6.0 BIODIVERSITY

6.1 INTRODUCTION

This chapter presents a Biodiversity Impact Assessment for the proposed project, focusing on terrestrial and aquatic flora, habitats, and fauna (including both volant and non-volant mammals) within the Zone of Influence (ZoI) of activities associated with the proposed project, which includes the proposed wind farm site, the proposed grid connection route (GCR), and the proposed turbine delivery route (TDR).

Together the area for the proposed wind farm site, the proposed GCR and the works areas of the proposed TDR are herein referred to as the 'proposed project'. This chapter should be read in conjunction with Chapter 2 - Description of the Proposed Project. Ornithology is addressed separately in Chapter 7 – Ornithology.

6.1.1 Brief Description of the Proposed Project

The applicant intends to develop the proposed project in County Waterford. It is proposed to supply power from the proposed project to the electricity network via tail-fed 110kV underground cable to the existing Dungarvan 110kV substation in the townland of Killadangan, County Waterford. The works will include the erection of 15 wind turbines, associated foundations and hard-standing areas, and all associated onsite and ancillary works including works required along the proposed GCR and TDR. The proposed project is described in detail in Chapter 2 – Description of the Proposed Project and is summarised in Section 6.1.2 below.

6.1.2 Brief Description of the Proposed Project Site

The proposed wind farm site is located in County Waterford on the northern border with County Tipperary, in the townlands of Knocknanask, Tooranaraheen, Knocknasheega and Scartmountain. Two of these townlands contain mountain peaks; Knocknanask (ITM 611600, 607249) at 486m and Knocknasheega (ITM 613691, 605992) at 430m elevation. The proposed project elevation, above sea level, ranges from 486m at the summit of Knocknanask (ITM 611600, 607249), to 430m at the summit Knocknasheega (ITM 613691, 605992) and down to 125m on the lower slopes of Scart Mountain at Sleveen.

The proposed wind farm site is 981.4 hectares (ha) in size, with a total permanent infrastructure footprint of 31ha. In general, the proposed wind farm site is predominantly covered by conifer plantations with a scattered mix of grassland, heath and broadleaved woodland. The conifer plantations are of varying degree of maturity and in some small areas within these plantations, habitats are returning to a more natural state. Knocknanask Mountain, however, is a mosaic of habitats composed of wet and dry heath with a small area of blanket bog. The proposed GCR is approximately 15.5km long and mainly follows the public road network between the southern area of the proposed wind farm site and the existing Dungarvan 110kV substation.

The proposed TDR follows the public road network from Belview Port via national roads including the N25, N29 and N72. The proposed works along the proposed TDR to allow for the delivery of oversized components to the wind farm site are located in the townlands of Bergery, Crinnaghtaun West and Lacken, with sections of minor widening of the local roads. Minor

additional works such as hedgerow trimming and temporary demounting of signage, etc. will also be required at various locations along the route.

6.1.3 Purpose of the Chapter

The purpose of this Biodiversity Impact Assessment is:

- To describe the baseline ecology of the proposed project (i.e. the proposed wind farm site, the proposed GCR and the proposed works along the TDR), through desktop review and ecological field surveys;
- To determine the ecological value and sensitivity of the identified ecological receptors;
- To assess the effects of the potential impacts, including direct, indirect and secondary impacts, and the significance of these effects, which may result from the proposed project during construction, operation and/or decommissioning;
- To prescribe mitigation measures to avoid and/or reduce the identified effects; and
- To identify any residual effects, post mitigation.

6.1.4 Project Team

This chapter was prepared by TOBIN Senior Ecologist, Áine Sands (B.Sc. MCIEEM) with assistance from TOBIN Project Ecologist, Joe Freijser (M.Sc. ACIEEM) and was senior reviewed by TOBIN Lead Ecologist and Associate Director, Laura Kennedy (M.Sc.). TOBIN ecologists carried out habitat, protected flora and fauna, and aquatic surveys to inform the proposed project. The aquatic ecology report (see Appendix 6-3) was prepared by TOBIN Senior Ecologist, Sinead O'Reilly (M.Res.).

In addition, AECOM carried out Annex I habitat condition surveys of Knocknanask and Knocknasheega mountains and prepared a baseline report (see Appendix 6-2). John Curtin (Eire Ecology Environmental Consultants) carried out bat surveys and prepared a baseline bat report and provided input to the bat impact assessment and mitigation (see Appendix 6-1).

Further credentials of TOBIN ecologists are provided hereunder.

Áine Sands B.Sc. (Hons)

This chapter was prepared by Áine Sands B.Sc. (Hons), Senior Ecologist with TOBIN. Áine has ten years post-graduate experience in ecology and environmental consultancy and holds Full CIEEM Membership. Áine has acted as Lead Ecologist for a number of large renewable energy projects, with a particular focus on wind farm development. Áine has a strong understanding of National and European legislation associated with biodiversity and is cognisant of relevant rulings by the Court of Justice of the European Union (CJEU).

Joe Freijser B.Sc. M.Sc. (Hons)

Joe has ten years post-graduate experience in aquatic and terrestrial ecology, environmental consultancy and civil engineering and holds Associate CIEEM membership. Joe has been involved in a number of large wind farm developments where he specialised in carrying out aquatic and terrestrial habitat surveys. Joe also has experience as acting as lead Ecological Clerk of Works (ECoW) for a number of infrastructure projects.

Sinead O'Reilly (M.Res.)

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

Laura Kennedy (M.Sc.)

Laura Kennedy (M.Sc.) is an Associate Director and Lead Ecologist with TOBIN. She has over fourteen years' experience in environmental sciences and environmental consulting. Laura's expertise includes; Project Management, Environmental Impact Assessment (EIA) Reporting, AAs, terrestrial, ornithological and aquatic ecological surveying, data analysis, environmental monitoring, and preparing technical reports.

6.1.5 Relevant Legislation and Guidance

The following legislation is relevant to this chapter:

- The Habitats Directive. Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora;
- The Birds Directive. Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds;
- European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011), as amended.
- The Wildlife Act 1976 (as amended), herein referred to as the Wildlife Act;
- The Flora (Protection) Order 2022 (S.I. No. 235 of 2022);
- The Inland Fisheries Acts 1959-2017, as amended;
- The EU Water Framework Directive (2000/60/EC);
- The EIA Directive 2011/92/EU, as amended by Directive 2014/52/EU;
- Planning and Development Act 2000 (as amended).

For further plans and policy see Chapter 4 – Policy Planning and Development.

6.2 METHODOLOGY

6.2.1 Overview

To inform this impact assessment, a desk study of available information and literature was conducted to identify the **study area** for the proposed project where significant effects to ecological receptors due to activities associated with the proposed project may occur.

The study area comprised all lands within and outside of the proposed project that supported ecological receptors with physical, hydrological, hydrogeological, and/or ecological connections to activities proposed for the project.

The desk study also informed the identification of **survey areas** for the relevant key ecological receptors (KERs) within the study area. The rationale used to identify KERs, and the assessment of effects is explained in Section 6.4 below.

Survey areas for different KERs vary depending on the 1) the nature of the source of effect, 2) the sensitivity of the receptor to environmental change, and 3) the pathway through which effects may occur (whether physical, hydrological, hydrogeological or ecological).

For reference, the terms in **bold** above are defined as follows:

Study Area: the study area incorporates all areas where significant effects could occur throughout the life of the proposed project. The study area is assessed using both desktop and field assessments.

Survey Area: the area where ecological field surveys were undertaken by specialists for each KER.

Zone of Influence: The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities (CIEEM, 2018. Table 6-1 below include a description of the study area and survey area identified for the proposed project.

Table 6-1:Study and Survey Areas

Ecological Receptor		Study Area	Survey Area	Rationale
Internationally Designated Sites (European Sites)		Individually assessed using the Source-Pathway-Receptor Model (OPR, 2021)	Within the proposed project where overlap occurs (habitats), outside the proposed project to certain distances (fauna) (refer to Section 6.3.2.2) and along selected sites within hydrologically connected watercourses (refer to Section 6.3.2.2.2).	The Source-Pathway-Receptor model is a standard tool in environmental assessment, which allows the identification of impacts (the source), potential pathways and receptors (qualifying interests and/or special conservation interests) which may be negatively impacted (OPR 2021). In order for an effect to occur, all three elements of this mechanism must be in place. Potential pathways are summarised hereunder: • Physical – physical connectivity (overlap) with sites. • Hydrological – connectivity via water bodies. • Hydrogeological – connectivity via groundwater bodies. • Air – atmospheric and noise emissions • Ecological – connectivity via species activity (e.g. foraging/commuting ranges)
Nationally Designated Sites				
All other Sites of Conservation Concern				
Habitats and Flora	Terrestrial habitats or plant species	0m (i.e. within proposed project)	Within the proposed project, where overlap occurs (habitats).	Habitat loss will only occur within the limits of the proposed project boundary, where infrastructure is proposed.
	Surface water dependent habitats or plant species	Receiving watercourses within and downstream of the proposed project	At selected sites within hydrologically connected watercourses (refer to Section 6.3.2.2.2).	All watercourses connected to the proposed project ultimately flow into the Blackwater River and Blackwater Estuary via the following WFD River Waterbodies: • Glennafallia_010,

Ecological Receptor		Study Area	Survey Area	Rationale
				• Glenshelane_010 • Moneygorm_010 • Finisk_030 • Farnane_010 and into Dungarvan Harbour via the: • Colligan River_040 The extent of water quality impacts on downstream receiving watercourses will not be considered effective past the first water body of depositional nature: thus, all downstream waterbodies to the tidal reaches of the River Blackwater Estuary and the tidal reaches of Dungarvan Harbour Estuary are considered potentially within the ZoI of the proposed project.
	Dust impacts	50m	Within the proposed project where overlap occurs, plus 50m where appropriate.	The Institute of Air Quality Management guidelines (Holman *et al.,* 2014) indicate that an assessment will be required where there is 'an ecological receptor within 50m of the boundary of a site; or 50m of the route(s) used by construction vehicles'.
Mammals	Breeding or resting sites	0m (i.e. within proposed project)	Within the proposed project where overlap occurs.	Habitat loss will only occur within the limits of the proposed project, where infrastructure is proposed.
		150m	Within the proposed project, plus 150m from any occurring works.	The outer extent of the survey area for protected mammal species was defined with regard to the National Road Authority (NRA) guidance related to badger (NRA, 2005) and guidance related to Otter (NRA, 2006) which state that noise impacts from construction works can

Ecological Receptor		Study Area	Survey Area	Rationale
				impact breeding badger setts/otter holts within 150m of a noise source. Other protected mammal species potentially present at the locality (e.g. hedgehog [*Erinaceous europaeus*]) are likely to have a smaller ZoI, as impacts are predominantly associated with habitat loss and will therefore be captured within the 150m survey buffer.
Bats	Roosting and foraging/commuting sites	0m (i.e. within proposed project)	Within the proposed project, where overlap occurs.	Habitat loss will only occur within the limits of the proposed project boundary, where infrastructure is proposed.
		Area of light spill from the light source	Within the proposed project, including the areas where artificial lighting will potentially have an effect.	The ZoI for impacts associated with artificial lighting, will be all illuminated areas from the overspill of proposed lighting.
Invertebrates	Resting and foraging habitat	0m (i.e. within proposed project)	Within the proposed project, where overlap occurs.	Habitat loss will only occur within the limits of the proposed project boundary, where infrastructure is proposed.
Amphibians and reptiles	Resting and foraging habitat	0m (i.e. within proposed project)	Within the proposed project, where overlap occurs.	Habitat loss will only occur within the limits of the proposed project, where infrastructure is proposed.
Aquatic Species	Instream freshwater flora and fauna	0m (i.e. within proposed project)	Within the proposed project, where overlap occurs.	Habitat loss will only occur within the limits of the proposed project boundary, where infrastructure is proposed.
		Receiving watercourses within and downstream of the proposed project	Within the proposed project, where overlap occurs and where hydrological connectivity exists with	All watercourses connected to the proposed project ultimately flow into the Blackwater River and

Ecological Receptor		Study Area	Survey Area	Rationale
			higher gradient (salmonid) rivers downstream.	Blackwater Estuary via the following WFD River Waterbodies: • Glennafallia_010 • Glenshelane_010 • Moneygorm_010 • Finisk_030 • Farnane_010 and into Dungarvan Harbour via the: • Colligan River The extent of water quality impacts on downstream receiving watercourses will not be considered effective past the first water body of depositional nature: thus, all downstream waterbodies to the tidal reaches of the River Blackwater Estuary and the tidal reaches of Dungarvan Harbour Estuary are considered potentially within the ZoI of the proposed project.

6.2.2 Consultation

Consultations held with various state agencies and environmental Non-Governmental Organisations (NGOs) were undertaken in January 2023 to inform this EIAR. The following organisations were consulted by email with respect to biodiversity:

- Development Application Unit (DAU) of the National Parks and Wildlife Service (NPWS);
- Inland Fisheries Ireland (IFI);
- Bat Conservation Ireland (BCI); and
- Irish Wildlife Trust (IWT).

The following paragraphs set out the responses received in relation to Biodiversity from the above consultees. Further information on consultation responses is provided in Chapter 1 (Introduction) of this EIAR. At the time of writing this Chapter, no response was received from Bat Conservation Ireland (BCI) or the Irish Wildlife Trust (IWT).

IFI

A statement was issued by IFI on 21 February 2023 which raised concerns around ground stability, physical interference with stream channels, prevention of discharges of polluting matters such as cement, silt deposition in streams, storage of fuels/oils and the increase of erosion. In response to IFI concerns, TOBIN has undertaken a full suite of aquatic surveys (in 2022 and 2023), both within and downstream of the proposed project, in order to inform the planning application. Stringent mitigation measures will be implemented as part of the proposed project and have been outlined within this report (see Section 6.8) and within the Natura Impact Statement (NIS) (TOBIN, 2024) which will ensure the protection of all hydrologically connected watercourses during all works associated with the proposed project.

DAU

A statement was issued by the DAU on 13 March 2023 (reference G Pre00020/2023) which raised a number of concerns relating to Annex I bird species, Annex I habitat and other protected aquatic and terrestrial species. All concerns raised by the DAU have been fully considered and addressed within this report, the NIS (TOBIN, 2024) and the Ornithology Chapter 7 of the EIAR. Similarly, stringent mitigation measures will be implemented as part of the proposed project to ensure the protection of habitats and species under the Habitats Directive.

6.3 BASELINE DATA COLLECTION

The description of the baseline ecology presented hereunder is based on information collated from desk study and data collected as part of ecological field surveys.

The sources of information and the literature used in the desk study are presented in Section 6.3.1 below, while the results of the ecological field survey undertaken for the proposed project are described in Section 6.3.2 below,

6.3.1 Desk Study

Information and literature considered in the desk study for this proposed project included:

- Identification of all sites designated for nature conservation[1] within the study area (refer to Table 6-1).
- A species list for the proposed project was generated using the National Biodiversity Data Centre (NBDC) map viewer[2]. Only rare or protected species recorded during the past 10 years within the 10km grid squares (hectad) S10, X19 and X29, which encompass the proposed project, were evaluated.
- A review of ordnance survey maps, orthophotography and Corine landcover dataset[3] in order to determine the broad habitats that occur within the study area.
- A review of published data from National Parks and Wildlife Service[4], Bat Conservation Ireland bat record maps[5], Inland Fisheries Ireland Water Framework Directive Fish Ecological Status[6] and the Botanical Society of Britain and Ireland Plant Atlas[7].

6.3.2 Field Surveys

A range of ecological field surveys were undertaken within the study areas described in Table 6-1 between October 2022 and January 2024 by qualified and experienced TOBIN ecologists, to inform the impact assessment of the proposed project. In addition, a number of targeted surveys were also undertaken by third party consultants, namely; AECOM and Eire Ecology.

All ecological field surveys carried out to inform the impact assessment of the proposed project are listed in Table 6-2. The survey methods used are described in the subsequent paragraphs.

Table 6-2: Date of Ecological Field Surveys Undertaken for the Proposed Project

Survey	Survey Dates	Personnel
Habitat Surveys	10 – 12 May 2022	TOBIN
	19 - 21 July 2023	
	27 September 2023	
	6 November 2023	
	15 January 2024	
Annex I habitat surveys	11 – 16 May 2023	AECOM
Non-volant Mammal Surveys	10 – 12 May 2022	TOBIN
	19 - 21 July 2023	
	27 September 2023	

[1] https://www.npws.ie/protected-sites [Accessed: November 2024]
[2] https://biodiversityireland.ie/ [Accessed: November 2024]
[3] https://land.copernicus.eu/pan-european/corine-land-cover [Accessed: November 2024]
[4] https://www.npws.ie/maps-and-data [Accessed: November 2024]
[5] https://www.batconservationireland.org/what-we-do/monitoring-distribution-projects/bat-record-maps [Accessed: November 2024].
[6] https://data.gov.ie/dataset/water-framework-directive-rivers-fish-ecological-status-2008-20221
[7] https://plantatlas2020.org/atlas [Accessed: November 2024]

Survey	Survey Dates	Personnel
	6 November 2023	
Bat Emergent Surveys	21 – 22 July 2022	Eire Ecology
	22 – 23 July 2022	
	26 – 27 July 2022	
	12 – 13 Sept 2022	
	14 – 15 June 2023	
Static Detector Bat Surveys	17 - 30 June 2022	Eire Ecology
	10 – 19 July 2022	
	4 – 13 August 2022	
	12 – 21 September 2022	
	21 October – 2 November 2022	
	15 - 31 May 2023	
Aquatic Surveys	15 – 18 August 2022	TOBIN
	19 – 20 July 2023	
eDNA Sampling	11 September 2023	TOBIN

6.3.2.1 Habitats and Flora

Habitat surveys were undertaken within the proposed wind farm site following methodologies outlined within Smith *et al.*, (2011) and NRA (2008) guidelines. All habitats encountered during the habitat survey were classified following Fossitt (2000). The *Interpretation Manual of EU Habitats*' (EC, 2013) was used when Annex I habitats were encountered.

Following the completion of the field surveys, habitat maps for the proposed wind farm site were prepared in accordance with the methodology outlined in Smith *et al.* (2011).

6.3.2.1.1 Annex I Habitats

The survey of potential Annex I habitats within the proposed wind farm site was carried out by AECOM habitat specialists with extensive experience of upland as well as lowland habitats.

Vegetation stands considered to be homogenous were assigned Annex I or non-Annex I Fossitt habitat types. Condition of Annex I habitat for H7130 Blanket bog (7130), Wet heath (4010), and Dry heath (4030) was recorded by making observations at various points during the habitat mapping and recording the relevant condition criteria in a tablet using a semi-automated spreadsheet. The condition criteria were as described in Perrin *et al.* (2014).

For further detail on the methods used during the survey of Annex I habitats please refer to Appendix 6-2.

6.3.2.2 Fauna

6.3.2.2.1 Mammals

A terrestrial mammal survey was carried out in line with guidance outlined in NRA (2008) throughout the proposed project. Target surveys for specific protected species was also undertaken and is discussed below. All signs and tracks were evaluated as they were encountered in the field (Bang *et al.* 2006). Survey methods adopted during the target species surveys, for Otter (*Lutra lutra*), Badger (*Meles meles*) and bats are outlined in the following sections.

6.3.2.2.1.1 Otter

Otter surveys were carried out following the NRA (2006) guidelines. The Otter surveys were conducted along the Glenshelane_010, which forms part of the Blackwater River (Cork/Waterford) SAC, and its tributaries which intersect the proposed project. The surveyors covered the length of the watercourses within the proposed project, plus an additional 150m buffer, to account for potential disturbance impacts. Any evidence of otter presence or activity, such as holts (breeding and temporary), slides and territorial marking points (spraints), was recorded

6.3.2.2.1.2 Badger

Badger activity was determined by field surveys for setts, trails, latrines and feeding signs following the approach set out in guidance prepared by the National Roads Authority (now Transport Infrastructure Ireland)(NRA 2005). Surveys for badger activity were undertaken at the proposed project, paying particular attention to suitable habitat in proximity to the proposed infrastructure sites plus an additional 150m buffer.

6.3.2.2.1.3 Bats

Bat surveys were undertaken by Eire Ecology. The surveys were undertaken in line with SNH guidelines, 'Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation' (SNH 2021) .

Eire Ecology carried out three different types of bats surveys to gather information on the local bat fauna of the proposed project;

- Passive Surveillance
- Walking/Driven Transects
- Roost surveys

For further information on the methodology used during the bat surveys refer to Appendix 6-1.

6.3.2.2.1.4 Other Mammals

Other protected mammal species such as Red Deer (*Cervus elaphus*), Fallow Deer (*Dama dama*), Red Squirrel (*Sciurus vulgaris*), Pine Marten (*Martes martes*), Irish Stoat (*Mustela erminea hibernica*), Irish Hare (*Lepus timidus hibernica*), Hedgehog (*Erinaceus europaeus*), and Pygmy Shrew (*Sorex minutus*) are likely to occur within the proposed project[2]. Any signs like droppings,

prints and suitable habitat were recorded during the surveys of the proposed project. The ecological survey techniques were derived from NRA (2008) guidance.

6.3.2.2.2 Fish and Aquatic Ecology

A suite of aquatic surveys were carried out by TOBIN at a number of streams and rivers present within the study area (Section 6.2.1). A total of 23 aquatic sites that are hydrologically connected to the proposed project were selected as shown in Figure 6-1.

The surveys comprised of an evaluation of the aquatic habitats, a biological water quality assessment (according to aquatic macroinvertebrate species composition), physical searching for protected aquatic species and eDNA sampling for the presence/absence of protected aquatic species.

A brief description of the survey methods is provided below.

