Glanareagh Stream. The potential for works associated with this underground crossing of the stream to result in perturbations to water quality, is considered further in **Section 6.6.3.2.2**.

6.6.3.1.5 Potential Direct Effects on Otter During the Construction and Decommissioning Phase

Typical potential direct impacts on Otters from construction works are associated with the loss of or damage to holts and couches or the abandonment of these breeding/resting sites as a result of ongoing disturbance. As detailed in **Section 6.5.4**, no holts, couches or field signs indicating the presence of an otter breeding/resting site were recorded within the Site during field surveys. Given the absence of such features there will be no potential for the construction phase of the Proposed Development to result in significant negative effects to otters.

6.6.3.1.6 Potential Direct Effects on Badgers & other Non-volant mammals during the Construction and Decommissioning Phase

Typical potential direct impacts on badgers and other non-volant mammals from construction works are associated with the loss of or damage to setts and breeding/resting places of other non-volant mammals, the abandonment of these breeding/resting sites as a result of ongoing disturbance and the potential for the loss of foraging habitat for these species. As detailed in **Section 6.5.4**, no setts, breeding or resting places of badger or other protected non-volant mammals were recorded within the Site during field surveys. Given the absence of such features there will be no potential for the construction phase of the Proposed Development to result in significant negative effects to badgers and other non-volant mammals by way of loss of or disturbance to their breeding/resting places.

6.6.3.1.7 Potential Direct Effects on Bats During the Construction and Decommissioning Phase

Typical potential direct effects on bats during the construction and Decommissioning Phase relate to the direct loss of or disturbance to roost sites supports by buildings and other structures or trees. Given that no roost sites within the Proposed Development site there will be no potential for the construction and Decommissioning Phase to result in direct effects to bats.

6.6.3.1.8 Potential Direct Effects on Birds During the Construction and Decommissioning Phase

Wind farm site

The construction phase of the wind farm will not result in the loss of any habitat for bird species.

Overground Electrical Cable

The minor nature of the works associated with the installation of polesets and the avoidance of any loss of hedgerow and broadleaved woodland habitat during poleset installation will minimise impacts to birds during the construction phase. Species occurring at and in the vicinity of poleset locations comprise commonly occurring ground dwelling birds such as meadow pipit and skylark of low to medium sensitivity. The installation works will have the potential to result in an impact of brief, very low to low significance to bird species.

Underground Electrical Cable

The underground line will result in the temporary disturbance to discrete areas of hedgerow and scrub habitat during the construction phase. Minor areas of wet heath also occur along two no. section of the underground electrical cable route. The overall extent of hedgerow, scrub and wet heath habitat loss will be imperceptible in the context of the prevalence of

these habitats in the surrounding area. The construction impact will also be temporary with hedgerow, scrub and wet heath to be reinstated over the underground electrical cable sections upon installation and backfilling. In view of the above the installation of the underground electrical cable is not predicted to have the potential to result in significant effects to the status of the local breeding bird population, which are considered to be of low to medium sensitivity. As per **Table 6.7** above a negligible/imperceptible effect to species of low to medium sensitivity will represent an impact of short-term very low significance.

TDR Widening Locations

The TDR widening locations will result in the temporary disturbance to discrete areas of hedgerow and scrub habitat during the construction phase. The overall extent of hedgerow and scrub habitat loss will be imperceptible in the context of the prevalence of these habitats in the surrounding area. The construction impact will also be temporary with hedgerow and scrub to be reinstated upon completion of turbine delivery. In view of the above, the temporary removal of hedgerow and scrub habitat at the TDR widening locations is not predicted to have the potential to result in significant effects to the status of the local breeding bird population, which are considered to be of low to medium sensitivity. As per **Table 6.7** above a negligible/imperceptible effect to species of low to medium sensitivity will represent an impact of short-term very low significance.

6.6.3.1.9 Potential Direct Effects on Kerry Slug During the Construction and Decommissioning Phase

Kerry slug have been recorded during surveys along the section of the overground electrical cable within the wind farm site and to the west of the wind farm site. Suitable exposed siliceous rock for Kerry Slug occurs within the wind farm site, however there will be no loss of such habitat to the footprint of the proposed wind farm. Suitable habitat for Kerry Slug occurs along sections of the overground electrical cable route. However no exposed siliceous rock habitat will be lost or temporarily disturbed as a result of the installation of pole sets for this section of the proposed Grid Connection route.

Based on the above, no impact to Kerry Slug arising from direct habitat loss are predicted. It is noted that, in the absence of adequate safeguards the construction phase works could result in the death of individual Kerry Slugs due to machinery movements in areas of suitable habitat. Such fatalities will represent a temporary, imperceptible impact to the wider Kerry Slug population occurring in the region.

6.6.3.1.10 Potential Direct Effects on Herpetofauna During the Construction and Decommissioning Phase

Potential direct impacts to common frog, smooth newt and common lizard during the construction works will be limited to direct mortality during vegetation clearance, excavations and spoil deposition works particularly in wet grassland and heath habitats. As detailed in **Section 6.5.8**, common frogs were recorded during surveys within the Site. The population at the Site is considered to be of Local (Higher) Importance (Rating D). The nature of the Site means that they have the potential to occur immediately adjacent to the existing infrastructure.

Potential impacts to herpetofauna can vary depending on the time of year, with destruction of hibernacula (locations being used for winter hibernation) being a particular concern. Hibernacula need to be frost-free, humid and safe from predators and flooding (Baker et al., 2011). Such areas can include bunds and rocky areas, notably when these occur within slightly drier habitats such as dry heath. In light of the above it is considered that, in the absence of mitigation measures, there is potential for significant temporary impacts to herpetofauna at the local level. Mitigation proposals in this respect are provided in **Section 6.7** below.

6.6.3.1.11 Potential Direct Effects on Terrestrial Invertebrates During the Construction and Decommissioning Phase

The loss of habitats to the footprint of the Proposed Development will result in the loss of terrestrial invertebrate habitat and therefore reduce the abundance and potentially the diversity of this group. The impact of the Proposed Development to terrestrial invertebrates will be at the local scale and restricted to local populations occurring at the Site.

Impacts on terrestrial invertebrates are considered temporary moderate negative where infrastructure is reinstated post construction e.g. proposed Temporary Construction Compound, temporary construction areas. Impacts on terrestrial invertebrate habitat are assessed as permanent moderate negative where infrastructure remains post construction.

6.6.3.1.12 Potential Direct Effects on Notable Flora During the Construction and Decommissioning Phase

No notable flora species were identified as occurring within the footprint of the Proposed Development and as such there will be no potential for the direct loss of such species.

6.6.3.1.13 Potential Direct Effects arising from the spread of Invasive Alien Species (IAS) During the Construction phase

No non-native invasive species have been recorded within the footprint of the proposed wind farm or at pole set and underground electrical cable sections of the proposed Grid Connection route. Fraga, *et al.* (2008) have identified a link between wind farms and the spread of IAS in upland habitats. Construction phase works will have the potential to result in the introduction of non-native invasive species. Mitigation measures are set out in Section 6.7 below that aim to avoid the introduction and spread of such species at and adjacent to areas of works during the construction phase.

6.6.3.2 Indirect Effects

6.6.3.2.1 Potential Indirect Effects on Designated Areas During the Construction and Decommissioning Phase

No pathways connect the Proposed Development to European Sites, NHA or pNHAs occurring in the wider surrounding area. In the absence of such pathways there will be no potential for potential indirect impacts to nature conservation areas to arise during the construction phase.

6.6.3.2.2 Potential Indirect Effects on Watercourses, Fisheries, Freshwater Pearl Mussel & Aquatic Fauna during the Construction and Decommissioning Phase

The Site

The potential impacts that may arise as a result of the Proposed Development relate to the discharge of contaminated surface water from the Site during the construction phase. The freshwater habitat receptors that are at risk from such discharges comprise the Derreenacrinnig and un-named streams draining the wind farm site and the higher order rivers, namely the Ilen and Meelagh Rivers downstream of these streams into which they drain.

Earthworks associated with the construction phase of the Proposed Development will necessitate the denuding of surfaces. In the absence of appropriate mitigation measures such activities will have the potential to generate silt-laden runoff from the works area and for this runoff to be discharged via existing preferential surface water flow pathways and drainage channels to the above listed streams.

As the Site is largely developed and no works are required in areas with peat, a peat landslide risk assessment is therefore not required. One was completed by MEL for the original EIA. It concluded that there was low risk of peat instability during the construction

phase and so, adopting the precautionary principle, site-specific mitigation measures were proposed. Mitigation by design (i.e., the avoidance of areas with steep gradient and deeper peat) was used to minimise risk of peat landslide.

Whilst the risk of a peat slide/ground movement event arising from the Proposed Development has been found to be negligible to low, in such an event the potential will exist for the conveyance of sediment to the Derreenacrinnig and un-named Streams and on downstream to the Ilen River and Meelagh River. Whilst the possibility of a slope failure at the Site has been assessed to be representative of a negligible to low risk, poorly managed construction activities (including spoil stockpiling and traffic movement) can increase the risk. Given the hydrological pathway to sensitive watercourses for aquatic fauna such as freshwater pearl mussel, Atlantic salmon, lamprey species and otters, any ground failure will have the potential to result in significant long-term damage to freshwater habitats.

The contribution of silt-laden runoff to the Derreenacrinnig and un-named Streams and further downstream to the main channels of the Ilen and Meelagh Rivers will have the potential to result in significant negative impacts to invertebrates, plant life and on all life stages of salmonid fish. The negative impacts of silt-laden runoff to fish species such as Atlantic salmon and brown trout include:

- The settlement of silt on spawning redds resulting in the infilling of intra-gravel voids and the smothering of eggs and newly hatched fish.
- Increase in turbidity and water colour resulting in a reduction in light penetration and perturbation to instream salmonid habitats.
- The settlement of silt on river beds can smother and displace macroinvertebrates, reducing the prey resource for fish species.
- Suspended solids can settle in pool and riffle habitats resulting in a reduction in the availability and quality of rearing habitat for fish.
- Silt-laden runoff can result in a reduction in transparency, impairing the ability of fish and otters to find food.
- Suspended solids can abrade or clog salmonid fish gills. Whilst high concentrations of suspended solids are required to clog fish gills, small concentrations can result in abrasion to gills a create the potential for infection.

The clearance of surface vegetation and the exposure of underlying substrate can result in the mobilisation of nutrients stored within soil substrates and the generation of nutrient-laden surface water runoff (Tuukkanen, 2017; Monteverde, 2022). Potential nutrient mobilisation is not just associated with substrates. Inputs of suspended solids can also

contribute to nutrient enrichment in receiving waters as a result of the release of nutrient bound to sediments following mobilisation (Sharpley et al., 1992; Ballantine et al. 2006). The degree to which sediment loss contributes to nutrient enrichment is dependent on the type of soil. Soils / subsoils will contribute varying degrees of loading of various compounds and nutrients, including Nitrogen (N) and Phosphorous (P) compounds, which are attributed to nutrient enrichment, or excessive loading of N and P in waters. The release of such sediment in silt-laden surface water runoff from works at the Site will have the potential to contribute to nutrient inputs to receiving waters within the Ilen and Meelagh sub-catchment and their conveyance downstream to the Ilen and Meelagh Rivers.

The discharge of nutrient laden surface water to the Derreenacrinnig and un-named Streams and downstream to the Ilen and Meelagh Rivers will have the potential to result in/contribute to reductions in water quality, increasing primary productivity leading to eutrophication and decreasing oxygen saturation. High oxygen levels in freshwaters are critical for all life stages of sensitive aquatic fauna such as Atlantic salmon. Such changes in watercourse trophic status will have the potential to contribute towards the degradation of habitat conditions with the Ilen and Meelagh sub-catchments downstream and their potential to support Atlantic salmon, otter and lamprey species.

Pearl mussels require specific habitat conditions for the survival of viable populations. The principal habitat requirements are oligotrophic, well-oxygenated waters of high-water quality with low levels of sedimentation and a firm substrate of gravels and sand. Pearl mussels also require a healthy stock of juvenile salmonids to host glochidia during the larval stage of their life cycle. Pearl mussels are very sensitive to any changes or perturbations to these habitat requirements. Mussels use their gills for feeding and respiration and high levels of suspended solids within watercourses can significantly affect mussel respiration and feeding by clogging gills. Persistent exposure to high levels of suspended solids can result in starvation or respiratory stress resulting in asphyxiation.

Silt accumulation on riverbeds also significantly affects recruitment and the viability of a population. During the juvenile stage mussels will spend several years buried beneath the course riverbed. A constant flow of oxygen through the riverbed to the juvenile mussels is required for survival. In the event that the construction phase of the Project contributes excessive silt-laden runoff to the Ilen and Meelagh sub-catchments downstream, the deposition of silt material over mussel beds will clog the interstice and reduce or prevent the penetration of oxygen to juveniles resulting in death.

Plant equipment and vehicles associated with excavation, material transport, and construction activities introduce the risk of hydrocarbon (fuel and oil) spillages and leaks, particularly in relation to regular refuelling which in turn implies the requirement of a fuelling station or will be supplied by fuel tanker scheduled to refuel the plant machinery directly. Similar to suspended solids arising from excavation activities, hydrocarbons accidentally introduced to the environment will likely be intercepted by drainage and surface water networks that drain the Site.

Hydrocarbons are a pollutant risk due to their toxicity to all flora and fauna organisms. Hydrocarbons chemically repel water and sparingly dissolve in water. The majority of hydrocarbons are light non-aqueous phase liquids (L-NAPL's) which means that they are less dense than water and therefore float on the water's surface. Hydrocarbons adsorb ('stick') onto the majority of natural solid objects they encounter, such as vegetation, animals, and earth materials such as soil. They burn most living organic tissue, such as vegetation, due to their volatile chemistry. They are also a nutrient supply for adapted micro-organisms, which can deplete dissolved oxygen at a rapid rate and thus kill off water-based vertebrate such as Atlantic salmon and invertebrate life. Hydrocarbons can bioaccumulate in salmonids (e.g. McCain *et al.* 1990), with Atlantic salmon known to be physically affected by short term exposure leading to loss of condition, and are also known to avoid areas containing hydrocarbons (e.g. Maynard and Weber 1981) leading to the effective loss of habitat or migration routes for the species.

The Proposed Development has the potential to result in the accidental spillage or deposition of construction materials such as cementitious materials into soils and in-turn, impact on surface water runoff, or accidental spillages directly intercepted by drainage or surface water networks associated with the proposed wind farm site.

Depending on the material in question, the introduction of such materials can lead to a local change in hydrochemistry and impact on the aquatic ecology of the receiving waterbody. For example, the introduction of cementitious material (concrete / cement / lean mix etc.) can lead to changes in soil and water pH, and increased concentrations of sulphates and other constituents of concrete. Fresh or wet concrete is a much more significant hazard when compared to old or set concrete which is considered inert in comparison, however it should also be noted that any construction materials or non-natural materials deposited, even if inert, are considered contaminants.

Overground Electrical Cable

All watercourses will be oversailed by the sections of overground electrical cable and no poles will be placed within 25m of any watercourse transected by the route. This approach will minimise the potential for negative impacts and with its implementation no significant effects to watercourses, fisheries and other aquatic fauna are predicted.

Underground Electrical Cable

The underground electrical cable will require the crossing of the Glanareagh Stream towards the eastern end of the second section of underground electrical cable along the proposed Grid Connection route. This stream will be crossed via horizontal directional drilling. During the horizontal directional drilling works there will be potential for the generation of surface water runoff from launch pits and receptor pits as well as the loss of fluids used during the horizontal directional drilling works. The drilling fluid to be used during horizontal directional drilling for the Project will be Clearbore or similar. Clearbore is a polymer-based product that is designed to instantly break down and become chemically destroyed in the presence of small quantities of calcium hypochlorite. The product is not toxic to aquatic organisms and is biodegradable. The drilling fluid will become mixed with material drilled in the borehole to form a drilling mud. As the drilling is completed under pressure any blockages in the pilot-hole during the pilot drill or reaming can result in the inadvertent breakout of drilling mud within the pilot-hole. Such breakouts can occur where an alternative path of less resistance through the overburden is present during a blockage. The breakout of drilling mud can result in contamination in the vicinity of the breakout. The breakout of drilling muds to the Glanareagh Stream crossed by the proposed electrical cable route will have the potential to undermine the status of instream habitats with resultant adverse effects to populations of fisheries and aquatic fauna such as invertebrates supported by this stream. Such an impact will be representative of a temporary, moderate negative effect.

Proposed TDR Widening Locations

No watercourse occurs at the TDR widening locations and there will not be potential for the temporary works associated with the widening to result in indirect effects to watercourses, fisheries and other aquatic fauna.

6.6.3.2.3 Potential Indirect Effects on Terrestrial Habitats During the Construction Phase

Indirect effects to terrestrial habitats during the construction phase of the wind farm relate to the potential for works to undermine key processes that underpin the status of these habitats. For terrestrial habitats this relates to the potential for works to undermine key hydrological or hydrogeological processes that underpin the status of terrestrial wetland

habitats. In the context of the wind farm site, no wetland habitats occur within the footprint of the proposed wind farm site and there will be no potential for the construction phase to result in indirect impacts to such habitats.

The polesets along the overground electrical cable route will not have the potential to result in indirect impacts to wetland habitats. The wetland habitats in which polesets will be located comprise wet heath and wet grassland. Both habitats are located on thin peat and mineral soils. Given the nature of the overburden and the very small footprint of the polesets there will be no potential for their installation to result in significant effects to these habitats.

The underground electrical cable will pass through 2 no. discrete areas of wet heath habitat. Wet heath at these locations is underlain by thin peat. The temporary nature of the works associated with the installation of the underground electrical cable, along with the discrete area to be temporarily excavated as well as the approach to Reinstatement, as set out in **Section 6.7** below, will ensure that this element of the Project will not result in significant indirect effects to habitat receptors such as wet heath.

Aside from hedgerow and scrub habitat no habitat receptors occur at the TDR widening locations. The temporary works associated with the widening locations will not have the potential to result in significant negative indirect impacts to hedgerow or scrub habitat.

6.6.3.2.4 Potential Indirect Effects on Otter During the Construction Phase

The main pressure affecting this species in Ireland is pollution, particularly from organic pollution resulting in fish kills and accidental deaths as a result of road traffic and fishing gear (NPWS, 2019b). The NPWS also list diffuse and point source pollution of freshwaters as a likely indirect impact to otters through changes in prey abundance. However, the NPWS conclude that these threats are considered to produce local impacts only and are not of significance for the national otter population. Nevertheless, such impacts have the potential to be of local significance in the context of a population supported by the Owvane, Ilen and Meelagh River catchments downstream. As such in the event of pollution, arising from construction activities to suitable otter foraging habitat downstream of the Project, the potential will exist for indirect impacts to the conservation status of otters within these sub-catchments, by way of reductions in the abundance of prey species.

Horizontal directional drilling for the crossing of the Glanareagh Stream will generate noise and vibration during drilling operations. The primary noise sources would consist of the elevated diesel-powered hydraulic drill drive, a diesel driven electricity generator, and

electrically driven spoil treatment plant for mechanical separation of solids from working fluid.

Table D.6 in BS5228: Part 2: 2009 +A1:2014 suggests that vibration from such activities falls to below 1 mm/s within a distance of approximately 10 to 15 metres. No other breeding sites are located in the vicinity of the proposed Grid Connection Route Options crossings and given the low levels of noise and vibration predicted to be generated during the drilling of the 110 mm boreholes along with the set-back distances of 50 m from the watercourse for the launch pits where the hydraulic driver and generator will be positioned, there will be no potential for significant disturbance to otters during this element of the Proposed Development.

Other potential indirect effects on otter during the construction phase are generally considered to be those associated with disturbance and water quality impacts on watercourses, resulting in potential impacts on prey availability. The effects of water quality perturbations to otter habitat have been described in **Section 6.6.3.2.2** above and it is considered that, without mitigation, potential indirect impacts on Otter as a result of perturbations to water quality will arise.

6.6.3.2.5 Potential Indirect Effects on Badgers & other Non-volant mammals during the Construction and Decommissioning Phase

Given that no breeding/resting sites for badgers or other non-volant mammals were recorded within or in the vicinity of the Site, there will be no potential for significant indirect disturbance to badgers and other non-volant mammals during the construction phase.

Other potential negative impacts to badgers during the construction phase of the Project include:

- The exposure of badgers to polluting substances such as chemicals, fuels and cement-based products; and
- The entrapment of badgers within excavation areas.

Without the implementation of appropriate construction practices, these impacts will have the potential to negatively affect badgers occupying the sett adjacent to the Site. **Section 6.7** below provides measures to ensure that disturbance associated with the sustained presence of humans is avoided.

6.6.3.2.6 Potential Indirect Effects on Bats During the Construction and Decommissioning Phase

Potential indirect effects on bats relate to the loss of habitat that may be used bats for roosting, foraging or commuting.

Given the absence of roost sites for bats occurring at or surrounding the Site there will be no potential for the Construction and Decommissioning Phase to result in the loss of roosting habitat for bat species.

The construction phase will have the potential to result in the loss of or damage to commuting and foraging habitat.

6.6.3.2.7 Potential Indirect Effects on Birds During the Construction and Decommissioning Phase

The construction phase will have the potential to result in short-term disturbance to bird species recorded within the proposed wind farm site and surrounding area with resultant displacement. The potential for construction phase activities to generate disturbance stimuli that result in the displacement of birds, has been found to vary between and within species. Of the target species recorded during bird surveys at and surrounding the wind farm site, none, with the exception of snipe, were found to breed and/or roost within the vicinity of the wind farm. The surveys also found these species to be more active in areas away from the wind farm site as opposed to within the wind farm site, thus limiting the potential for disturbance and displacement effects. Given the absence of suitable habitat for target species within the wind farm site, the prevalence of activity associated with these species away from the immediate vicinity of the wind farm and the absence of breeding and roosting within/immediately adjacent to the wind farm, any short-term disturbance and subsequent displacement effects that could arise during the construction phase to these species will be negligible. A negligible magnitude impact to this species of low to medium sensitivity will represent a short-term impact of very low to low significance.

Snipe were recorded roosting in Molina dominated heath on the slopes to the north and south of the proposed wind farm. The numbers of snipe roosting in the vicinity of the wind farm were low. Given that general absence of reliance on the proposed wind farm site for breeding or roosts as well as the extensive areas of suitable habitat occurring in the wider area any short-term disturbance and subsequent displacement effects that could arise during the construction phase to snipe will be negligible. A negligible magnitude impact to this species of medium sensitivity will represent a short-term impact of very low significance. The most frequently recorded species within the immediate vicinity of the wind farm site were passerines such as meadow pipit and skylark. Given the short-term nature of the

construction phase and the small area that will be subject to disturbance associated with construction works, the potential for impact for disturbance to these species is assessed as being representative of a medium magnitude impact. A medium magnitude impact to these species of low to medium sensitivity will represent an impact of short term, very low to low significance.

