

## 5 BIODIVERSITY

### 5.1 INTRODUCTION

This chapter has been prepared by Biosphere Environmental Services, on behalf of Inchamore Wind DAC, to accompany a planning application for the Development. This EIAR assesses the Project as a whole, including all relevant ancillary and subsidiary elements that are not part of the Development, and all direct and indirect effects, and cumulative impacts and interactions.

This chapter assesses the impacts of Inchamore Wind Farm (the Development) (as shown in **Figure 1.2**) on Terrestrial Ecology (namely habitats, flora, mammals and Kerry Slug). The Development refers to all elements of the application for the construction, operation and decommissioning of the proposed Inchamore Wind Farm (**Chapter 2: Project Description**). Where negative effects are predicted, the chapter identifies appropriate mitigation strategies therein. The assessment considers the potential effects during the following phases of the Project:

- Construction of the Project;
- Operation of the Project, and
- Decommissioning of the Project

Common acronyms used throughout this EIAR can be found in **Appendix 1.2**. This chapter of the EIAR is supported by Figures provided in **Volume III** and by the following Appendix documents provided in **Volume IV** of this EIAR:

- **Appendix 5.1** Total plant species list for habitats encountered within the redline boundary of the Site for the proposed wind farm at Inchamore
- **Appendix 5.2** Plant species list for habitats encountered along forest tracks within the grid connection route
- **Appendix 5.3** Bat Report: proposed wind farm development at Inchamore, Co. Cork. Bat Eco Services, 2023
- **Appendix 5.4** Inchamore Wind Farm: Kerry Slug Survey. Prepared by Wetlands Survey Ireland, September 2021
- **Appendix 5.5** Proposed Wind Farm Development at Inchamore, Co, Cork: Habitat Enhancement Plan. Prepared by BioSphere Environmental Services, 2023.
- **Appendix 5.6** Gortyrhilly and Inchamore Wind Farms, Bat Survey 2019/2020 Report. Prepared by Fehily Timoney Consulting Engineers

A Construction and Environmental Management Plan (CEMP) for the Project is appended to the EIAR in **Appendix 2.1**. This document is a key construction contract document, which will ensure that all mitigation measures, which are considered necessary to protect the environment, are implemented. For the purpose of this application, a summary of all the mitigation measures for the proposed wind farm project is included in **Appendix 17.1**.

### 5.1.1 Details of the Proposed Development

A detailed description of the Project has been included in **Chapter 2: Project Description**.

### 5.1.2 Purpose of the Report

The purpose of the report is to:

- Establish and evaluate the baseline ecological environment, as relevant to the Project.
- Identify, describe and assess all potentially significant ecological effects associated with the Project
- Set out the mitigation measures required to address any potentially significant ecological effects and ensure compliance with relevant nature conservation legislation.
- Provide an assessment of the significance of any residual ecological effects.
- Identify any appropriate compensation, enhancement or post-construction monitoring requirements.

### 5.1.3 Project Team

The following personnel have been involved in the terrestrial ecology assessment for the proposed Inchamore Wind Farm project.

**Dr Brian Madden BA (Mod.), Ph.D, MCIEEM** graduated in Natural Sciences from the University of Dublin in 1984 and earned a Ph.D. degree in 1990 from the National University of Ireland for his research on ecosystem processes in raised bogs. Brian has been operating as a consultant ecologist since the 1990s and has worked on a broad range of projects in all counties on the island of Ireland. Dr Madden is the lead author of this chapter and he also carried out habitat and mammal surveys at the proposed wind farm development site.

**Dr John Conaghan BSc., PhD, MCIEEM** is an experienced plant ecologist who has worked as a consultant ecologist in Ireland since 1994. He is a specialist in the survey and assessment of wetland vegetation and habitats with bogs and fens his main area of expertise. These surveys and assessments have contributed towards Environmental

Impact Assessments of a range of wind farm, power line, road, and gas pipeline developments. John carried out the habitat and flora surveys for the project.

**Dr Patrick Crushell BSc MSc PhD MCIEEM CEcol** holds an honours degree in Applied Ecology from UCC, a Masters degree in Environmental Resource Management from UCD and a PhD on peatland ecology from Wageningen University, the Netherlands. Patrick carried out the surveys for Kerry Slug for the project.