6.3.2.2.2.1 White-clawed Crayfish

At the aquatic survey locations as shown on Figure 6-1: Survey LocationsFigure 6-1, and where suitable habitat was identified, White-clawed Crayfish (*Austropotamobius pallipes*) surveys were undertaken. Visual inspections and hand searching following survey methods outlined in the Irish Wildlife Manuals (Reynolds *et. al.,* 2010) were carried out within a 10-15m survey area. Refuge sites such as spaces under large boulders and crevices or burrows within the riverbanks were investigated by hand using gloves and small nets as required.

6.3.2.2.2.2 Lamprey Species

At the aquatic survey locations as shown on Figure 6-1 and where suitable habitat was present, surveys for all life stages of lamprey species (Brook Lamprey [*Lampetra planeri*], River Lamprey [*Lampetra fluviatilis*] and Sea Lamprey [*Petromyzon marinus*]) were undertaken. Scoop surveys were undertaken in suitable habitat to identify the presence or absence of the three lamprey species. This involved taking a sample of the silt (at the edge of the riverbank) with a hand net. The hand net was inserted into the sediment at a 45° angle, and a volume of silt was scooped into the net and the sediment was checked for lamprey (ammocetes, juveniles and adults). Any lamprey caught were then identified using the field guide produced by Gardiner (2003).

6.3.2.2.2.3 Freshwater Pearl Mussel

An assessment of habitat to support Freshwater Pearl Mussel (*Margaritifera margaritifera*) was undertaken following methodologies outlined within Moorkens & Killeen, (2020) guidance. This included a visual assessment of $1m^2$ areas of habitat and an assessment of the riverbed substrate: physical substrate parameters (assessment of the substrate surface composition), plants cover (presence of excessive filamentous algae and presence/absence of macrophytes) and coarse decomposing organic matter.

6.3.2.2.2.4 eDNA Water Sampling

Environmental (e)DNA water sampling was carried out at six locations in all hydrologically connected waterbodies within and downstream of the proposed project (refer to Figure 6-1). The six survey locations were placed strategically at downstream locations which were informed by the presence of suitable habitat and ecological expertise. This non-intrusive, highly sensitive method has the ability to detect very low levels of DNA in the water column. This was undertaken to screen for the presence/absence of White-clawed Crayfish, Atlantic Salmon, and

Freshwater Pearl Mussel within each selected waterbody. All samples collected were sent to a ISO9001 accredited laboratory for analysis and results. It is important to note that eDNA does not provide definitive confirmation of species presence or absence, but rather offers an indication of their likely occurrence. The eDNA surveys results were therefore considered in conjunction with all other aquatic survey results.

Further description of the aquatic surveys undertaken are described in Appendix 6-3.

6.3.2.2.3 Amphibians and Reptiles

Common Frog (*Rana temporaria*), Smooth Newt (*Triturus vulgaris*) and Common Lizard (*Lacerta vivipara*) have a widespread distribution in Ireland. The following sections describe the survey methodologies undertaken for these species.

6.3.2.2.3.1 Smooth Newt

A Smooth Newt survey, which included visual daytime searches for adults and juveniles (efts) and egg inspection, was carried out within suitable habitat within all parts of the proposed project, following methodologies outlined in the Meehan (2013) guidelines. The suitable survey sites (small pools and drainage ditches) were surveyed during the day by walking around the perimeter of the water body, stopping every 2m to examine the water for newts of all life cycle stages (Meehan, 2013). No trapping or net dipping, which requires a licence, was carried out.

6.3.2.2.3.2 Common Frog

A Common Frog survey was carried out in suitable habitat within the proposed project, such as tyre ruts, drainage ditches and small ponds following methodologies outlined in the NRA (2008) and Reid *et al.* (2013) guidelines. The visual daytime searching survey included the searching of water bodies looking for signs of frogs and tadpoles.

6.3.2.2.3.3 Common Lizard

The Common Lizard is widespread in Ireland and occurs in suitable habitats such as stone walls, dry banks, heathland and bog habitats (King *et al.*, 2011). Suitable habitat was searched for the presence of frogs during the walkover surveys.

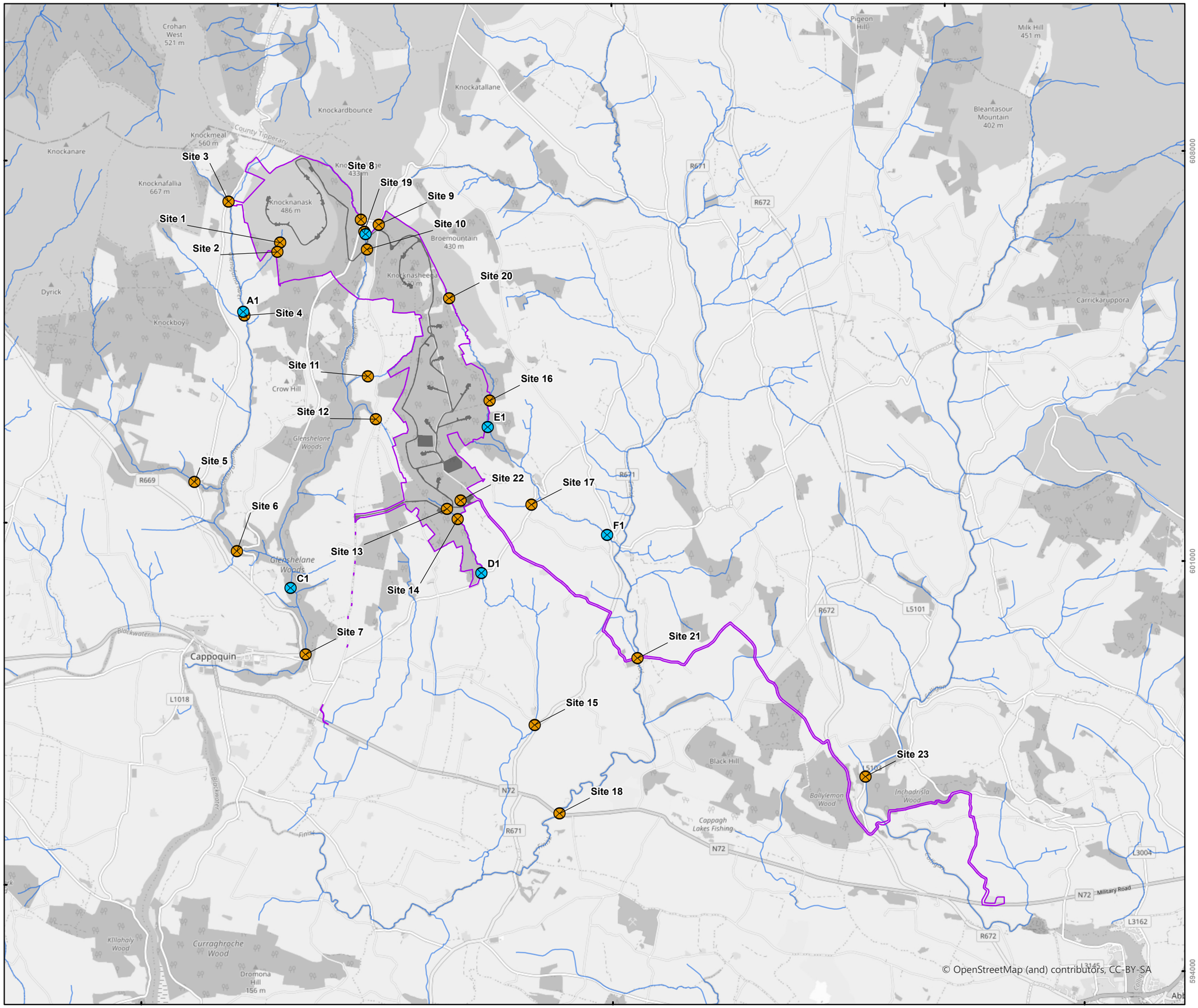
6.3.2.2.4 Marsh Fritillary

Targeted Marsh Fritillary (*Euphydryas aurinia*) surveys were undertaken in areas of potentially suitable habitat within all parts of the proposed project, following methods outlined in Phelan *et al.* (2021). The survey included searching for the presence of Devil's-bit Scabious (*Succisa pratensis*), the Marsh Fritillary food plant (Phelan *et al.,* 2021).

6.3.2.3 Survey Limitation

Access was granted in all areas of the proposed project which were subsequently surveyed by TOBIN Ecologists and a team of third-party specialists. However, some small areas of the proposed project could not be fully surveyed on foot due to dense vegetation and/or steep terrain. Following best practice guidelines (CIEEM, 2018), these areas were instead surveyed and visually assessed from adjacent lands and/or from public roads using binoculars, where possible, and were supported by information obtained from a review of aerial photography and desk study data. Notwithstanding the limited access to a small number of areas, a comprehensive description of the baseline biodiversity of the study area, likely to be affected by

the proposed project, was captured and sufficient data was gathered to inform the impact assessment.



Legend

- EIAR Study Area
- Proposed infrastructure footprint within the proposed wind farm site
- WFD - River Water Bodies

Survey Locations

- eDNA sampling sites
- Kick sampling sites

0 1.5 3
Kilometres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY \ WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
A	12/11/2024	First issue	S.P	J.S

Client: Ireland FuturEnergy

Project: Scart Mountain Wind Farm

Title: Figure 6-1 Aquatic Survey and eDNA sampling locations

Scale @ A3:	1:60,000	
Prepared by:	Checked by:	Date:
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Map Ref: 11303-024-Aq.S-WFD-TOB-A

Draft: A

6.4 ASSESSMENT APPROACH

6.4.1 Key Ecological Receptors

The rationale used to identify KERs is explained in the text below. Importance may relate, for example, to the quality or extent of the site or habitats therein; habitat and/ or species rarity, the extent to which such habitats and/ or species are threatened throughout their range, or to their rate of decline.

6.4.2 Determining Importance

The importance of KERs is evaluated using the criteria provided in the table on page 16 and 17 of the NRA (2009) guidelines. The NRA guidelines evaluate the importance of ecological receptors using a geographic scale as listed below:

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

Habitats were evaluated and assigned a value from the above geographic scale by measurement against published selection criteria where available. Examples of relevant criteria include: descriptions of habitats listed on Annex I of the Habitats Directive etc. In assigning a level of value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. Reference was therefore made to published lists and criteria where available. Examples of relevant lists and criteria included species of European conservation importance (as listed on Annexes II and IV of the Habitats Directive).

Those ecological receptors identified as being of Local Importance (higher value) or greater, are considered to be KERs and are carried forward for assessment. Ecological receptors identified as being of local importance (lower value) are scoped out and not considered further in this chapter.

6.4.3 Impact Assessment

The impact assessment process involves the following steps:

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

In this chapter all potential effects were characterised using the guidance produced by the EPA, (EPA, 2022 see page 50 and 51):

- Quality of Effects (positive / negative)

- Significance of Effects (imperceptible to profound effects)

Describing the extent and context of effects:

- Describing the probability of effects (likely / unlikely)
- Duration of effects (temporary to permanent)
- Frequency of effects (reversible or not)

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

Consideration of conservation status is important for evaluating the effects on individual habitats and species, and assessing their significance:

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

It is important for the Biodiversity Impact Assessment to clearly differentiate between avoidance mitigation, compensation and enhancement and these terms are defined here as follows:

- Avoidance is used where an impact has been avoided, e.g. through changes in scheme design;
- Mitigation is used to refer to measures to reduce or remedy a specific negative impact *in situ*;
- Compensation describes measures taken to offset residual effects, i.e. where mitigation *in situ* is not possible; and
- Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

6.5 BASELINE ECOLOGICAL CONDITIONS

The following sections provide a description of the baseline conditions for biodiversity within the study areas of the proposed project.

6.5.1 Desk Study Results

6.5.1.1 Sites Designated for Nature Conservation

In the following sections all sites of International and National Importance within the study area are evaluated and are illustrated on **Error! Reference source not found.**.

6.5.1.2 European sites

European sites with a pathway linking to the proposed project were considered in this assessment. These European sites are illustrated on

Figure 6-2.

The proposed project overlaps with the Blackwater River (Cork/Waterford) SAC [002170] at a bridge crossing over the Glenshelane River (EPA code: 18G11) between Knocknanask and Knocknasheega Mountain and where the proposed GCR crosses the Finisk River (EPA code: 18F02). Therefore, a direct viable source-pathway-receptor link, via hydrological connectivity, was identified at these locations. Indirect hydrological source-pathway-receptor links were identified for the Glennafallia River (EPA code: 18G10), the Boherawillin River (EPA code: 18B35) and the Farnane River (EPA code: 18F06) which overlap with the proposed project and all drain into rivers which form part of the Blackwater River (Cork/Waterford) SAC [002170].

The proposed project is also hydrologically connected to the Blackwater Estuary SPA [004028] which is located approximately 25km downstream of the proposed project. The proposed GCR crosses the Colligan River (EPA code: 17C01) which is hydrologically connected to the Dungarvan Harbour SPA [004032] approximately 4.7km downstream.

6.5.1.3 Natural Heritage Areas

No Natural Heritage Areas (NHAs) were identified within the study area of the proposed project (refer to

Figure 6-2).

6.5.1.4 Other Sites of Conservation Concern

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

There is hydrological connectivity between the proposed project and two pNHAs; Blackwater River and Estuary pNHA [000072] and Dungarvan Harbour pNHA [000663]. These pNHA sites lie entirely within the boundaries of the designated European sites, as illustrated in

Figure 6-2.

8°0'0"W

7°45'0"W

52°18'45"N

52°10'30"N

604000

615000

N

Lower River Suir SAC

Nier Valley Woodlands pNHA

Nier Valley Woodlands SAC

Glenboy Wood pNHA

Comeragh Mountains SAC

Comeragh Mountains pNHA

Lismore Woods pNHA

Glenmore Wood pNHA

Blackwater River (Cork/Waterford) SAC

Blackwater Callows SPA

Blackwater River Callows pNHA

Glendine Wood SAC

Dungarvan Harbour SPA

Dungarvan Harbour pNHA

Colligan Estuary

Brickey Estuary

Upper Blackwater M Estuary

Blackwater River And Estuary pNHA

BLACKWATER (MUNSTER)_220

BLACKWATER (MUNSTER)_230

GLENSHELANE_010

FINISK_020

FINISK_030

DARNANE_010

MONETGORM_010

COLLIGAN_060

OpenStreetMap: © OpenStreetMap (and) contributors, CC-BY-SA
World Light Gray Reference: Esri, HERE

Legend

- Proposed project
- Biodiversity enhancement lands
- WFD - Transitional Water Bodies
- WFD - River Water Bodies

Designated Sites

- Special Protection Areas (SPAs)
- Special Areas of Conservation (SACs)
- proposed Natural Heritage Areas (pNHAs)

0 2.5 5
Kilometres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY \ WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

A	16/12/2024	First issue	S.P	A.S
Rev	Date	Description	By	Chkd.

Client: Ireland FuturEnergy

Project: Scart Mountain Wind Farm

Title: Figure 6-2: Designated Sites within the Zone of Influence of the proposed project

Scale @ A3: 1:100,000

Prepared by:	Checked by:	Date:
S.Pezzetta	A.Sands	December 2024

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Map Ref: 11303-009-D.S-WFD-TOB-A

Draft: A

6.5.1.5 Data from Ecological Stakeholders and NGOs

The desktop assessment included a review of available data from ecological stakeholders and NGOs of which the findings are summarised in the following sections.

6.5.1.5.1 National Parks Wildlife Services

Spatial Data Review

EU Habitats Directive, Annex I habitat, National Survey of Native Woodlands, Long Established Woodlands and the Irish Semi-natural Grassland Survey datasets were downloaded from the NPWS website[4] and were reviewed to determine overlap with the proposed project.

The spatial data review[4] indicated that an area of Wet Heath (4010) potentially occurs across Knocknanask Mountain and a small area on Knocknasheega Mountain. These areas were further investigated during habitat surveys (Section 6.3.2.1.1).

Records of protected and rare species, from the NPWS website, occurring within the proposed project were also reviewed. Otter was recorded in 2010 in the northern area of the proposed wind farm site between Knocknanask and Knocknasheega in the upper reaches of the Glenshelane River.

Sensitive Data Request

A sensitive data request for hectads S10, X19 and X29 (which encompass the proposed project) was issued to NPWS on 3 August 2023 and a NPWS data package was received on 21st August 2023. The data set contained the same location for Otter in the upper reaches of the Glenshelane River, the Annex V lichen species, Reindeer Moss (*Cladonia portentosa*) located in the northwest area of Knocknanask Mountain and Common Frog located close to the directional drilling site for the proposed GCR under the Colligan River. Fallow Deer was also recorded throughout the proposed wind farm site.

A sensitive data request was sent to the NPWS for records of Freshwater Pearl Mussel within the study area and its sub catchments (refer to Table 6-1). The data received indicated that there are currently no records of Freshwater Pearl Mussel populations present within the sub catchments of the study area. Suitable habitat is present within the Araglin (Blackwater)_020 catchment, located west of the proposed project, with no downstream hydrological connectivity to the proposed project (NPWS, 2012).

6.5.1.5.2 National Biodiversity Data Centre

A search of the NBDC database[2] was carried out in August 2023 and November 2024 for records of protected flora and fauna recorded (excluding avifauna) and invasive nonnative species (INNS) listed under the Third Schedule of the Birds and Natural Habitats Regulations (2011) within hectads S10, X19 and X29 which encompass the proposed project. Results of protected flora and fauna are listed in Table 6-3. Third Schedule invasive flora and fauna species are listed respectively in Table 6-4 and Table 6-5 below.

Table 6-3: Protected Flora and Fauna under the Habitats Directive (HD) and Wildlife Acts (WA)

Species name	Date of last record	Designation	Location in relation to the proposed project
Common Frog	17/10/2020	EU HD Annex V, WA	Species previously recorded approximately 4.3km north-east of the proposed project and along the grid connection route (grid square X29).
Smooth Newt (*Lissotriton vulgaris*)	06/10/2019	WA	Species previously recorded approximately 4.5km south of the proposed project.
Common Lizard	10/07/2020	WA	Species previously recorded approximately 6.1km south-east of the proposed project.
Daubenton's Bat (*Myotis daubentonii*)	27/08/2012	EU HD Annex IV, WA	Species recorded approximately 3.4km south-west of the proposed project.
Eurasian Badger	31/12/2016	WA	Species previously recorded within the north-west boundary of the proposed project with multiple records surrounding the site boundary within 1km.
Eurasian Red Squirrel	13/11/2016	WA	Species previously recorded within the southern section of the site and along the proposed GCR.
European Otter	12/06/2015	EU HD Annex II, IV and WA	There are three records of otter within the north-west of the site along the Glenshelane_010 river. Otter is also recorded along the Colligan_040 (IE_SE_17CO10300) which is crossed by the proposed GCR (grid square X29)
Pine Marten	31/12/2012	EU HD Annex V, WA	Species previously recorded throughout the site within squares S10 and X19 and along the GCR (grid square X29)
West European Hedgehog	27/07/2022	WA	Species previously recorded approximately 0.2km south of the site boundary, adjacent to the Glenshelane_010 river.
Marsh Fritillary	07/06/2021	EU HD Annex II	Species previously recorded approximately 6km south of the site boundary throughout grid square X19.

Table 6-4: Third Schedule (Regulation S.I. 477) Invasive Flora species

Species name	Date of last record	Designation	Location in relation to the proposed development site and grid connection route
Fallopia japonica x *sachalinensis* = F. x *bohemica*	08/09/2020	High Impact Invasive Species	Species previously recorded approximately 4.6km south of the proposed grid connection route
Indian Balsam / Himalayan Balsam (*Impatiens glandulifera*)	14/07/2022	High Impact Invasive Species	Species previously recorded on the north-west border of the site and are also recorded along the grid connection route.
Japanese Knotweed (*Fallopia japonica*)	22/07/2022	High Impact Invasive Species	Species previously recorded throughout the centre of the site and along the grid connection route.

Table 6-5: Third Schedule (Regulation S.I. 477) Invasive Fauna Species

Species name	Date of last record	Designation	Location in relation to the proposed development site and grid connection route
American Mink (*Mustela vison*)	04/03/2014	High Impact Invasive Species	Species previously recorded approximately 1.6km south of the proposed project boundary and along the grid connection route (grid square X19).
Harlequin Ladybird (*Harmonia axyridis*)	14/11/2022	High Impact Invasive Species	Species previously recorded approximately 6.2km south-west and within 2km of the grid connection route.
Brown Rat (*Rattus norvegicus*)	19/02/2017	High Impact Invasive Species	Species recorded approximately 4.5km south-west of the site boundary
Eastern Grey Squirrel (*Sciurus carolinensis*)	02/01/2013	High Impact Invasive Species	Species previously recorded approximately 4.6km south-west of the site boundary and along the grid connection route (grid square X29)
Fallow Deer	25/11/2016	High Impact Invasive Species (and protected under the Wildlife Acts)	Species previously recorded throughout the entire site (grid square S10 and X19) and along the grid connection route (grid square X29).

6.5.1.6 Hydrology

The proposed wind farm site and part of the proposed GCR are located in the western section of the South-Western River Basin District which lies entirely within the Blackwater (Munster) WFD Catchment (catchment ID_907). Approximately 7km of the proposed GCR and the Dungarvan 110kV substation lie within the South-Eastern River Basin District and within Colligan-Mahon WFD Catchment (catchment ID_906). The proposed wind farm is divided into two sub-catchment areas; the northwestern part lies within the Blackwater (Munster)_SC_140 and the southeastern part lies within the Finisk_SC_010.

6.5.1.7 Review of Previous Ecological Assessments

A review of previous ecological assessments which were carried out in proximity to the proposed project was undertaken and are summarised below.