6.6.3.2.8 Potential Indirect Effects on Kerry Slug During the Construction and Decommissioning Phase

Potential impacts to Kerry Slug as a result of the Proposed Development relate to the loss of habitat and the potential for fatalities during construction works. Such impacts are representative of direct effects to Kerry Slug and have been set out in **Section 6.6.3.1.8** above.

6.6.3.2.9 Potential Indirect Effects on Herpetofauna During the Construction and Decommissioning Phase

Potential indirect effects on common frog, smooth newt and common lizard during the Construction and Decommissioning Phase, are generally considered to be those associated with disturbance. However, although these species are easily disturbed when approached, the impact of disturbance is not considered likely to carry over a significant distance. As noted in **Section 6.6.3.1.9** above these species are considered to be sensitive to impacts associated with the direct loss of habitat to the footprint of the Site. The proposed works will be undertaken from the temporary infrastructure provided for the construction phase and from the existing wind farm infrastructure during the Decommissioning phase. Suitable habitat for these species will extend into the wider area, ensuring that there is sufficient habitat remaining to support these species in an undisturbed state. Given the limited likely effective disturbance distance for these species and the extensive area of suitable habitat for them in the wider area the potential indirect effects on these species during the construction phase are not considered to be significant.

6.6.3.2.10 Potential Indirect Effects on Terrestrial Invertebrates During the Construction Phase

Potential indirect effects on terrestrial invertebrates during the construction and Decommissioning Phase will relate to effects associated with disturbance. Whilst terrestrial invertebrates are easily disturbed when approached, the impact of disturbance is not considered likely to carry over a significant distance. As noted in **Section 6.6.3.1.10** above these species are considered to be sensitive to impacts associated with the direct loss of habitat to the footprint of the Site. The proposed works will be undertaken from the temporary infrastructure provided for the construction phase and from the existing wind farm

infrastructure during the Decommissioning phase. Suitable habitat for terrestrial invertebrates will extend into the wider area, ensuring that there is sufficient habitat remaining to support these species in an undisturbed state. Given the limited likely effective disturbance distance for these species and the extensive area of suitable habitat for them in the wider area the potential indirect effects on terrestrial invertebrates during the construction phase are not considered to be significant.

6.6.4 Potential Effects during the Operational Phase

6.6.4.1 Potential Direct Effects on designated areas during the Operational Phase

The potential effects of the operational phase of the Proposed Development to designated sites is set out in the accompanying NIS. The NIS has concluded that given the absence of any element of the Proposed Development within the boundary of any European Sites, NHAs or pNHAs it will not have the potential to result in direct effects to designated areas that could in turn result in adverse impacts to the integrity of these sites.

6.6.4.2 Potential Direct Effects on Habitats during the Operation phase

The operation phase of the Proposed Development will not cause significant or adverse direct impacts to the quality or functionality of the habitats occurring within the Proposed Development area.

6.6.4.3 Potential Direct Effects on Watercourses, Fisheries, Freshwater Pearl Mussel and Associated Fauna during the Operational Phase

There is limited potential for direct effects on receiving watercourses within or bounding the Proposed Development during the operational phase as no instream works or loss of natural watercourse features are planned as part of the operational phase. However, in the event that a maintenance need arises for the watercourse crossing within the Site during the operational phase, instream works may be required and such works could result in direct effects to these watercourses. Such a direct effect upon watercourses and downstream ecology during the operational phase are considered to have the potential to be significant at the local scale.

6.6.4.4 Potential Direct Effects on Otter during the Operation phase

The operation phase of the Proposed Development will not have the potential to result in direct effects to otters. No otter holts or couches were identified within the Site and there will be no potential for operational phase maintenance activities to result in disturbance to otters.

6.6.4.5 Potential Direct Effects on Badgers & other Protected Non-volant mammals during the Operation phase

No effects to badgers or other protected non-volant mammals are predicted during the operational phase of the Proposed Development. As no field signs indicating the presence of such species were noted within the Site during field surveys and due to the limited human presence for maintenance works during daylight hours, outside the period of peak badger and other protected non-volant mammals' activity, no significant effects are predicted to affect such species during the operation of the Proposed Development.

6.6.4.6 Potential Direct Effects on Bats during the Operational Phase

The potential direct effects on bats during the operational phase of the Project relates to the potential for collision with bats that use the proposed wind farm site. The proposed wind farm site has been identified as a site of low risk to bats, based on the size of the proposed wind farm and the habitats occurring within and adjacent to it.

The results of the bat monitoring on site and subsequent analysis using Kepel (2011) indicate that activity by Leisler's bat, Common pipistrelle, Soprano pipistrelle, Myotis species, brown long-eared bat and Nathusius pipistrelle within and adjacent to the proposed wind farm site is overall Low throughout the Site and throughout the bat activity season.

Myotis species and brown long-eared bats are considered to be at low risk of collision with operating turbines (NatureScot (2021)) and given the low levels of activity recorded for these species during monitoring, the proposed wind farm is predicted to present a low risk of collision to these species.

6.6.4.6.1 Leisler's bat

Table 6.27 below provides an overall seasonal risk assessment, as per **Table 3b** of the NatureScot (2021) guidelines for Leisler's bat based on the Site risk level and the seasonal activity category assigned to Leisler's bat. Based on the low risk assessment for each season, the overall collision risk assessment for Leisler's bat is Low.

Table 6.27: Seasonal Collision Risk Assessment to Leisler's bat (as per Table 3b of the NatureScot (2021) Guidelines)

Site Risk Level	Season	Seasonal Activity Category	Overall Seasonal Risk Assessment
Low (2)	Spring	Low (1)	Low (2)
	Summer	Low (1)	Low (2)
	Autumn	Low (1)	Low (2)

6.6.4.6.2 Common pipistrelle

Table 6.28 below provides an overall seasonal risk assessment, as per **Table 3b** of the NatureScot (2021) guidelines for Common pipistrelle based on the Site risk level and the low to moderate activity category assigned during spring and autumn, and the low activity category assigned during summer for Common pipistrelle. Based on the low risk assessment for each season the overall collision risk assessment for Common pipistrelle is Low.

Table 6.28: Seasonal Collision Risk Assessment to Common pipistrelle (per Table 3b of the NatureScot (2021) Guidelines)

Site Risk Level	Season	Seasonal Activity Category	Overall Seasonal Risk Assessment
Low (2)	Spring	Low to Moderate (2)	Low (4)
	Summer	Low (1)	Low (2)
	Autumn	Low to Moderate (2)	Low (4)

6.6.4.6.3 Soprano pipistrelle

Table 6.29 below provides an overall seasonal risk assessments, as per **Table 3b** of the NatureScot (2021) guidelines for Soprano pipistrelle based on the Site risk level and the seasonal activity category assigned to Soprano pipistrelle. Based on the low risk assessment for each season the overall collision risk assessment for Soprano pipistrelle is Low.

Table 6.29: Seasonal Collision Risk Assessment to Soprano pipistrelle (per Table 3b of the NatureScot (2021) Guidelines)

Site Risk Level	Season	Seasonal Activity Category	Overall Seasonal Risk Assessment
Low (2)	Spring	Low (1)	Low (2)
	Summer	Low (1)	Low (2)
	Autumn	Low (1)	Low (2)

6.6.4.6.4 Brown Long-eared Bat

Table 6.30 below provides an overall seasonal risk assessments, as per **Table 3b** of the NatureScot (2021) guidelines for brown long-eared bat based on the Site risk level and the seasonal activity category assigned to brown long-eared bat. Based on the low risk assessment for each season the overall collision risk assessment for brown long-eared bat is Low.

Table 6.30: Seasonal Collision Risk Assessment to Nathusius pipistrelle (per Table 3b of the NatureScot (2021) Guidelines)

Site Risk Level	Season	Seasonal Activity Category	Overall Seasonal Risk Assessment
Low (2)	Spring	Low (1)	Low (2)
	Summer	Low (1)	Low (2)
	Autumn	Low (1)	Low (2)

6.6.4.6.5 Nathusius pipistrelle

Table 6.31 below provides an overall seasonal risk assessments, as per **Table 3b** of the NatureScot (2021) guidelines for Nathusius pipistrelle based on the Site risk level and the seasonal activity category assigned to Nathusius pipistrelle. Based on the low risk assessment for each season the overall collision risk assessment for Nathusius pipistrelle is Low.

Table 6.31: Seasonal Collision Risk Assessment to Nathusius pipistrelle (per Table 3b of the NatureScot (2021) Guidelines)

Site Risk Level	Season	Seasonal Activity Category	Overall Seasonal Risk Assessment
Low (2)	Spring	Low (1)	Low (2)
	Summer	Low (1)	Low (2)
	Autumn	Low (1)	Low (2)

6.6.4.7 Potential Direct Effects on Birds during the Operation Phase

The potential for direct effects on birds during the operation phase of the Project will relate to the potential for birds to collide with operating turbines. Consideration of the potential for birds to collide with the proposed overground electrical cable section of the Grid Connection route is also considered in this section.

Operating wind turbines have the potential to affect birds through:

1. Collision with wind turbines;
2. Reduction in habitat extent; and
3. Declines in foraging efficiency and/or prey species

6.6.4.7.1 Collision with Turbines

Collision can result in the direct mortality or lethal injury of birds and can result not only from collisions with wind turbine blades but also with other structures associated within wind turbines such as towers, nacelles etc. Collision risk can be influenced by topography and weather, particularly during periods of poor visibility i.e. fog. Other factors influencing collision risk include species-specific flight behaviour and morphology (de Lucas *et al.*, 2008). With the exception of notable examples such as Altamont Pass, the majority of studies assessing collision caused by wind farms have recorded relatively low levels of mortality. However, this may be a reflection of the fact that many wind farms are located away from large concentrations of birds. Percival (2003) suggested that wind farms in Ireland are most likely to have serious negative impact on birds where high densities of seabirds, wintering wildfowl or breeding raptors occur.

Another factor which may have influenced the low mortality rates of previous studies, is the fact that mortality rates are based only on found corpses. This may lead to an under-recording of mortality if scavenging rates of corpses is high in the vicinity of wind farms. In general, it is considered that collision rates are likely to be low provided wind farms are sited in areas that do not support significant populations of rare and relatively long-lived species with low reproductive rates.

Collision Risk to Buzzard

Pearce-Higgins (2009) found buzzard showed strong avoidance to wind turbines and this behavioural response is likely to reduce the risk of any collision posed by the proposed wind farm. During their review of fatalities at 46 wind farm sites in Europe, Hoetker *et al.* (2006) identified 26 fatalities for buzzard, while Fennelly (2015) reported 2 fatalities following a review of monitoring at 25 wind farm sites in Ireland.

A total of 34 flights, amounting to 3,255 seconds, were observed for buzzard during bird surveys. Of this time a total of 1,200 seconds were recorded within the flight Survey Area (FSA), whilst the percentage time buzzards were recorded within the FSA amounted to c. 0.1% of all survey time. Of the 34 flights observed, only 2 were recorded within the rotor swept area of the proposed wind turbines (representing 0.004% of the total survey time).

Based on the absence of any evidence of breeding in the vicinity of the proposed wind farm and the low level of flight activity recorded within the flight Survey Area or within the rotor sweep area of the turbines the risk of collision to buzzards is assessed as being a low magnitude impact. A low magnitude impact to this species of low sensitivity, will represent an impact of very low significance. Even assuming a worst-case scenario of a medium magnitude impact to this species of low sensitivity, the significance of the effect will still be very low.

Collision Risk to Hen Harrier

The risk of hen harrier collision with wind turbines is considered to be lower than that for most other raptors. Studies have shown that the fatalities of hen harrier through collision with turbines are rare (Whitfield and Madders, 2006; Garvin *et al.*, 2011). Scott & McHaffie (2008) reported a hen harrier fatality at a wind farm in Co. Antrim and suggested that the risk of collision may be increased during periods of poor visibility. Fennelly (2015) reviewed the results of monitoring at 25 wind farm sites in Ireland and did not identify any other fatality over and above that reported by Scott & McHaffie. However, more recently a hen harrier fatality has been reported at a wind farm site in Co. Kerry. However, the majority of studies have shown that the fatalities of hen harrier through collision with turbines are rare (Whitfield and Madders, 2006b). This study by Whitfield and Madders (2006b) concluded that "hen harriers do not appear to be susceptible to colliding with turbine blades and that collision mortality should rarely be a serious concern". This conclusion is supported by the findings reported by Garvin *et al.* (2011) as well as Forrest (2011), with the latter finding no hen harrier collision victims at the 28 turbine Paul's Hill Wind Farm in Scotland during fortnightly searches at 10 of the 28 turbines over a five-year period. This finding was made despite the presence of three breeding pairs in the vicinity of the wind farm. Forrest *et al.* (2011) concluded that the risk to hen harriers posed by collision with turbines is negligible and asserted that, provided suitable nesting habitat is available, this species will not be deterred from nesting in close proximity to turbines.

A similar finding was reported by Haworth Conservation (2015) during eight years (2007 – 2014 inclusive) of monitoring at the Edinbane Wind Farm where regular hen harrier flight

activity within the wind farm was recorded. In addition, numerous breeding pairs were observed breeding in the wider area. Wilson *et al.* (2015) cites the work of Whitfield & Madders (2006), which found hen harriers demonstrating avoidance behaviour close to turbines and go on to state that it may be possible that hen harriers modify their flight height during the small proportion of time that they are within close proximity of individual turbines. The lower susceptibility to collision is due to the low flight altitude of hen harriers (the majority of which are below 20m above ground), the higher rotor swept area of modern turbines and the high avoidance rate⁸ (99% avoidance rate has been assigned by SNH) of wind turbines (Madders & Whitfield, 2006, Garvin *et al.*, 2011). The low flight of this species versus the height of the turbines influences the low potential for collision risk between this species and turbines. Only 2 flights of hen harrier were recorded during bird field surveying at and in the vicinity of the proposed wind farm (i.e. within the flight Survey Area FSA), representing c. 0.01% of the total survey monitoring time of the FSA. No flight activity was recorded within the rotor sweep area of the proposed wind farm turbines.

Studies have also shown that the risk of collision to hen harrier and raptors in general does not increase with increased (harrier/raptor) abundance (Madders & Whitfield, 2006, de Lucas *et al.*, 2008). A number of studies have concluded that the collision impacts are not likely to be biologically significant because the numbers of birds involved are likely to be minimal.

It is noted that hen harrier may be at greater risk during display flights and during fledgling flights. However, no evidence of breeding hen harrier was recorded during monitoring and this species is not considered to breed within the flight Survey Area or wider surrounding area. As such, based on the results of Baseline surveys, the potential for collision between hen harriers during display flights and the proposed turbines will not arise.

In light of the above evidence, it is considered that potential for collision with hen harrier will be negligible representing an effect or risk of negligible magnitude. A negligible magnitude effect to this species of high sensitivity will represent an impact of very low significance.

Collision Risk to Chough

Chough were identified breeding in the wider region surrounding the wind farm site. At least 2 no. nest sites are located within a c. 1.5 km distance of the nearest proposed turbine. A total number of 27 chough flights were observed during bird surveys. None of the flights

⁸ Note that "avoidance" here refers to the avoidance of a wind turbine when on a collision path, rather than avoidance of areas associated with a wind farm, which is considered to constitute "displacement".

were recorded within the FSA or the rotor swept area of the wind farm. The habitats occurring within the wind farm site and the vicinity of the proposed turbines does not provide suitable foraging, breeding, roosting conditions for chough. In view of the above the potential for turbine collision with chough will be negligible, representing an effect or risk of negligible magnitude. A negligible magnitude effect to this species of high sensitivity will represent an impact of very low significance.

Collision Risk to Kestrel

Kestrel displays low levels of avoidance to operating wind turbines and is therefore at high risk of colliding with operating turbines. The SNH avoidance rate for kestrel is set at 95% and collision with turbines have been reported, with disproportionate numbers recorded for kestrel relative to other species at a number of wind farm sites (Cordeiro *et al.*, 2013; Lekuona & Ursúa, 2006; Whitfield & Madders, 2006). These findings are supported by Fennelly (2015) who reported the highest level of fatalities for kestrel following a review of monitoring at 25 wind farm sites in Ireland. A total of 5 fatalities were identified. Kestrel prefers to forage over open ground with short swards (Whittingham & Devereux, 2008) and Cordeiro *et al.* (2013) also showed that this species prefers to forage over such habitats on wind facing slopes. Rasran & Mammen (2017) compared the results of long-term monitoring data (collected between 1991 and 2006) for raptors (including kestrel) in areas (225 areas in total) in Germany with and without wind turbines and found no significant relationship between the development of wind energy use and bird of prey populations or breeding success. They concluded that wind energy developments did not seem to have an extensive influence on the bird of prey populations in Germany.

A total of 26 kestrel flights, amounting to 1,800 seconds, were recorded during bird surveys. None of the observations for this species were indicative of breeding within or in the vicinity of the proposed wind farm. Of the 1,800 seconds of flight observation, 975 seconds were observed within the FSA, amounting to c. 0.08% of the total survey time. Kestrel was not observed flying within the rotor swept area during the bird surveys.

Based on the absence of any evidence of breeding in the vicinity of the proposed wind farm and the overall low level of flight activity recorded within the flight Survey Area and within the rotor sweep area in the vicinity of the proposed turbines, the potential for collision is assessed as being a negligible magnitude impact. A negligible magnitude impact (which assumes a loss of <1% of the kestrel population over the lifetime of the wind farm) to this receptor of medium sensitivity will represent an impact of very low significance.

Collision Risk to Peregrine

Peregrine falcon are considered to be at relatively low risk of collision with operating turbines (Madders & Whitfield, 2006). While a small number of peregrine-turbine collisions are documented within Europe including the Orkney Islands, Scotland (Meek et al., 1993; Ruddock & Reid, 2010) there are other numerous records of this species nesting in close proximity to operating turbines without any record of collision and fatalities. Monitoring at Bryn Tylti Wind Farm in Powys Wales recorded a pair successfully breeding within 250m of a turbine and were regularly recorded hunting in and around the wind farm (Philips, 1994). Successful breeding has been documented 200 m from wind turbines at Kirkby Moor, Cumbria (Percival 2014) and 180m from turbines at Little Cheyne Court, Kent (Percival, 2019). Enercon (2018) reported the successfully breeding of a pair (raising three chicks) in a nest box mounted on a wind turbine tower in Germany (Enercon 2018).

A total of 4 no. flights of Peregrine (amounting to 210 seconds) were recorded during the bird surveys. Of this time 180 seconds, representing c. 0.01% of the total survey time, was observed within the FSA. No flight activity was observed within the rotor swept area. Overall, Peregrine activity was very low during the bird surveys.

Given the above and the favourable conservation status of Peregrine falcon, the operation phase of the turbine is predicted to represent a negligible risk of collision fatality to Peregrine. A negligible magnitude impact (which assumes a loss of <1% of the Peregrine population over the lifetime of the wind farm) to this receptor of high sensitivity will represent an impact of very low significance.

Collision Risk to Merlin & Sparrowhawk

Both merlin and sparrowhawk were recorded rarely during the bird surveys, with only 1 merlin flight and 4 sparrowhawk flights observed. All five no. flights were observed well outside the FSA. Given the low levels of activity for both species in the vicinity of the wind farm and the absence of any activity within the FSA and the rotor swept area the proposed wind farm is considered to represent a negligible risk of collision to merlin and sparrowhawk. A negligible magnitude impact (which assumes a loss of <1% of the Peregrine population over the lifetime of the wind farm) to this receptor of high sensitivity will represent an impact of very low significance.

Collision Risk to Snipe

During the Baseline surveys completed between 2019 and 2022 snipe were never recorded flying within the rotor sweep area and were recorded for only 95 seconds within the flight Survey Area.

No evidence of breeding snipe was recorded within the flight Survey Area during the surveys. The presence of snipe during the non-breeding season was also found to be low with a low number of records for both the 2019/2020 and 2020/2021 non-breeding seasons. Snipe fly relatively low to the ground when flushed and often land a short distance from the take off point. When on a site, wintering snipe typically stay on the ground foraging, and do not tend to regularly fly within the Site. They are only occasionally seen on the wing when moving between feeding areas. As previously stated, snipe tend to avoid turbines, which further reduces collision risk. Based on the findings of the Baseline surveys, the absence of breeding and the low level of activity recorded for the non-breeding season, the risk of collision to snipe is assessed as being a low magnitude impact. A low magnitude impact (which assumes a loss of 1 to 5% of the kestrel population over the lifetime of the wind farm) to this avian receptor of medium sensitivity will represent an impact of very low significance. Even assuming a worst-case scenario of a medium magnitude impact to this species of medium sensitivity, the significance of the effect will still be low.

Collision Risk to Mallard

During the Baseline surveys completed between 2019 and 2022 mallard were never recorded flying within the rotor sweep area and were recorded for only 105 seconds within the flight Survey Area.

No evidence of breeding mallard was recorded within the flight Survey Area during the surveys. The presence of mallard during the non-breeding season was also found to be low with only a total of two observations recorded for the 2019/2020 and 2020/2021 non-breeding seasons. Based on the findings of the Baseline surveys, the absence of breeding and the low level of activity recorded for the non-breeding season, the risk of collision to mallard is assessed as being a low magnitude impact. A low magnitude impact to this avian receptor of low sensitivity will represent an impact of very low significance. Even assuming a worst-case scenario of a medium magnitude impact to this species of low sensitivity, the significance of the effect will still be low.

Collision Risk to Lesser Black-backed Gull

High avoidance rates of wind turbines by gull species have been reported by SNH. Cook et al. (2015) have also reported very high avoidance rates for gulls at >99.9%. A total of 21 Lesser Black-backed Gull flights, amounting to 3,300 seconds, were observed during the bird surveys. Of this time, 1,680 seconds were recorded within the FSA, representing c. 0.1% of the total survey time. No Lesser Black-backed Gulls were observed within the rotor swept area of the proposed turbines.

In view of the absence of flight activity within the rotor swept area, the low occurrence of flight within the flight Survey Area, along with the high avoidance rates and absence of breeding and roosting of this species at the wind farm site, the potential for turbine collision with Lesser Black-backed Gull will be negligible, representing an effect or risk of negligible magnitude. A negligible magnitude effect to this species of high sensitivity will represent an impact of very low significance.

Collision Risk to Lesser Black-backed Gull

High avoidance rates of wind turbines by gull species have been reported by SNH. Cook et al. (2015) have also reported very high avoidance rates for gulls at >99.9%. A total of 21 Greater Black-backed Gull flights, amounting to 660 seconds, were observed during the bird surveys. Of this time, 405 seconds were recorded within the FSA, representing c. 0.03% of the total survey time. No Greater Black-backed Gulls were observed within the rotor swept area of the proposed turbines.

In view of the absence of flight activity within the rotor swept area, the low occurrence of flight within the flight Survey Area, along with the high avoidance rates and absence of breeding and roosting of this species at the wind farm site, the potential for turbine collision with Greater Black-backed Gull will be negligible, representing an effect or risk of negligible magnitude. A negligible magnitude effect to this species of high sensitivity will represent an impact of very low significance.

Collision Risk to Passerines

Common resident passerines such as meadow pipit, skylark, goldcrest and other passerines are not considered to be at risk of collision with the operating wind farm as their flight heights are generally well below the lowest point of a rotating turbine blade. The risk of collision is assessed as being of negligible magnitude and negligible significance.

6.6.4.7.2 Reduction in Habitat Extent

Operating wind farm site can result in displacement of bird species from habitats that they rely upon due to the presence of turbines. The extent of displacement can vary between species with publications (e.g. Pearce-Higgins *et al.*, 2012) noting declines in population densities for species at wind farm site following their construction. As set out above the proposed wind farm will not result in the loss of any habitat that is relied upon by bird receptors occurring in the vicinity of the wind farm site. The footprint of the proposed wind farm site consists of existing access road and hardstanding as such there will be no reduction in habitat extent as a result of the proposed wind farm. Furthermore, the habitats occurring adjacent to and in the vicinity of the wind farm site, such as *Molinia* dominated wet heath and conifer plantation, have not been identified as being relied upon by populations of these species. Given the artificial made ground habitat occurring at the wind farm site and the absence of reliance by avian receptors on lands adjacent to the Site, the potential displacement effect and associated habitat loss that could arise as a result of the operating turbines will be representative of a low magnitude impact and an effect of very low significance for populations of local bird species.

6.6.4.7.3 Collision with Overground Electrical Cable

New power line can pose a collision risk to birds in areas where sensitive bird species are present, such as the overwintering grounds of wildfowl species or the breeding territories of raptors, waders and wildfowl.

The proposed 20kV line represents a commonly occurring feature in the Irish countryside which have not been identified as presenting a significant collision risk to bird species. RPS (2016) also found during their review of high-powered cables ranging from 11 to 440kV lines that collision with lines are relatively rare events and few incidences of collision with species of medium or high conservation concern were identified during this study. In light of the above, the risk posed by the proposed 20kV line to birds is considered to be representative of a negligible magnitude impact and an effect of very low significance for populations of local bird species.

6.6.5 Potential indirect effects during the Operational Phase

The potential for indirect effects to arise during the operational phase and impact receptors that include designated areas, the aquatic environment and associated aquatic fauna and habitats are considered in the following subsections. The operation phase will not have the potential to result in significant indirect impacts to otter.

6.6.5.1 Potential indirect effects on designated areas during the Operational Phase

The designated conservation areas have been identified as occurring within the zone of influence of the Proposed Development and as such the Project will not pose a risk of indirect effects to such sites during the operation phase.

6.6.5.2 Potential indirect effects on watercourses, Fisheries, Freshwater Pearl Mussel and associated Fauna during the Operational Phase

There is potential for indirect effects on watercourses during the operational phase of the Proposed Development due to the operation of permanent site drainage. As with the construction activities sediments and hydrocarbons represent the source of risk to water quality during operation phase maintenance works. These effects are already described for the Construction and Decommissioning Phase and are also a risk in the operational phase of the Proposed Development.

Taking this into account, unmitigated, the potential for indirect effects on watercourses resulting from the operational phase is considered to be significant at the local scale. This is due to the potential for wider surface water runoff given the larger areas of hardstanding required to accommodate the proposed wind farm infrastructure.

6.6.5.3 Potential indirect effects on Habitats during the Operational Phase

During the operation of the wind farm, the increased area of hard standing within the Site and surrounding the proposed wind turbine locations will have the potential to lead to changes in the volume and nature of site runoff.

The use of construction materials with a different mineralogical composition to that of the surrounding substrate can lead to changes in the hydrochemistry of the substrate into which these materials are placed. Heathland, such as wet heath are sensitive to changes in hydrochemistry and pH levels given the low pH of these habitats. Where materials with different mineralogical composition are used, waters percolating through these materials will acquire a different hydrochemical signature to waters associated with the native substrate of the Site. The impact of this percolating water to the surrounding substrate will depend on the difference between the mineralogy of the imported material and native substrate. Imported material that is highly alkaline in nature, such as cement-based products, can leach highly alkaline waters into the native substrate adjacent to these areas. This can result in the alteration of the hydrochemistry of sub-soil waters by elevating pH levels, which in turn can lead to a change in vegetation community. As such in the absence

of the use of appropriate materials, such an effect could result in significant effects to the status of wet heath occurring in the immediate vicinity of the Site infrastructure.

Aside from the potential changes to surface water runoff rates and mineralogy the operation of the Proposed Development will not result in any additional land take or loss of revegetated habitats and as such there is no potential for any significant effects in this regard. In addition, the operational phase has the potential to result in enhancement of the surrounding areas within the Site and within the Habitat Management Plan area through habitat rehabilitation management (as described in the Biodiversity Management Plan) that will be implemented during the construction phase of the Proposed Development and maintained during the operational phase.

6.6.6 Cumulative Effects

6.6.6.1 Cumulative Effects on Non-Avian Biodiversity

It is anticipated that, in the absence of mitigation, the key cumulative impacts upon non-avian biodiversity during the operation of the Proposed Development are largely as a result of existing drainage on the Site which could exacerbate erosion within the vicinity of the proposed infrastructure. As such, the potential for cumulative impacts as a result of the operation of the Proposed Development is considered to be significant at the local level, taking into consideration the potential for cumulative effects of other land use operations, such as drainage from neighbouring conifer plantations and public road corridors, in the vicinity of the Site. This is because, cumulatively and before mitigation is introduced at the Site, the installation of wider surface areas of hardstanding and potentially operational drainage as required, in-combination with other land uses such as forestry could result in greater surface water runoff in the region as a whole. This could potentially result in increased washout to receiving watercourses during operation. In the absence of appropriate mitigation, increased surface water runoff can lead to an exacerbation of erosion and/or sediments entering local watercourses, particularly during the first few years of operation. Mitigation proposals in this respect are provided in **Section 6.7**.

6.6.6.2 Cumulative Effects on Avian Biodiversity

There are 22 operational, consented and proposed wind farms within 20 km of the Site. **Figure 2.4** of this EIAR shows the location of proposed, permitted and operational wind farms within a 20 km radius of the proposed Derreenacrinnig West Wind Farm and **Appendix 1.5** to this EIAR provides further information on these wind farms. A total of 195 turbines are associated with these 22 no. wind farms.

The proposed Derreenacrinnig West Wind Farm will see a 1.5% increase in turbines in the area (<20 km distant). This percentage increase is considered to be of low significance. For instance, in the context of the impact magnitude scale set out in **Table 6.7** it represents a minor shift from Baseline conditions of between 1% – 5%, which is representative of a low magnitude impact. In view of this and in view of the impact assessment set out above, the additive impact of the Proposed Development in-combination with other wind farms in the surrounding area to bird populations will not be of significance.

It is assumed that the neighbouring sites hold similar bird assemblages to the proposed Derreenacrinnig West Wind Farm Site and that birds observed as part of this assessment use the surrounding landscape, including the surrounding wind farm sites. The wider environment provides ample suitable alternative habitat to support displaced birds. Whilst the Proposed Development will increase the number of proposed turbines in the immediate area, it will not significantly increase impact on the local bird population or on birds present on the proposed Site.

For the species occurring on lands of the proposed or operational wind farms/turbine sites detailed above, the effects assessed in combination are likely to remain long term, not significant.

Cumulative and in-combination impacts associated with disturbance/displacement have been considered in relation to potentially affected species. Cumulative impacts have been assessed in relation to habitat loss and are predicted to be long term and not significant.

The construction phase, the most disruptive and potentially the most impactful phase for each of the granted projects, will likely be staged at different times to that of the Proposed Development construction, allowing birds to be displaced only temporarily. Therefore, the cumulative impacts of construction is deemed to be long term, negative and not significant. It is noted that multiple wind turbines can have a cumulative impact with respect to collision mortality. The level of risk depends on the scale and distance between projects; the bird species that occur in the area; and the potential for wind farms to combine to result in a risk to populations of species of conservation concern. Species that do not regularly fly at turbine height and that show high levels of turbine avoidance are not likely to be affected at an individual project level or at a cumulative level.

Cumulative impacts relating to collision have been assessed. Due to the flight behaviour of all birds assessed and rate of their occurrence in the local area it is expected that collision risk assessed in combination will remain long term, negative and not significant.

6.7 MITIGATION MEASURES

Section 6.6 identified the need for mitigation of the following potentially significant effects:

Table 6.32: Summary List of Significant Effects before Mitigation

Potential significant effects during the construction phase on:	Potential significant effects during the operational phase on:
Watercourses (indirect effects)	Watercourses and lake habitats (indirect effects)
Terrestrial habitats: Wet heath, acid grassland; wet grassland & hedgerow	Annex 2 species: Freshwater pearl mussel, Otters, Atlantic salmon, Lamprey species (indirect effects)
Annex 2 species: freshwater pearl mussel; Brook Lamprey; Otters, Atlantic salmon (indirect effects) Annex 2 species: Kerry Slug (direct effects)	Other Aquatic species: fish species (indirect effects)
Badgers & Other protected non-volant mammals (indirect effects)	Herpetofauna (indirect effects)
Other Aquatic species: fish species (indirect effects)	Watercourses (indirect effects)
Herpetofauna (indirect effects)	
Watercourses (indirect effects)	Watercourses (indirect effects)

Core areas of mitigation required relates to aspects such as minimising the extent of working areas and control of sediment and other pollution, in addition to timing and specific methods to avoid impact on particular species. The incorporation of these requirements into appropriate compliance documents and overseeing of mitigation measures by an Ecological Clerk of Works is also fundamental.

This section sets out the required mitigation and draws on other sections and reports as necessary. Notably, the mitigation from **Chapter 7 Land and Soils** and **Chapter 8: Hydrology and Hydrogeology** are highly pertinent as these chapters set out the required mitigation to avoid impact on watercourses and water-based erosion and avoid/minimise

the risk of a slope failure event during the construction phase of the Proposed Development. These mitigation requirements are not repeated in this section but need to be implemented in full to avoid impacts on ecological features and are referred to as appropriate.

6.7.1 Construction Phase Mitigation

6.7.1.1 Mitigation by Avoidance

6.7.1.1.1 Protection of Watercourses, Fisheries & Freshwater Pearl Mussel

The Proposed Development has been designed to ensure that an adequate buffer zone is provided for between this infrastructure and watercourses. In addition, given the presence of the existing access road and hardstand no new watercourse crossings will be required at the wind farm site. The buffer zone implemented between all large-scale infrastructure associated with the Site, such as turbines, Turbine Hardstands, and access tracks are located at distances of over 50 m from any watercourses, except for where the existing access track crosses minor stream headwaters. In addition, the best practice construction measures that are described below are designed to avoid impacts on areas that are outside the Site including watercourses.

A Surface Water Management Plan (SWMP) has been prepared for the Proposed Development and this plan ensures the implementation of a suite of measures that will avoid negative impacts to water quality and the hydrological regime of the Derreenacrinnig east Stream and the un-named stream drainage the wind farm site and the higher order Owvane, Ilen and Meelagh Rivers downstream.

The mitigation measures set out in the SWMP, and in **Chapter 8 Hydrology and Hydrogeology** have been designed to manage flow regimes, sediment loss and other pollutant loss to the aquatic environment during the construction phase. These mitigation measures are informed by and consistent with the mitigation measures for freshwater pearl mussel set out by Atkinson et al. (2023).

Protection of Watercourse during Watercourse Crossings

Wind Farm Site

At the Site, drains and minor gullies and streams feeding the Derreenacrinnig East Stream are crossed by the existing access road between the wind farm site entrance and turbine T03. No new channel crossing are required as part of the proposed wind farm development. The following design measures have been implemented for the existing watercourse crossings to ensure any potential impacts of the water quality of the Derreenacrinnig East Stream are minimised:

- Vehicles and plant used in the construction of the proposed crossing will only be refuelled at the Site's bunded and designated refuelling area, no refuelling will be permitted within 50 m of any watercourse at the Site
- To mitigate against the potential risk of accidental leaks or spillages from plant and equipment the following measures will be implemented: Multiple spill kits will be maintained on the Site at all times within the cabs of vehicles and placed strategically at environmentally sensitive locations across the Site. Spill kits will be routinely inspected to ensure that they are fully stocked with oil absorbent booms and pads at all times. Oil absorbent booms will be installed downstream of channel crossing work areas within 25 m of the works location prior to the commencement of works.

Grid Connection Route

The overground electrical cable route has been designed such that all polesets are positioned a minimum distance of 25m from the nearest watercourse, thus avoiding any impacts to watercourse and associated riparian zones.

One no. watercourse crossing, a crossing of the Glanareagh Stream will be required along 1 no. section of the underground electrical cable route. The crossings will be via horizontal directional drilling, thus avoiding the need for any instream works for this watercourse crossing. The mitigation measures to be implemented during horizontal directional drilling are set out in below.

Protection of Watercourses during Horizontal directional drilling

The following mitigation measures to reduce potential impacts associated with horizontal directional drilling (HDD) will be implemented:

- Clearbore, which is not toxic to aquatic organisms and is biodegradable will be the drilling fluid used.
- Mud mixing will be monitored to suit the ground conditions encountered.
- The drilling fluids will be constantly monitored, any changes required to the mix will be performed on site by a specialised HDD Contractor upon consultation with the drilling fluid supplier and Environmental Clerk of Works.
- Mud testing equipment will be available at all times during drilling operations to monitor key mud parameters.
- All equipment will be carefully checked on a daily basis by the Site Supervisor prior to use to ensure plant and machinery is in good working order with no leaks or potential for spillages.

- Spill kits, including an appropriate hydrocarbon boom will be available on the Site in the event of any unforeseen hydrocarbon spillages and all staff shall be trained in their use.
- All plant, materials and wastes will be removed from site following the HDD works.
- The launch pit will be reinstated to the original land surface condition and the normal duct trench will continue from this point.
- Should any dewatering be required, it will be carried out in accordance with the CEMP provided in **Appendix 2.1**.
- Test pits and boreholes will not be located directly on, or extend through, the proposed alignment, as these weak points may serve as conduits where inadvertent fluid returns or frac outs could occur. At least a 3m offset will be provided between the boreholes and pipe alignment.

The following measures will be implemented at launch and receptor pits to ensure that the excavation, preparation and works undertaken at these pits do not pose a risk to the water quality of the Glanareagh Stream and the Mealagh River downstream of the horizontal directional drilling:

- All launch pits and reception pits for horizontal directional drilling under watercourses will be buffered back from watercourses at a minimum distance of 20 m.

All spoil arisings from the launch and reception pit at the proposed horizontal directional drilling crossing will be stored in bunded areas to prevent the runoff of silt-laden runoff from the spoil to watercourses. All spoil material will be reused to reinstate the launch pits and reception pits.

Pumps will be available at the launch and receptor pits. The pumps will be powered by diesel fuel and will be stored in a secure bunded area. The pumps will be used to pump any standing water from the pits during works. A lay flat hose will be positioned within the pit and pooling surface water will be pumped from the pit via the lay flat over adjacent vegetated surfaces. Under no circumstances will the lay flat outfall be directed to an existing drainage ditch or the watercourse being crossed via horizontal directional drilling. The discharge of the surface water to vegetated ground will allow for discharge to ground and will retard overland flows in the direction of the watercourse being crossed.

Continuous monitoring of drilling fluid/mud pressure will be undertaken by the drill technician during all drilling. The drill technician in turn will be supervised by the drill supervisor and all horizontal directional drilling will be monitored by the Project Ecological Clerk of Works (ECoW). The continuous monitoring will ensure that in the event of a change in pressure

due to a blockage, the technician will be immediately alerted to this change and will cease drilling operations. This will prevent drill fluid/mud from breaking out through an alternative path of least resistance and will prevent such materials from breaking out to the river. The avoidance of a breakout depends primarily on the experience of the drilling personnel and reliable, accurate drilling records interpreted in relation to the geotechnical information available. The drilling personnel will be suitably qualified and experienced to complete the works. Boreholes will be completed at all HDD locations as part of the Site Investigations works to be completed during the detailed design phase. Trends during the pilot drilling will be monitored and tracked so as to maximise the chances of accurately establishing a point where the formation is causing drilling fluid losses. The volume of drilling mud entering and returning from the bore will be constantly monitored by the drill operating staff. Staff will be especially vigilant for any loss of volume of drill mud returns, which would indicate the escape of drilling mud from the bore.

At the location a number of measures can be implemented as follows:

- Pump drilling fluid with a higher density into the formation.
- Circulate and pump organic lost circulation materials (LCM) into the loss zone to physically seal the fracture. Lost circulation occurs when drilling fluid, flows into one or more geological formations instead of returning to the launch area.
- Grout the loss zone; and/or
- Launch a packer before the loss zone. A packer is a mechanical device sent down the hole to the area of concern. It is designed for blocking the system for sealing grout to set.

All of the above options will be prepared and made available for application during the HDD works.

All equipment will be carefully checked on a daily basis by the Site Supervisor prior to use to ensure plant and machinery is in good working order with no leaks or potential for spillages. In order to minimise any risk of pollution in the first instance. Spill kits, including an appropriate hydrocarbon boom will be available on the Site in the event of any unforeseen hydrocarbon spillages and all staff shall be trained in their use. It is noted that, given the separation distances between the launch pit and reception pit for the crossing under the Glanareagh Stream that the potential for the release of hydrocarbons to the stream will be extremely unlikely.

In addition to the supervision of drilling the Project ECoW will be required to supervise the set-up and Reinstatement of all launch pits and reception pits at all watercourse crossings to ensure that all measures required to protect water quality and instream habitats are properly implemented.

In addition to the horizontal directional drilling method provided under separate cover, a detailed method statement for the crossing of watercourses will be prepared in advance of all crossings and will be submitted to the NPWS and IFI for agreement prior to the commencement of works.

All drilling fluids and spent drill mud will be prepared and returned within a closed drilling train. All spent mud will be discharged from the closed drilling train to an impermeable bunded container and will be removed from site for disposal at an appropriately licenced facility.

All fuels, lubricants and hydraulic fluids for equipment used during horizontal directional drilling will be stored in securely bunded containers and will not be carried to within 10 m of any watercourse.

All measures detailed in the SWMP and CEMP prepared for the Project to protect water quality will be implemented during horizontal directional drilling works.

An Emergency Response Plan has been prepared as part of the Project's CEMP and all measures detailed therein will be implemented in the event of an emergency.

6.7.1.1.2 Protection of Important Habitats

Wet Heath

The proposed wind farm development will not result in the loss of any semi-natural habitats of ecological value. The polesets associated with the overground electrical cable will result in minor loss of wet heath, scrub and wet grassland to the footprint of the poles. Two discrete sections of the proposed underground electrical cable will result in the temporary disturbance of wet heath during the installation of the underground electrical cable.

In order to ensure the full Reinstatement of wet heath habitat along the two sections of the underground electrical cable route, the first step of the electrical cable installation works will be to remove the wet heath vegetation as surface turves. The surface turves to be removed will measure 0.5m x 0.5m and be excavated to a minimum depth of 0.3m or to bedrock

level where substrate overburden is shallower than 0.3m. The turves will be set down opposite the excavated location by the excavator. Turves will not be stacked and will be kept moist in the event of prolonged dry weather coinciding with the electrical cable installation works. Once the electrical cable ducting is installation and encased with fill layers to ESB specifications, the electrical cable trench will be backfilled and capped with the turves saved during the initial excavations. The turves will be carefully reinstated by the excavator operator so that they are knitted together.

Hedgerows

Short section of hedgerow will be temporarily removed during the installation of the underground electrical cable. A total of 6 no. hedgerow will be severed during the installation of the underground electrical cable. The combined extent of hedgerow to be lost at the 6 location is estimated to be c. 24m. Once the underground electrical cable is installed, replanting will be undertaken to reconnect the 6 no. hedgerows severed during the installation works. Replanting will be undertaken with native willow species comprising *Salix aurita* and *Salix cinerea*.

Approximately 225m of hedgerow will be temporarily removed at the TDR widening locations no. 1 and 6. Once turbine delivery is completed the hedgerows will be reinstated with native species comprising *Salix aurita*, *Salix cinerea*, *Crataegus monogyna* and *Prunus spinosa*.

Measures to Protect Habitats

- The full extent of the infrastructure footprint will be marked out prior to the commencement of works, with an appropriately robust and visible fencing / marker system. Where this meets Annex I habitats, this will also be the full extent of the works corridor, with no machinery access (access will only be allowed on foot and only for the purposes of silt / pollution control if required), storage or other works allowed outside this area.
- The efficacy and coherence of the marker system (and required remediation) will form an essential part of the Site operations.
- A pre-construction Invasive Species Survey will be conducted during the optimal growing season (May to August immediately prior to works occurring at this site for the Proposed Development) and shall include data on all locations, extents and potential construction impacts in relation to scheduled and non-scheduled Alien Invasive Species (IAS). This survey will be completed along with reporting on the best course of action to be implemented to avoid the spread of such IAS on the Site or further afield.

The management of IAS identified as occurring within the Site will be undertaken in accordance with best practice management guidelines as set out in the TII guidelines "The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads" (2010).

6.7.1.1.3 Protection of Important Mammal Species

The Ecological Clerk of Works for the construction phase will complete a pre-construction survey to confirm the continued absence of mammal breeding and resting places within 50 m of the construction footprint or identify the presence of newly established breeding/resting places. Based upon the results of these surveys, the ECoW will establish whether or not there is a need at that stage for the implementation of further mitigation measures and the requirement for protected species licences. An example of where such a need could arise is where a badger sett becomes established along or in the immediate vicinity of a hedgerow that will be intersected by the proposed access track.

6.7.1.1.4 Protection of Bats

The Natural England guidance (2014) and NatureScot (2021) recommends that potential collision to bats from wind farm developments can be minimised by siting the proposed turbines so that all parts of the turbine are over 50m from the nearest vegetated corridor. The location of the proposed turbines will satisfy this recommendation with no vegetated corridors occurring within 50m of a turbine rotor diameter. To this end a "bat buffer" area will be implemented around all turbines such that the buffer area will remain free of suitable foraging habitat, consisting of hedgerows, treelines or scrub.

In order to avoid the potential for future interactions between the proposed wind farm and local bat populations, all structures associated with the proposed wind farm such as the control building will be built in a manner to ensure no roosting opportunities are present for bats. Also, no structured vegetation, in the form of hedgerows, treelines, scrub etc. will be permitted to establish at these locations during the operational phase of the turbines.