The closest development to the proposed project is Dyrick Hill Wind Farm, the main findings in relation to ecology are outlined hereunder.

Dyrick Hill Wind Farm (Doherty Environmental Consultants (DEC), 2023)

Dyrick Hill Wind farm Ltd are proposing to develop a 12 no. 6.0 – 7.2 MW turbine wind farm and grid connection at Dyrick Hill, Co Waterford. DEC undertook a suite of ecological surveys to inform the Dyrick Hill Wind Farm between 2020 and 2023 (DEC, 2023). The key findings of the ecological surveys are summarised below:

- During the habitat survey, mostly habitats of Local Importance were recorded. Two accounts of Annex I habitats were identified within and adjacent to the Dyrick Wind farm site (Dry Heath 4030 and Wet Heath 4010).

Static and transect bat surveys were undertaken within the proposed project, and a total of ten bat species were recorded; Daubenton's Bat, Whiskered Bat, Natterer's Bat, Myotis Bat, Leisler's Bat, Nathusius' Pipistrelle, Common Pipistrelle, Soprano Pipistrelle, Pipistrelle Bat, Brown Long-eared Bat. Five confirmed roost sites (built structures) were recorded within the Dyrick Wind farm site and another three built structures were considered to have moderate potential. Five trees were considered to be of moderate bat roost potential (BRP) and another 12 were identified as low BRP. The survey concluded that the proposed project has both high habitat suitability and high roost potential for bats.

- No evidence of Badger, tracks or foraging signs, were recorded within the Dyrick Wind Farm site and no setts were recorded.
- No evidence of Otter, tracks or foraging signs, were recorded within the Dyrick Wind Farm site and no holts were recorded.
- Numerous Common Frogs were recorded within the Dyrick Wind Farm site.
- The Marsh Fritillary Butterfly was not recorded within the Dyrick Wind Farm site, even though it's foodplant, Devil's Bit-scabious (*Succisa pratensis*), was occasionally recorded.
- No evidence or any other protected species was recorded during the surveys.

6.5.2 Field Survey Results

The findings of the ecological field surveys undertaken in 2022 and 2023 are detailed in the following sections. All habitats recorded within the proposed project are illustrated on Figure 6-3, Figure 6-4 and Figure 6-5 and are also contained in Appendix 6-4.

6.5.2.1 Habitats

6.5.2.2 C1 – Arable crops

One area of arable crops was recorded along the N72 at a turning point for the proposed TDR. The crop consisted of Rye (*Secale cereale*) and the margins contained Thistles (*Cirsium* sp.), Red Fescue (*Festuca rubra*), Ragwort (*Senecio jacobaea*) and Red Clover (*Trifolium pratense*). The arable crops were assessed to be of Local Importance (lower value) and will not be considered further within the assessment.

6.5.2.3 BL1 - Stone walls and other stonework

A small number of stone walls were recorded throughout the proposed project, mostly along drainage ditches or within conifer plantations. Plant species recorded included Bracken (*Pteridium aquilinum*), Gorse (*Ulex europaeus*), Ling (*Calluna vulgaris*) and Bilberry (*Vaccinium myrtillus*). The stone walls were assessed to be of Local Importance (lower value) and will not be considered further within the assessment.

6.5.2.4 BL3 - Buildings and artificial surfaces

Artificial surfaces recorded included tarmac roads and car parks. There are no buildings within the proposed wind farm site. The artificial surfaces were assessed to be of Local Importance (lower value) and will not be considered further within the assessment.

6.5.2.5 ED2 - Spoil and bare ground

Areas of bare ground were recorded throughout the wind farm site. These areas consisted of forestry roads and access tracks. The recorded spoil and bare ground were assessed to be of Local Importance (lower value) and will not be considered further within the assessment.

6.5.2.6 ED3 -Recolonising bare ground

One area of recolonising bare ground was recorded along the N72 at a turning point for the proposed TDR. The area is an old track completely overgrown with the following species; Hedge Parsley (*Torilis japonica*), Ragwort, St. John's Wort (*Hypericum perforatum*), White Clover (*Trifolium repens*), Ribwort Plantain (*Plantago lanceolata*), Yorkshire Fog (*Holcus lanatus*), Herb Robert (*Geranium robertianum*) and Scarlet Pimpernel (*Anagallis arvensis*). The recorded recolonising bare ground was assessed to be of Local Importance (lower value) and will not be considered further within the assessment.

6.5.2.7 FW1 - Eroding/ upland rivers

Fourteen watercourses were recorded within and downstream of the proposed project (see Table 6-6). These watercourses were high gradient, fast flowing streams with mainly boulder and cobble beds with rare areas of gravel and little to no areas containing silt deposits.

Table 6-6: Recorded eroding / upland rivers

No.	EPA Code	EPA Name	WFD River Waterbody	WFD Code
1	18K35	Knocknanask Stream	Glennafallia_010	IE_SW_18G100040
2	18B35	Boherawillin Stream	Finisk_030	IE_SW_18F020500
3	18T06	Toor 18 Stream	Farnane_010	IE_SW_18F060300
4	18F02	Ballykerin_Middle Stream	Finisk_030	IE_SW_18F020500
5	17C01	River Colligan	Colligan_040	IE_SE_17C010300
6	18M26	Moneygorm Stream	Moneygorm_010	IE_SW_18M260940
7	18G11	Glenshelane River	Glenshelane_010	IE_SW_18G110300
8	18K43	Knocknasheega Stream	Glenshelane_010	IE_SW_18G110300
9	18C31	Coolagortboy Stream	Glenshelane_010	IE_SW_18G110300
10	18S06	Scart 18 Stream	Finisk_020	IE_SW_18F020300
11	18B02	River Blackwater	Blackwater (Munster)_220	IE_SW_18B022700
12	18F02	Finisk River	Finisk_020	IE_SW_18F020300
13	18G10	Glennafallia 18	Glennafallia_020	IE_SW_18G100200
14	18M05	Moneygorm East Stream	Finisk_030	IE_SW_18F020500

The riparian vegetation present included species like Gorse, Soft Rush (*Juncus effusus*), Willow (*Salix* sp.), Bracken, Bell Heather, Ling Heather, Purple Moore Grass (*Molinia caerulea*), Bilberry, Mountain Ash and in some cases the conifers were planted right up to the edge of the stream. Macrophytes recorded included Water Crowfoot (*Ranunculus* sp.), Fool's Watercress (*Apium nodiflorum*), Duck weed (*Lemna* sp.), Brooklime (*Veronica beccabunga*) and aquatic bryophytes, including *Fontinalis* sp. As discussed in the aquatic report (Appendix 6-3) most streams and rivers connected to the proposed project have 'high' or 'good' water quality status and may support juvenile salmonids and other protected aquatic organisms. All watercourses recorded within the proposed project flow into the Finisk River or Blackwater River which are part of the River Blackwater (Munster) SAC [002170].

For further information on survey site locations refer to Appendix 6-3.

All watercourses with connectivity to the proposed project were assessed to be of **Local Importance (higher value).** The Glenshelane River and Finisk River lies entirely within the River Blackwater (Cork/Waterford) SAC, however the rivers are not qualifying interests of the SAC.

Plate 6-1: The Glenshelane Upland Eroding River (taken upstream of proposed clear span bridge crossing)

6.5.2.8 FW4 - Drainage ditches

Fifteen drainage ditches were recorded within the proposed project. The condition recorded was 'poor' to 'moderate' with only one macrophyte recorded; Round-leaved Crowfoot (*Ranunculus omiophyllus*). Riparian species include Soft Rush, Bracken, Gorse, Wild Angelica (*Angelica sylvestris*) and Cuckoo Flower (*Cardamine pratensis*). This habitat was assessed to be of Local Importance (lower value) and will not be considered further within the assessment.

Plate 6-2: Typical drainage ditch alongside a forestry access road

6.5.2.9 GA1 - Improved agricultural grassland

Two fields were recorded as improved agricultural grassland within the wind farm site. These improved agricultural fields generally have relatively low biodiversity and are used for cattle grazing or silage. Species recorded included Perennial Rye-grass (*Lolium perenne*) and White Clover (*Trifolium repens*). This habitat is botanically poor, intensively managed for agriculture and occurs in abundance throughout Ireland. The improved agricultural grassland within the proposed project were assessed to be of Local Importance (lower value) and will not be considered further within this assessment.

6.5.2.10 GS2 - Dry meadows and grassy verges

Grassy verges were recorded along the N72 at a turning point for the proposed TDR. The habitat was in poor condition with evidence of recent mowing. Species recorded included Perennial Rye-grass, White Clover, Ribwort Plantain (*Plantago lanceolata*) and Ragwort. The recorded dry meadows and grassy verges were assessed to be of Local Importance (lower value) and will not be considered further within the assessment.

6.5.2.11 GS3 - Acid grassland

Small patches of acid grassland were recorded in the northwestern part of Knocknanask at the wind farm site which were heavily grazed. These small patches were scattered throughout a greater area of Annex I Wet Heath but was not identified as 'Annex I priority species-rich *Nardus* grasslands' as per Perrin *et al.*, (2014) due to the lack of species diversity. Species recorded included Common Bent (*Agrostis capillaris*), Sweet Vernal Grass (*Anthoxanthum odoratum*), Heath Bedstraw (*Galium saxatile*), Tormentil (*Potentilla erecta*) and Sheep's Sorrel (*Rumex acetosella*), and the moss (*Rhytidiadelphus squarrosus*). One small area was also recorded on the eastern side of Knocknasheega.

These small patches of habitat are uncommon within the study area and thus this habitat is considered to be of **Local Importance (higher value).**

6.5.2.12 GS4 - Wet grassland

One small area of wet grassland was recorded in the northern part of the proposed wind farm site along an upland tributary of the Glenshelane River (not named by EPA). It consisted of a rank field grazed by sheep with scattered gorse scrub. Species recorded included Soft Rush, Gorse and scattered Ling Heather. This habitat showed low species diversity. The recorded wet grassland areas were assessed to be of Local Importance (lower value) and will not be considered further within the assessment.

Plate 6-3: Species poor wet grassland

6.5.2.13 HD1 - Dense bracken

Relatively large areas of dense bracken were recorded on the south and eastern slopes of Knocknanask and Knocknasheega within the proposed wind farm site. Bracken is a native fern which can become invasive and take over heathland habitats that were historically disturbed (Bardon *et al.*, 2018). Patches of Bracken were also scattered throughout the proposed wind farm site, amongst heath habitats. The dense bracken habitat was assessed to be of Local Importance (lower value) and will not be considered further within the assessment.

6.5.2.14 HH1 - Dry siliceous heath / Annex I European dry heath (4030)

Dry heath was recorded on the lower, southern and western slopes of Knocknanask. In Knocknasheega, it was recorded throughout the proposed wind farm site in all locations where conifer has previously been cleared. Moss cover within the dry heath of Knocknasheega was generally high and included *Rhytidiadelphus loreus*, *Hylocomium splendens* and *Pleurozium schreberi.* The habitat was generally dominated by Ling and Bilberry with frequent *Cladonia portentosa* and Bell Heather (*Erica cinerea*) present.

This habitat is classified as European dry heath (4030) using the European Union classification system. The example of this habitat in Knocknanask is considered to be in poor condition with an 'unfavourable bad' conservation status following the condition assessment methodology defined by Perrin *et al.*, 2014. The main cause for this undesirable conservation status is likely from historic peat cutting and recent burning that has taken place in Knocknanask (see Appendix 6-2).

Considering the degraded nature of the dry heath, the habitat was assessed as being of **County Importance.** This is based on the 'poor' condition and 'unfavourable bad' conservation status of dry heath Annex I habitats (refer to Appendix 6-2).

Plate 6-4: Area of Annex I European dry heath in a forestry clearance on Knocknasheega

6.5.2.15 HH3 - Wet heath / Annex I Atlantic wet heath (4010)

Some areas of wet heath were recorded on the western side of Knocknasheega, but the most substantial area of this habitat was recorded on Knocknanask, and evidently covers most of the mid-range of the entire mountain. Species recorded included Cross-leaved Heath (*Erica tetralix*), Bell Heather, Bilberry, Purple Moorgrass and Deer Grass (*Trichophorum germanicum*). The moss layer was poor, with generally only *Hypnum jutlandicum* and *Sphagnum capillifolium* recorded.

This habitat was assessed to be Annex I Atlantic wet heath (4010) but, especially in Knocknanask, was considered to be in poor condition with an 'unfavourable bad' conservation status (Perrin *et al.*, 2014). The main cause for this undesirable conservation status is likely from historic peat cutting and recent burning that has taken place (see Appendix 6-2).

Considering the degraded nature, the habitat was assessed as being of **County Importance.**

Plate 6-5 Area of Annex I Atlantic wet heath on the western side of Knocknanask, with a view of the summit

6.5.2.16 PB2 - Upland blanket bog / Annex I Blanket bog (7130)

Blanket bog was only recorded on Knocknanask and covered the entire summit of the mountain. This habitat, however, is heavily degraded from historical peat cutting and the remaining peat layer is generally thin, with a very low abundance of indicator species like *Sphagnum* species or Hare's-tail Cottongrass (*Eriophorum vaginatum*). Frequently encountered species within the degraded blanket bog included Ling, Deer Grass, Bell Heather, Cros-leaved Heath and Bilberry. Where there was low cover of Purple Moor-grass and Wavy Hair-grass (*Avenella flexuosa*), small amounts of Green-ribbed Sedge (*Carex binervis*) were recorded. Typical abundant Sphagnum moss species like *Sphagnum capillifolium* were rare and *Sphagnum papillosum*, which would be common in intact bogs was only recorded once. The most abundant bryophyte was *Hypnum jutlandicum,* a species typical for dryer bog and heath. The moss *Racomitrium lanuginosum* and the lichen *Cladonia portentosa,* both common bog species, were rare within the habitat.

This habitat was classified as non-priority Annex I blanket bog (7130) and considered to be in poor condition with an 'unfavourable bad' conservation status as per Perrin *et al.,* (2014). The main cause for this undesirable conservation status is the historic peat cutting and recent burning that has taken place (see Appendix 6-2).

A very small area of priority Annex I blanket bog (7130) was recorded on the southern slope of Knocknanask. This gently sloping patch of bog, with abundant Purple Moor-grass, contained the abundant positive indicator species Hare's-tail Cottongrass, Bilberry, Deer Grass, Cross-leaved Heath, *Sphagnum papillosum*, *Sphagnum capillifolium,* but rarely *Sphagnum cuspidatum*. It is the abundant Hare's-tail Cottongrass and frequent *Sphagnum papillosum* that indicate this bog is intact and considered to be in 'good' condition. However, due to the very small size and ongoing pressures the conservation status was 'unfavourable inadequate' as per Perrin *et al.,* (2014).

Considering the degraded nature, the habitat was therefore assessed as being of **County Importance.**

6.5.2.17 WD3 - (Mixed) conifer woodland

This habitat was occasionally encountered throughout the proposed wind farm site. The dominant tree species included non-native Lodge Pole Pine (*Pinus contorta*), Sitka Spruce (*Picea picea*) and *Eucalyptus* sp. Unlike most areas that were recorded, one narrow band of mixed conifer woodland located on the west bank of the Glenshelane River (where the proposed access road within the wind farm site to Knocknanask will cross) was relatively species rich. This band contained the following species; Sitka Spruce, Gorse, Willow, Hawthorn (*Crataegus monogyna*), Mountain Ash (*Sorbus aucuparia*), Bramble (*Rubus fructicosus*), Soft Rush and Sycamore (*Acer pseudoplatanus*).

Due to the diversity of native woodland species, the area of this habitat located on the west bank of the Glenshelane River was assessed to be of **Local Importance (higher value).**

Plate 6-6 Strip of woodland classified as mixed conifer woodland with a high diversity of native woodland species

6.5.2.18 WD4 - Conifer plantation

The main habitat within the proposed wind farm site consists of mature conifer plantations. The planted species were Sitka Spruce with some areas also planted with Lodgepole Pine. Conifer plantations are monocultures of non-native trees that support very few native flora and fauna. In the few areas where immature conifer plantations were recorded, the understory often included occasional Ling, *Sphagnum* sp., and more frequently Bracken, Bramble, Willow, Soft Rush and Bilberry. These open immature woodland habitats occur sporadically throughout the proposed wind farm site and a particularly large area is located to the west of the Glenshelane River. The conifer plantation habitat was assessed to be of Local Importance (lower value) and will not be considered further within the assessment.

Plate 6-7 Open immature conifer plantation with a diverse heath-land understory

6.5.2.19 WL1 - Hedgerows

Very few hedgerows were recorded within the proposed project. The only hedgerows were recorded along the N72 at a turning point for the proposed TDR. Species included Mountain Ash, Willow, Blackthorn (*Prunus spinosa*), Ash (*Fraxinus excelsior*) with an understory of Gorse, Bramble, Ragwort, Herb Robert, Meadowsweet (*Filipendula ulmaria*) and Selfheal (*Prunella vulgaris*). The hedgerows were dense and well established.

Hedgerows were assessed to be of **Local Importance (higher value).**

6.5.2.20 WL2 - Treelines

A small number of treelines were scattered throughout the centre and southern part of the proposed wind farm site. Species recorded included Ash, Beech (*Fagus sylvatica*), Hawthorn, Willow and Ivy (*Hedera Hibernica*) with typical understories of Cow Parsley (*Anthriscus sylvestris*), thistles sp., Fox Glove (*Digitalis purpurea*) and False Oat-grass (*Arrhenatherum elatius*).

Therefore, treelines were assessed to be of **Local Importance (higher value).**

6.5.2.21 WS1 - Scrub

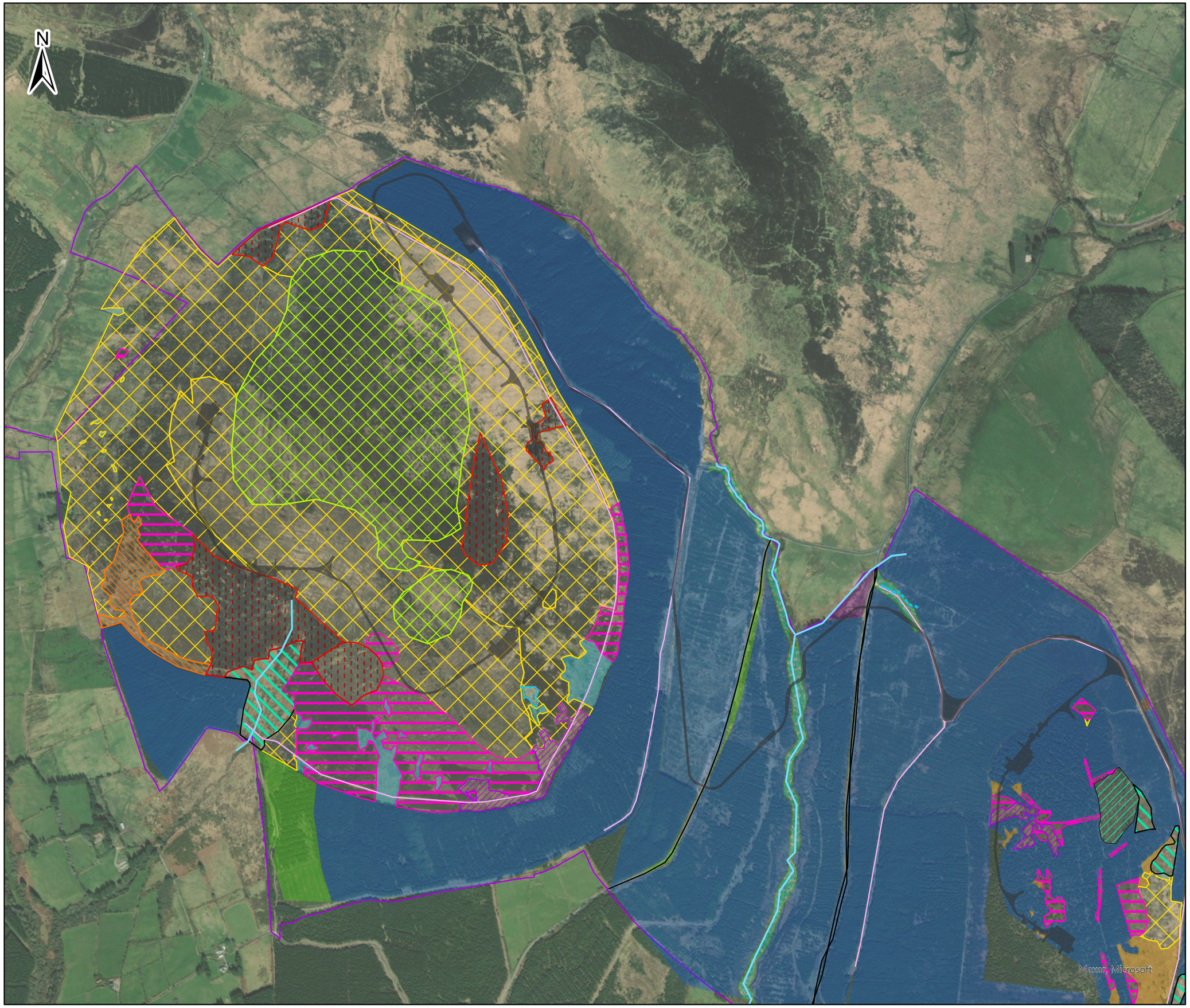
An area of scrub is present within the proposed wind farm site along the Glenshelane River, which forms part of the Blackwater River (Cork/Waterford) SAC. This habitat, which was less than 5m in height, lies in a steep river valley and consists of native species including abundant Willow sp. with occasional Mountain Ash, Alder, Hazel, and Hawthorn with an understory of Bramble, Bracken and Soft Rush. Additional smaller areas of scrub are located throughout the proposed wind farm site. Species recorded included Gorse, Willow, Alder and Bramble in a mosaic with Bracken, Ling, Soft Rush, Purple Moor-grass, Hogweed (*Heracleum sphondylium*) and Herb Robert.