6.7.1.1.5 Protection of Avian Receptors

Pre-construction surveys, completed by suitably experienced ornithologists, will be completed in order to help inform the approach to the construction works associated with the proposed wind farm to confirm the continued absence of the presence/absence of any breeding or roosting sites for sensitive ornithological receptors, namely hen harrier, merlin and Peregrine.

Prior to any construction works being undertaken (including enabling works and ground investigations) surveys will be undertaken to identify any breeding/roosting activity associated with these sensitive ornithological receptors. Where such activity by these species is identified the Sites will be identified and will be demarcated so as to avoid disturbance to them. The Applicant will appoint a suitably experienced ECoW to oversee the works and help ensure that suitable protection zones are established and adhered to during the works. Species and site-specific buffer zones, following current best practice, will be established, appropriate to the specific circumstances, under the advice of a suitably experienced ornithologist.

In addition to the pre-construction surveys, all works areas will be checked by a suitably experienced ecologist/ornithologist or the ECoW for the presence of any nesting birds in advance of works commencing during the main bird breeding season. Should any active nest sites be found in areas where construction works are proposed, the location of the nest will be protected from damage and disturbance.

All works will be monitored by a suitably experienced ecologist / ornithologist or the ECoW to help ensure that protection measures are properly implemented and maintained and that works proceed in accordance with best practice and the requirements of the legislation protecting breeding birds. The ECoW will provide a toolbox talk before any personnel start on site which will cover the issue of breeding birds, their legal protections, what to look for and what to do should breeding bird behaviour or a potential nest site be found.

6.7.1.1.6 Protection of Kerry Slug

In order to avoid the potential for mortality to Kerry Slug the ECoW will complete checks for the presence of Kerry Slug in areas of suitable habitat occurring within the construction footprint of the wind farm. In the event that slugs found to be present, they will be transferred to suitable habitat in landholding away from the construction footprint. Such on-going monitoring of suitable habitat within the construction footprint will continue throughout the construction phase. Such monitoring will be undertaken during periods of wet weather when slugs are most active and feeding on the surface and therefore at greater risk of impacts by movement of machinery.

The transfer of Kerry Slugs will be subject to a derogation licence from the NPWS.

6.7.1.1.7 Protection of Herpetofauna

The Ecological Clerk of Works for the construction phase will complete a survey of the construction footprint during spring (late February / March / early April) ahead of the proposed works in order to identify any key amphibian breeding areas. This will allow wildlife barriers to be installed where necessary to minimise impacts upon such features where these are likely to be indirectly affected by the works.

6.7.1.2 Mitigation by Design & Best Construction Practice

6.7.1.2.1 Protection of Watercourses, Fisheries & Freshwater Pearl Mussel

An Ecological Clerk of Works ("ECoW") will be employed from the commencement to completion of construction works, including access tracks, On-site Electrical Substation and Control Building, Temporary Construction Compound, Turbine Hardstands and Turbine Foundations and Wind Farm Internal Cabling works at a minimum. Primary roles for the ECoW will include the setting out and monitoring of the working corridor and review of pollution control measures and working practices during the active construction period as well as ad hoc input into site remediation.

For the construction of culverts, all activities must adhere to IFI, (2016) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters. Section 9 Planning, Design and Construction Issues details on Best Practice guidance for the installation of culverts on watercourses.

All measures outlined in the accompanying SWMP will be fully implemented by the contractor and will be agreed to with the planning authority in advance of construction activities. The objective of the SWMP is to prevent pollution to watercourses and adverse impacts to sensitive fauna. The SWMP has provided sufficient detail so that all activities that could potentially lead to negative impacts on water quality have been identified. The SWMP is based upon a detailed understanding of the hydrology, hydrogeology and geology within and surrounding the Proposed Development.

All watercourses draining the Site will be examined on a repeated scheduled timeframe (i.e. daily/weekly/fortnightly etc.) as deemed appropriate by the Contractor, Planning Authority, NPWS and Inland Fisheries Ireland. A log will be kept of these examinations and a water sampling protocol to monitor key water quality parameters will be established in agreement with the NPWS and Inland Fisheries Ireland. The monitoring protocol will be devised so that sediment release (should it occur) from the Site is detected at an early stage. Sediment

release to the above watercourses from the site will be restricted to <25mg/l as per the Salmonid Water Regulations.

Method statements outlining the approach to all surface watercourse crossing will be approved in advance with Inland Fisheries Ireland.

Disturbance to natural drainage features will be avoided during the construction phase of the Proposed Development. The design of the Proposed Development has allowed for the establishment of a 50 m wide watercourse buffer zone during the construction phase.

Uncontaminated surface runoff will be diverted away from construction areas through the installation of interceptor drains up-gradient of construction areas.

Drainage waters originating in construction areas will be collected in a closed system and treated prior to controlled, diffuse release. Drainage waters from construction areas will be managed through a series of treatment stages that include swales, check dams and settlement/attenuation ponds along with other pollution control measures such as silt fences and silt mats.

A three-stage treatment train will be employed to capture, retain and treat discharges during the construction phase. This treatment train is also proposed for discharges from hard surfaces that will be installed as a result of the Proposed Development.

Settlement/attenuation ponds will be used to attenuate and treat runoff. A detailed pre-construction peat stability assessment has considered the appropriate location of settlement/attenuation ponds so that these facilities will not increase the risk of slope failure. These will have permanent open water to minimise the risk of sediment washout. Settlement/attenuation pond side slopes will be constructed at shallow grades such as 1 in 3 side slope. Settlement/attenuation ponds will be designed so that outflows are spread diffusely over a wider area so that increases in run-off can be mitigated. Erosion control and detention ponds will be regularly maintained during the construction phase.

Standing water from excavations will not be pumped directly into watercourses. Where dewatering of excavations is required, water will be pumped to the head of a treatment train in order to receive full treatment prior to discharge.

Roadside drains will be shallow with moderate gradients to prevent scouring. In steep areas check dams (possibly in conjunction with settlement ponds and / or cross drains) may be necessary to reduce flow rate.

Oil fuel will be stored within containment areas and emergency response measures for oil spillage on site will be prepared.

Refuelling of plant during construction will be carried out at a designated area, a minimum of 50 m from watercourses. Drip trays and spill kits will be available on site. Maintenance of all plant and machinery will be undertaken off-site. Only emergency break-down maintenance will be carried out on site.

Cement for the substation building will be mixed within containment areas. When Readymix vehicles are used for the foundations of the substation and turbines, they will be washed in the same area and the water cycled.

All vehicles transporting materials to and from the Site will store materials in a contained load so that the potential for emissions or spillage is reduced during journeys and bridge crossing over watercourses. The measures outlined in the UK's Planning Policy Guidance No. 26: Dealing with Spillages on Highways (a Good Practice Guidance notes proposed of the UK EA/SEPA/EHS) will be adhered to in the event of a spillage or accident during the transportation of materials.

All construction personnel will be trained in pollution incident control response. An emergency response plan has been prepared as part of the CEMP for the Proposed Development and information outlining response procedures and contingency plans to contain pollution, as set out in the CEMP, will be made available on site.

Access tracks and turning areas will be confined to areas of shallow peat where possible and will be constructed on a geotextile layer. These areas will also be kept as level as possible to avoid fast run-off. This can be achieved by following contours where possible. At the proposed temporary storage area, impermeable berms will be put in place surrounding the spoil storage receptor area. The berms will be established in advance of the deposition of spoil material. The berms will be designed to account for a bulking factor of 10% of the spoil material to be disposed in these areas.

6.7.1.2.2 Prevention of Spread of Invasive Alien Species

Construction plant and machinery can if not well-maintained result in the introduction of non-native invasive plant species. The introduction and/or spread of invasive species such as Himalayan Balsam, Giant Rhubarb or Rhododendron for example, could result in the establishment of invasive alien species and this may have negative effects on the surrounding environs. Appropriate spread prevention measures have been incorporated into the design of the Project. The following measures address potential effects associated with the construction phase of the Project:

- Good construction site hygiene will be employed to prevent the introduction and spread of problematic invasive alien plant species (e.g. Himalayan Balsam, Japanese Knotweed etc.) by thoroughly washing vehicles prior to leaving any site.
- All plant and equipment employed on the construction site (e.g. excavator, footwear, etc.) will be thoroughly cleaned down using a power washer unit prior to arrival on site to prevent the spread of invasive plant species
- All washing will be undertaken in areas with no potential to result in the spread of invasive species. This process will be detailed in the contractor's method statement.
- Any soil and topsoil required on the Site will be sourced from a stock that has been screened for the presence of any invasive species and where it is confirmed that none are present.
- All planting and landscaping associated with the Proposed Development shall avoid the use on invasive shrubs such as Rhododendron.

6.7.1.3 Mitigation by Reduction

6.7.1.3.1 Protection of important habitats

A site-specific CEMP will be implemented to ensure that potential adverse impacts to upland watercourses flowing through the Site are avoided. Minimum buffer zones will be implemented between areas associated with the construction of Turbine Foundations and streams/eroding gullies, except where stream crossings are required.

Within the wind farm site operatives, plant and machinery will be restricted to the footprint of the Proposed Development construction boundary and will not be permitted to encroach upon adjacent lands. This will reduce the potential for damage and disturbance to heath, acid grassland and mosaic habitats.

For the overground electrical cable poleset installation construction traffic and machinery movement will be confined to specific roads and access routes. Construction vehicles to be used in areas underlain by thin peat substrate will be of low ground bearing pressure.

Trampling and the use of machinery on saturated, quaking surfaces has been avoided by positioning polesets outside of such locations. The locations of poles has been configured to minimise the number occurring within wet grassland and wet heath and the use of brash mats will be used if required.

As per the Baseline description, the Meelagh River valley, at the crossing point of the proposed overhead line does not function as an established commuting route for sensitive bird species such as wildfowl and raptors. However, it is possible that this river valley will be occasionally used by such species. Haas et al. (2005) described general principles for protecting birds from collision with overhead lines, including routing of overhead lines as low as possible, for example behind buildings or rows of trees and attach clearly visible markers on the overhead lines posing a high collision risk. The overhead line does not represent a high collision risk to birds and has been designed to following existing hedgerow boundaries as it crosses the Meelagh Valley. As an additional precautionary measure the section of the overhead line crossing the valley between polesets 101 and 109 will be fitted with clearly visible markers. This will further reduce the low collision risk posed by the overhead line to birds.

6.7.1.3.2 Protection of Watercourses

All elements of the SWMP and the mitigation measures outlined in **Chapter 8 Hydrology and Hydrogeology** to reduce the amount of silt-laden water generated within the construction footprint will be implemented. These measures will include the provision of clean water catch drains upslope of construction areas and the minimisation of excavation footprints and the time excavations and surfaces are left exposed and denuded.

6.7.1.4 Offsetting

6.7.1.4.1 Habitat restoration

The approach to the Reinstatement of wet heath along short sections of underground electrical cable trenching has been set out above.

Areas of existing hardstand within the wind farm site that are not required for the Proposed Development will be set aside for habitat management. A Habitat Management Plan is provided as **Appendix 6.2** and all measures set out in this plan will be implemented as part of the Proposed Development. The restoration and enhancement of areas of heath and acid grassland will aim to achieve the restoration and enhancement of an area.

6.7.2 Operational Phase mitigation

6.7.2.1 Mitigation by Design

6.7.2.1.1 Protection of Watercourses

The following measures are required in order to ensure the ongoing protection of watercourses:

- Re-seeding / re-vegetation of all areas of bare ground or the placement of Geo-jute (or similar) matting will take place as practically possible at the start of the operational phase to prevent run-off.
- Silt traps erected during the construction phase within roadside and artificial drainage will be replaced with stone check dams for the lifetime of the Project. These stone check dams will only be placed within artificial drainage systems such as roadside drains and not natural streams or ditches.
- A full review of construction stage temporary drainage will be undertaken by the Developer (in conjunction with the Project Hydrologist/ Site Engineer and the Project Ecologist) following the completion of construction, and drainage removed or appropriately blocked where this will not interfere with infrastructure.
- The Temporary Construction Compound / office must house all chemicals within a secure bunded COSSH store for the operational phase of the Project.

6.7.2.1.2 Protection of Bats

Turbines will operate in a manner which restricts the rotation of the blades as far as is practicably possible below the manufacturer's specified cut-in speed (SNH 2021). This is usually achieved by feathering the blades during low wind speeds; the angle of the blades is rotated to present the slimmest profile possible towards the wind, ensuring they do not rotate or 'idle' when not generating power.

Post-construction surveys will be undertaken for the first three years of operation to confirm if blanket curtailment restrictions can be amended in line with post-construction activity levels. The post construction surveys will be used to update the current curtailment regime (blanket curtailment) designed around the values for the key weather parameters and other factors that are known to influence collision risk. This will include all of the following:

- Wind speed in m/s (measured at nacelle height)
- Time after sunset
- Month of the year
- Temperature (°C)
- Precipitation (mm/hr)

6.7.2.2 **Offsetting**

6.7.2.2.1 **Restoration of Important Habitats**

Restoration of habitats will require ongoing positive management input as well as monitoring of success and necessary remedial measures. This is set out in the Habitat Management Plan in **Appendix 6.2**.

6.7.3 **Decommissioning Phase Mitigation**

No new impacts on the surface water and groundwater receiving environment are anticipated during the Decommissioning phase of the Project. The Decommissioning phase of the Project will result in the removal of Site infrastructure such as wind turbines and the Met Mast etc. No new additional mitigation measures to those proposed for the construction which will also be implemented during Decommissioning are required for the Decommissioning phase of the Proposed Development. The Decommissioning phase and associated removal of major infrastructure components is anticipated to result in similar potential risks to surface water and groundwater as those that will be encountered during the construction phase of the Proposed Development.

The excavation of greenfield land is not expected to be required during the Decommissioning phase. In addition, the movement of plant, vehicles and equipment is not expected to be required during the Decommissioning phase since all of the Project's hardstand areas will be pre-existing by the time the Decommissioning phase is being carried out. As a result, the risk of elevated suspended solids being discharged in surface water run-off to the downstream receiving environment is expected to be low. However, the potential risk remains for spills of fuels hazardous chemicals which is a common risk to all developments. The mitigation measures outlined in this chapter will be implemented during the Decommissioning phase to reduce the potential for such impacts.

6.8 **MONITORING**

An ECoW will be appointed prior to the commencement of construction. The ECoW will be an ecologist with experience of Baseline ecological surveys, pre-construction surveys and construction phase supervision. The ECoW will be responsible for completing pre-construction surveys and supervising construction works and advising on the implementation of biodiversity enhancement measures that will be commenced during the construction phase.

Pre-construction confirmatory surveys required in advance of the construction phase will include as a minimum:

- Otter surveys along the Derreenacrinnig East Stream and the un-named stream draining the proposed wind farm site to the north. Surveys to be completed will pay particular attention to identifying the presence/absence of otter holts/couches within 150 m of the proposed wind farm infrastructure. In the event that otter holts or couches identified within 150 m of the Proposed Development the status of the breeding/resting place will be confirmed. Where the holt/couch is identified as a breeding site, then, in the absence of a derogation licence, no works will be permitted to proceed within a 150 m radius of the breeding place, whilst it is still actively used as a breeding site. In the event that a non-breeding active holt or couch is identified within 50 m of the Proposed Development, then, in the absence of a derogation licence, no works will be permitted to proceed within a 50 m radius of the non-breeding but active holt or couch.
- Non-native invasive plant species surveys: An up-to-date confirmatory non-native invasive plant species survey of the Site and adjacent areas will be completed during the growing season immediately prior to the commencement of construction works.
- The ECoW will ensure that best practice construction methods and mitigation measures detailed in this EIAR and accompanying planning documentation including the CEMP and NIS are implemented in full.
- The ECoW will be responsible for ensuring that the construction phase contractor is aware of key biodiversity receptors. The ECoW will inspect the construction works throughout the construction phase and will pay particular attention to the implementation of all biodiversity related mitigation measures.
- The ECoW will provide monitoring inspection reports during the construction phase and will also provide a close-out report following the completion of the contract construction works.
- Where necessary the ECoW will liaise with relevant authorities such as Cork County Council, the IFI and the NPWS with respect to construction phase activities that relate to biodiversity.
- As part of the ECoW terms of appointment, the ECoW will be vested with the authority to stop works where activities have been identified on site that are not in accordance with the mitigation measures outlined in this EIAR, the NIS and/or the CEMP prepared for the planning application for the Proposed Development.

6.8.1 Post-construction phase monitoring

6.8.1.1 Habitats

Post construction phase monitoring will be completed as per the specification for monitoring set out in the Habitat Management Plan in **Appendix 6.2**.

6.8.1.2 *Bats*

Post-construction surveys will be undertaken for the first three years of operation to confirm that the post-construction activity levels are in line with the pre-construction activity levels. The post construction surveys will be used to inform the turbine operation regime designed around the values for the key weather parameters and other factors that are known to influence collision risk to bats. This will include all of the following:

- Wind speed in m/s (measured at nacelle height)
- Time after sunset
- Month of the year
- Temperature (°C)
- Precipitation (mm/hr)

Monitoring will be completed by installing automatic bat detectors at the turbine locations. Monitoring will be completed in accordance with the approach to bat activity monitoring set out by SNH (2021).

6.8.1.3 *Birds*

A detailed breeding bird monitoring will be implemented at least 12 months prior to the start of construction works. The monitoring plan would detail survey methods, and the reporting mechanism, for each focal species. The surveys would be completed by suitably experienced ornithologists. The surveys will commence (as a minimum) in the breeding season prior to works commencing and for at least the first fifteen years of wind farm operation (i.e., annually for the first three years, then fifth, seventh, tenth and fifteen years). At which point the need for further monitoring would be reviewed. The surveys would include the flight Survey Area which comprises the three proposed turbines and a 500m surrounding buffer area.

The monitoring will comprise:

Vantage point surveys as per SNH (2017) from the two vantage points used for the Baseline surveys.

Breeding bird survey following methods used in the Baseline survey to be repeated yearly between early April to early July during each operation phase monitoring year.

Collision fatality searches which will involve the search of a standard polygon area around each of the 3 no. turbines. At the start of each survey, data recorded will include meteorological and ground cover information. The locations of any carcasses found will be

recorded by GPS and will be photographed in-situ. The state of each carcass will be recorded on a corpse record card, using the following categories (after Johnson 2003):

- Intact - a carcass that is completely intact, is not badly decomposed, and shows no sign of being fed upon by a predator or scavenger
- Scavenged - an entire carcass which shows signs of being fed upon by a predator or scavenger, or a portion(s) of a carcass in one location such as wings, legs, skeletal remains or pieces of skin
- Feather Spot - ten or more feathers at one location indicating predation or scavenging. If only feathers are found, 10 or more total feathers or two or more primaries must be discovered to consider the observation a casualty.

Searcher efficiency and predation tests will be carried out at the commencement of the programme in order to calibrate the results to account for the search dog's ability to find bird corpses and to also account for scavenging of corpses by animals. The collision searches will be carried out on a monthly basis in years 1, 2, 3, 5, 7, 10, 15 of the operational wind farm.

6.9 RESIDUAL EFFECTS

The direct and indirect effects of the Proposed Development to biodiversity have been set out in **Section 6.6** above. There will be no loss of habitat to the footprint of the proposed wind farm site. There will be temporary disturbance to wet heath, wet grassland, hedgerows and scrub along the proposed Grid Connection route. All habitats will be reinstated following the completion of works. The wind farm site is not relied upon as a breeding, resting, foraging site by non-volant mammals or by bats. Mitigation measures have been set out to further ensure that the Proposed Development does not pose a risk of significant effects to such species.

The risk posed by the proposed wind farm to avian receptors is assessed to be of very low significance.

A Habitat Management Plan will be implemented to enhance the cover of semi-natural heath and grassland habitats within the proposed wind farm site. This plan comprises measures for the restoration of an area of existing hardstanding, approximately 0.85 Ha in size, to a mix of heath and acid grassland habitat.

Table 6.33: Assessment of Residual Effects

Biodiversity Receptor	Impact	Significance	Probability	Mitigation	Residual Impact
European Sites	No European Sites are located within the zone of influence of the Project.	No significant effects to European Sites are identified	Unlikely	No mitigation measures specific to the protection of European Sites are required given the absence of likely significant effects to European Sites.	No residual adverse effects
NHAs	No NHAs are located within the zone of influence of the Project.	No significant effects to NHAs are identified	Unlikely	No mitigation measures specific to the protection of NHAs are required given the absence of likely significant effects to NHAs.	No residual adverse effects
pNHAs	No pNHAs are located within the zone of influence of the Project.	No significant effects to pNHAs are identified	Unlikely	No mitigation measures specific to the protection of pNHAs are required given the absence of likely significant effects to pNHAs.	No residual adverse effects
Wet heath, wet grassland,	Minor temporary disturbance to habitats during the installation of	Temporary, reversible, imperceptible to slight negative impacts for the	Certain	Reinstatement of wet heath, wet grassland, hedgerow and scrub habitat temporarily disturbed	No long-term to permanent residual impact associated with the underground electrical cable installation.

Biodiversity Receptor	Impact	Significance	Probability	Mitigation	Residual Impact
hedgerow & scrub	the underground electrical cable. Minor disturbance to habitat during the installation of polesets.	installation of the underground electrical cable. Permanent, imperceptible to slight negative impact for the installation of polesets.		during the installation of the underground electrical cable.	Permanent, imperceptible to slight impact associated with the overground electrical cable.
Aquatic Habitats	Potential for the discharge of pollutants such as sediment or hydrocarbons downstream to aquatic habitats.	The significance of impact will depend upon the magnitude of the pollution event (i.e. the levels of pollution released). Any pollution event with the potential to result in short to long-term perturbations to the status of receiving aquatic habitats.	Likely	Minimise ground disturbance. Timing of works and implementation of surface water management and control measures. Implementation of all mitigation measures set out in Section 6.7, Chapter 7 & 8 . The implementation of mitigation measures will negate the potential for this impact to arise.	Imperceptible
Fisheries and Aquatic Fauna	Potential for the discharge of pollutants such as sediment or hydrocarbons downstream to aquatic habitats that support fisheries and aquatic fauna.	The significance of impact will depend upon the magnitude of the pollution event (i.e. the levels of pollution released). Any pollution event with the potential to result in short to long-term perturbations to the status of receiving aquatic	Likely	Minimise ground disturbance. Timing of works and implementation of surface water management and control measures. Implementation of all mitigation measures set out in Section 6.7, Chapter 7 & 8 . The implementation of mitigation	Imperceptible

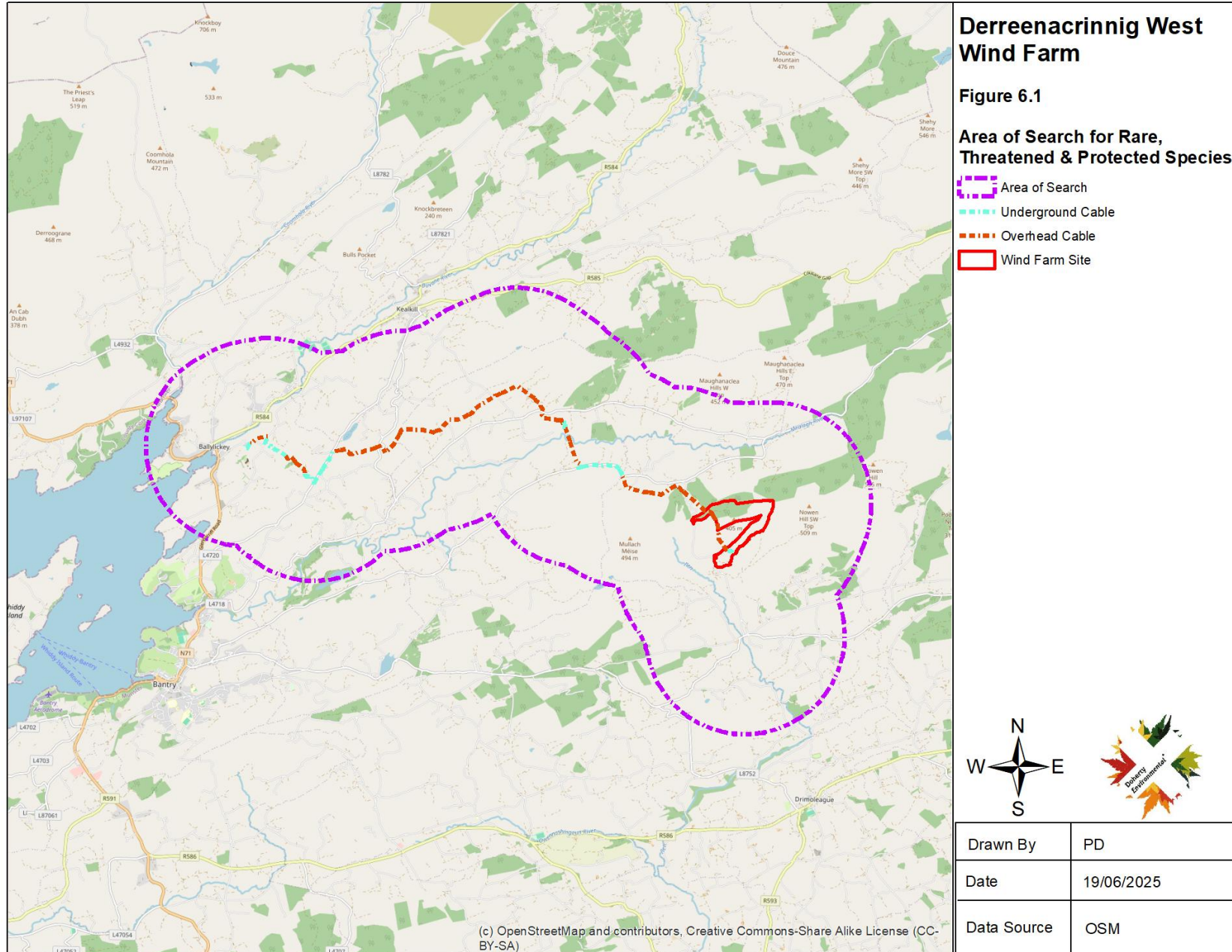
Biodiversity Receptor	Impact	Significance	Probability	Mitigation	Residual Impact
		habitats to support fisheries and aquatic fauna.		measures will negate the potential for this impact to arise.	
Otters	Potential for indirect impacts to otters as result of perturbations to aquatic habitats downstream that are relied upon by otter or provide suitable habitat for otters.	The significance of impact will depend upon the magnitude of the pollution event (i.e. the levels of pollution released). Any pollution event with the potential to result in short to long-term perturbations to the status of receiving aquatic habitats to support otters.	Likely	Minimise ground disturbance. Timing of works and implementation of surface water management and control measures. Implementation of all mitigation measures set out in Section 6.7, Chapter 7 & 8 . The implementation of mitigation measures will negate the potential for this impact to arise.	Imperceptible
Bats	Low risk of potential impacts during the operation phase to bat species	Potential for imperceptible to slight negative impacts to the local population of Soprano pipistrelle and Common pipistrelle populations.	Possible	Implementation of mitigation measures set out in Section 6.7 .	The adjudged worst-case scenario is that, during operation, the turbines may possibly cause injury or death to a few individual specimens of bats such as Leisler's bat as it is a high-flying species (10 m to 70 m+). However, the results of Baseline monitoring indicates that Leisler's bat and other bat species do not rely on the surrounding area for foraging and that the risk of collision will be low.

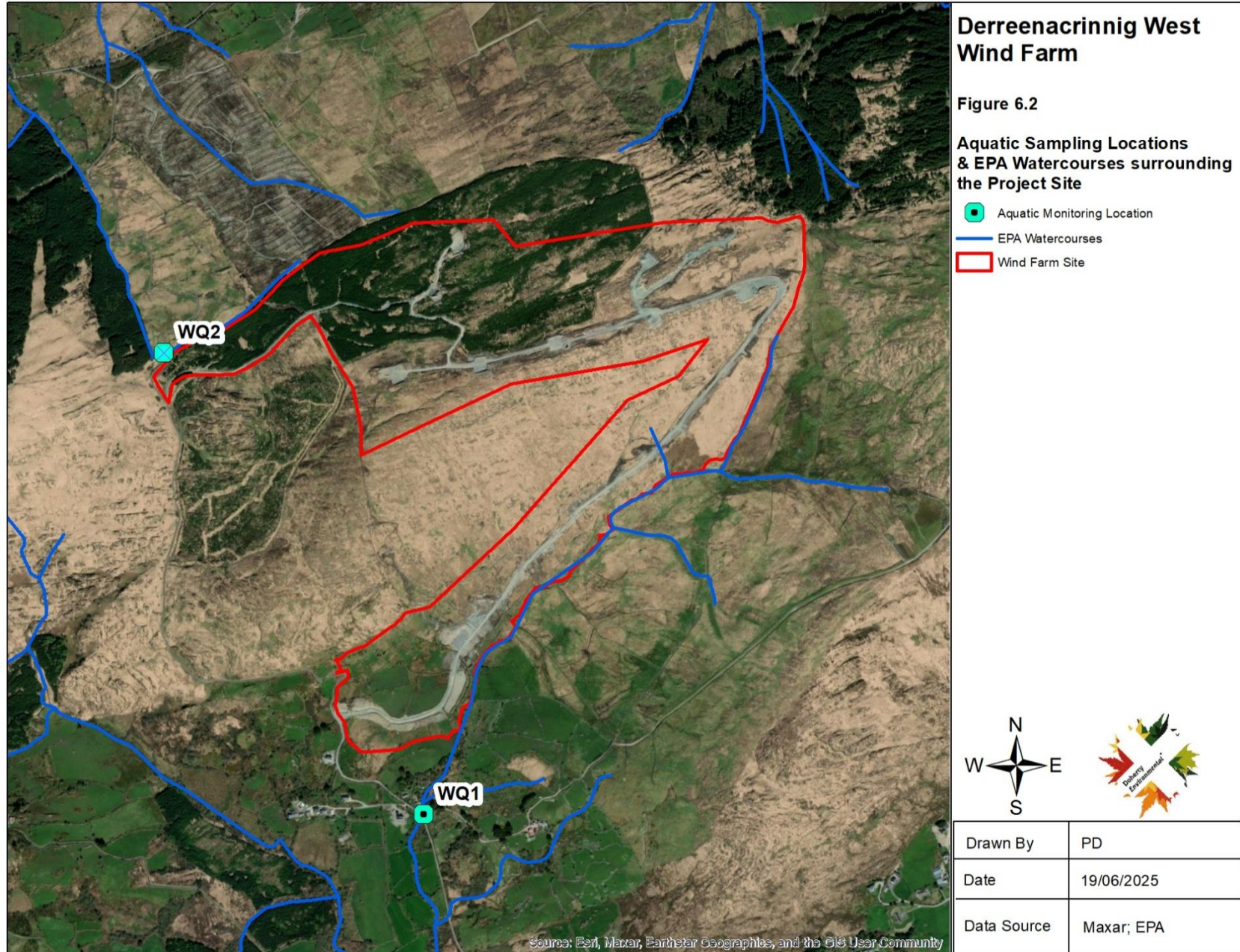
Biodiversity Receptor	Impact	Significance	Probability	Mitigation	Residual Impact
					<p>Operation phase monitoring will provide further evidence to confirm the low risk of collision to bats, and in the unlikely event that operation phase monitoring identifies a higher than low risk to bats, measures can be implemented to reduce this risk through amendment to the operating regime of turbines during periods of higher than low risk levels.</p> <p>The resulting effect of the Proposed Development on local bat populations, with implemented mitigation measures, is considered to be a imperceptible to slight residual negative reversible effect and in the local context with the favourable conservation status (FCS) of bat species being unaffected and all species confirmed or expected on or near the study areas are predicted to persist.</p>

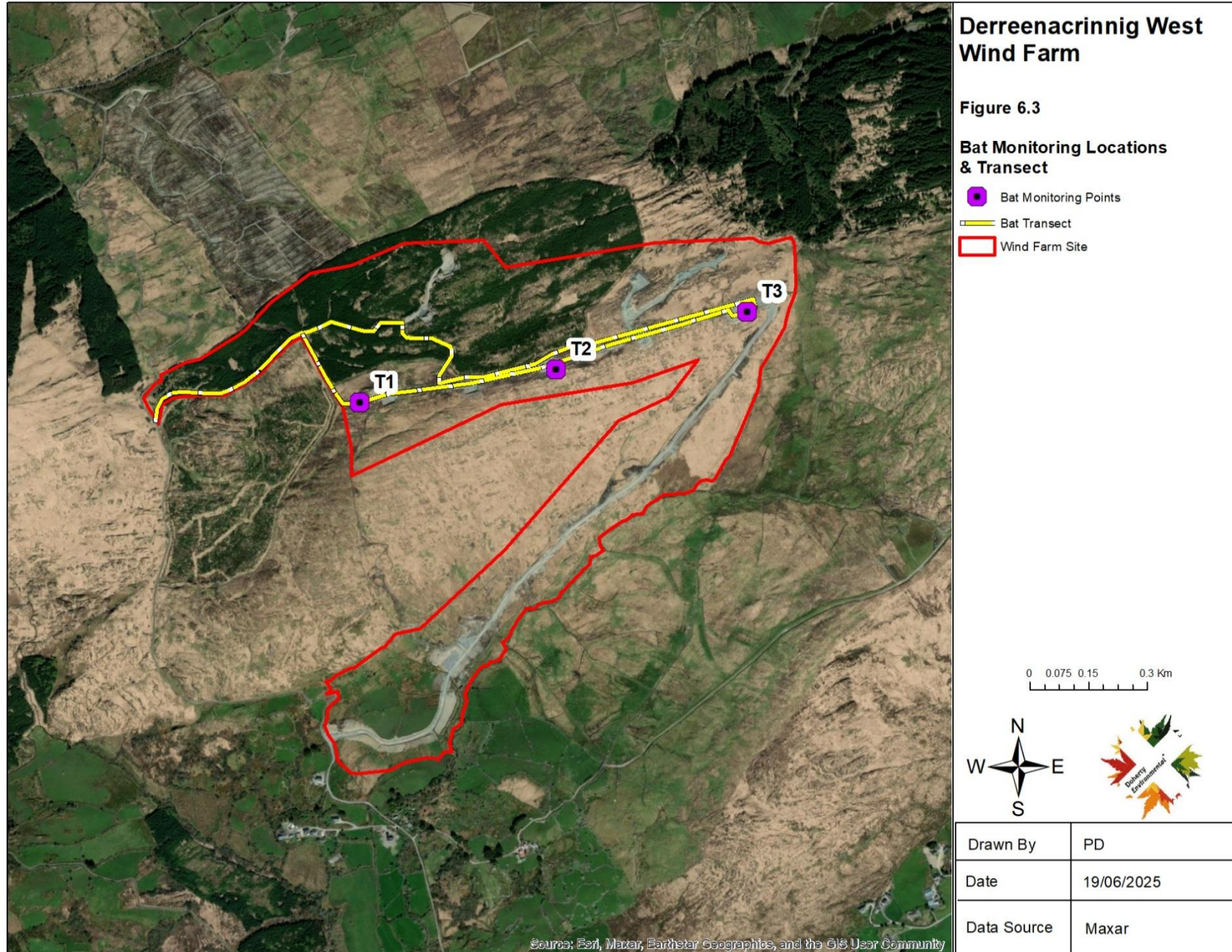
Biodiversity Receptor	Impact	Significance	Probability	Mitigation	Residual Impact
Birds	Risks of impact to bird receptors have been identified to be very low to low.	Very low to low impact to bats as per the Percival assessment method cross tabulates to an impact of imperceptible to slight significance.	Likely	Mitigation measures have been set out to minimise impacts to birds during the construction phase and to monitoring the operation phase to confirm no changes in bird activity in the vicinity of the wind farm and or changes to the potential impact posed by the wind farm to birds informed by the Baseline conditions.	<p>The adjudged worst-case scenario is that, during operation, the turbines may possibly cause injury or death to a few individual specimens of birds. However, the results of Baseline monitoring indicates that sensitive bird species do not rely on the wind farm site for nesting, roosting or foraging and that the risk of collision will be low.</p> <p>Operation phase monitoring will provide further evidence to confirm the low risk of collision to birds, and in the unlikely event that operation phase monitoring identifies a higher than low risk to birds, measures can be implemented to reduce this risk through amendment to the operating regime of turbines during periods of higher than low risk levels.</p>

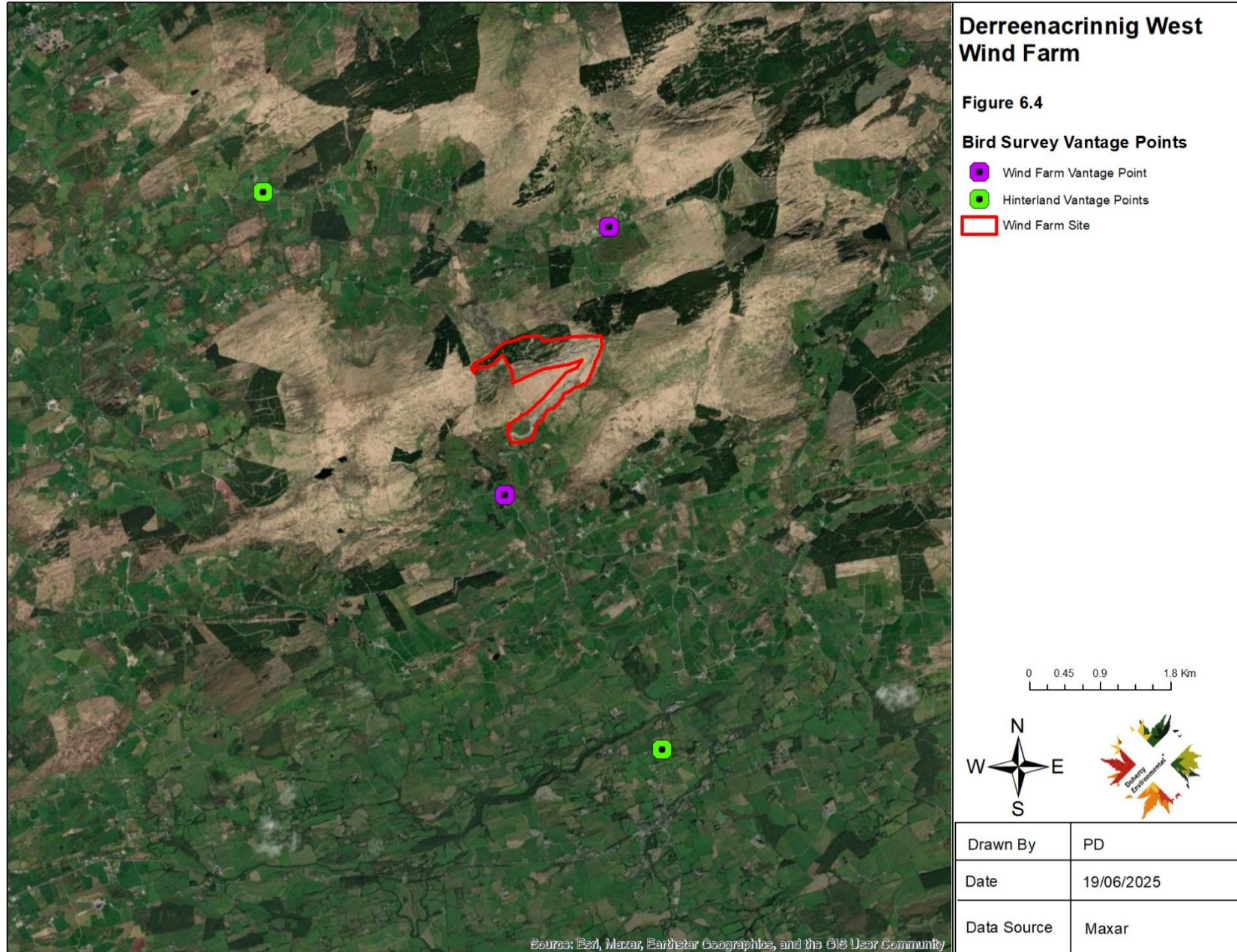
Biodiversity Receptor	Impact	Significance	Probability	Mitigation	Residual Impact
					The resulting effect of the Proposed Development on local bird populations, with implemented mitigation measures, is considered to be a imperceptible to slight residual negative reversible effect and in the local context with the favourable conservation status (FCS) of bird species being unaffected and all species confirmed or expected on or near the study areas are predicted to persist.
Herpetofauna	Mortality resulting from construction works. Loss of foraging habitat.	Potential for impacts to the local common frog populations.	Likely	Minimise ground disturbance. Timing of works. Habitat management measures as part of the Habitat Management Plan. Implementation of mitigation measures set out in Section 6.7 .	Imperceptible
Terrestrial Invertebrates	Loss of habitat.	Potential for impacts to the local terrestrial fauna populations.	Likely	Minimise ground disturbance. Timing of works. Habitat management measures as part of the Habitat Management Plan.	Imperceptible