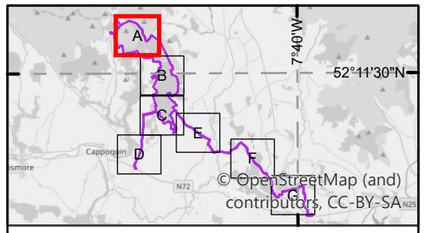
Therefore, scrub was assessed to be of **Local Importance (higher value).** The scrub on either side of the Glenshelane River, whilst lying entirely within the River Blackwater (Cork/Waterford) SAC, it is not a qualifying interest habitat of the SAC.

Plate 6-8 Area of Willow scrub on either side of the Glenshelane River at the clear span bridge location

6.5.2.22 WS5 - Recently felled woodland

This habitat was only recorded in the southernmost part of the proposed access track within the proposed wind farm site and contained few species. All trees had been felled and species that were recolonising the area included Soft Rush, Gorse, Bramble and Ling. The recorded recently felled woodland was assessed to be of Local Importance (lower value) and will not be considered further within the assessment.





Legend

- Proposed project
- Proposed infrastructure footprint within the proposed wind farm site

Habitats

- BL3 - Buildings and artifical surfaces
- ED2 - Spoil and bare ground
- FW1 - Eroding/ upland rivers
- FW4 - Drainage ditches
- GS4 - Wet grassland
- HH1 - Dry siliceous heath
- HH2 - Dry calcareous heath
- WD3 - (Mixed) conifer woodland
- WD4 - Conifer plantation
- WS1 - Scrub
- WS5 - Recently felled woodland
- GS3 - Acid grassland
- HD1 - Bracken
- HD1 - Dense Bracken
- (WD4 conifer plantation)

Annex I

- H4010 wet heath
- H4010 wet heath (in mosaic with bracken)
- H4030 dry heath
- H4030 dry heath (in mosaic with bracken)
- H4030 dry heath and H4010 wet heath (in mosaic with bracken)
- H4030 dry heath and H4010 wet heath (mosaic)
- H7130 non-priority; inactive degraded blanket bog
- H7130 priority; active blanket bog
- H4030 dry heath

0 250 500
Meters

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Client: Ireland FuturEnergy

Project: Scart Mountain Wind Farm

Title: Figure 6-3A: Habitats - Page 1 of 7 -

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S.Pezzetta	A.Sands	December 2024

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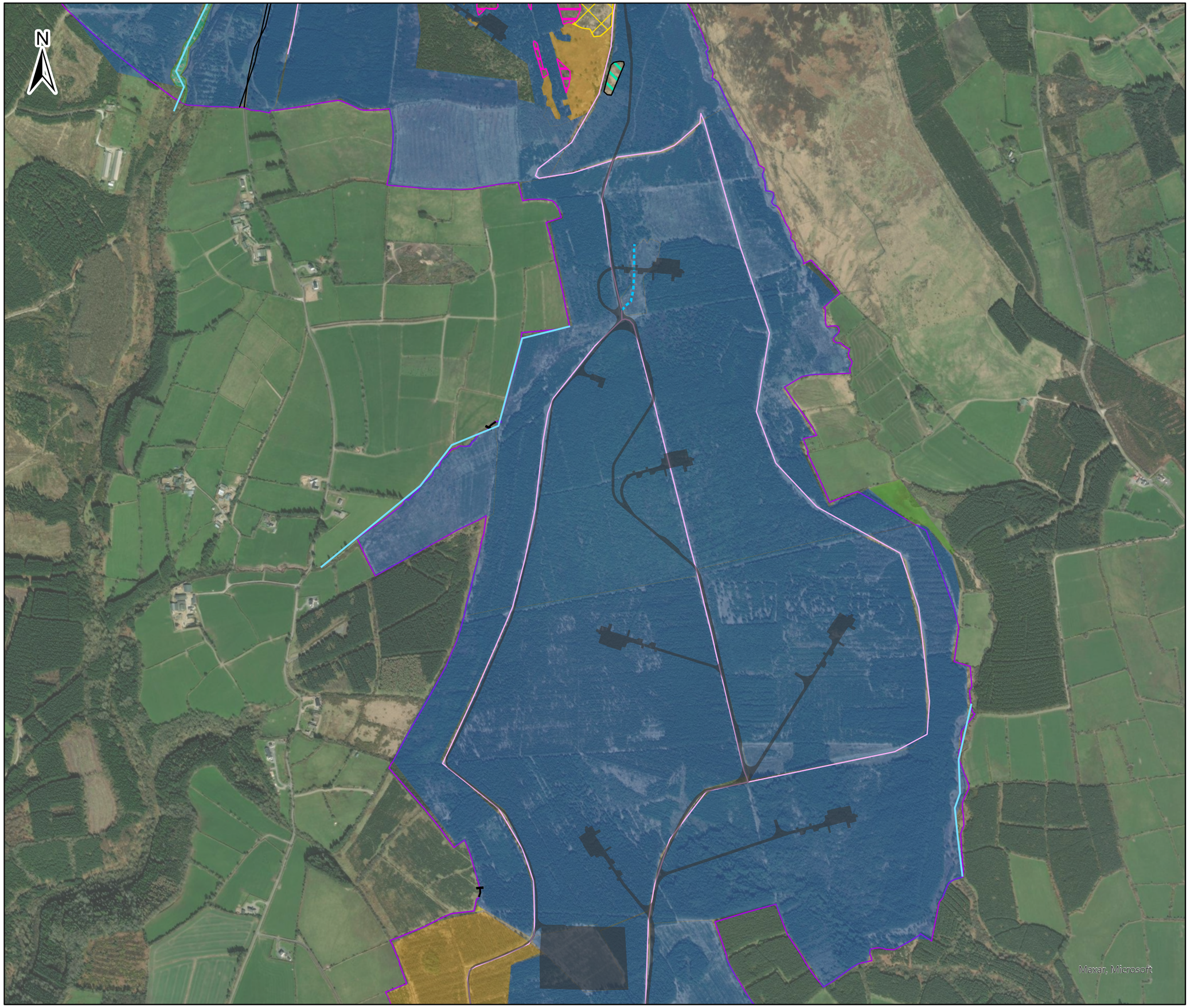

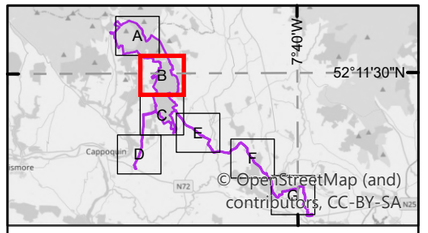

Legend

- Proposed project
- Proposed infrastructure footprint within the proposed wind farm site

Habitats

- BL1 - Stone walls and other stonework
- BL3 - Buildings and artifical surfaces
- ED2 - Spoil and bare ground
- FW1 - Eroding/ upland rivers
- FW4 - Drainage ditches
- GA1 - Improved agricultural grassland
- HD1 - Dense bracken HH1 - Dry siliceous heath
- HH1 - Dry siliceous heath
- WD1 - (Mixed) broadleaved woodland
- WD4 - Conifer plantation
- WS1 - Scrub
- HD1 - Bracken
- (WD4 conifer plantation)

Annex I

- H4010 wet heath
- H4010 wet heath (in mosaic with bracken)
- H4030 dry heath

0 250 500
Meters

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Title: Figure 6-3B: Habitats - Page 2 of 7 -

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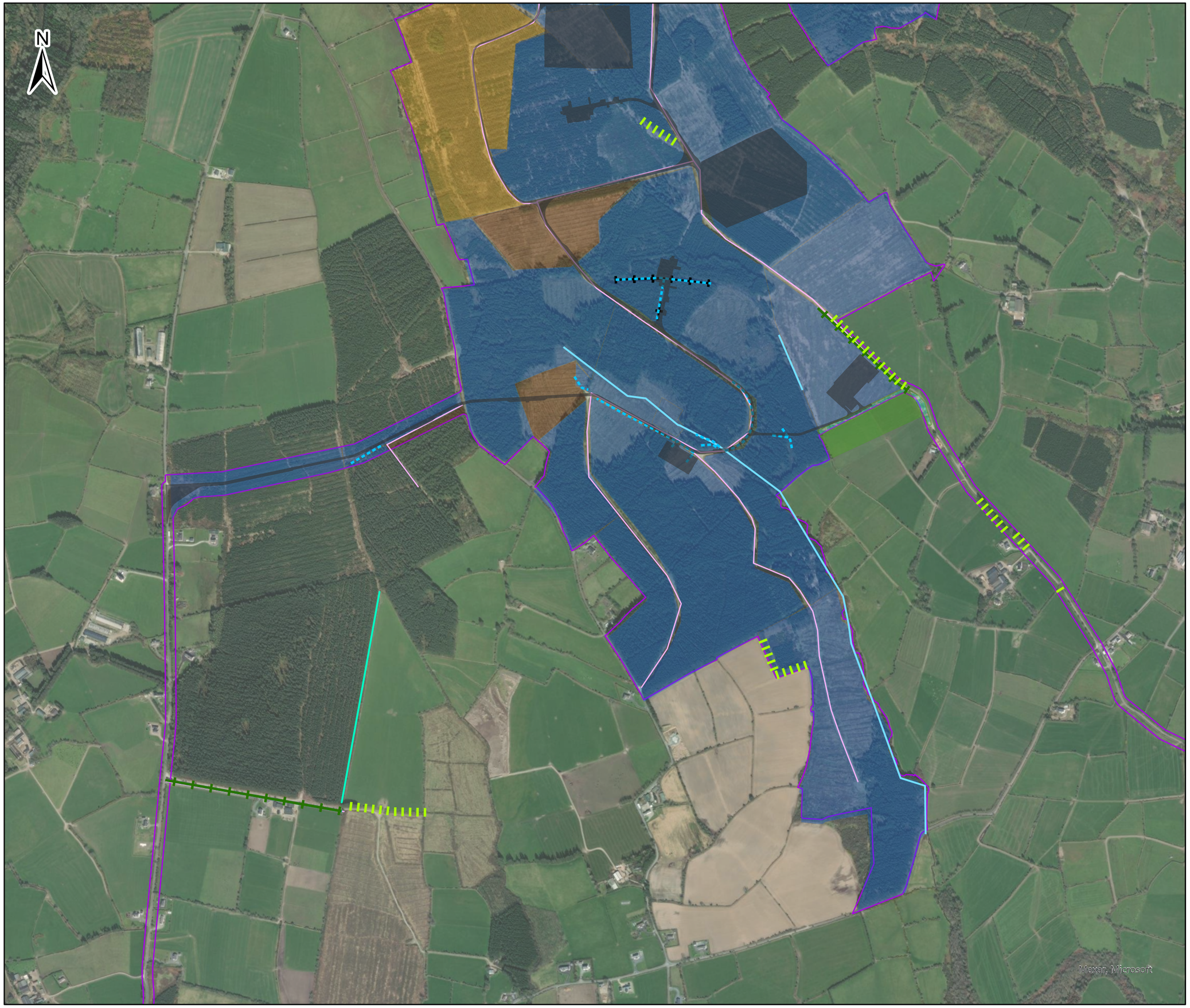

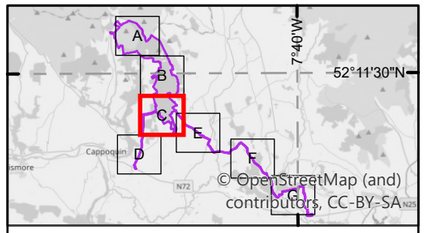

Legend

- Proposed project
- Proposed infrastructure footprint within the proposed wind farm site

Habitats

- BL1 - Stone walls and other stonework
- ED2 - Spoil and bare ground
- FW1 - Eroding/ upland rivers
- FW4 - Drainage ditches
- WL1 - Hedgerows
- WL2 - Treelines
- WS1 - Scrub
- GA1 - Improved agricultural grassland
- WD1 - (Mixed) broadleaved woodland
- WD4 - Conifer plantation
- WS1 - Scrub
- WS5 - Recently felled woodland

0 250 500
Meters

NOTES

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Project: Scart Mountain Wind Farm

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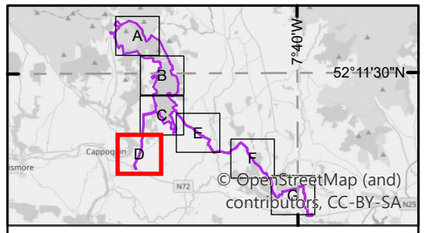

Legend

- Proposed project
- Proposed infrastructure footprint within the proposed wind farm site

Habitats

- BL1 - Stone walls and other stonework
- WL1 - Hedgerows
- WL2 - Treelines
- WS3 - Ornamental/Non-native shrub
- BC1 - Arable crops
- BL3 - Buildings and artifical surfaces
- ED3 - Recolonising bare ground
- GS2 - Dry meadows and grassy verges
- HD1 - Dense bracken HH1 - Dry siliceous heath
- WS1 - Scrub

0 250 500
Meters

NOTES

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Project: Scart Mountain Wind Farm

Title: Figure 6-3D: Habitats - Page 4 of 7 -

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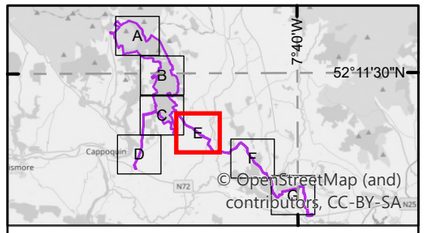

Legend

- Proposed project
- Proposed infrastructure footprint within the proposed wind farm site

Habitats

- ED2 - Spoil and bare ground
- FW1 - Eroding/ upland rivers
- WL2 - Treelines
- GA1 - Improved agricultural grassland
- WD4 - Conifer plantation
- WS1 - Scrub

0 250 500
Meters

NOTES

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Project: Scart Mountain Wind Farm

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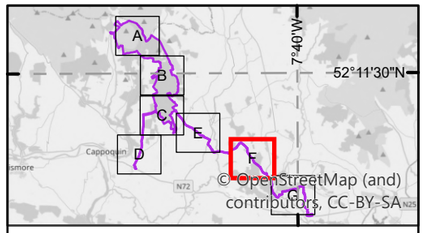

Legend

- Proposed project
- Proposed infrastructure footprint within the proposed wind farm site

Habitats

- FW4 - Drainage ditches
- WL2 - Treelines

0 250 500
Meters

NOTES

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Project:

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Title:

Figure 6-3F:
Habitats
- Page 6 of 7 -

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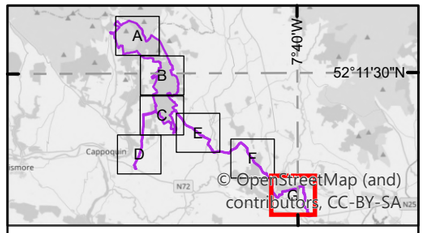

Legend

- Proposed project
- Proposed infrastructure footprint within the proposed wind farm site

Habitats

- FW1 - Eroding/ upland rivers
- WD2 - (Mixed) broadleaved conifer woodland
- WL2 - Treelines
- GA1 - Improved agricultural grassland
- WD1 - (Mixed) broadleaved woodland

0 250 500
Meters

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Title: Figure 6-3G: Habitats - Page 7 of 7 -

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6.5.2.23 Invasive Non-Native Species (Flora)

Two INNS plant species were recorded; Himalayan Balsam (*Impatiens glandulifera*) and Rhododendron *(Rhododendron ponticum)* were recorded within parts of the proposed project.

6.5.2.23.1 Himalayan Balsam

Himalayan Balsam is a high impact invasive species registered on the Third Schedule (Part 1 Plants) of the S.I No. 477 European Communities (Bird and Natural Habitats) Regulations 2011.

Himalayan Balsam was mostly recorded along the proposed TDR. It was recorded along a stream flowing under the N72 just before the Boheravaghera crossroads where the turbine delivery vehicles will turn off to access the proposed wind farm site. Along the road that leads to the access point Himalayan Balsam was present at a number of locations along the roadside. The Himalayan Balsam does not occur within the construction works area and will not be disturbed by the proposed works.

Plate 6-9 Linear stand of Himalayan Balsam along roadside of turbine delivery route

6.5.2.23.2 Rhododendron

Rhododendron is a high impact invasive species registered on the Third Schedule (Part 1 Plants) of the S.I No. 477 of 2011, European Communities (Bird and Natural Habitats) Regulations 2011.

A single stand of Rhododendron was recorded within the proposed wind farm site, east of the Glenshelane River. Rhododendron does not occur within the construction works area and will not be disturbed by the proposed works.

Plate 6-10: Stand of Rhododendron

6.5.2.24 Mammals

6.5.2.24.1 Otter

All streams and drainage ditches within all parts of the proposed project were surveyed for Otter. No holts, spraints, slides, couches or other evidence of Otter activity was recorded during surveys within the proposed project. Optimal foraging habitat however was recorded along the lower reaches of the Glennafallia, Glenshelane and Farnane rivers (located within and downstream of the proposed project). In addition, the larger Finisk River and the Colligan River contain suitable salmonid populations for foraging (O'Reilly, 2009).

As outlined in Section 6.5.1.5.2, Otter have previously been recorded on the upper reaches of the Glenshelane River, upstream of the proposed Glenshelane clear span bridge river crossing, and also on the River Finisk, approximately 3km downstream of the proposed project. There is potential that Otter use connected streams and rivers that are hydrologically connected to the proposed project for foraging and commuting, due to the suitable habitat present and availability of prey (refer to Section 6.5.2.27). All NPWS records of Otter are within the boundaries of the Blackwater River (Cork/Waterford) SAC of which it is a qualifying interest.

The local population of Otter was therefore assessed as being of **International Importance.**

6.5.2.24.2 Badger

Little evidence of Badger activity was recorded within the proposed project during surveys. A single disused Badger sett was recorded near the western boundary of the proposed wind farm site along the Knocknasheega Stream, located 160m west of the proposed site road. The sett

was confirmed to be disused using a camera trap (under license No. 16/2022) which was installed at the sett for a period of five days.

The desk study indicates that Badger was previously recorded within the proposed wind farm boundary to the south of Knocknanask, no other records are available within the wind farm site boundary.

Despite the lack of evidence of Badger recorded during the field surveys, it is expected that Badger may use the proposed wind farm site for foraging and commuting, at least on occasion, considering the large areas of suitable habitat present within the study area.

The local badger population was assessed as being of **Local Importance (Higher Value).**

Plate 6-11 Potential badger sett showing no current signs of activity

6.5.2.24.3 Red Deer

Red Deer is the only true native species of Deer in Ireland. Red Deer was recorded on two occasions by identification of droppings; once in the northern part of the Glenshelane River Valley and once near the proposed substation site situated adjacent to the upper reaches of the Boherawillin Stream, in the southern part of the proposed wind farm site.

The native Red Deer population was assessed to be of **Local Importance (higher value).**

6.5.2.24.4 Fallow Deer

Fallow Deer were introduced to Ireland approximately 800 years ago and have since naturalised, although their populations can still have detrimental impacts on tree recruitment, overgrazing and poaching of streams which was evident during the survey. Fallow Deer are present locally in large numbers, throughout the proposed project. Heavy poaching of streams

and heathland habitat was observed, together with numerous tracks, droppings and occasional live sightings.

The Fallow Deer population was assessed to be of **Local Importance (higher value) because of their protection under the Wildlife Act.**

6.5.2.24.5 Bats

A specialist bat survey was carried out by Eire Ecology Environmental Consultants (see Appendix 6-1). Bat species recorded by static detectors included:

- Brown Long-eared Bat
- Common Pipistrelle
- Daubenton's Bat
- Leisler's Bat
- Nathusius' Pipistrelle
- Soprano Pipistrelle
- Natterer's Bat (Myotis nattereri)

A maternity roost for Common and Soprano Pipistrelle was recorded in a derelict dwelling along the upper reaches of Ballynamult Stream (EPA code: 18B13) approximately 1km north of the proposed wind farm site at Knocknasheega (Irish Grid coordinates: 214308, 107659). Brown Long-eared Bat was also recorded at this roost during an emergence survey.

An additional roost for a single Soprano Pipistrelle was recorded along the Graigueavurra Stream (EPA code: 18G34), approximately 14km south of where the River Farnane intersects with the proposed wind farm site boundary (Irish Grid coordinates: 215752, 101954).

No bat roosts, however, were recorded within the boundary of the proposed wind farm site.

The local population of bats were assessed to be of **Local Importance (higher value).**

6.5.2.24.6 Other Mammals Species

Other mammal species that were recorded during the desk study, within the study area included Irish Hare, Eurasian Red Squirrel, the West European Hedgehog and Pine Marten. Although none of these species were recorded during the surveys, there is potential that these species may utilise the proposed project, at least on occasion, due to the presence of suitable habitat (e.g. scrub, conifer plantation).

The population of other mammals was assessed to be of **Local Importance (higher value) because of their protection under the Wildlife Act and EU Habitats Directive.**

6.5.2.25 Invertebrates and Amphibians

6.5.2.25.1 Common Frog

Common Frog was recorded throughout the southern part of the proposed wind farm site, mostly within forestry drainage ditches which is their common breeding habitat (Reid *et al.,* 2013). Common Frog was also recorded within the willow scrub habitat, along the upper reaches of the Glenshelane River at the location of the proposed clear span bridge crossing. Suitable habitat such as drainage ditches, wet grassland and ephemeral ponding of water were also

recorded throughout the proposed project. Considering the live sighting of the species during the surveys and the suitable habitat present within the proposed project, the species is likely to commonly occur throughout the proposed project.