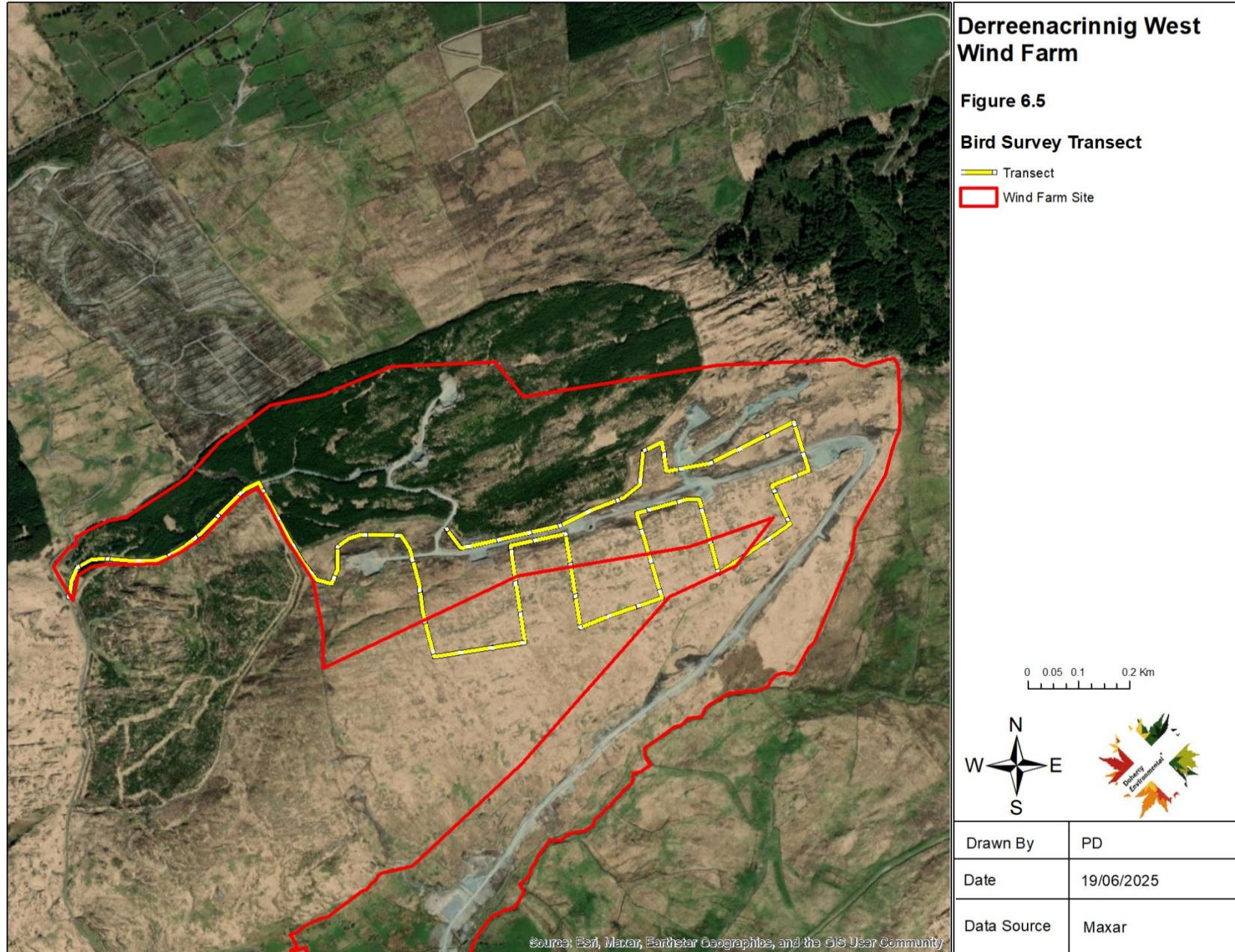
BIODIVERSITY FIGURES

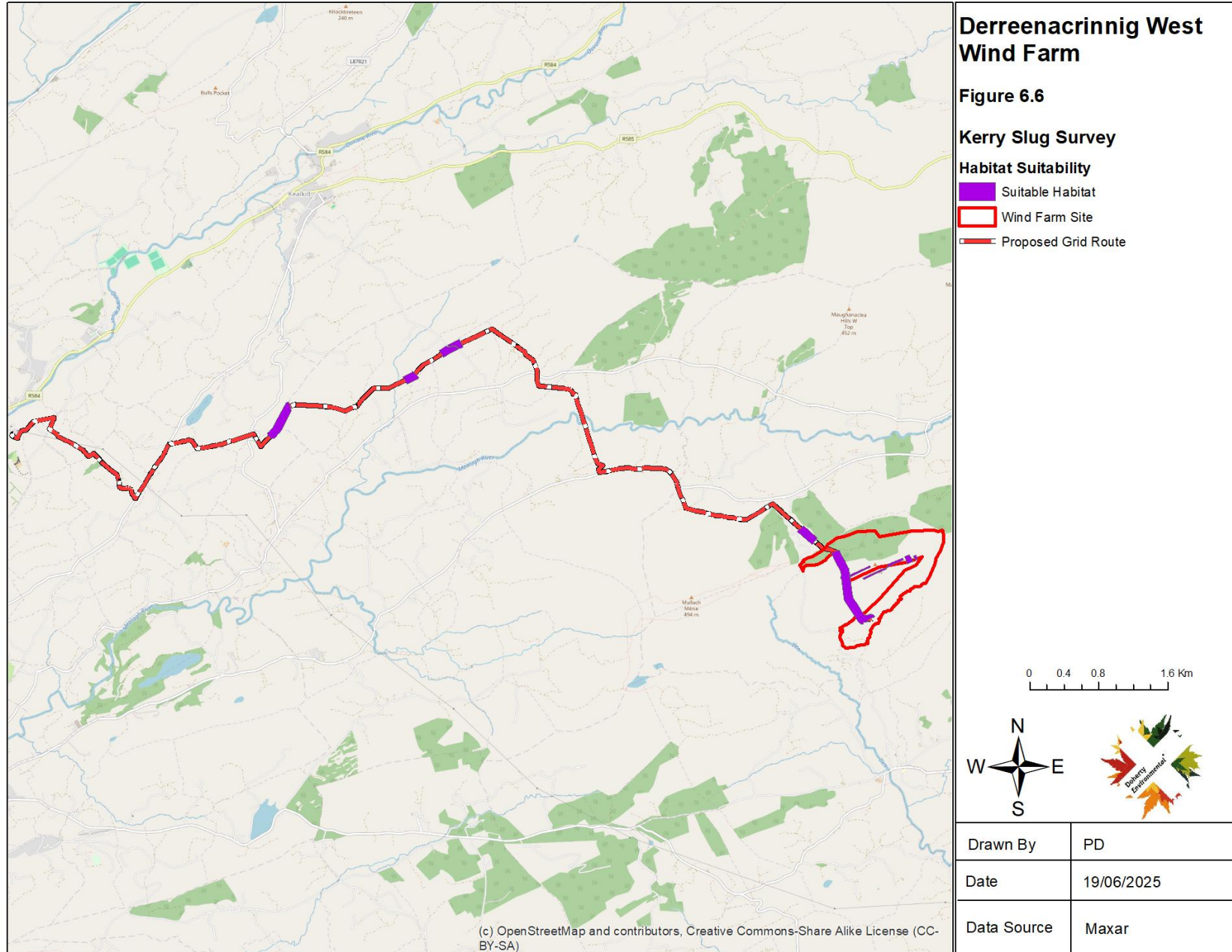


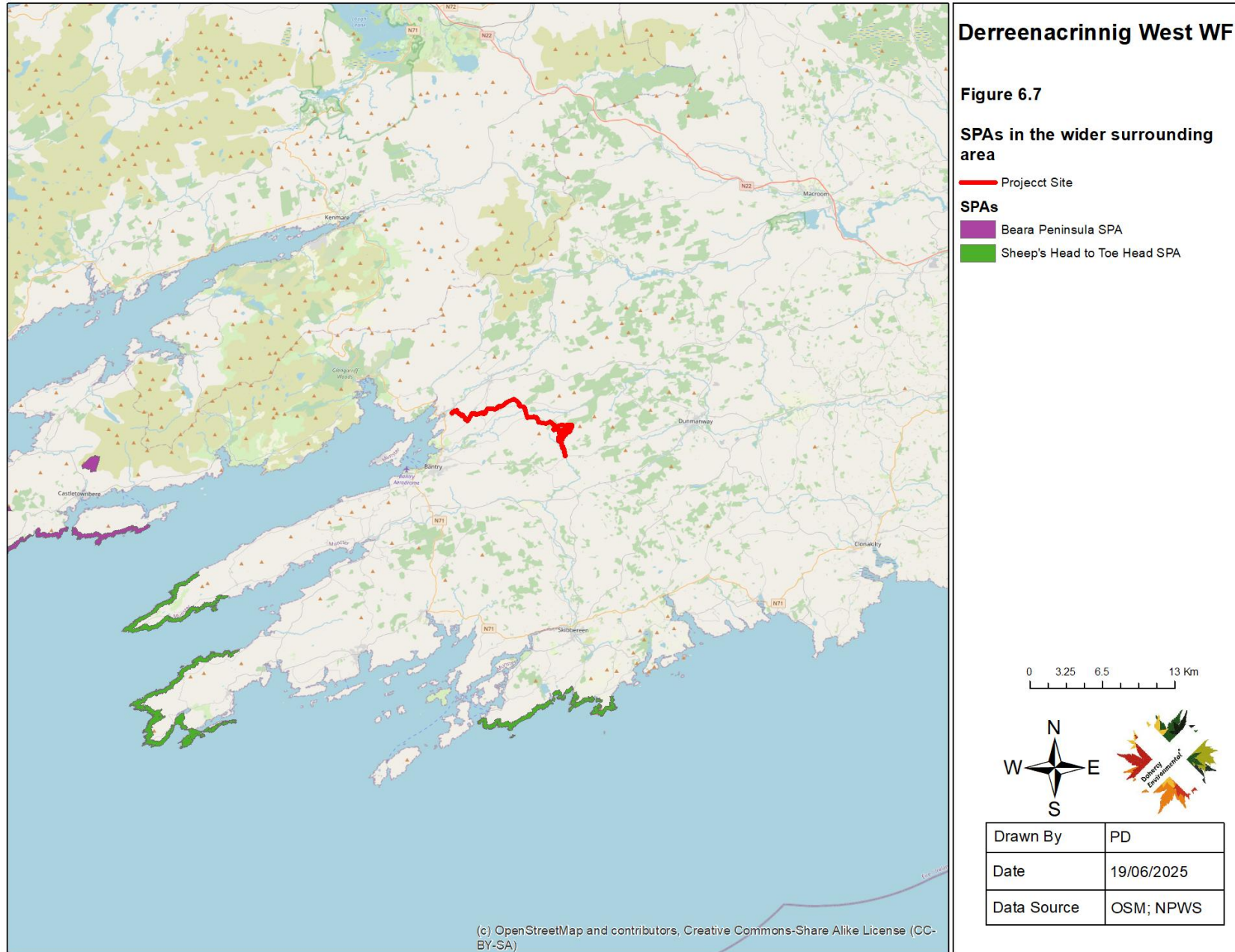


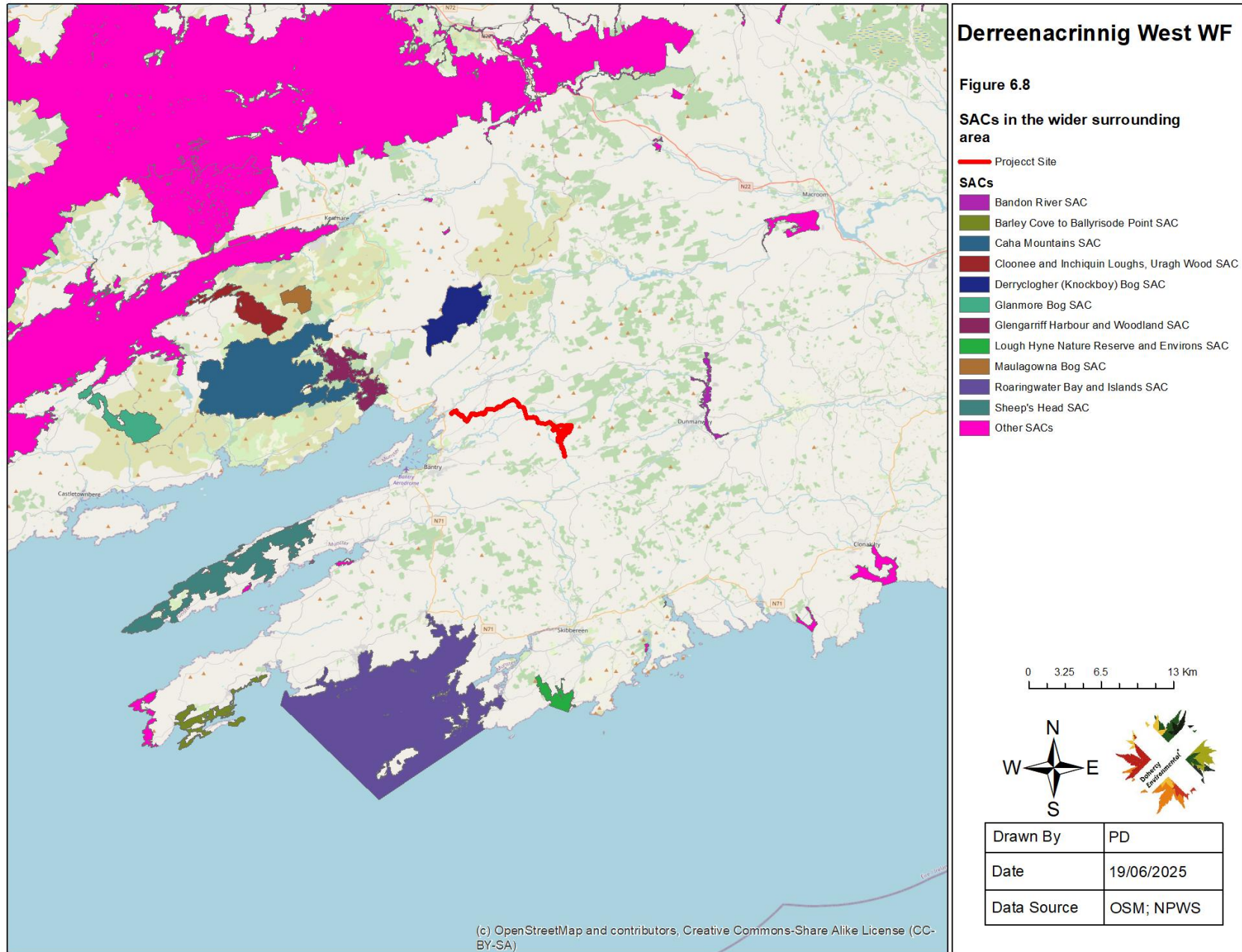


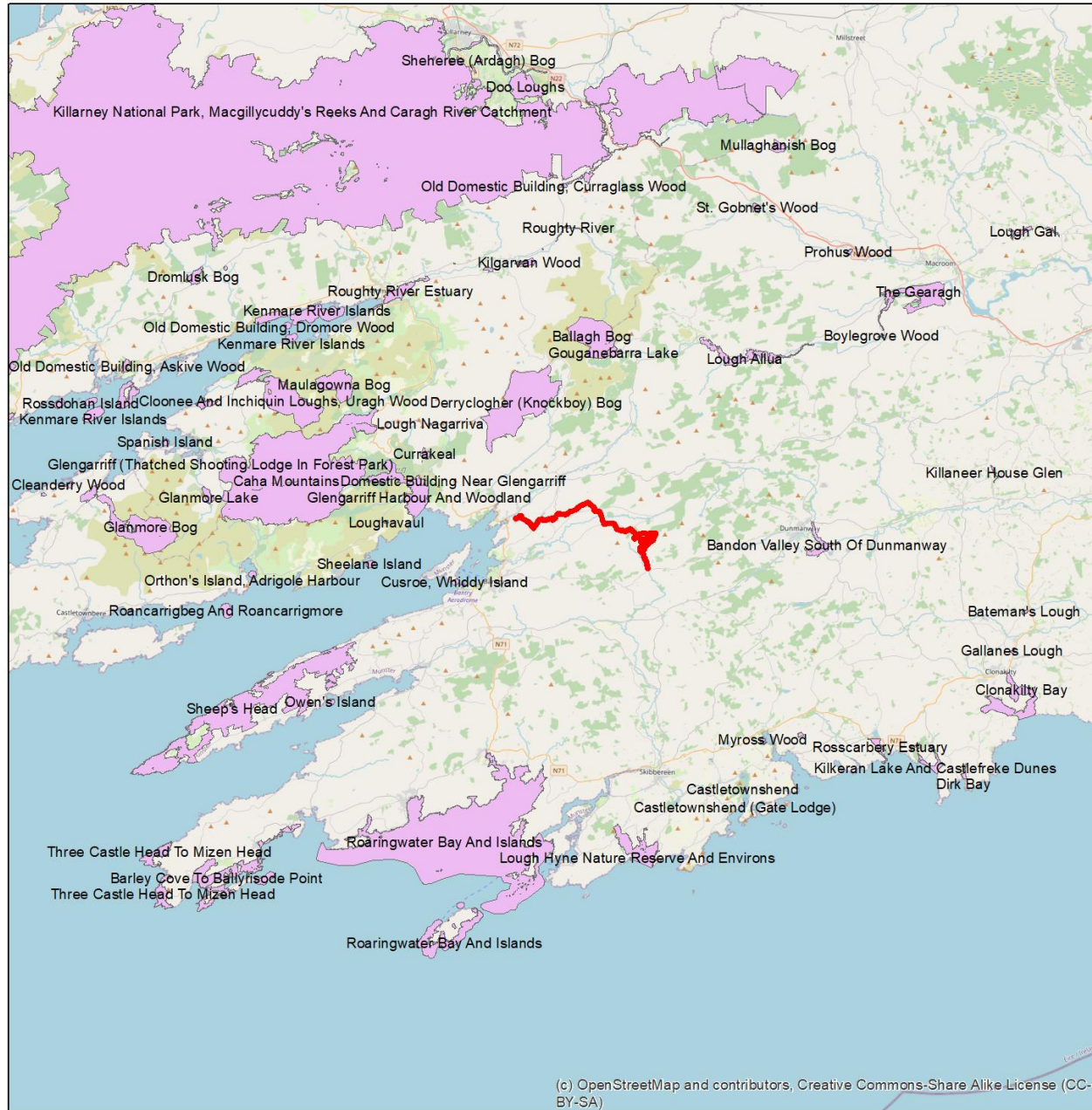










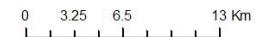


Derreenacrinnig West WF

Figure 6.9

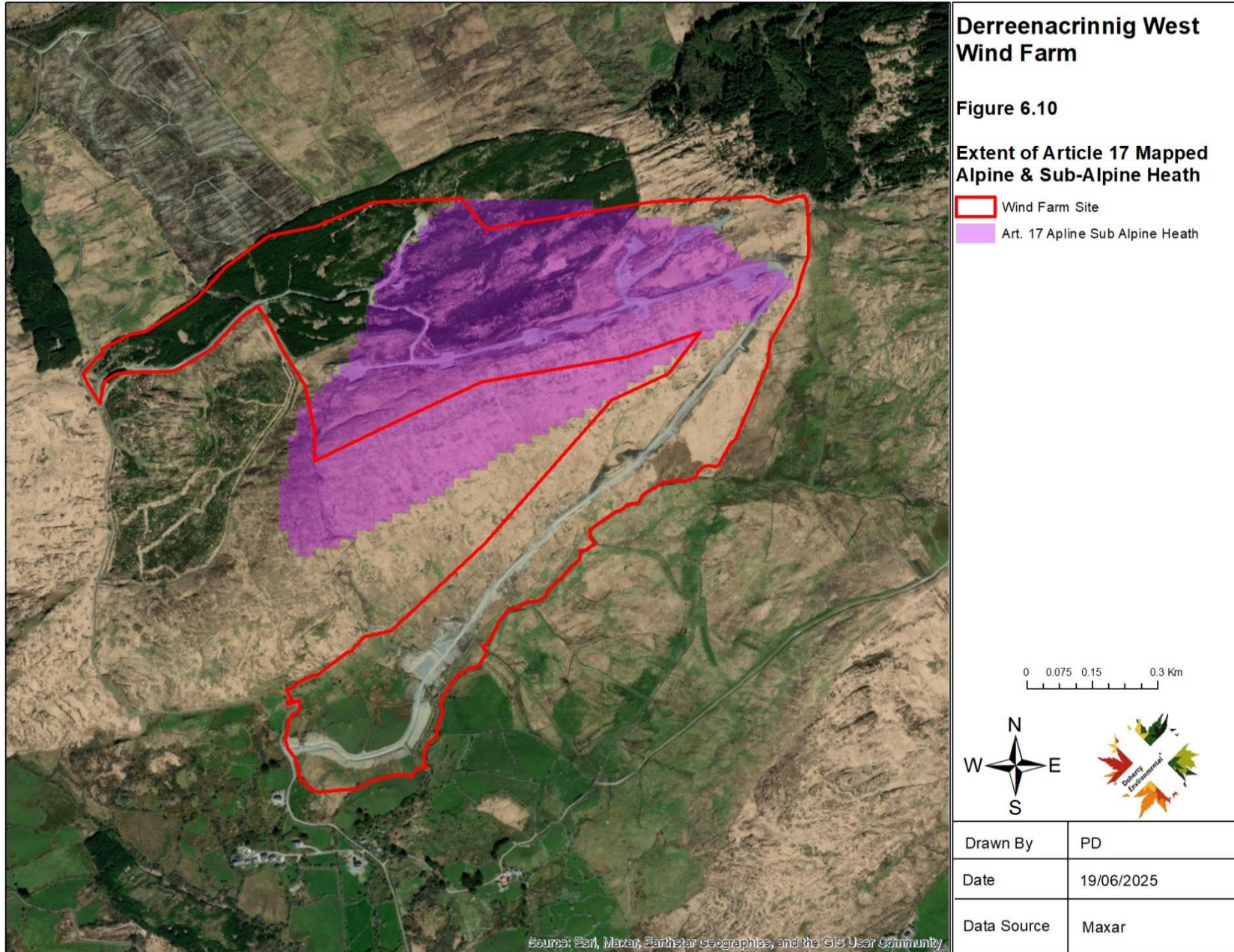
pNHAs in the wider surrounding area

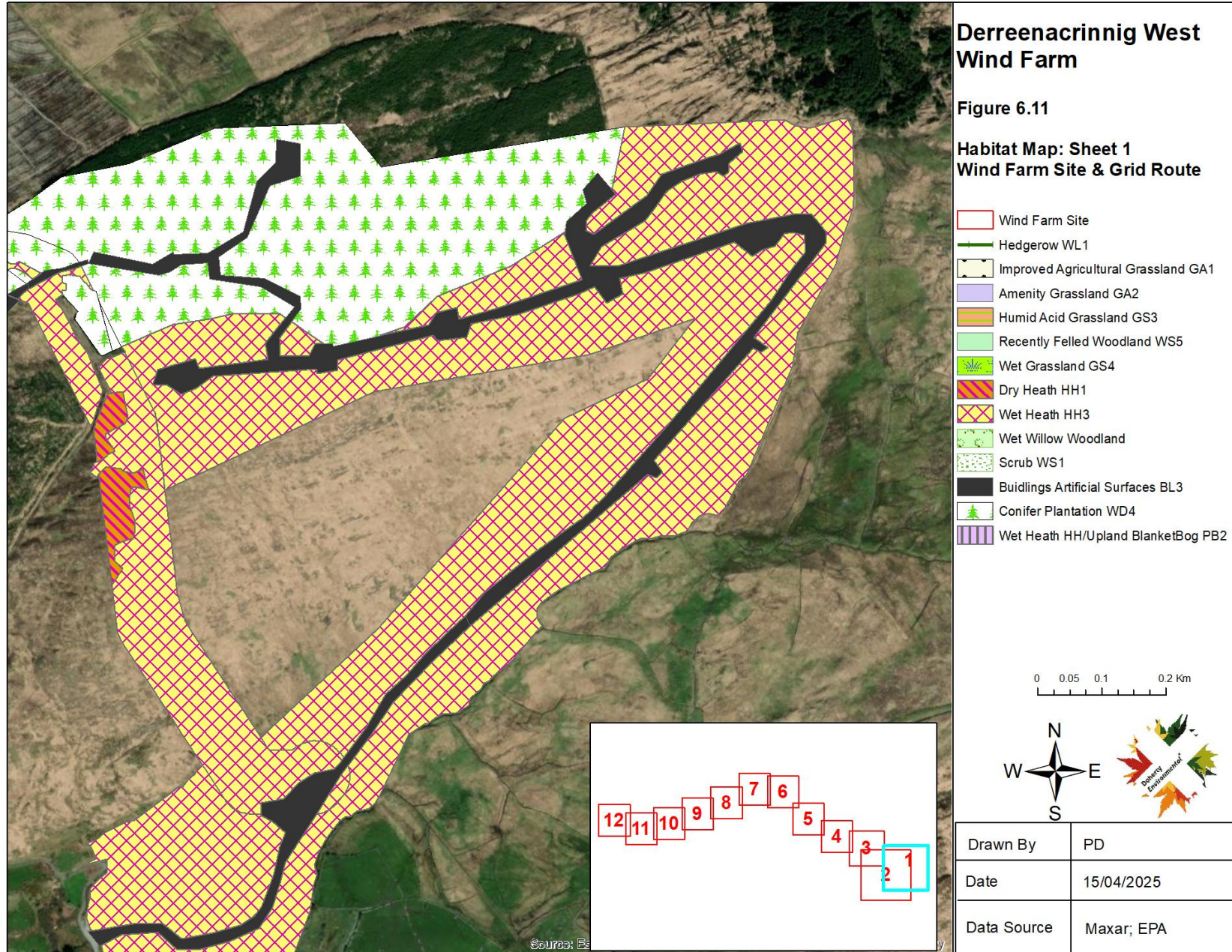
- Project Site
- pNHAs in Wider Area

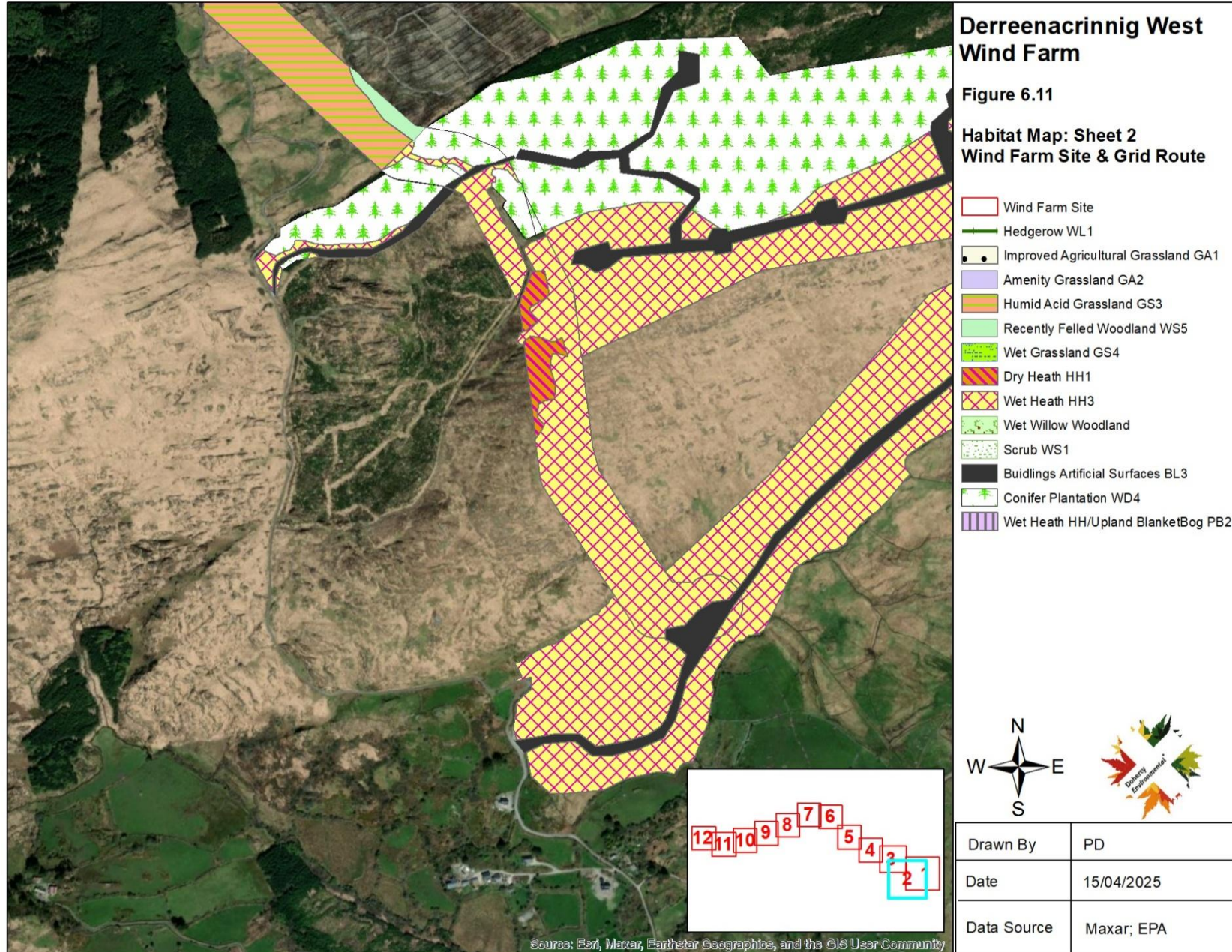


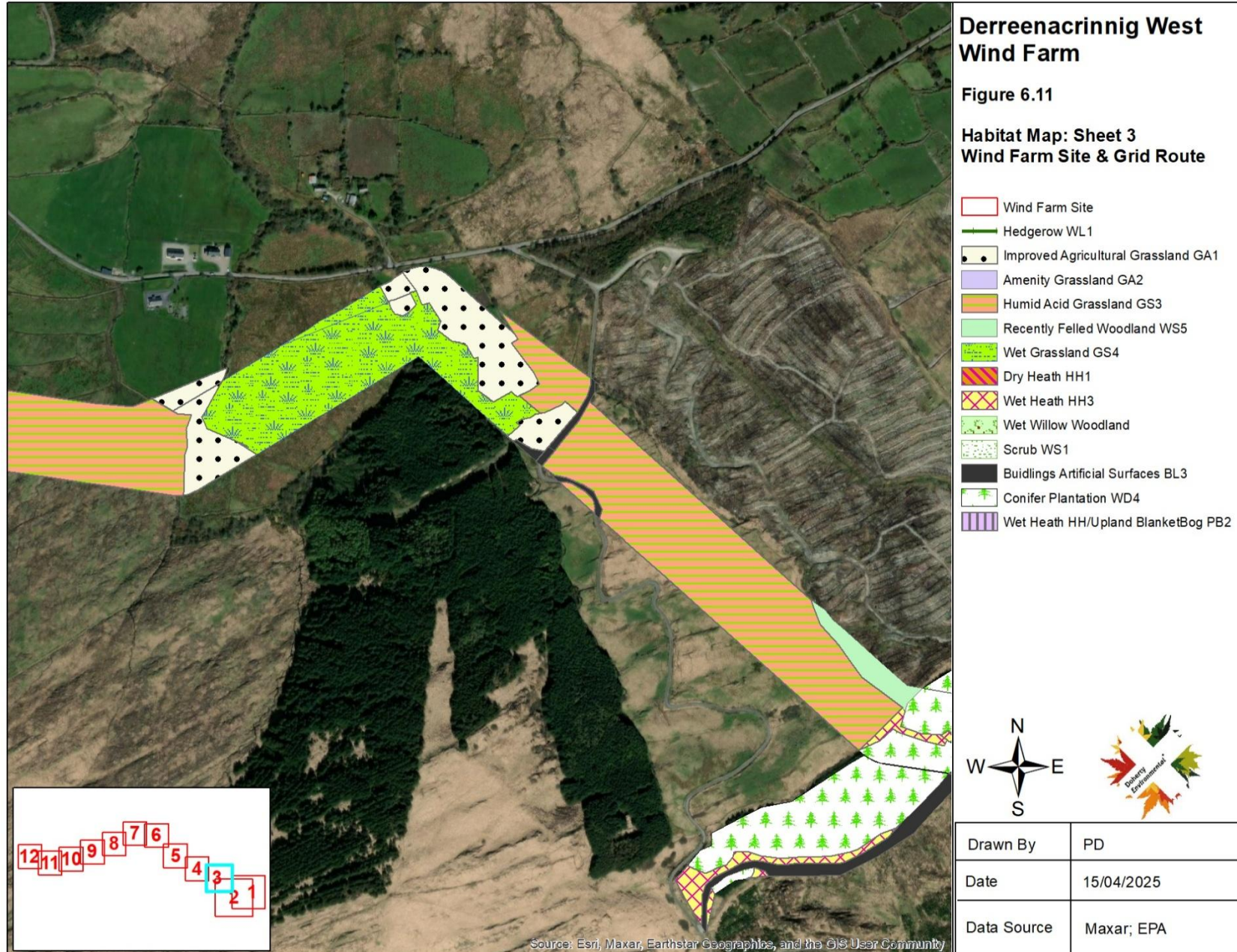
Drawn By	PD
Date	19/06/2025
Data Source	OSM; NPWS

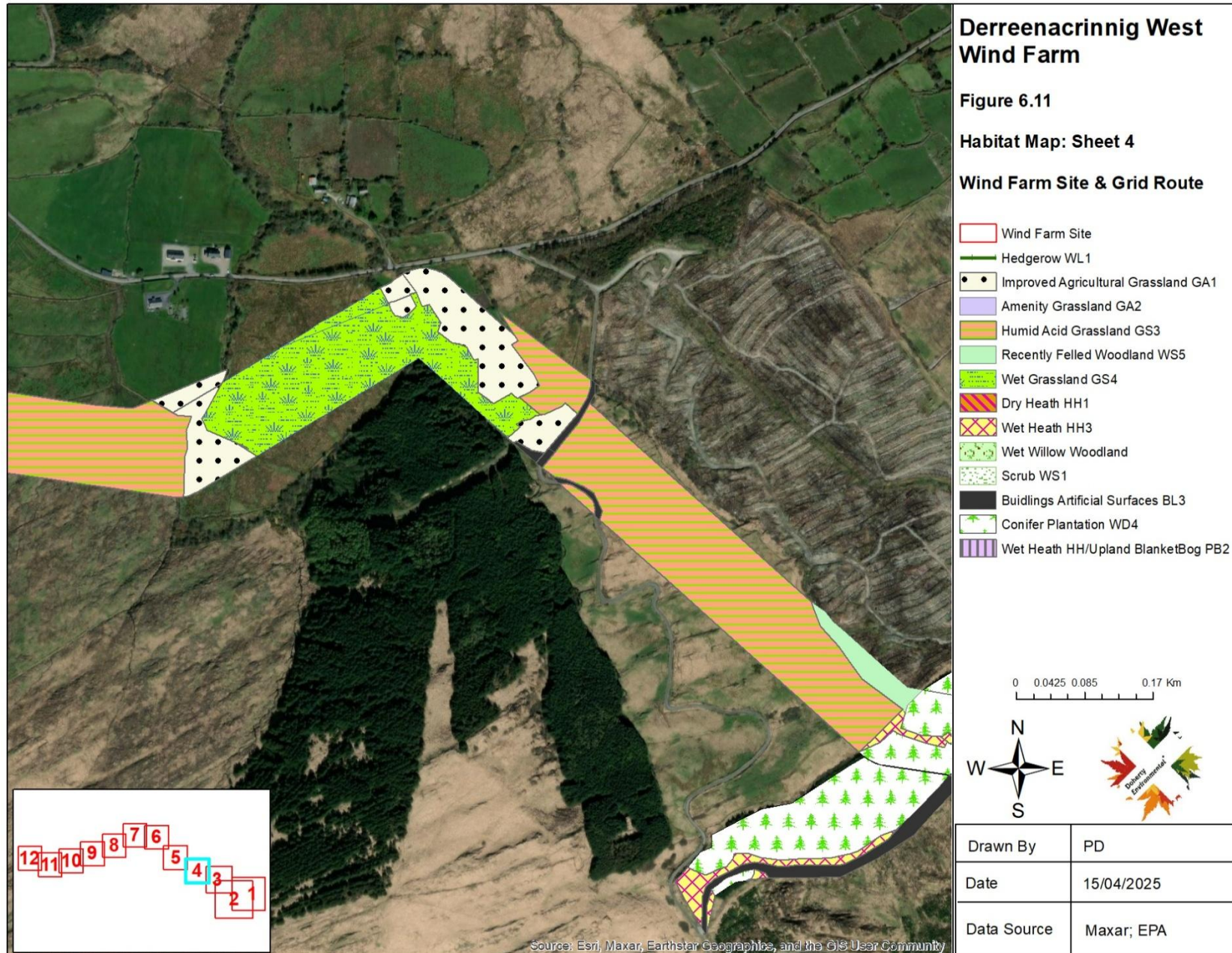
(c) OpenStreetMap and contributors, Creative Commons-Share Alike License (CC-BY-SA)