Common Frog was assessed to be of **Local Importance (higher value).**

Plate 6-12: Suitable Common Frog spawning habitat (left photo) and an Adult Frog (right photo) recorded within the proposed wind farm site

6.5.2.25.2 Smooth Newt

Smooth Newt is known to use a variety of water body types, such as garden ponds, natural pools, drainage ditches and quarry ponds (Meehan, 2013). A Smooth Newt survey was undertaken along the drainage ditches and small ponds present within the proposed project. No Smooth Newts were recorded during the field surveys and habitat was found to only be sub-optimal for newts. The pools of standing water and drainage ditches were deemed too shallow to support Smooth Newts, as the species generally utilises ponds with a depth of 0.5-1m (O'Neil *et al.,* 2004). Although Smooth Newt has previously been recorded within the wider surrounding area (outside the proposed project - refer to the desk study, Section 6.5.1.5.2 and Table 6-3) Smooth Newt are not likely to use the proposed project due to the absence of suitable habitat. Smooth Newt were therefore considered to be absent from the study area and are not considered further within the assessment.

6.5.2.25.3 Common Lizard

Common Lizard is a common species but difficult to observe, and occurs in a range of habitats, especially on east to south facing moors (peatland and heather) and rocky habitats (dry stone walls) (NRA, 2008; Gandola, 2019). Common Lizard was not recorded during the surveys but has been previously recorded within 100m of the Glenshelane River crossing (refer to Table 6-3). Suitable habitat was recorded within the proposed wind farm site such as stonewalls, heath and peatland habitat. Considering the presence of suitable habitat, and the previous recordings within the study area, the occurrence of this species within the proposed project could not be ruled out.

Common Lizard was assessed to be of Local Importance (higher value).

6.5.2.25.4 Marsh Fritillary

The species is widespread in Ireland and can be reasonably common if suitable habitat is present. Although widespread, it is also listed as vulnerable on the red list of Irish butterflies (Regan *et al.* 2010) due to habitat loss and degradation.

Although Marsh Fritillary was recorded during the desk study to the west and east of the proposed wind farm site as recent as 2021 (refer to Table 6-3), no suitable habitats, nor its food plant Devil's-Bit Scabious were recorded within the proposed wind farm site, during the habitat surveys. Marsh Fritillary is therefore considered to be absent from the study area and is not considered further within the assessment.

6.5.2.26 Invasive Non-Native Species (INNS) (Fauna)

6.5.2.26.1 Muntjac Deer

Muntjac Deer is a high impact invasive species registered on the Third Schedule (Part 2A Animals) of the S.I No. 477 of 2011, European Communities (Bird and Natural Habitats) Regulations 2011.

Muntjac Deer droppings were recorded at one location in the proposed wind farm site, at the northern part of Knocknasheega. Muntjac is a very small species of deer with small droppings which are often pointed on both ends as shown in Plate 6-14 below.

Plate 6-13: Muntjac Deer dropping recorded within the proposed wind farm site

6.5.2.27 Aquatic Species

Aquatic surveys were carried out at 23 locations including six additional eDNA sampling locations. A summary of the result is provided below.

6.5.2.27.1 Freshwater Pearl Mussel

eDNA sampling was carried out at survey sites along on the Glennafallia_020, Finisk_030 and the Franane_010 rivers to determine their possible presence/absence in waterbodies located downstream of the proposed project. The results did not suggest presence of Freshwater Pearl Mussel in any of the sampled waterbodies which aligned with the desk and aquatic habitat survey results. For further information see the aquatic report (Appendix 6-3).

Freshwater Pearl Mussel was not recorded in any waterbody hydrologically connected to the project. Therefore, Freshwater Pearl Mussel is not considered a KER and will not be assessed further.

6.5.2.27.2 White-clawed Crayfish

During surveys, no live White-clawed Crayfish were recorded. There was also no evidence recorded of White-clawed Crayfish carapace or claw remains on the riverbanks or bridge ledges, in the form of Otter scat or remains from predation.

The watercourses located within the boundary of the proposed project do not have suitable habitat for White-clawed Crayfish due to unsuitable geology, peatland afforested catchments, high energy channels and unsuitable substrate. Suitable instream vegetation and burrowing habitat required for crayfish was rare to absent resulting in a low availability of refuges.

eDNA sampling was carried out at strategically chosen locations on the Glennafallia_020, Finisk_030 and the Farnane_010 rivers to determine their possible presence/absence in waterbodies located downstream of the proposed project. The results indicated did not suggest presence of White-clawed Crayfish in any of the sampled waterbodies which corresponded with the desktop and aquatic habitat survey results. For further information see Appendix 6-3.

Due to the lack of evidence of White-clawed Crayfish recorded in any waterbody hydrologically connected to the proposed project and as the waterbodies within the study area lie outside the range of this species[2], effects are unlikely to occur. Therefore, White-clawed Crayfish is not considered a KER and will not be further assessed.

6.5.2.27.3 Salmonids

Following the habitat suitability survey, it was determined that the watercourses within the proposed project offer limited spawning, holding or nursery habitat for salmonids. This is mainly due to the high-energy flow, inaccessible reaches, and steep gradient, making them inaccessible for migratory salmon. However, the survey sites located on watercourses downstream of the proposed project (refer to Figure 6-1), offer improved salmonid habitat due to the low-lying topography, substrate composition and lower energy nature of the watercourses. This was evident in the lower reaches, where suitable salmonid holding, spawning and nursery habitat was recorded present at Site 21 and 23 on the Finisk and Colligan rivers (i.e. watercourses that are proposed to be crossed by the GCR).

The eDNA sampling was carried out at chosen locations on the Glennafallia_020, Finisk_030 and the Farnane_010 rivers to determine the possible presence/absence of Atlantic Salmon in waterbodies located downstream of the proposed project. The eDNA sampling indicated Atlantic Salmon to be present in the Glennafallia_020 (C1, upstream of Site 7) and the Farnane_010 rivers (E1, downstream of Site 16 and F1, downstream of Site 17) (refer to Figure

6-1). For further information see Appendix 6-3. These watercourses are all hydrologically connected to the proposed project and the Blackwater River (Cork/Waterford) SAC.

The population of Atlantic Salmon present in the sampled waterbodies was assessed to be of **International Importance.**

6.5.2.27.4 Lamprey

There were five areas on the Finisk River identified to be suitable for Lamprey ammocoetes; Site 11, 18, 20, 21 and 22 (refer to Figure 6-1). Site 18 contained six Lamprey ammocoetes ranging from 1.5cm-7cm, while Site 21 on the Finisk River contained four lamprey ammocetes that were all 2cm in length.

These watercourses drain the proposed project and flow into the Blackwater River (Cork/Waterford_ SAC. It is likely that these recorded species form part of the SAC population.

The populations of Sea, River and Brook Lamprey present in the sampled waterbodies was assessed to be of **International Importance.**

6.5.2.27.5 European Eel

European Eel was not recorded during the field surveys. The majority of survey sites were considered sub-optimal or unsuitable for Eel because of the high gradient, high-energy profiles and typical upland nature of the channels. All watercourses downstream of the study area however have the potential to support European Eel and the species has previously been recorded in the River Finisk by IFI in 2017 (Record ID:954; IFI, 2021), approximately 50m downstream of the proposed directional drilling works on the proposed GCR.

As European Eel is critically endangered and is present downstream of the sampled waterbodies, it was assessed to be of **Local Importance (higher value).**

6.5.2.28 Biological water quality

Macroinvertebrate sampling was undertaken at 22 of the 23 aquatic survey sites (site 1 was dry) within and downstream of the proposed project.

Of the 22 sites sampled, the target of Q4 unpolluted water quality was only achieved at six sampling sites, a Q3-Q4 status slightly polluted water was recorded at five sites and a Q3 status of moderately polluted water was recor4ded at 11 sites. The Small Streams Risk Score (SSRS) score for all sites ranged from 2.4 to 10.8 indicating that 15 of these streams and rivers are 'At Risk' of failing to meet 'Good' ecological status as required under the WFD. The results from these site surveys are discussed in detail in the aquatic report in Appendix 6-3.

6.6 SUMMARY OF KEY ECOLOGICAL RECEPTORS

Following a review of the existing environment presented above, KERs within the study area of the proposed project were evaluated in accordance with the evaluation criteria set out in Section 6.4. Table 6-7 lists all KERs for which detailed assessment is required (i.e. all receptors of Local Importance (high value) or higher and/ or subject to legal protection), the geographical context within which each is considered to be important and their legal status.

Table 6-7: Summary of Key Ecological Receptors for Protected Sites

Site	NRA (2009) Ecological Value	KER	Rational for Inclusion as KER
European Sites			
Blackwater River (Cork/Waterford) SAC [002170]	**International**	**Yes**	The Blackwater River SAC (Glenshelane River EPA code: 18G11) flows through the proposed project and the construction of a clear-span bridge is proposed to cross this SAC and River. Therefore, a pathway for possible effect is present.
Blackwater Estuary SPA [004028]	**International**	**Yes**	This SPA lies at the mouth of the Blackwater River which is hydrologically connected to the proposed wind farm site approximately 16.4km downstream.
Dungarvan Harbour SPA [004032]	**International**	**Yes**	There is potential for hydrological connectivity with the proposed GCR directional drilling works under the Colligan River (EPA code: 17C01). Therefore, there is potential for significant effects to occur.
pNHA			
Blackwater River and Estuary pNHA [000072] **[situated within Blackwater River (Cork/Waterford) SAC and**	**National**	**Yes**	This pNHA is situated within the Blackwater River (Cork/Waterford) SAC downstream of the proposed project. Therefore, a pathway for possible effect is present.

Site	NRA (2009) Ecological Value	KER	Rational for Inclusion as KER
Dungarvan Harbour SPA]			
Dungarvan Harbour pNHA [000663] **[situated within Dungarvan Harbour SPA]**	**National**	**Yes**	There is potential for hydrological connectivity with the proposed GCR directional drilling works under the Colligan River (EPA code: 17C01). Therefore, there is potential for significant effects to occur.

Table 6-8: Summary of Key Ecological Receptors for Habitats

Fossitt Habitat and code	Annex I habitat	NRA (2009) Ecological Value	KER	Rational for KER determination
BC1 - Arable crops	No	Local Importance (lower value)	No	This agricultural habitat has low ecological value and has therefore not been identified as a KER and will not be considered further.
BL1 - Stone walls and other stonework	No	Local Importance (Lower value)	No	A small number of stone walls were recorded within the study area mostly along drainage ditches or within conifer plantations.
BL3 - Buildings and artificial surfaces	No	Local Importance (lower value)	No	No noteworthy buildings were recorded within the study area that may have bat roost potential. Artificial surfaces recorded included tar-mac roads and car parks. The habitat was assessed as being of low ecological value and will not be considered further.
ED2 - Spoil and bare ground	No	Local Importance (lower value)	No	This habitat is found throughout the proposed wind farm site and mainly consisted of forestry roads and access tracks.
ED3 - Recolonising bare ground	No	Local Importance (lower value)	No	The habitat was assessed as being of low ecological value and will not be considered further.

Fossitt Habitat and code	Annex I habitat	NRA (2009) Ecological Value	KER	Rational for KER determination
FW1 - Eroding/ upland rivers	No	**Local Importance (Higher value)**	**Yes**	This habitat will potentially be impacted by surface water runoff and by works involving river crossings like the proposed clear-span bridges and horizontal directional drilling (HDD) locations.
FW4 - Drainage ditches	No	Local Importance (lower value)	No	These consisted mainly of forestry drains with low macrophyte cover.
GA1 - Improved agricultural grassland	No	Local Importance (lower value)	No	The improved agricultural grasslands have relatively low biodiversity and are used for cattle grazing or silage. The habitat was assessed as being of low ecological value and will not be considered further.
GS2 - Dry meadows and grassy verges	No	Local Importance (lower value)	No	The habitat was in poor condition and was recently mowed. The habitat was assessed as being of low ecological value and will not be considered further.
GS3 - Acid grassland	No	**Local Importance (higher value)**	No	These patches of habitat have links to Annex I priority species-rich *Nardus* grasslands (Fossitt, 2000) and are surrounded by Annex I wet heath. However, the small areas of this habitat lie outside of the proposed works footprint (approximately 300m to the west of Turbine 2) and will therefore not be impacted.
GS4 - Wet grassland	No	Local Importance (lower value)	No	This habitat consisted of a rank field with scattered scrub which was grazed by sheep, tree stumps from historical forestry were also present. The habitat was assessed as being of low ecological value and will not be considered.
HD1 - Dense bracken	No	Local Importance (lower value)	No	Patches of dense Bracken were scattered throughout the wind farm site amongst heath habitats. Bracken is a

Fossitt Habitat and code	Annex I habitat	NRA (2009) Ecological Value	KER	Rational for KER determination
				native type of fern which can become invasive and take over wetland and heathland habitats that are exposed and have become drier over time. The habitat was assessed as being of low ecological value and will not be considered further.
HH1 - Dry siliceous heath	Yes - European dry heath (4030)	**County Importance**	**Yes**	Although in poor condition due to grazing and burning it is considered a habitat of community interest listed in Annex I of the EC Habitats Directive.
HH3 - Wet heath	Yes - Annex I Atlantic wet heath (4010)	**County Importance**	**Yes**	Although in poor condition due to grazing and burning, especially in Knocknanask, it is considered a habitat of community interest listed in Annex I of the EC Habitats Directive. Turbine n. 1, 2, 3 and 5, including the proposed road will directly impact the habitat.
PB2 - Upland blanket bog	Yes - Annex I Blanket bog (7130)	**County Importance**	**Yes**	Although this habitat was in poor condition (non-priority) due to historic peat cutting, grazing and burning, it remains a habitat of community interest as listed in Annex I of the EC Habitats Directive. This habitat is threatened in EU territory (NPWS 2019b). One small area of Annex I priority blanket bog was also recorded. It is unlikely that the blanket bogs will be physically impacted by the proposed works but the works may have an impact on the hydrology of the area possibly impacting on this habitat.
WD1 - broadleaved woodland	No	Local Importance (lower value)	No	This habitat consisted of a single Eucalyptus plantation. The habitat was assessed as being of low ecological value and will not be considered.

Fossitt Habitat and code	Annex I habitat	NRA (2009) Ecological Value	KER	Rational for KER determination
WD3 - (Mixed) conifer woodland	No	**Local Importance (higher value)**	**Yes**	This habitat was occasionally encountered throughout the proposed wind farm site and showed good diversity of native tree species. This habitat will be traversed by a proposed road between Knocknasheega and Knocknanask.
WD4 - Conifer plantation	No	Local Importance (lower value)	No	Conifer plantations are monocultures of non-native trees that support very few native flora and fauna. The habitat was assessed as being of low ecological value and will not be considered.
WL1 - Hedgerows	No	**Local Importance (higher value)**	**Yes**	Hedgerow habitat will be impacted at the turning point of the proposed TDR.
WL2 - Treelines	No	**Local Importance (higher value)**	**No**	No treelines will be impacted as a result of the proposed project.
WS1 - Scrub	No	**Local Importance (higher value)**	**Yes**	An area of scrub will be impacted by the proposed access road and clear span bridge.
WS5 - Recently felled woodland	No	Local Importance (lower value)	No	This habitat contained few recolonising species. The habitat was assessed as being of low ecological value and will not be considered.
Invasive non-native plant species	No	N/A	No	The INNS are not considered KERs as they do not occur within the ZoI of the proposed project and will not be disturbed.

Table 6-9: Summary of Key Ecological Receptors for Species

Species	EU habitats Directive	Wildlife Acts	NRA (2009) Ecological Value	KER	Rational for Inclusion as KER
Mammals					
Otter	Annex II and IV	Yes	**International Importance**	**Yes**	Otter are likely to occur within the ZoI of the proposed project. There is potential for the works to cause visual and noise disturbance to this species. There is also potential to impact indirectly via potential impacts to surface water which may decrease food availability.
Badger	NA	Yes	**Local Importance (higher value)**	**Yes**	Signs of Badger activity were recorded within the study area during the surveys and desktop study. There is potential to impact on this species.
Red Deer	NA	Yes	**Local Importance (higher value)**	**Yes**	Red Deer was recorded within the study area during surveys. There is potential to impact on this species.
Fallow Deer	NA	Yes	**Local Importance (higher value)**	**Yes**	Fallow Deer were recorded in large numbers within the study area. They are also considered a high-impact invasive species (NBDC, 2023). There is potential to impact on this species.
Other mammals	Annex V (Pine Marten only)	Yes	**Local Importance (higher value)**	**Yes**	Red Squirrel, Pine Marten, Irish Stoat, Irish Hare, Hedgehog and Pygmy Shrew were recorded on the NBDC website[2]. Although no signs were recorded during the survey, potential impacts can occur on these species.
Non-native invasive mammal	NA	No	Local Importance (lower value)	No	The proposed project will not result in the breeding/ release of this species.

Species	EU habitats Directive	Wildlife Acts	NRA (2009) Ecological Value	KER	Rational for Inclusion as KER
species (Muntjac)					
Bats					
Common Pipistrelle	NA	Yes	**Local Importance (higher value)**	**Yes**	This bat species will encounter a high risk of turbine collisions (turbine 9, 10, 13 and 14) during its entire active season (April to September inclusive). There is potential to impact on this species. For further information see Appendix 6-1.
Leisler's Bat	NA	Yes	**Local Importance (higher value)**	**Yes**	This bat species will encounter a high risk of turbine collisions (turbine 11, 12, 13 and 14) during its entire active season (April to September inclusive). There is potential to impact on this species. For further information see Appendix 6-1.
Soprano Pipistrelle	NA	Yes	**Local Importance (higher value)**	**Yes**	This bat species will encounter a high risk of turbine collisions (turbine 10 and 14) during its entire active season (April to September inclusive). There is potential to impact on this species. For further information see Appendix 6-1.
All other bat species	NA	Yes	Local Importance (higher value)	No	No significant effects are anticipated as a result of the proposed project. For further information see Appendix 6-1.
Amphibians					
Common Frog	NA	Yes	**Local Importance (higher value)**	**Yes**	Common Frog was recorded during the desktop study and throughout the southern part of the proposed wind farm site mostly within

Species	EU habitats Directive	Wildlife Acts	NRA (2009) Ecological Value	KER	Rational for Inclusion as KER
					forestry drainage ditches which is common breeding habitat. Common Frog was also recorded at the clear span bridge location over the Glenshelane River. There is potential to impact on this species.
Smooth Newt	NA	Yes	Local Importance (higher value)	No	Smooth Newt was recorded 2.5 km south of the proposed wind farm site during the desktop study[2], however none were recorded during the surveys. Within the upland habitat dominated by conifer plantations and heather no suitable spawning or foraging habitat was observed.
Reptiles					
Common Lizard	NA	Yes	**Local Importance (higher value)**	**Yes**	Common Lizard was recorded during the desktop study but not during the survey, however, large areas of suitable / preferred habitat (heathland) was recorded within the proposed wind farm site. There is potential to impact on this species.
Invertebrates (Insect)					
Marsh Fritillary	Annex II	Yes	County Importance	No	No suitable habitat was present within the proposed wind farm site. There is no potential for impacts to this species.
Invertebrates (Bivalves)					
Freshwater Pearl Mussel	Annex II and V	Yes	International Importance (where Qualifying Interests [QI] of SAC)	No	No suitable habitat was recorded within or downstream of the proposed project and the species was not detected in any water sample that

Species	EU habitats Directive	Wildlife Acts	NRA (2009) Ecological Value	KER	Rational for Inclusion as KER
					was tested for eDNA. There is no potential for impacts to this species.
Invertebrates (Crustaceans)					
White-clawed Crayfish	Annex II and V	Yes	International Importance (where QI of SAC)	No	Suitable habitat for this species was not recorded within the proposed project. The proposed project is not hydrologically connected to waterbodies with known populations. There is no potential to impact on this species
Fish					
Atlantic Salmon	Annex II	Yes	International Importance (where QI of SAC)	Yes	Potential for indirect effects to Atlantic Salmon located downstream of the proposed project.
Lamprey sp. (Brook Lamprey, River Lamprey and Sea Lamprey)	Annex II and V (River Lamprey only)	No	International Importance (where QI of SAC)	Yes	Potential for indirect effects to Lamprey sp. located downstream of the proposed project.
European Eel	No	No	Local Importance (higher value)	Yes	Potential for indirect effects to this critically endangered species (IUCN Red List) which is present in the Finisk River approximately 50m downstream of a proposed GCR directional drilling site (Record ID 954, 30/08/2017 (IFI, 2021).

6.7 ASSESSMENT OF EFFECTS

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

6.7.1 Do Nothing Scenario

The proposed project encompasses commercial conifer forestry plantation and agricultural lands that are currently managed through a combination of intensively managed agroforestry and agricultural practices. If the proposed project does not proceed, the area is likely to continue to be used for forestry and agricultural purposes. Due to the more extreme nature of current weather patterns, it is also likely that drought and heavy rainfall will continue to increase erosion already present on Knocknanask.

6.7.2 Designated Sites

6.7.2.1 Construction Phase

6.7.2.1.1 European Sites

TOBIN prepared a Screening for Appropriate Assessment (AA) report which investigated the potential for the proposed project (construction, operational and decommissioning phases) to give rise to likely significant effects on European site(s), either alone or in-combination with other plans or projects. The screening assessment concluded, in light of best available scientific data, that there is potential for likely significant effects on the Qualifying Interests and conservation objectives of the:

- Blackwater River (Cork/Waterford) SAC [002170]
- Dungarvan Harbour SPA [004032]
- Blackwater Estuary SPA [004028]

A NIS was therefore prepared (contained within the Planning Application, TOBIN, 2024) to assess the potential for the proposed project to result in adverse effects on the integrity of these sites. The NIS identified the potential for adverse effects on the integrity of the Blackwater River (Cork/Waterford) SAC, Dungarvan Harbour SPA and Blackwater Estuary SPA due to a potential degradation of water quality within the site during the construction and decommissioning phases, in the absence of mitigation.

The degradation of water quality would result in a change in the community distribution and structure within habitats, a decrease in habitat area, and would reduce the carrying capacity of the SAC and SPAs to support the qualifying interests. Therefore, a degradation in water quality within the European sites would result in likely adverse effects on the qualifying interests/special conservation interests in view of their conservation objectives.

A degradation of water quality during the construction and decommissioning phases would result in **short-term, negative, moderate effects on the integrity of the European sites, at an international geographical scale.**

6.7.2.1.2 Other Designated Sites

Two pNHAs were identified as having source-pathway-receptor links to the proposed project, therefore significant effects are anticipated. The pNHAs are listed below:

- Blackwater River and Estuary pNHA [000072] (situated within Blackwater River (Cork/Waterford) SAC and Blackwater Estuary SPA)
- Dungarvan Harbour pNHA [000663] (situated within Dungarvan Harbour SPA)

Both pNHAs are located entirely within the above-mentioned European sites and therefore potential impacts discussed in relation to the European sites may also negatively affect the two pNHAs.

A degradation of water quality during the construction phase would result in **short-term, negative, moderate effects on the integrity of the pNHAs, at a national geographical scale.**

6.7.2.2 Operational Phase

6.7.2.2.1 European Sites

The NIS concluded that the proposed project will not result in any adverse effects during the operational phase. The management of surface water will be carried out in accordance with the proposed design and associated management features such as settlement ponds and Sustainable Drainage System (SuDS) which will have been installed during the construction phase and will be maintained throughout the operational phase. The drainage design will ensure that any surface water arising from the proposed project during operation will be contained and treated to ensure it can be dispersed from the proposed project without any impact on existing downstream activities. Therefore, there is no potential for water quality impacts during the operational phase.

The Collision Risk Model identified that there is no potential for significant effects on special conservation interests designated within any SPA (refer to Chapter 7 – Ornithology).

The proposed project will result in a slight increase in disturbance during the operational phase, but this will not result in significant effects on any qualifying interest.

Thus, considering the above, the operational phase of the proposed project **will not result in significant effects on the integrity of European sites at any geographical scale.**

6.7.2.2.2 Other Designated Sites

As mentioned, both pNHAs (Blackwater River and Estuary pNHA and Dungarvan Harbour pNHA) are located completely within the above-mentioned European sites. Therefore, considering the same operational phase impacts, the operational phase of the proposed project **will not result in significant effects on the integrity of pNHAs at any geographical scale.**

6.7.2.3 Decommissioning Phase

The proposed project is expected to be operational for at least 35 years. Decommissioning will include the dismantling of infrastructure, minor excavation activities and the removal of waste offsite. Impacts during the decommissioning on designated sites are expected to be of a lesser extent and magnitude to those anticipated during the construction phase, and of a shorter duration.

6.7.3 Habitats

6.7.3.1 Construction phase

6.7.3.1.1 FW1 – Eroding/ upland rivers

Habitat loss

There will be no loss of eroding/ upland river habitat as a result of the proposed project.

Water Quality Impacts

There will be no instream works carried out in any of the rivers identified in Section 6.5.2.7. However, at three locations a clear span bridge will be constructed over the watercourses. At these clear span bridge construction sites, potential exists for effects on water quality from sediment and construction pollution from hydrocarbons and construction materials resulting in a deterioration of water quality.

Directional drilling will be carried out under four rivers, the Colligan River, the Ballykerin_Middle Stream, the Finisk River and the Scart_18 Stream as part of the proposed GCR infrastructure. At each location a launch and reception pit will be excavated. During these works there is potential for impacts to occur from sediment runoff and drill lubricant (e.g. bentonite) pollution.

Infrastructure site works

It will be necessary to progressively clear the peat and subsoil material from the proposed wind farm site to facilitate formations for construction. Large volumes of peat and subsoil will be removed to allow construction of the hardstand areas, borrow pits, construction compound and site roads.

Site clearance, excavation activities and the stockpiling of material have the potential to result in the runoff of sediment and nutrients, if not appropriately managed, which could result in an increase of suspended solids and nutrients depositing within nearby watercourses. At Knocknanask and Knocknasheega there are a number of drainage ditches occurring throughout the proposed wind farm site, which are all hydrologically connected to EPA streams and rivers flowing into the Glenshelane and Glennafallia Rivers which flow into the Blackwater River (Cork/Waterford) SAC, the Blackwater River and Estuary pNHA and further downstream into the Blackwater Estuary SPA. In the southern part of the proposed wind farm site a number of drainage ditches are hydrologically connected to streams flowing into the Farnane and Boherawillin Rivers that discharge into the River Finisk which forms part of the Blackwater River (Cork/Waterford) SAC.

Increased silt loading in watercourses can stunt macrophyte growth, enhance filamentous algae growth, limit dissolved oxygen capacity and reduce the ecological quality of watercourses ultimately causing increased mortality of fish and other aquatic organisms. There is also the potential for spills and leaks of hydrocarbons, oils, and chemicals from storage areas or plant and equipment to impact on aquatic habitats.

The impacts on water quality of the upland/ eroding river habitat within and downstream of the proposed project have the potential to **result in a short-term, negative, moderate effects at a local geographical scale on the following rivers:**

- Glennafallia River
- Glenshelane River
- Farnane River
- Boherawillin River
- Finisk River
- Blackwater River

- Colligan River

Further details on surface water impacts are outlined in Chapter 9 – Hydrology and Hydrogeology.

6.7.3.1.2 HH1 - Dry Siliceous Heath / Annex I Dry Heath [4030]

Habitat loss

A total of 0.33ha of dry heath habitat will be lost to the proposed project which represents approximately 0.8% of the total Annex I dry heath habitat that was recorded within the project site (41.2ha). The areas of dry heath to be lost to the proposed project are within the favourable reference range (FRR) for dry heath habitat (NPWS, 2019b). The loss of 0.33ha of Annex I habitat therefore has the potential to impact the conservation status of the habitat. The Article 17 report (NPWS, 2019a) includes the area of this habitat that is present in Ireland (1230.01 km2 or 123,001ha). The loss of 0.33ha amounts to a national percentage loss of 0.00027%.

The reference area for dry heath is currently assessed by the NPWS to be Unknown, with a declining trend in area, estimated to be approximately 0.001% per annum since 1994. However, the NPWS considers an annual loss of 0.001% too small to trigger a deteriorating trend in overall status (NPWS, 2019b). The declining trend is due to pressures like intensive grazing by livestock, burning for agriculture, afforestation, wind power and associated infrastructure. The NPWS state that the overall conservation status of area is assessed as 'unfavourable-inadequate'. Therefore, the proposed project will have the potential to contribute a loss of 0.00027% (27 % of the total annual loss) of this habitat at a national level.

The permanent loss of the Annex I dry heath habitat within the proposed wind farm site **will result in a permanent, negative, moderate effects on the habitat at a county geographical scale.**

Dust Impacts

The Air Quality Assessment carried out within Chapter 14 – Air Quality and Climate, indicated that the '*likelihood of a significant nuisance arising from dust effects as a result of earthworks, prior to mitigation, is High*', and '*with respect to human health and ecology effects, the likely effect is assessed to be low and high risk respectively'.*

Excavation activities will be carried out within and adjacent to the dry heath habitat which could result in the deposition of dust within the habitat. The deposition of dust within the habitat could negatively impact sensitive heath and bog plant species, which would impact the structure and composition of the habitat.

The deposition of dust within the habitat would result in **short-term, negative, slight effects on the habitat at a local geographical scale**.

6.7.3.1.3 HH3 - Wet Heath / Wet Heath [4010]

Habitat loss

The footprint of the proposed project overlaps with the Annex I wet heath habitat where construction access roads and turbines 1 - 5 will be carried out. A total of 2.79ha of Annex I wet heath habitat will be lost to the proposed project which represents ca. 2.43% of the total Annex I wet heath habitat (114.91ha) that was recorded within the proposed wind farm site.

The areas of wet heath to be lost to the proposed project lie within the FRR for wet heath habitat (NPWS, 2019b). The loss of 2.79ha of Annex I habitat therefore has the potential impact the conservation status of the habitat. The Article 17 report (NPWS, 2019b) includes the area of this habitat that is present in Ireland (1598.51km2 or 159,851ha). The loss of 2.79ha amounts to a national percentage loss of 0.002%.

The reference area for wet heath was assessed by the NPWS to be 'inadequate', with a decreasing trend in area, estimated to be approximately 0.002% per annum since 1994 (NPWS, 2019b). This is due to pressures like intensive grazing by livestock, burning for agriculture, afforestation, wind power and associated infrastructure. The NPWS state that the overall conservation status is assessed as 'deteriorating'. Therefore, the proposed project will have the potential to contribute a loss of 0.002% (100% of the annual loss) of this habitat at a national level.

Considering the area of habitat which will be lost and that the habitat is in 'poor' condition and 'unfavourable bad' conservation status (refer to Appendix 6-2), **the permanent loss of the Annex I wet heath habitat within the proposed wind farm site will result in a permanent, negative moderate effect at a county geographical scale.**

Dust Impacts

As mentioned, dust effects on ecology receptors were considered 'High' (refer to Chapter 14 – Air Quality and Climate Change). Excavation activities will be carried out within and adjacent to the wet heath habitat which could result in the deposition of dust within the habitat. The deposition of dust within the habitat could negatively impact sensitive heath and bog plant species, which would impact the structure and composition of the habitat.

The deposition of dust within the habitat would result **in short-term, negative slight effects on the habitat at a local geographical scale**.

Alterations of Groundwater Flow

A large area of wet heath was recorded on Knocknanask. A total of five turbines (No. 1-5) are proposed for Knocknanask including relevant infrastructure within this habitat. This may have an effect on the hydrological regime of this habitat. The proposed road and related infrastructure may act as a barrier for water flow through the shallow peat layer. This could cause the lower elevated areas to dry out and higher elevated areas to retain more water, thus interrupting the existing hydrological regime.

A change in the hydrological regime within the wet heath habitat will result in a **permanent, negative, slight effects on the habitat at a at a local geographical scale.**

6.7.3.1.4 PB2 - Upland Blanket Bog

Habitat loss

The proposed infrastructure associated with the wind farm does not overlap with the upland blanket bog and therefore there will be no direct loss of habitat.

Dust Impacts

Excavation activities will be carried out within and adjacent to the upland blanket bog habitat which could result in the deposition of dust within the habitat. The deposition of dust within the

habitat could negatively impact sensitive heath and bog plant species, which would impact the structure and function of the habitat.

The deposition of dust within the habitat would result in **short-term, negative, slight effects on the habitat at a local geographical scale**.

Alterations of Groundwater Flow

Blanket bog was recorded on Knocknanask only. A total of five turbines (No. 1-5) are proposed for Knocknanask including relevant infrastructure which will encircle three quarters of the upland blanket bog. This may have an effect on the hydrological regime of this habitat. The proposed road and related infrastructure may act as a barrier for water flow through the shallow peat layer. This could cause the lower elevated areas to dry out and higher elevated areas to retain more water, thus interrupting the existing hydrological regime.

The potential impact on the hydrological regime of Annex I upland blanket bog within the proposed wind farm site will result in a **long term, negative, slight effects on the habitat at a local geographical scale.**

6.7.3.1.5 WD3 - (Mixed) Conifer Woodland

Habitat loss

The proposed TDR crosses this habitat to the west of the Glenshelane River on Knocknanask. In addition, the proposed GCR route crosses this habitat to the north of the Colligan River. Trees and understory vegetation located within the area of proposed infrastructure will likely need to be felled/cleared to facilitate the works (over a width of approximately 10m).

The loss of 0.07ha of (Mixed) conifer woodland will result in a **short term, negative, not significant effects on the habitat at a local geographical scale.**

6.7.3.1.6 WL1 - Hedgerows

Habitat loss

Where the proposed TDR turns off the N72 towards the proposed wind farm site, two hedgerows will be impacted (approximate length 70m). Following the completion of the construction phase, the area of hedgerow will be reinstated.

Considering the small area of hedgerow which will be temporary lost to facilitate the proposed project and the common occurrence of hedgerows within the wider surrounding area, the loss of the habitat will result in **short-term, negative, not significant effects at a local geographical scale.**

6.7.3.1.7 WS1 - Scrub

Habitat loss

Throughout the proposed wind farm site, small areas of scrub will need to be removed in order to establish the necessary infrastructure. The most notable area of scrub is the willow scrub located on either side of the Glenshelane River within the Blackwater River (Cork/Waterford) SAC. A clear span bridge will be constructed to span over this willow scrub habitat and avoid works within the SAC boundary.

The loss of 0.07ha scrub habitat will result in a **permanent, negative, not significant effect at a local geographical scale.**

6.7.3.2 Operational Phase

Habitat Loss

There will be no loss of habitats associated with the proposed project during the operational phase, with the exception of maintenance vegetation clearance around the turbines (refer to Section 6.8.2.1.4). During the operation of the wind farm, maintenance activity will be infrequent and low intensity, such maintenance activities will be confined to turbine locations, substations and other hardstanding infrastructures. It is possible that the overall habitat may improve due to a decrease of burning activities due to the newly installed turbines.

Water Quality

During the operational phase of the project, surface water runoff will be managed in accordance with the proposed design and associated management features such as settlement ponds which will be installed during the construction phase and will be maintained through the operational phase. The drainage design will ensure that any surface water arising from the proposed wind farm during operation will be contained and treated to ensure it can be dispersed from the proposed project without any significant impact on existing water bodies and aquatic organisms.

There is **no potential for significant effects on habitats during the operational phase**.

6.7.3.3 Decommissioning Phase

Decommissioning will include the dismantling of infrastructure, minor excavation activities and the removal of waste offsite. Impacts during decommissioning phase on habitats are expected to be of a lesser extent and magnitude to those anticipated during the construction phase, and of a shorter duration.

6.7.4 Species

6.7.4.1 Construction Phase

6.7.4.1.1 Otter

Habitat Loss

Construction works have the potential to result in effects on Otter. No instream works are proposed as part of the proposed project, however there is potential for the loss of suitable habitat which supports the species (NIEA, 2011) particularly at the HDD reception pit sites and where the clear-span bridges are proposed where habitat on the banks of river will temporarily be lost.

Clear-span bridges

Where clear span bridges are proposed over the Glenshelane River, Boherawillin Stream and Moneygorm East Stream, scrub and woodland vegetation will need to be removed (approximately 170m^2), which Otter may commute along. The presence of the construction machinery and personnel may also result in a temporary barrier to commuting Otter along the river. The Glenshelane River at the bridge location forms part of the Blackwater River (Cork/Waterford) SAC. Therefore, the construction works associated with the installation of

the clear span bridge across the Glenshelane River will result in **temporary, negative, slight effects on the local Otter population at an international geographic scale**.

Directional drilling

Directional drilling will use the road corridor for reception pit and launch pit placement. Where directional drilling is proposed under the Colligan River in a rural setting, scrub and woodland vegetation removal is proposed to accommodate the proposed GCR, possibly impacting on habitat occasionally used by Otter. Considering the minimal removal of scrub and woodland required for these works, the temporary loss of habitat at these locations will **not result in any significant effects to Otter at any geographical scale.**

Disturbance/displacement

There is potential that the proposed construction works, associated with the clear span bridges and directional drilling works, which are located directly adjacent to watercourses, may result in the disturbance of Otter when foraging or commuting nearby.

The construction of the proposed GCR which crosses a number of streams and rivers using directional drilling has the potential to result in disturbance to Otter.

However, the majority of construction activities will take place during daylight hours, thereby avoiding disturbance to Otter which are mostly crepuscular. Considering that the construction works will not be undertaken when Otter are most active and that no holts were recorded within the ZoI of the proposed project, the temporary disturbance associated with construction works will result in **temporary, negative, imperceptible effects (effect is not significant) on the local Otter population at an international geographic scale**.

Water Quality Impacts

Considering the proximity of the construction works to a number of watercourses, there is potential for elements of the proposed project, such as the installation of the clear span bridges and the HDD works along the proposed GCR, to result in the runoff of sediment laden water and hydrocarbons to deposit within the Glennafallia River, Glenshelane River, Farnane River, Boherawillin River which all flow into the Finisk River and the Blackwater River if not appropriately managed. This will result in indirect impacts on Otter due to a degradation of water quality resulting in impacts on their foraging resources. Chanin (2003) notes that 'Otters are not directly affected by water quality and will forage in conditions that seem extremely unpleasant to humans, however, where deterioration in water quality leads to a deterioration in food supply there will clearly be an indirect effect'.

A degradation of Otter foraging resources would therefore cause a **short-term, negative, slight effect on the conversation status of the local Otter population, at an international geographical scale**.

6.7.4.1.2 Badger

Habitat Loss

Despite the low levels of badger activity recorded during the surveys, there is potential that Badger may forage and commute throughout the proposed wind farm site, at least on occasion, due to the presence of suitable habitat and the previous historical records of the species. The

proposed project therefore has the potential to result in loss of possible foraging habitat for the species.

Considering the low level of activity recorded within the proposed project, the loss of approximately 35ha (0.36% of total landholding) of habitat, of which 94% comprises conifer plantations, it is considered that the loss will result in **permanent, negative, imperceptible effects (effect is not significant) on the local Badger population, at a local geographic scale.**

Disturbance/displacement

Construction works can result in the disturbance of badger breeding sites located within 150m of a construction works site (NRA, 2005). Although a sett (not in use at the time of the survey) was recorded within the proposed project site, the sett was located on the boundary, approximately 160m from construction works. Disturbance to the sett, even if it becomes active, are considered unlikely due to the setback distance from any significantly noise works.

Potential exists for Badger to forage within proximity to construction works areas. However, Badgers are a nocturnal species and are not likely to be active during the main construction works periods, which will be carried out during daylight hours.

Disturbance associated with the construction phase will not result in significant effects on the conservation status of the local Badger population at any geographic scale.

6.7.4.1.3 Deer

Habitat Loss

Deer tracks were regularly observed throughout the proposed project and local deer grazing and poaching was observed to be severe (see Appendix 6-2) and were considered likely to be caused by Fallow Deer. The proposed construction works will result in a permanent loss of foraging habitat. As noted, the habitat lost equates to approximately 0.36% of the total landholding. Considering the small area of habitat loss and the availability of similar alternative habitat within the wider, surrounding area, the loss of 0.36% of available foraging habitat **will not result in significant effects on the conservation status of the local Deer population at any geographic scale.**

Disturbance/displacement

The construction works are likely to temporarily disturb Deer from nearby foraging habitats. However, Deer are mobile species and are likely to move to alternative foraging sites during the construction phase, which exist in abundance within the wider landscape. Disturbance impacts to Deer during the construction phase **will not result in significant effects on the local Deer population at any geographic scale.**

6.7.4.1.4 Other Mammal Species

Habitat loss

The desktop study provides evidence that the proposed project supports other small, protected mammal species, such as Pine Marten, Hedgehog, Red Squirrel, Pygmy Shrew, Irish Stoat and Irish Hare. However, considering the availability of similar habitat within the surrounding environment and the lack of evidence recorded of these species during the field surveys, it is

considered that the proposed project is unlikely to be an important site supporting significant numbers of these protected mammal species.

In relation to habitat loss, considering the abundance of alternative suitable habitat within the wider landscape the potential impacts associated with habitat loss **will not result in significant effects on the conservation status of other mammal species at any geographic scale.**

Disturbance/displacement

In relation to disturbance, given the mobile nature of these species, the lack of evidence recorded during the site visits, and the availability of alternative habitat within the wider area the potential impacts associated with disturbance **will not result in significant effects on the conservation status of other mammal species at any geographic scale.**

6.7.4.1.5 Bats

The following bat species were considered to be at high risk from the proposed project (see Table 6-10 below:

- Common Pipistrelle
- Soprano Pipistrelle
- Leisler's Bat

Table 6-10: Shown below is a summary of risk assessment for the relevant bat species (from Appendix 6-1). Red highlighted cells show high risk for entire bat season (April to September inclusive)

Will turbines have a high risk to bats from July to September inclusive? (Yes/No)												
Turbine No	**1**	**2**	**4**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Leisler's Bat	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Common Pipistrelle	No	No	No	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes
Soprano Pipistrelle	No	Yes	No	No	No	No	Yes	Yes	No	No	Yes	Yes
Nathusius pipistrelle	No	No	No	No	No	No	No	No	No	No	No	No

Habitat loss

No bat roosts were identified within the proposed project. In addition, all trees to be felled within the proposed project were deemed non-suitable as they comprise Sitka Spruce and Eucalyptus (see Table 3-2 in Appendix 6-1,) and were assessed as having 'Negligible' bat roost potential, as per Collins (2016), due to the lack of suitable roost features. The clearance of vegetation to facilitate the proposed project will not result in the loss of bat roosting sites.

The proposed construction works will result in a loss of woodland (conifer plantations), the edge of woodlands are used by bats for foraging and commuting. As the woodland will not be removed completely, the woodland edge foraging/commuting habitat will not be lost entirely. Given the low ecological value of the conifer plantations, the loss of conifer woodland and the

displacement of foraging/commuting habitat will result in a **permanent, negative, not significant effect on the local bat population at a local geographical scale.**

Disturbance/displacement

New lighting will be installed at the proposed substation site. The new lighting will result in a localised increase in artificial lighting within the immediate surrounding area, which can negatively impact nocturnal species (Rich & Longcore, 2005). Lighting can impact bats' roosting sites, commuting routes and foraging areas (BCI, 2010) . Although no confirmed bat roosts were identified within the proposed project, or within the immediate surrounding area, bats were recorded foraging and commuting within the proposed project during the dusk activity survey. Direct illumination of bat commuting or foraging routes could alter feeding patterns, and/or deter bats from commuting along affected corridors, ultimately impacting bat populations.