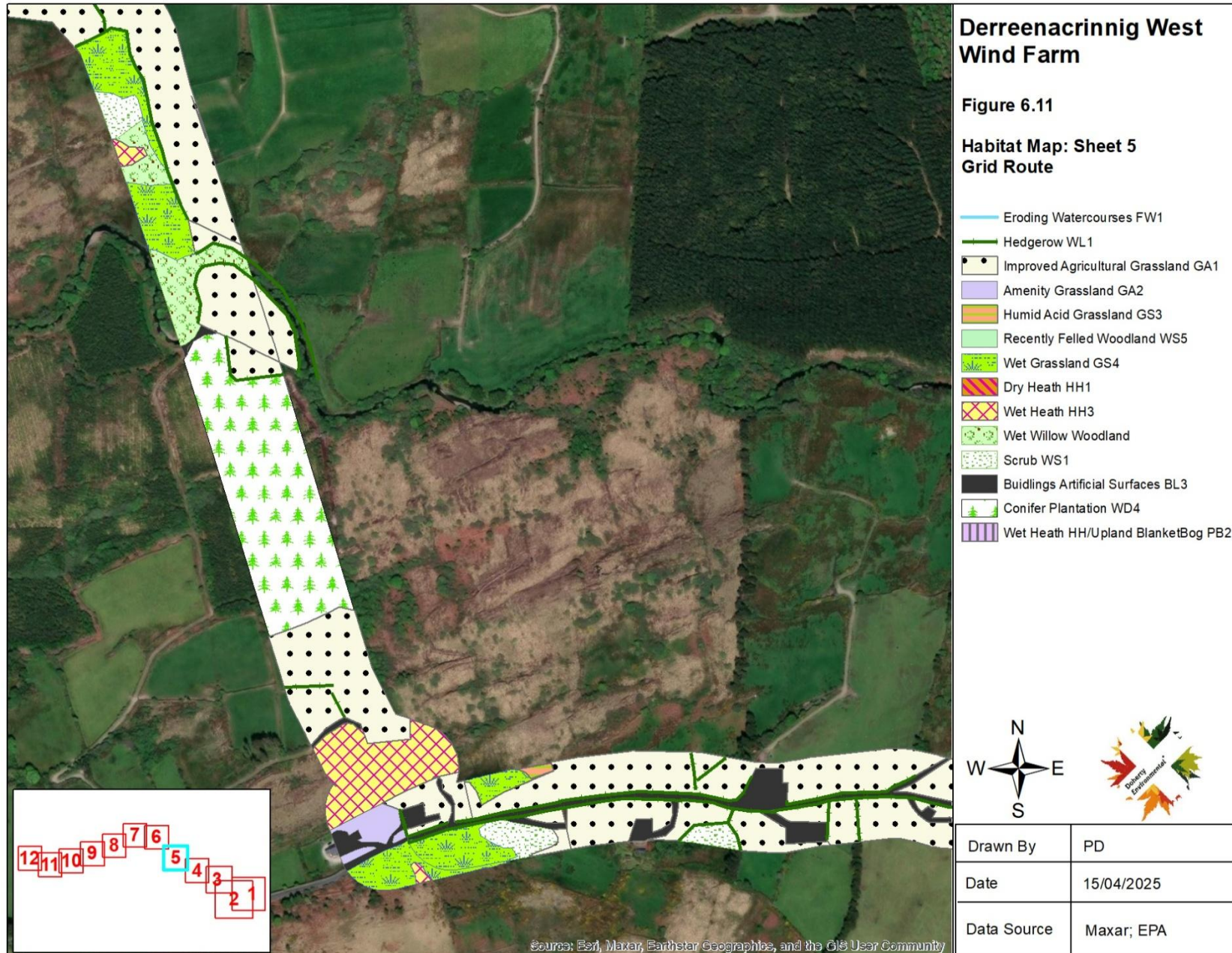


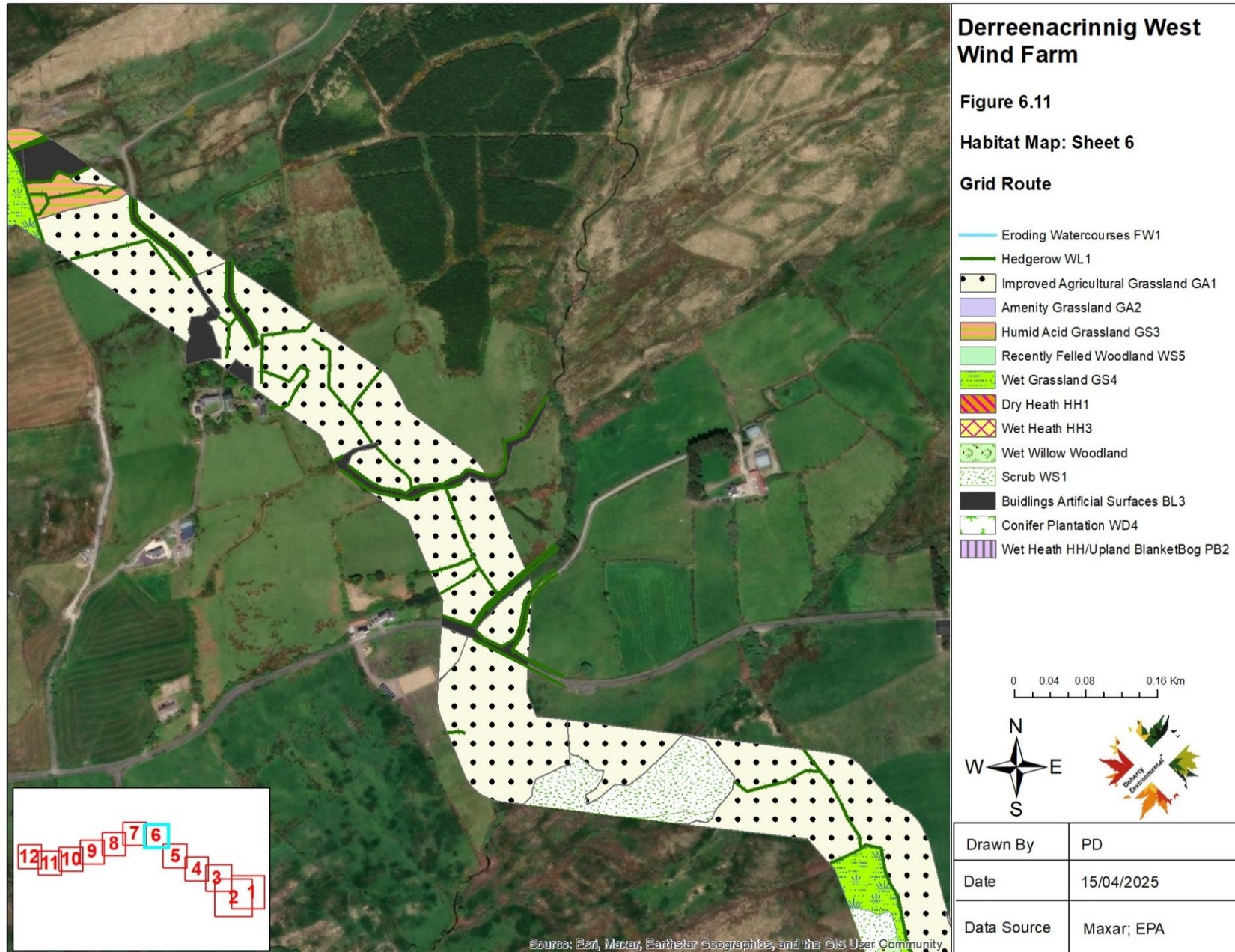


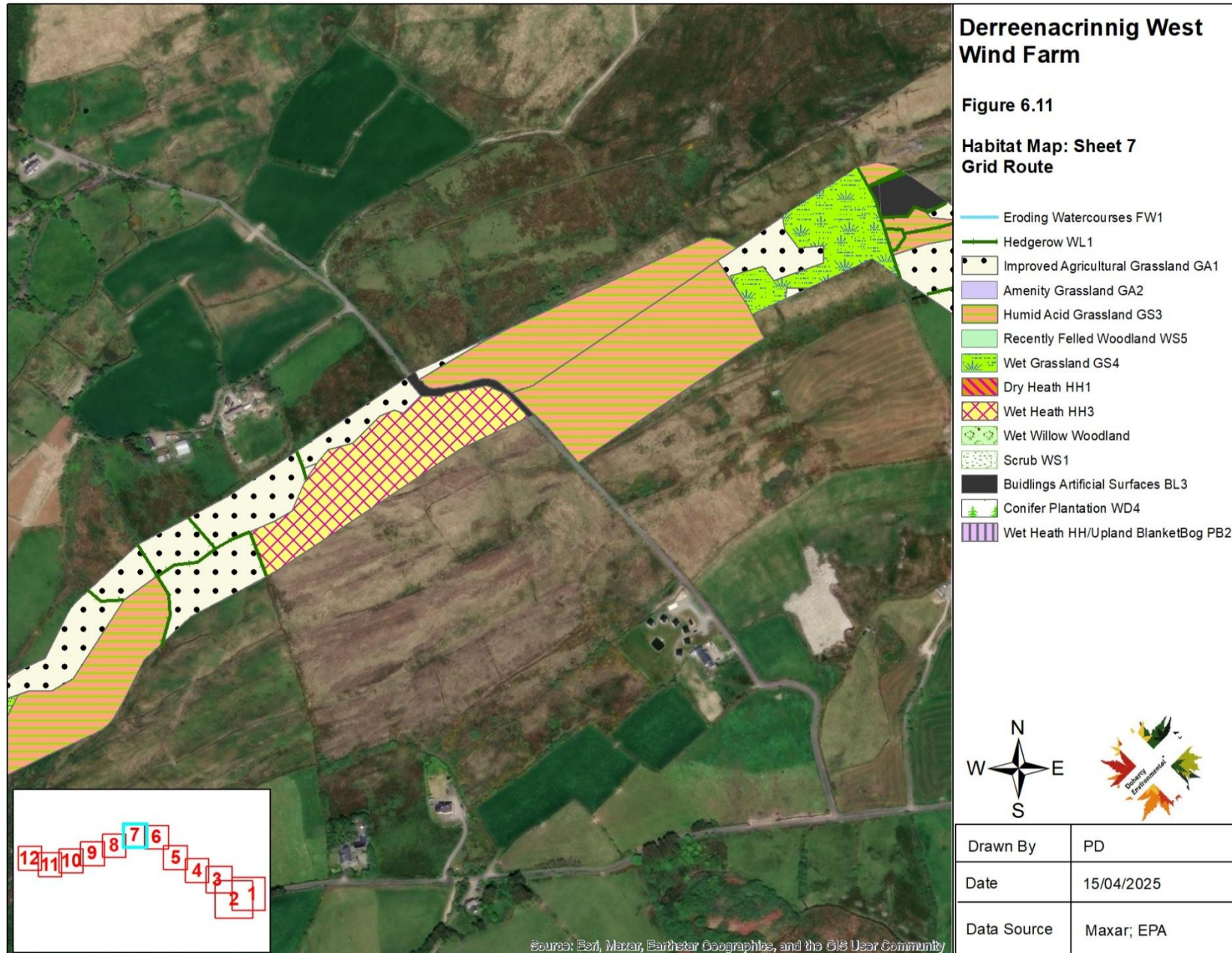


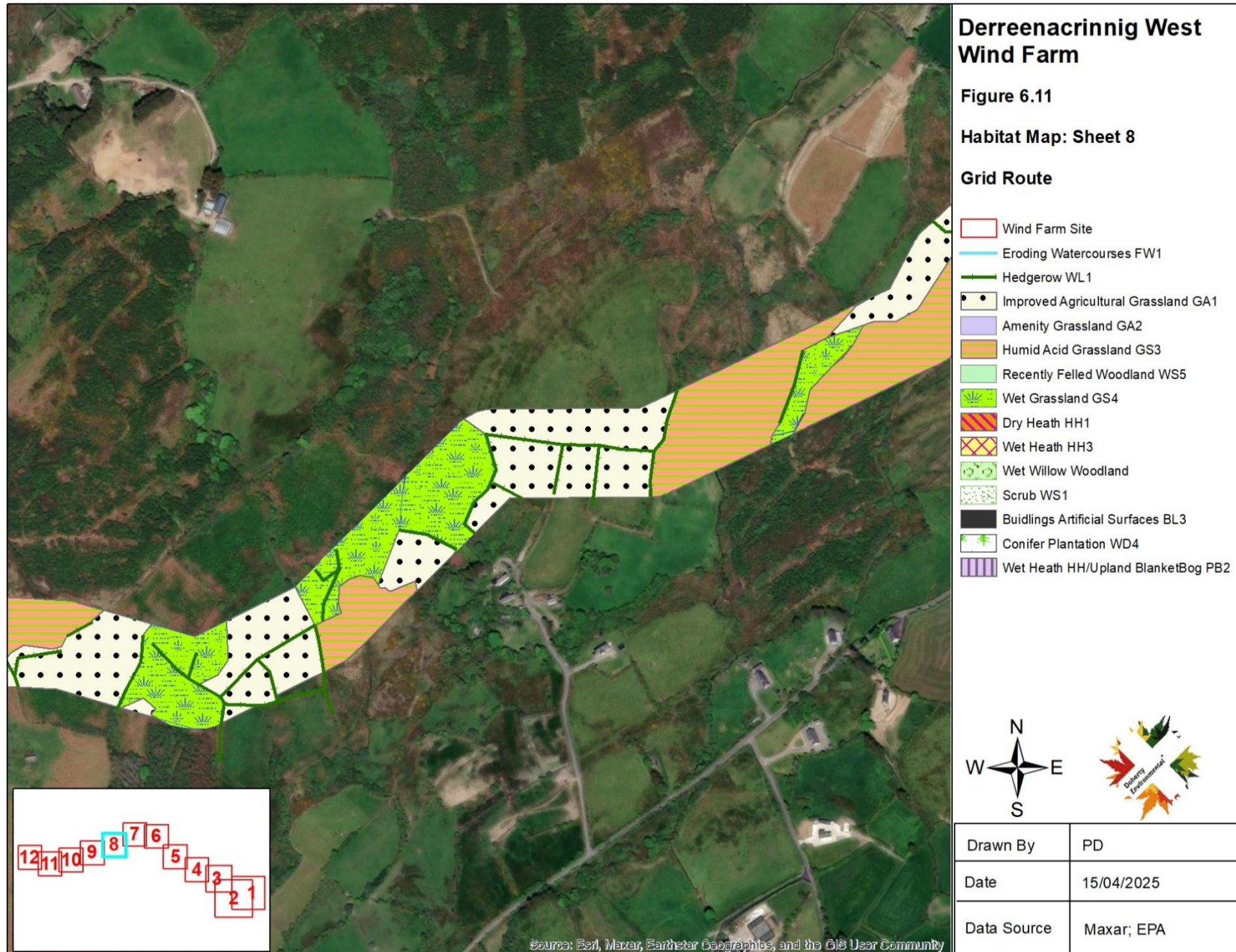


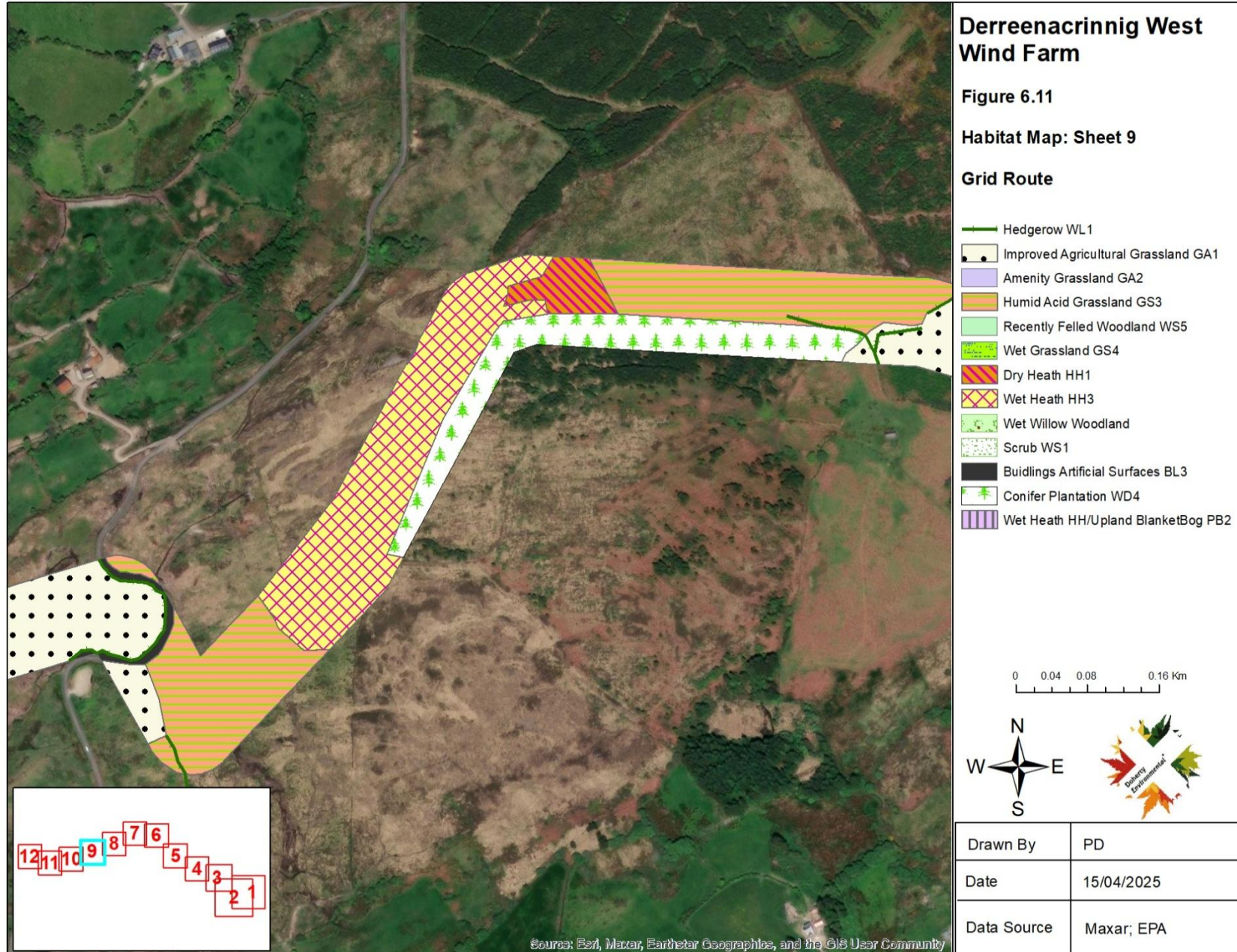


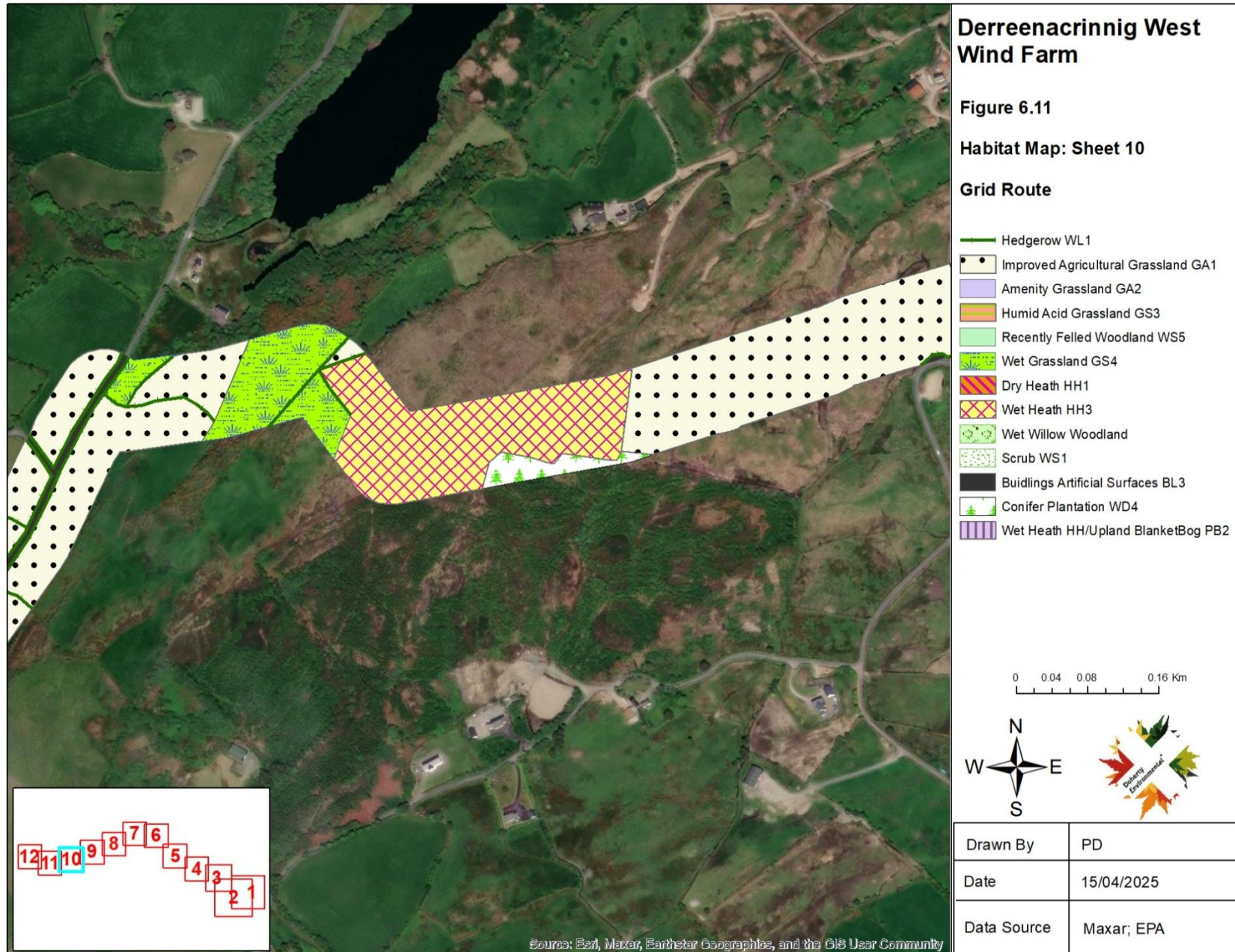


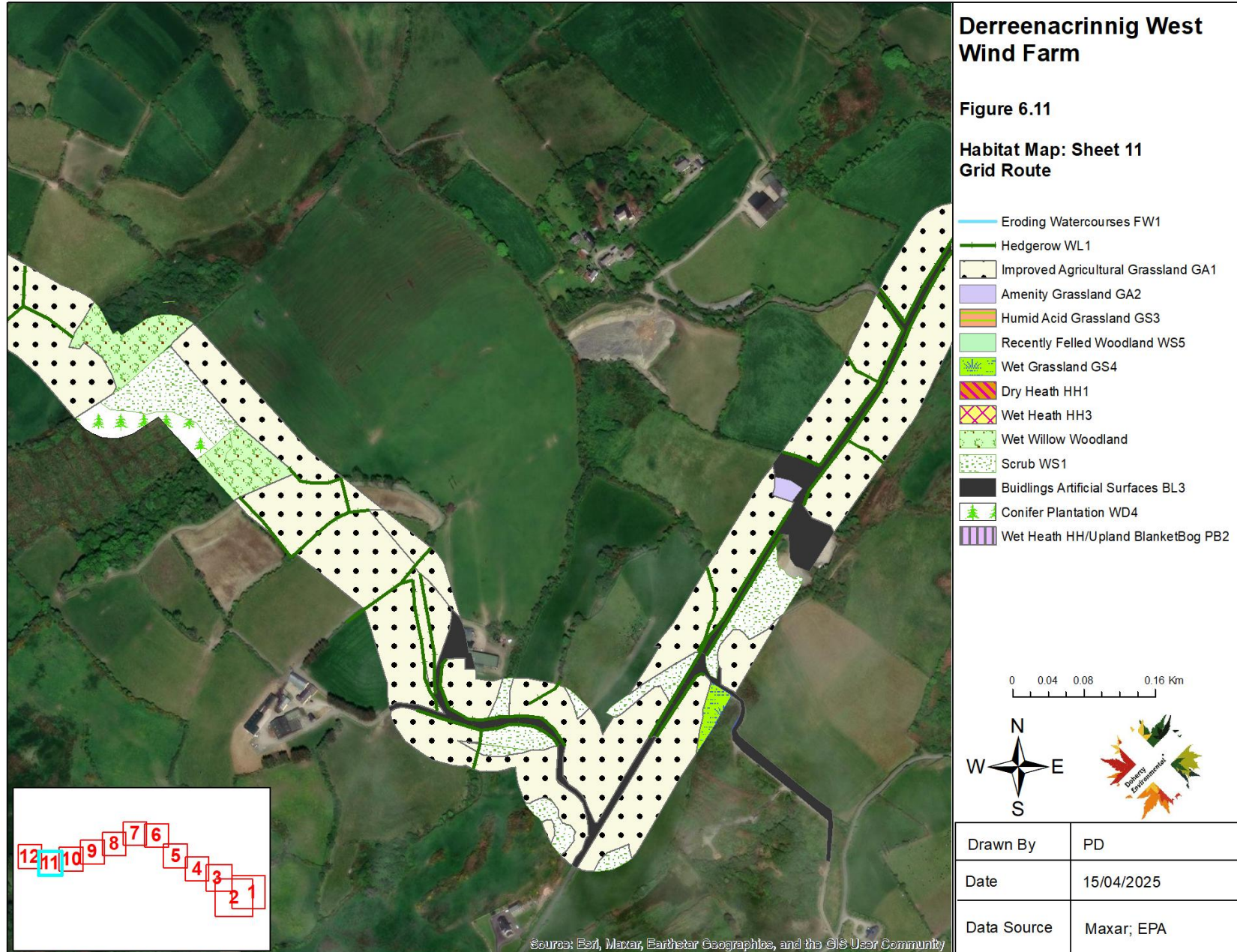


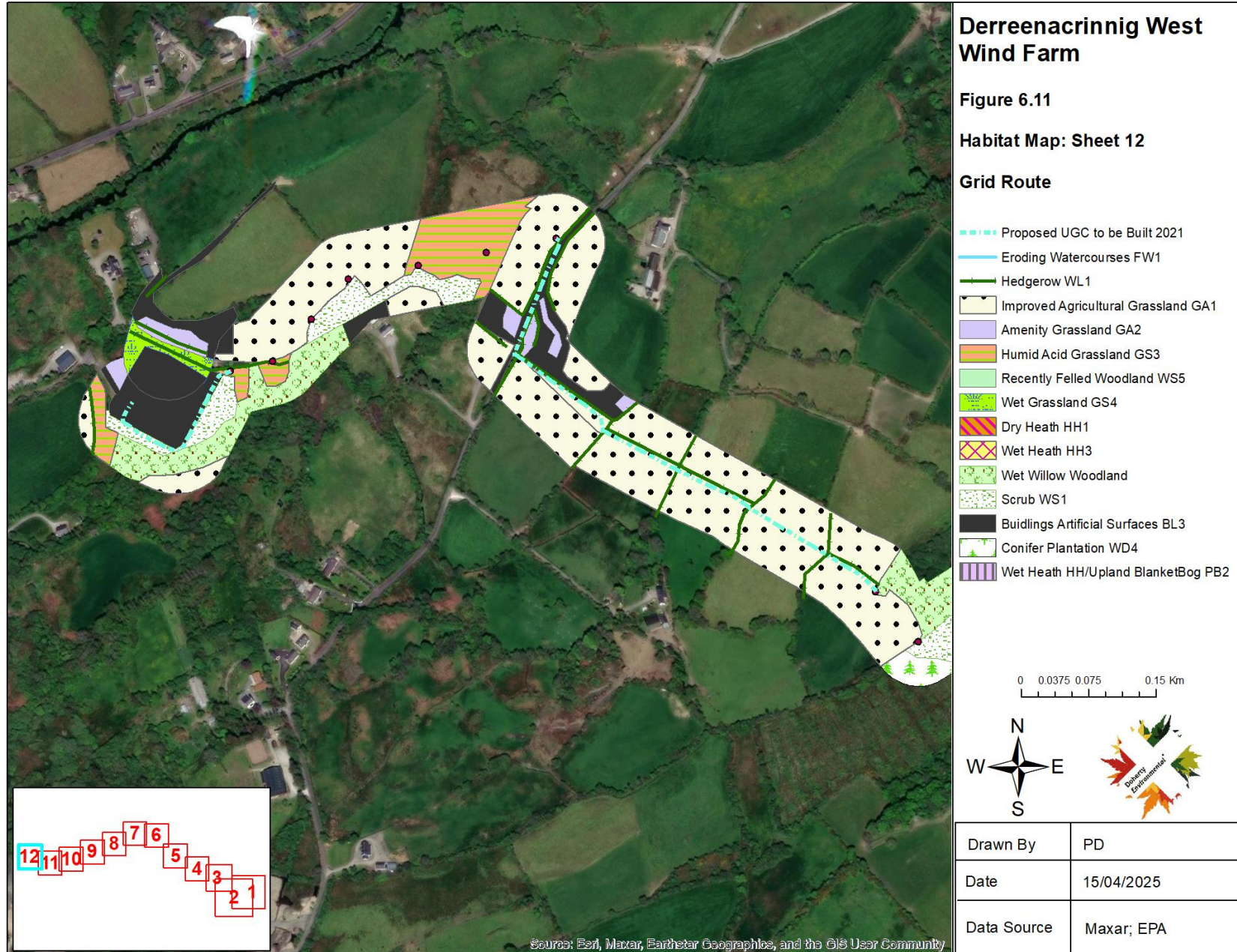


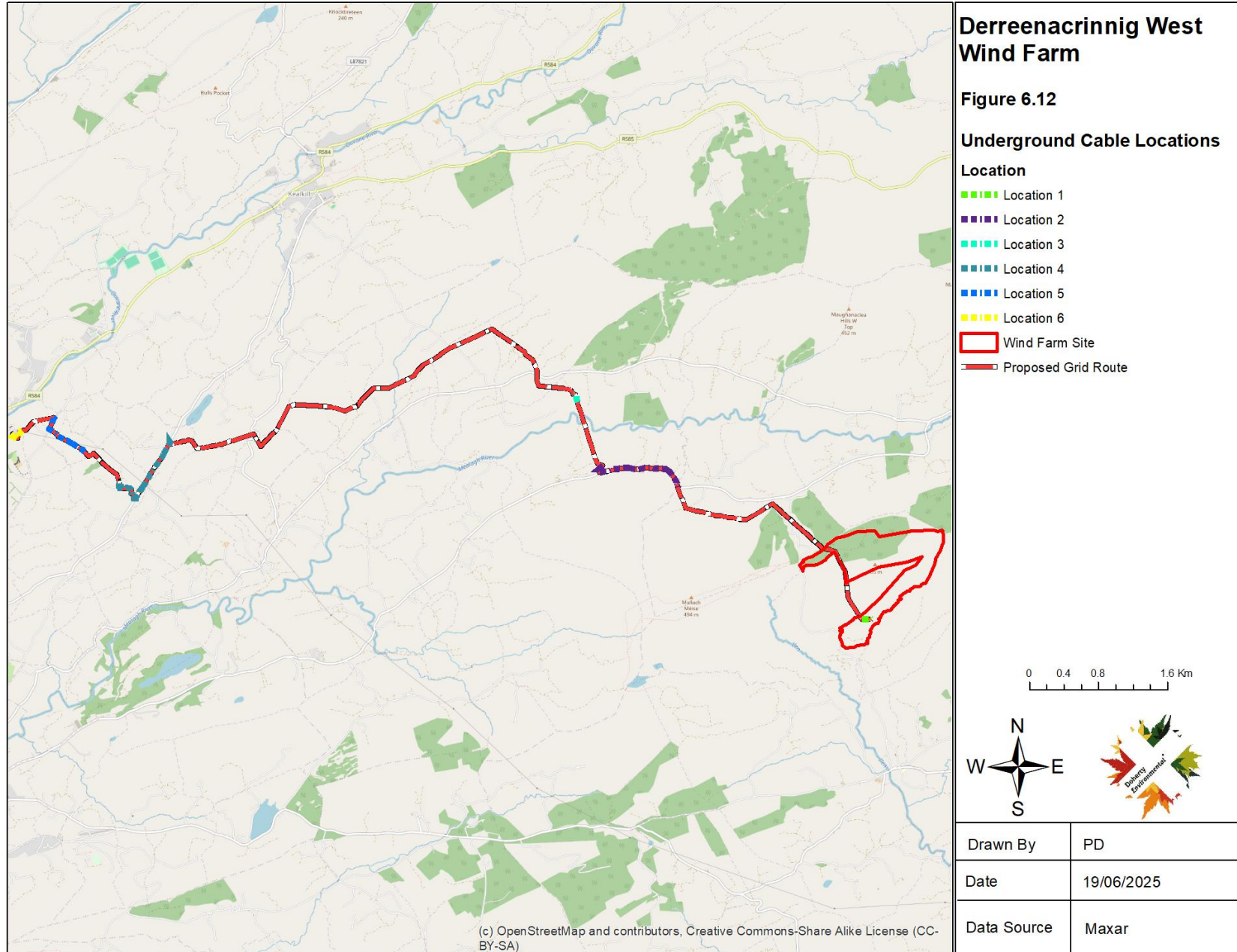














Derreenacrinnig West

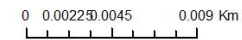
Figure 6.13

TDR Widening Location

Habitat Map: Sheet 1

Chainage 0 - 130m

-  Dry Meadow Grassy Verge GS2
-  Improved Agricultural Grassland GA1
-  Hedgerows
-  Buildings Artificial Surfaces BL3



Drawn By	PD
Date	19/05/2025
Data Source	Maxar; Corine

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Derreenacrinnig West Wind Farm

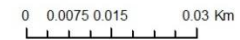
Figure 6.13

TDR Widening Location

Habitat Map: Sheet 2

Chainage 660 - 1,100m

-  Scrub WS1
-  Buildings Artificial Surfaces BL3



Drawn By	PD
Date	19/05/2025
Data Source	Maxar; Corine

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Derreenacrinnig West Wind Farm

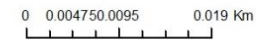
Figure 6.13

TDR Widening Location

Habitat Map: Sheet 3

Chainage 1250 - 1350

-  Improved Agricultural Grassland GA1
-  Hedgerows
-  Wet Grassland GS4
-  Buildings Artificial Surfaces BL3



Drawn By	PD
Date	19/05/2025
Data Source	Maxar; Corine

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Derreenacrinnig West Wind Farm

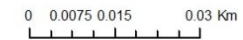
Figure 6.13

TDR Widening Location

Habitat Map: Sheet 4

Chainage 1460 - 1650

-  Improved Agricultural Grassland GA1
-  Hedgerows
-  Buildings Artificial Surfaces BL3



Drawn By	PD
Date	19/05/2025
Data Source	Maxar; Corine

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