Excess illumination of bat features could result in **short-term, negative slight effects on the local bat population, at a local geographical scale.**

6.7.4.1.6 Common Frog

Habitat loss/ Direct Mortality

The drainage ditches and ephemeral ponding of water within the proposed project were identified as being suitable habitat for Common Frog. The proposed project has the potential to cause direct mortality to adults, juveniles, their eggs and to reduce available suitable habitat for this protected amphibian species.

If construction works occurs within their suitable habitat during the Common Frog spawning season (February to June), there is potential that spawn, juveniles (tadpoles) and adults will be impacted. These impacts are likely to result in **short term, negative, slight effects on the Common Frog local population, at a local geographical scale.**

6.7.4.1.7 Common Lizard

Habitat loss/ Direct Mortality

Although not recorded during the surveys, there is potential that Common Lizard may occur within the boundaries of the proposed project, due to the presence of suitable habitat. Areas of heather will be lost to the proposed project, but this will constitute a small area, relative to the overall size of heather habitat available at the site.

There will be a loss of 0.16ha of dry heath and 1.93ha of wet heath habitat, both in poor condition and of bad conservation status, as a result of the proposed project.

Considering the relatively small area of habitat loss, and alternative suitable supporting habitat available for the species occurs throughout the surrounding area, impacts are likely to result in **short term, negative, imperceptible effects (effect is not significant) on the local Common Lizard population, at a local geographical scale.**

6.7.4.1.8 Fish

Construction works will be undertaken in close proximity to the watercourses located within the proposed project during the construction of the clear span bridges and directional drilling works. These proposed construction works have the potential to result in indirect effects on protected aquatic fish species as listed below, due to the potential release of sediment laden

water and/or hydrocarbons (oils, fuels) and concrete which would result in a degradation of water quality.

Atlantic Salmon

An accidental pollution event of a sufficient magnitude or the release of sediment- laden water and/or hydrocarbons into the river during the construction phase could affect the water quality downstream of the proposed project and impact Atlantic Salmon by smothering spawning grounds with silt and affecting respiration. One of the most important factors for Atlantic Salmon egg survival is oxygen supply, which is dependent upon dissolved oxygen concentration and inter-gravel flow. High concentrations of suspended solids in the river are undesirable as they are likely to result in infilling of the gravel pores with fine material (Cowx and Fraser, 2003).

A degradation in water quality would cause a **short-term, negative moderate effects on Atlantic Salmon at an international geographical scale.**

Lamprey sp.

Impacts on water quality due to the release of sediment laden water and/or hydrocarbons, of a sufficient magnitude, could affect the water quality downstream of the proposed project and impact Brook, River and Sea Lamprey by smothering spawning grounds with silt and affecting respiration. High concentrations of suspended solids in the river are undesirable as they are likely to result in infilling of the gravel pores with fine material and particles can abrade lamprey gills (Cowx and Fraser, 2003).

A degradation in water quality would cause a **short-term, negative moderate effect on Lamprey at an international geographical scale.**

European Eel

European Eel are impacted by habitat degradation and pollution (OSPAR, 2022). A potential sedimentation or pollution incident could therefore impact on critically endangered European Eel populations downstream of the proposed project.

A degradation in water quality (from the release of sediment laden water and hydrocarbons) would cause a **short-term, negative moderate effect on European Eel at a local geographical scale.**

6.7.4.2 Operational Phase

6.7.4.2.1 All Species

Noise and Vibration

As outlined in Chapter 12 – Noise and Vibration, during the operation phase noise levels will be within the best practice noise limits and no significant effects are expected to occur.

During the operational phase the level of operational traffic and ongoing maintenance is expected to be low. It is considered that any disturbance during the operational phase would result in **long term, negative, imperceptible effects (effect is not significant) on protected fauna at a local geographical scale.**

6.7.4.2.2 Bats

Lighting

New lighting will be installed at the proposed substation site The new lighting will result in a localised increase in artificial lighting within the immediate surrounding area, which can negatively impact nocturnal species (Rich & Longcore, 2005). Lighting can impact bats' roosting sites, commuting routes and foraging areas (Bat Conservation Ireland, 2010). Although no confirmed bat roosts were identified within the proposed wind farm site, or within the immediate surrounding area, bats were recorded foraging and commuting within the proposed project during the dusk activity survey. Direct illumination of bat commuting or foraging routes would alter feeding patterns, and/or deter bats from commuting along affected corridors, ultimately impacting bat populations.

Excess illumination of bat features could result in **negative, short-term, slight effects on the local bat population, at a local geographical scale.**

Collision Risk

Collison risk is a potential issue in relation to bats, with certain species being at a greater risk due to their flight characteristics and foraging habitats. Common Pipistrelle, Leisler's Bat and Soprano Pipistrelle were identified as being at risk of colliding with turbines 1, 2, 4, 6, 7, 8 (July to September) 9, 10, 11, 12, 13 and 14 (April to September) (see Table 6-10) and are discussed further below.

Common Pipistrelle

This bat species will encounter a high risk of turbine collisions (turbine 9, 10, 13 and 14) during its entire active season (April to September inclusive) and a risk of turbine collision between July and September (turbine 7 and 12). **Potential long-term, negative significant effects are likely to occur at a local geographic scale.**

Leisler's Bat

This bat species will encounter a high risk of turbine collisions (turbine 11, 12, 13 and 14) during its entire active season (April to September inclusive) and a risk of turbine collision between July and September (turbine 1, 2, 4, 6, 8, 9 and 10). **Potential long-term, negative significant effects are likely to occur at a local geographic scale.**

Soprano Pipistrelle

This bat species will encounter a high risk of turbine collisions (turbine 10 and 14) during its entire active season (April to September inclusive) and a risk of turbine collision between July and September (turbine 2, 9 and 13). **Potential long-term, negative significant effects are likely to occur at a local geographic scale.**

6.7.4.3 Decommissioning Phase

Decommissioning will include the dismantling of infrastructure, minor excavation activities and the removal of waste offsite. Impacts during the decommissioning phase on species are expected to be of a lesser extent and magnitude to those anticipated during the construction phase, and of a shorter duration.

6.8 MITIGATION

Mitigation measures which will be employed to avoid and/or reduce significant effects on biodiversity as a result of the proposed project are described below.

6.8.1 Construction Phase Mitigation Measures

Mitigation measures which will be implemented during the construction phase are detailed in the following sections. A Construction Environmental Management Plan (CEMP) has been prepared for the proposed project and is included within the Planning Application. The CEMP includes measures to prevent pollution of surface waters in addition to the project specific Surface Water Management Plan (SWMP) which forms part of Chapter 9 Hydrology and Hydrogeology. All mitigation measures outlined within this Biodiversity Chapter are also included within the CEMP.

6.8.1.1 European Sites

Mitigation measures protecting surface water quality will ensure the protection of the Blackwater River (Cork/Waterford) SAC, Dungarvan Harbour SPA and the Blackwater Estuary SPA during the construction phase are outlined in Chapter 9 – Hydrology and Hydrogeology, Section 9.5 and Section 7 of the NIS (TOBIN, 2024) which is contained in the Planning Application.

6.8.1.2 Proposed Natural Heritage Areas

Mitigation measures protecting surface water quality which will ensure the protection of the Blackwater River and Estuary pNHA and Dungarvan Harbour pNHA during the construction phase are outlined in Section 9.5 of Chapter 9 – Hydrology & Hydrogeology and Section 7 of the NIS (TOBIN, 2024) which is contained in the Planning Application.

6.8.1.3 Habitats

6.8.1.3.1 FW1 - Eroding/ upland rivers

All mitigation measures associated with the protection of water quality are outlined in Chapter 9 – Hydrology and Hydrogeology Section 9.5 and within the SWMP will be implemented, which will ensure the protection of the eroding/ upland river habitats located within or hydrologically connected to the proposed project. Further specific mitigation measures associated with the protection of water quality are outlined in the following paragraphs.

Sediment runoff at clear span bridge and directional drilling sites

The proposed mitigation measures are outlined here:

- No instream works will take place during all phases of the proposed project.
- Silt fences will be erected along all areas where the construction works are within 20m of a stream or river and 10m around stockpiled material. All silt fences will be erected outside of flood zones. The silt fencing will remain in position during the full construction phase of the project.
- Silt fences (woven, high tensile strength heavy porous filter fabric) will be used. No mesh type silt fences will be permitted. Silt fencing will be installed as per the manufacturer's guidelines (the bottom section buried at least 10cm deep) prior to any ground disturbance works.
- The excavated subsoil will be utilised on site and used to create bunds around the proposed facilities to create surface water runoff barriers.

- Excavation works will not be carried out during or following heavy rainfall (i.e. if there is a yellow weather warning or higher in place or 5-mm in a 1-hour period).
- A minimum 10m untouched vegetated buffer zone will be retained between the silt fence and the watercourse.
- No permanent storage of excavated material will be permitted within 50m of the any watercourse within the proposed project or within 10m from drainage ditches;

Construction pollution control at clear span bridge and directional drilling sites

- Spill-kits and hydrocarbon absorbent mats will be stored in the cabin of all construction vehicles. All machine operators and site staff must be fully trained in the use of this equipment.
- All machinery will be regularly maintained and checked for fuel, oil or hydraulic fluid leaks.
- Servicing of machinery will only be undertaken within the construction compound or offsite.

6.8.1.3.2 HH1 - Dry siliceous heath (Annex I Dry Heath)

A total of 0.33ha of Annex I dry heath will be lost to the development on Knocknanask and Knocknasheega (see Section 6.7.3.1.2). To compensate for this loss, restoration and enhancement measures will be implemented as detailed in the Biodiversity Management Plan (BMP) which is included in Appendix 2-1 of the EIAR.

In addition, the following mitigation measures will be implemented:

- Vegetation clearance will be kept to a minimum to prevent unnecessary habitat loss where works are to be carried out within dry heath habitat, especially in areas of Annex I habitat. The proposed construction work areas will be demarcated prior to the construction works commencing, to minimise the footprint of the works within dry heath habitat
- No clearance of vegetation will be undertaken outside of the demarcated areas within the proposed project.
- Suitably sized access mats will be used where appropriate to mitigate rutting on soft or wet ground and reduce soil erosion.
- All plant vehicles will be restricted to designated areas and access tracks to avoid impacting adjacent habitats and to ensure that soil compaction is restricted to these tracks.
- A Dust Management Plan has been prepared and in included as an Appendix in Chapter 14 – Air Quality & Climate. The Plan outlines dust suppression measures which will be implemented during the construction phase which will ensure the protection of habitats.

6.8.1.3.3 HH3 - Wet heath (Annex I Wet Heath)

A total of 2.79ha of Annex I wet heath will be lost to the development on Knocknanask only (see Section 6.7.3.1.2). To compensate for this loss, restoration and enhancement measures will be implemented as detailed in the BMP which is included in Appendix 2-1 of the EIAR.

In addition, the following mitigation measures will be implemented:

- Vegetation clearance will be kept to a minimum where works are to be carried out within wet heath habitat.
- The proposed construction work areas will be demarcated prior to the construction works commencing, to minimise the footprint of the works within wet heath habitat. No clearance of vegetation will be undertaken outside of the demarcated areas within the proposed project.
- Suitably sized bog mats will be used where appropriate to avoid rutting and reduce soil erosion.
- All plant vehicles will be restricted to designated areas and access tracks to avoid impacting adjacent habitats and to ensure that soil compaction is restricted to these tracks.
- Suitably sized drainage pipes will be perpendicularly placed under the road to ensure the hydrological link between wet heath habitat on the upper and lower mountain side is maintained.
- A Dust Management Plan has been prepared and in included as an Appendix in Chapter 14 – Air Quality & Climate. The Plan outlines dust suppression measures which will be implemented during the construction phase which will ensure the protection of habitats.

6.8.1.3.4 PB2 - Upland blanket bog (Annex I Blanket Bog)

No Annex I blanket bog will be physically impacted by the works but to ensure minimum disturbance to the hydrology the following mitigation measures will be in place:

- No access will be permitted to the areas of blanket bog habitat, especially the small area of intact priority Blanket Bog located 100m to the southeast of Turbine no. 5.
- Suitably sized drainage pipes will be perpendicularly placed under the road to ensure the hydrological link between blanket bog habitat on the upper and lower mountain side is maintained.
- Measures that will benefit the enhancement of the degraded blanket bog in the upland areas of Knocknanask are further described in the BMP, Appendix 2-1 of the EIAR.
- A Dust Management Plan has been prepared and in included as an Appendix in Chapter 14 – Air Quality & Climate. The Plan outlines dust suppression measures which will be implemented during the construction phase which will ensure the protection of habitats.

6.8.1.3.5 WD3 - (Mixed) conifer woodland

The following mitigation measures will be implemented to minimise the impacts to these habitats:

- The area to be felled will be demarcated prior to the works commencing
- If trees are to be felled within the bird nesting season, it is recommended that trees are first surveyed for the presence of bird nests. Where a nest is found, and if feasible, the tree will be cornered off until the chicks have fledged or until nesting has failed.

6.8.1.3.6 WS1 – Scrub and WL1 – Hedgerows

The following mitigation measures will be implemented to minimise the effects on these habitats:

- The area to be cleared/felled will be demarcated prior to the works commencing, to ensure vegetation clearance is kept to a minimum.
- If hedgerows are to be cleared within the bird nesting season, it is recommended that the trees are first surveyed for the presence of bird nests. Where a nest is found, and if feasible, the tree will be cornered off until the chicks have fledged or until nesting has failed.
- Following the removal of the proposed TDR turning bay (which will result in the loss of 70m of hedgerow) new hedgerow, comprising a mix of native species will be replanted at the same location.

6.8.1.4 Species

6.8.1.4.1 Otter

The following mitigation measures will be implemented to minimise water quality impacts on Otter:

- Water quality will be protected in all watercourses hydrologically connected to the proposed project following the mitigation measures detailed in sections 6.8.1.3.1 of this Chapter.

In order to prevent barrier effects to Otter commuting along the Glenshalane River the following mitigation measures will be implemented:

- Temporary fencing will be erected, allowing a 3m buffer from the riverbanks and the construction works area, creating an exclusion zone. The exclusion zone will protect the riverbanks and maintain safe passage of otter along the banks during the construction phase.
- All construction lighting will be directed away from the river to maintain a dark corridor.

6.8.1.4.2 Badger

The following mitigation measures will be implemented to minimise the impacts on Badger:

- Any temporary construction lighting used during the construction works will be cowled away from potential foraging/commuting sites to prevent disturbance to Badger within the area.
- To protect individual Badgers during the construction phase of the proposed project, all open excavations on site will be backfilled as soon as possible. Any deep excavations will have egress ramps in place, where feasible, to allow badger to safely exit the excavations.

Refer to Section 6.9.3.2 for details on pre-construction monitoring.

6.8.1.4.3 Other Protected Mammal Species

The following mitigation measures will be implemented to minimise the impacts on other mammal species:

- Any temporary construction lighting used during the construction works will be cowled away from potential foraging sites.

- To protect other mammal species during the construction phase of the proposed project, all open excavations on site will be backfilled as soon as possible. Any deep excavations will have egress ramps in place to allow mammals to safely exit the excavations.

6.8.1.4.4 Common Frog and Common Lizard

The following mitigation measures will be implemented to minimise the impacts on Common Frog:

- Pre-construction survey measures for Common Frog are outlined in Section 6.9.3.3 and in Section 6.9.3.4.
- All open excavations on site will be backfilled as soon as possible.

6.8.1.4.5 Aquatic Species

All mitigation measures associated with sediment and pollution control outlined in Chapter 9 – Hydrology and Hydrogeology Section 9.5 and within the SWMP will be implemented, which will ensure the protection of aquatic habitat located within or hydrologically connected to the proposed project.

Mitigation measures for all aquatic species identified as KER (Atlantic Salmon, Lamprey sp. and European Eel) will also follow the specific measures as set out in Section 6.8.1.3.1.

6.8.1.4.6 Bats

6.8.1.4.6.1 Buffer zone

As noted, Bats typically use woodland edge habitats for commuting and feeding purposes. Where turbines occur in close proximity to conifer plantation, the areas of conifer will be felled in order to discourage bat species from flying close to turbines.

The turbines blade tip height range from 179.5m to 185m, a rotor diameter range from 149m to 163m, a hub height range from 102.5m to 110.5m inclusive. Thus, all turbines within the proposed wind farm site will have a buffer between 97m to 100m.

6.8.2 Operational Phase Mitigation Measures

Mitigation measures which will be implemented during the operational phase are detailed in the following sections.

6.8.2.1 Bats

This section refers to ongoing mitigation once turbines are operational. Various measures will be implemented which lower the risk of bat fatalities throughout the lifespan of the wind farm. Buffer zones surrounding each turbine will dissuade woodland bats that depend on landscape features for guidance from flying near turbines. Two further methods are proven to reduce bat fatalities; feathering (reduced rotation speed when turbines are idling) and curtailment (keeping turbines turned off when conditions are good for bat activity). All turbines in the proposed wind farm will be feathered, while turbines 9, 10, 11, 12, 13 and 14, deemed high risk during the entire bat active season will be curtailed from April to September inclusive and turbines 1, 2, 4, 6, 7 and 8 will be curtailed from July to September.

6.8.2.1.1 Feathering of turbine blades

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. This is 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. Automatic 'feathering' of idling blades will be implemented (through Supervisory Control and Data Acquisitions [SCADA]) to reduce rotation speed of blades to below 1 RPM while idling (as recommended in Mathews, [2016]).

Turbine blades spinning in low wind can kill bats, however bats cannot be killed by feathered blades which are not spinning (Horn *et al.,* 2008). The feathering of turbine blades combined with increased cut-in speeds have been shown to reduce bat fatalities from 30% to 90% (NIEA, 2021; SNH, 2021; Wellig S.D., 2018; Rydell J., 2010; Arnett, 2011 and Baerwald, 2009).

As such, the feathering of blades to prevent 'idling' during low wind speeds is a requirement for all turbines and will be implemented.

6.8.2.1.2 Cut-in speeds/Curtailment

Increasing the cut-in speed above that set by the manufacturer can reduce the potential for bat/turbine collisions. A study by Arnett *et al.*, (2011) showed a 50% decrease in bat fatality can be achieved by increasing the cut-in speed by 1.5m/s.

The feathering of turbine blades combined with increased cut-in speeds has been shown to reduce bat fatalities from 30% to 90% (Adams *et al.,* 2021, Arnett et al., 2008, 2011, 2013; Baerwald et al., 2009). The most recent of studies showed a 63% decrease in fatalities (Adams *et al.,* 2021).

Species with elevated risk of collision (Leisler's bat, Soprano and Common Pipistrelle) in particular would benefit from increasing the cut-in speed of turbines, as dictated on a case-by case basis depending on the activity levels recorded at each turbine (see Table 6-10).

Increased cut-in speeds will be implemented from commencement of operation. Cut-in speeds will be increased during the bat activity season (April-September) where weather conditions are optimal for bat activity (see below) from 30 minutes prior to sunset and to 30 minutes after sunrise at turbines 9, 10, 11, 12, 13 and14. In addition, turbines 1, 2, 4, 6, 7 and 8 will be curtailed under the same parameters from July to September inclusive. No curtailment is currently necessary for turbines 3, 5 and 15.

Cut-in speeds restrictions will be operated according to specific weather conditions:

- When the air temperature is above a 10.0°C at nacelle height.
- Wind speeds below 5.0m/s (at nacelle height).

6.8.2.1.3 Alternative smart curtailment option

Due to the considerable unnecessary down time resulting from the proposed 'blanket curtailment' (above) and the advances in smart curtailment a focused curtailment regime could replace the proposed blanket curtailment outlined above once case studies have been published demonstrating its effectiveness at avoiding bat collisions.

This would focus on times and dates, corresponding with periods when the highest level of bat activity occurs within the site. This includes the use of the SCADA operating system (or equivalent) to only pause/feather the blades below a specified wind speed and above a specified temperature within specified time periods.

Post-constructions surveys will be undertaken for 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)

6.8.2.1.4 Buffer zones

The vegetation-free buffer zones around the identified turbines will be managed and maintained during the operational life of the development. Annual inspections of each buffer zone will be carried out and any regenerating trees or tall shrubs above 1m will be cut back. These buffer zones will be maintained as bog / heath type vegetation dominated by low-growing dwarf shrubs and grasses.

6.8.3 Decommissioning Phase Mitigation Measures

Impacts during decommissioning are expected to be a lesser extent and magnitude to those anticipated during the construction phase, and generally of a shorter duration. Therefore, the same mitigation measures implemented during the construction phase (see Section 6.8.1), will be applied during the decommissioning works.

6.9 PROPOSED MONITORING

6.9.1 Roles and Responsibilities (Construction Phase)

The applicant will appoint an Owners Engineer (OE) to act on their behalf during the construction phase of the project. The OE will have access to and / or employ various specialist advisors such as an archaeologist, ecologist, hydrologist and geotechnical engineer. The role of these specialist advisors will be defined in detail in the OE specifications but in summary it is expected that they will review and approve method statements and other documents relating to their specialisms.

The applicant will appoint a contractor to construct the proposed project, and the contractor will be required to provide a suite of specialists, including the ECoW, as part of their delivery team.

The applicant, OE and Contractor's team will form the '*Project Team'* for the construction phase of the development of the proposed project.

6.9.2 Core Responsibilities of Ecological Clerk of Works

The role of the ECoW is defined by British Standard BS 42020:20131 as 'person who has the ecological qualifications, training, skills and relevant experience to undertake appropriate monitoring and to provide specialist advice to "development" site personnel on necessary working practices required to i) safeguard *ecological receptor*s on site and ii) aid compliance with any consents and relevant wildlife legislation related to the works'. The requirements of the ECoW role is typically largely fulfilled by a single individual with support and assistance provided by technical specialists and senior colleagues when required. The ECoW (individual or team of individuals) must therefore have appropriate qualifications, training and experience to meet the requirements of the role and in addition, where needed, can access support from senior ecologists within the company with the required qualifications, training and experience.

The ECoW will have the power to 'Stop Works' at any time they deem it necessary to do so.

The ECoW will be responsible for monitoring compliance with the mitigation measures and construction phase monitoring requirements relating to ecology / biodiversity as set out in the project EIAR, CEMP etc. The ECoW will be responsible for the day-to-day management and interaction with the project Environmental Manager. The ECoW will have authority over the content of routine reports and will act independently in determining instances of non-compliance with the consents and licenses or any breaches of environmental legislation.

The role of the ECoW includes tasks such as, but not limited to, the following:

- Nest checks during bird breeding season,
- Relocation of amphibians,
- Supervision of works as required to ensure compliance with environmental legislation and the requirement of the schedule of works and EIAR.
- Preparation of Method Statements for ecological tasks such as those described above.
- Input to, and review of, construction method statements to ensure adequate protection of biodiversity is addressed during works.
- Updating the Biodiversity Management Plan during the lifetime of the project.

The ECoW will also be required to document activities using photographs and log information to registers / logs. The Environmental Manager and ECoW will work as a team and are expected to be in contact daily with the ECoW relaying any identified concerns or issues on site to the Environmental Manager.

6.9.3 Pre-construction Biodiversity Surveys

The pre-construction surveys will be carried out in suitable habitat, in advance of the construction works by the appointed ECoW.

6.9.3.1 Otter

Pre-construction Otter survey will be undertaken no more than 10—12 months in advance of the construction works as per the advice in the NRA (2008) guidelines, particularly at the directional drilling and clear-span bridge locations. In the event that a new holt (established within the interim period) is identified within the footprint of the works during the pre-construction survey, a method statement will be prepared detailing survey / monitoring methods, if required, and any mitigation will be applied. The method statement will also be used

to support a licence application to the NPWS licensing unit if a licence to disturb is required. The survey works and any mitigation required will be implemented prior to starting site clearance and any construction works

6.9.3.2 Badger

A pre-construction badger survey will be carried out prior to site clearance or works commencing. In the event that a new sett is discovered within the footprint of the construction works appropriate measures such as exclusion zones or sett exclusions will be carried out following industry methods. A method statement will be prepared detailing survey / monitoring methods, if required, and any mitigation to be applied.

The survey works and any mitigation required will be implemented prior to starting site clearance and any construction works.

6.9.3.3 Common Frog

The Irish Wildlife Manual: National Frog Survey of Ireland 2010/11[8] states '*Common frogs are among the earliest amphibians to breed as winter gives way to spring. Adults migrate to breeding ponds (unless they hibernated there) usually in February or early March, depending on latitude, altitude and local weather conditions'.*

Common Frog will be surveyed during the appropriate season in advance of any works at drainage ditches, slow flowing streams and ponds where the Common Frog may spawn. Suitable breeding habitat such as pools, ponds and drainage ditches within the project site were noted during the baseline surveys and will inform the pre-construction survey. A method statement will be prepared to detail specific measures to translocate the frogs and spawn, by hand or net, to suitable nearby habitat (to be identified prior to carrying out the survey) that will not be impacted by the proposed project. The method statement will be used to inform the application to NPWS for a licence to capture and relocate spawn and Frogs.

6.9.3.4 Common Lizard

Common Lizard will be surveyed during the appropriate season (March to October) in advance of any works at suitable habitat for the species. The survey work will focus on the peatland habitats at Knocknanask and Knocknasheega as these are suitable for use by the species. A method statement will be prepared to detail specific measures to translocate Common Lizard within the footprint of the works to similar habitat a sufficient distance away from the works. The method statement will be used to inform the application to NPWS for a licence to capture and relocate Common Lizard.

6.9.4 Post-construction Bat Monitoring

The baseline Bat survey will be updated in the first year of operation of the proposed wind farm.

In addition, monitoring will take place for three years after turbines have become operational, providing sufficient data to detect any significant change in bat activity relative to pre-construction levels. It will assess changes in Bat activity patterns and the efficacy of mitigation to inform any changes to curtailment.

[8] https://www.npws.ie/sites/default/files/publications/pdf/IWM%2058%20frog.pdf

During years one to three of operation (under blanket curtailment restrictions) bat activity will be measured at each turbine location (1 to 15), in combination with carcass surveys. Systematic searches for carcasses on the ground below wind turbines (focusing on the hard standing) will be undertaken. The searches will be undertaken by appropriately trained ecologist(s).

In addition, wind speed and temperature data will be continuously recorded at the nacelle height of each turbine.

Modern remotely operated wind turbines as proposed here allow cut-in speeds to be controlled centrally/automatically, facilitating an operation regime designed to minimise harmful impacts to Bats.

6.9.4.1 Monitoring Curtailment

If, following the initial three years of post-construction surveys, Bat activity increases above the baseline and/or remains consistently high and carcass searches indicate fatalities are occurring (refer below), increased cut-in speeds will continue. This will subsequently be monitored in years 5, 7, 10, 15, 20, 25 and 30 with further review after each monitoring period.

Alternatively, if it is found that the results of Bat activity surveys and fatality searches confirm that the level of Bat activity at turbine locations is low then consent will be sought from Waterford County Council (in consultation with NPWS) for the cessation in the requirement for these cut-in speeds / curtailment measures, or a reduction on the timing restrictions for these measures.

Where post construction acoustic surveys are undertaken, they will utilise full spectrum automatic detectors deployed, as a minimum, for one complete Bat activity season.

An assessment of static data gathered during operational surveillance will be completed using the online analysis tool Ecobat as recommended by SNH (2021) as a minimum, or other equivalent guidance as dictated by up-to date standards and practices.

6.9.4.1.1 Bat fatality monitoring

Although curtailment is a mitigation proven to lower bat fatalities it is recommended that the scheme be monitored for bat fatalities for the first three years of operation (post construction surveys) and subsequently in years 5, 7, 10, 15, 20, 25 and 30 as part of the additional curtailment monitoring schedule. A comprehensive onsite fatality monitoring programme is to be undertaken following published best practice (e.g. SNH 2021 or equivalent at the time of operation). Turbines 10, 13 and 14 will be included in all searches (highest recorded Bat activity).

a) Carcass removal trials to establish levels of predator removal of possible fatalities. This will be done following best recommended practice and with due cognisance of published effects such as predator swamping, whereby excessive placement of carcasses increases predator presence and consequently skews results. At the time of writing (2024), predation trials set using trail cameras following guidance set out in (Smallwood, 2010) provides the most accurate results.
b) Turbine searches for fatalities will be undertaken with the use of conservation dogs following best practice in terms of search area (minimum radius hub height) and at intervals selected to effectively sample fatality rates as determined by carcass removal trials in. At the time of writing (2024), the typical search area surrounding the turbine

bases follow (Edkins, 2014) Impacts Of Wind Energy Developments On Birds And Bats: Looking Into The Problem, who recommends the ''search width should be equal to the maximum rotor tip height", e.g. turbines at proposed project have a max tip height of 185m thus the spread of searched area, as a rectangle, square or circle, should be 92.5m in either direction form the turbine base;

c) Search intervals will follow SNH (2021) guidance.
d) Recorded fatalities will be calibrated against known predator removal rates to provide an estimate of overall fatality rates.
e) Monitoring report to be submitted annually to Waterford County Council and the NPWS.

6.10 CUMULATIVE EFFECTS

Information on the relevant projects within the vicinity of the proposed project is described in Chapter 4 of this EIAR (Policy, Planning and Development Context). The information was sourced from a search of the local authorities planning registers, EPA website, planning applications, EIAR documents and planning drawings which facilitated the identification of past and future projects, their activities and their potential environmental impacts. All projects listed in Chapter 4 of this EIAR were reviewed as part of the cumulative effects assessment. Key projects with the potential for cumulative effects are described further below.

The location of any offsite replanting (alternative afforestation) associated with the proposed project will be greater than 10km from the proposed wind farm site and also outside any potential hydrological pathways of connectivity (i.e. outside the catchment within which the proposed project is located). This was also considered here, but was found to have no significant cumulative effects due to this location requirement.

6.10.1 Projects

Dyrick Hill Wind Farm (Planning Ref.: 317265)

The proposed Dyrick Hill Wind Farm, the site of which is located directly adjacent to the currently proposed Scart Mountain Wind Farm site, was recently (October 2024) refused planning permission by An Bord Pleanála. As there is still a potential for judicial review at the time of writing this EIAR chapter (November 2024), it has been decided to include the project in the cumulative impact assessments. In the event that the refusal of the Dyricck Hill Wind Farm application is confirmed prior to the determination of the current application, then any discussions around cumulative impacts for this project in this EIAR can be ignored by ABP.

The proposed Dyrick Hill Wind Farm consists of 12 turbines of 6.0 to 7.2 MW each, associated infrastructure and a grid connection. The development is located in County Waterford on the Broemountain area which directly borders the proposed wind farm site. An EIAR of the Dyrick Hill Wind Farm was produced and an ecological appraisal undertaken (DEC, 2023), The EIAR identified potential impacts which included but are not limited to; habitat loss, disturbance to fauna, water quality impacts and habitat degradation. Additionally, the EIAR prescribed mitigation measures which will be implemented during all phases of the development.

After implementing the mitigation measures the residual impact associated with the Dyrick Hill Wind Farm on aquatic habitats, fisheries and aquatic fauna, Otter, and Herpetofauna was

considered to be imperceptible. For Bat species the residual impact was deemed to be a slight to imperceptible negative reversable effect, with the overall favourable conservation status being unaffected. For a number of habitats (acid grassland, wet grassland, hedgerows and dry heath) the residual impact is considered to be a permanent loss. However, a Habitat Management Plan was developed which describes measures and sets targets to offset the long-term loss of these habitats.

Therefore, no significant cumulative impacts are expected to occur.

Coumnagappul Wind Farm (Planning Ref.: 318446)

Coumnagappul Wind Farm Limited are proposing the development of 10 no. wind turbines with a blade tip height of 185m, a hub height of 104m and a rotor diameter of 162m, located approximately 10km northeast of the proposed Scart Mountain Wind Farm. The Project EIAR (Fehily Timoney, 2023) includes a Biodiversity Impact Assessment on key ecological receptors, which identified potential significant effects on designated sites, habitats and species in the absence of mitigation measures. The EIAR concluded however that '*the implementation of detailed mitigation measures outlined in the Natura Impact Statement, this chapter, Chapter 11 Soils, Geology and Hydrogeology and Chapter 12 Hydrology and Water Quality and the CEMP) there will be no significant residual impacts from the Site, GCR and TDR on biodiversity'.*

Considering the Coumnagappul Wind Farm project will not result in any residual significant effects, there is no potential for in-combination effects with the proposed project under appraisal in this report.

Therefore, no significant cumulative impacts are expected to occur.

6.10.2 Other Smaller Developments

There are a number of small projects in the area surrounding the proposed project that involve the construction or extension of small residential properties (e.g. Application no's: 22624, 19484, 19724 and 19726). Due to the small and temporary nature of these developments and lack of connectivity to the proposed project, there is limited potential for cumulative effects to arise.

6.11 RESIDUAL EFFECTS

The design of the proposed project has considered the existing ecological conditions within the receiving environment. Following the implementation of the proposed mitigation and monitoring measures associated with the construction, operation and decommissioning phases it is anticipated that the proposed project, will not result in significant residual effects on biodiversity, at any geographical scale, with the exception of the permanent loss of wet [4010] and dry [4030] heath. It was concluded that the loss of these habitats will result in significant residual effect at a County Level. Therefore, appropriate habitat compensation and enhancement measures will be implemented as outlined in Section 6.12 of this Chapter and is further detailed in the BMP in Appendix 2-1 of the EIAR.

A summary of the conclusions is provided in Table 6-11.

Table 6-11: Residual effects of the proposed project

Key ecological receptors	Potential effects	Significance of effects	Mitigation measures	Residual effects	Compensation Measures
European Sites					
Blackwater River (Cork/Waterford) SAC [002170]	Degradation of water quality (during the construction and decommissioning phases of the proposed project).	Short-term, negative moderate effects at an international scale.	Refer to Section 6.8.1.1.	No significant residual effects.	NA
Blackwater Estuary SPA [004028]	Degradation of water quality (during the construction and decommissioning phases of the proposed project).	Short-term, negative moderate, effects at an international scale.	Refer to Section 6.8.1.1.	No significant residual effects.	NA
Dungarvan Harbour SPA [004032]	Degradation of water quality (during the construction and decommissioning phases of the proposed project).	Short-term, negative moderate, effects at an international scale.	Refer to Section 6.8.1.1.	No significant residual effects.	NA
National sites (only pNHA)					

Key ecological receptors	Potential effects	Significance of effects	Mitigation measures	Residual effects	Compensation Measures
Blackwater River and Estuary pNHA [000072] **[situated within the Blackwater River (Cork/Waterford) SAC and Dungarvan Harbour SPA]**	Degradation of water quality (during the construction and decommissioning phases of the proposed project).	Short-term, negative moderate, effects at a national scale.	Refer to Section 6.8.1.2.	No significant residual effects.	NA
Dungarvan Harbour pNHA [000663] **[situated within Dungarvan Harbour SPA]**	Degradation of water quality (during the construction and decommissioning phases of the proposed project).	Short-term, negative moderate, effects at a national scale.	Refer to Section 6.8.1.2.	No significant residual effects.	NA
Habitats					
FW1 - Eroding/ upland rivers	Degradation of water quality (during the construction and decommissioning phases of the proposed project).	Short term, negative significant, effects at a local scale.	Refer to Section 6.8.1.3.1	No significant residual effects.	NA

Key ecological receptors	Potential effects	Significance of effects	Mitigation measures	Residual effects	Compensation Measures
HH1 - Dry siliceous heath **(Annex I Dry Heath)**	Loss of habitat	Permanent, negative moderate, effect during the construction phase at a county scale.	Refer to Section 6.8.1.3.2	**Long-term significant residual effect anticipated at a county scale.** However, following the correct implementation of the compensation and enhancement measures outlined in Section 6.12, and further detailed in the BMP (contained in Appendix 2-1 of the EIAR) will contribute towards improving the habitat condition and restoring its Favourable Conservation Status. The improvement of 41.87ha of dry heath will offset the loss of 0.33ha of degraded dry heath.	Refer to Section 6.12 and Appendix 2-1 of the EIAR.
	Dust impacts	Short-term, negative, slight effects at a local scale		No significant residual effects.	NA
HH3 - Wet heath **(Annex I Wet Heath)**	Loss of habitat	Permanent, moderate, negative effect during the construction phase at a county scale.	Refer to 6.8.1.3.3	**Long-term significant residual effect anticipated at a county scale.** However, following the correct implementation of the compensation and enhancement measures, outlined in Section 6.12, and further detailed in the BMP (contained in Appendix 2-1 of the EIAR), will contribute towards improving the habitat condition and restoring its Favourable Conservation Status. The improvement of 112.12ha of wet heath will offset the loss of 2.79ha of degraded wet heath.	Refer to Section 6.12 and Appendix 2-1 of the EIAR
	Dust impacts	Short-term, negative, slight effects at a local scale		No significant residual effects.	NA

Key ecological receptors	Potential effects	Significance of effects	Mitigation measures	Residual effects	Compensation Measures
PB2 - Upland blanket bog **(Annex I Blanket Bog)**	Habitat degradation by changes to hydrological regime.	Long-term slight, negative effect during the construction phase at a county scale.	Refer to 6.8.1.3.4	No significant residual effects.	NA
	Dust impacts	Short-term, negative, slight effects at a local scale		No significant residual effects.	NA
WD3 - (Mixed) conifer woodland	Loss of habitat	Permanent, not significant, negative effect during the construction phase at a local scale.	Refer to 6.8.1.3.5	No significant residual effects.	NA
WL1 - Hedgerows	Loss of habitat	Short term, not significant, negative effect during the construction phase at a local scale at a local scale.	Refer to 6.8.1.3.6	No significant residual effects.	NA
WS1 - Scrub	Potential loss of habitat	Permanent, not significant, negative effect during the	Refer to 6.8.1.3.6	No significant residual effects.	NA

Key ecological receptors	Potential effects	Significance of effects	Mitigation measures	Residual effects	Compensation Measures
		construction phase at a local scale.			
Mammals					
Otter	Habitat Loss	Temporary, slight, negative effects during the construction phase at an international scale.	Refer to 6.8.1.4.1	No significant residual effects.	NA
	Disturbance	Temporary, imperceptible effects during the construction phase at an international scale.	Refer to 6.8.1.4.1	No significant residual effects.	NA
	Water Quality Impacts	Short term, slight, negative effect during the construction and decommissioning phase at an international scale.	Refer to 6.8.1.4.1	No significant residual effects.	NA
Badger	Habitat Loss	Permanent, imperceptible negative effect	Refer to 6.8.1.4.2	No significant residual effects.	NA

Key ecological receptors	Potential effects	Significance of effects	Mitigation measures	Residual effects	Compensation Measures
		during the construction and decommissioning phase at a local scale.			
Deer	Habitat Loss	Permanent, not significant negative effects during the construction and decommissioning phase at a local scale.	Refer to 6.8.1.4.3	No significant residual effects.	NA
	Disturbance	Short term, not significant negative effects during the construction and decommissioning phase at a local scale.	Refer to 6.8.1.4.3	No significant residual effects.	NA
Other mammal species	Habitat Loss	Permanent, not Significant negative effects during the construction and decommissioning phase at a local scale.	Refer to 6.8.1.4.3	No significant residual effects.	NA

Key ecological receptors	Potential effects	Significance of effects	Mitigation measures	Residual effects	Compensation Measures
	Disturbance	Short term, not significant negative effects during the construction and decommissioning phase at a local scale.	Refer to 6.8.1.4.3	No significant residual effects.	NA
Bats					
Common Pipistrelle, Leisler's Bat and Soprano Pipistrelle	Habitat Loss	Permanent, not significant negative effect during the construction and decommissioning phase, at a local scale.	Refer to 6.8.1.4.6	No significant residual effects.	NA
	Disturbance - light	Short term, slight, negative effect during the construction, operation and decommissioning phase, at a local scale.	Refer to 6.8.1.4.6	No significant residual effects.	NA
	Collision risk – direct mortality	Long term, significant negative effect during the	Refer to 6.8.2.1	No significant residual effects.	NA

Key ecological receptors	Potential effects	Significance of effects	Mitigation measures	Residual effects	Compensation Measures
		operational phase, at a local scale.			
Amphibians					
Common Frog	Loss of Habitat and direct mortality	Short term, slight negative effect during the construction and decommissioning phase at a local scale.	Refer to 6.8.1.4.4	No significant residual effects.	NA
Reptiles					
Common Lizard	Loss of Habitat and direct mortality	Short term, imperceptible effects during the construction and decommissioning phases at a local geographical scale.	Refer to 6.8.1.4.4	No significant residual effects.	NA
Aquatic species					
Atlantic Salmon,	Degradation in water quality due to potential for sediment	Short-term, moderate negative effects during the construction and decommissioning	Refer to 6.8.1.4.5	No significant residual effects.	NA

Key ecological receptors	Potential effects	Significance of effects	Mitigation measures	Residual effects	Compensation Measures
	runoff and other pollution events.	phases at an international scale.			
Lamprey sp.	Degradation in water quality due to potential for sediment runoff and other pollution events.	Short-term, moderate negative effect during the construction and decommissioning phases at an international scale.	Refer to 6.8.1.4.5	No significant residual effects.	NA
European Eel.	Degradation in water quality due to potential for sediment runoff and other pollution events.	Short-term, moderate negative effect during the construction and decommissioning phases at a local geographical scale.	Refer to 6.8.1.4.5	No significant residual effects.	NA

6.12 ENHANCEMENT MEASURES

6.12.1 Habitat Compensation Measures

The proposed project will result in the permanent loss of 2.79ha wet heath (4010) and 0.33ha of dry heath (4030) as described in Sections 6.7.3.1.2 and 6.7.3.1.3. To compensate for the loss of wet heath (4010) and dry heath (4030) the following compensatory measures will be implemented:

- Management of grazing
- Prevention of burning

The correct implementation of the compensation and enhancement measures will contribute towards improving the wet heath (4010) and dry heath (4030) condition and restoring its Favourable Conservation Status. The improvement of 112.12ha of wet heath will offset the loss of 2.79ha of degraded wet heath. And the improvement of 41.87ha of dry heath will offset the loss of 0.33ha of degraded dry heath.

For further details on the proposed compensation for loss of habitat which will be implemented refer to the BMP Appendix 2-1 of the EIAR.

6.12.2 Habitat Enhancement Measures

To enhance the existing habitat within the proposed project site and within lands located outside the proposed project the following measures will be implemented:

- Clearence of conifer plantation
- Removal of bracken
- Rush and grassland management
- Hedgerows management
- Reduction in fertilizer
- Planting of native trees
- Scrub development

Further details on the above enhancement measures are included within the BMP in Appendix 2-1 of the EIAR.

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