**Dr Tina Aughney** holds a BSc in Environmental Science and a PhD degree from NUI Galway and has been working as a bat specialist since 2000. Tina carried out bat surveys at the proposed Inchamore Wind Farm in 2022 and prepared the bat impact assessment for the project.

**Dr Jonathon Dunn (Fehily Timoney Consultants)** – conducted bat static detector surveys in 2019/2020, Jonathon is an ecologist with over seven years' experience in the environmental sector and holds a BA (Hons) in Natural Sciences (Zoology) from the University of Cambridge, an MSc in Ecology, Evolution and Conservation from Imperial College London and a PhD in Avian Ecology from Newcastle University.

## 5.2 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

### 5.2.1 Chapter Structure

In line with the EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022), the structure of this Biodiversity chapter is as follows:

- Assessment Methodology and Significance Criteria.
- Description of baseline conditions within the Project area.
- Identification and assessment of impacts on biodiversity associated with the Project, during the construction, operational and decommissioning phases.
- Mitigation measures to avoid or reduce the impacts identified.
- Identification and assessment of residual effects of the Project considering mitigation measures.
- Identification and assessment of cumulative impacts if and where applicable.

### 5.2.2 Relevant Legislation and Policy

The main pieces of legislation relevant to this chapter are as follows:

- The Wildlife Acts 1976 – 2022 as amended

- The Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) as amended
- The Birds Directive (Council Directive 2009/147/EC on the conservation of wild birds) as amended
- European Communities (Birds and Natural Habitats) Regulations 2011 - 2021
- Flora (Protection) Order, 2022 (S.I. No. 235 of 2022)

In considering ecological survey and assessment of impacts of the proposed Project, this chapter was prepared in accordance with the following guidance and information documents:

- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022).
- European Commission (2017) Environmental Impact Assessment of Projects. Guidance on the preparation of the Environmental Impact Assessment Report. (Directive 2011/92/EU as amended).
- NRA (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes.
- CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.
- Fossitt (2000). A Guide to Habitats in Ireland, Heritage Council, Kilkenny.
- Smith *et al.* (2011). Best Practice Guidance for Habitat Survey and Mapping in Ireland.
- Northern Ireland Environment Agency, Natural Environment Division (2021) Guidance on Bat Surveys, Assessment and Mitigation for Onshore Wind Turbine Developments in Northern Ireland. Belfast: Department of Agriculture, Environment and Rural Affairs (Northern Ireland).
- Scottish Natural Heritage (2019). Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation.
- EUROBATS 'Guidelines for consideration of bats in wind farm projects' Revision 2014.
- Bat Conservation Trust 'Bat Survey Good Practice Guidelines' 2012 (BCT Guidelines).
- Bat Conservation Ireland (2012). Wind Turbine/Wind Farm Development Bat Survey Guidelines, Version 2.8 December 2012 Bat Conservation Ireland, [www.batconservationireland.org](http://www.batconservationireland.org).
- Marnell, F., Kelleher, C. & Mullen, E. (2022). Bat Mitigation Guidelines for Ireland. V2. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage. Dublin, Ireland.

- England, N. (2014). Bats and onshore wind turbines Interim guidance. Rodrigues, L., Bach, L., Dubourg-Savage, M., Karapandža, B., Kovač, D., Kervyn, T., Minderman, J. (2015).

### 5.2.3 The Study Area

The principal study area for habitats and flora, terrestrial mammals and Kerry Slug was the actual Site for the proposed wind farm at Inchamore (as shown in **Figure 1.1**). This was considered adequate as the site does not adjoin any designated area or habitat of particular conservation value. However, the study area was extended to a distance of approximately 2 km from the wind farm boundary for the checking of potential bat roosts.

The study area also included the route for the underground grid connection (see **Figure 1.2**). This extends for a distance of approximately 19.9 km from the proposed 38 kV substation at Inchamore Wind Farm to the existing 220 kV GIS substation at Ballyvouskill. For the turbine delivery route, an assessment was made of locations where physical works are required to facilitate the passing of the vehicles (see **Figure 2.6**).

For habitats and flora species, the main study area is all land within the Redline boundary. However, consideration is given to the potential for sensitive habitats, such as bogs, fens, springs etc., or protected or rare plant species (including bryophytes), to a distance of up to 1 km of the Project area but more should ecological or hydrological connectivity exist. Such habitats may be part of designated sites at a national or international level (Department of Environment, Heritage and Local Government 2010).

For terrestrial mammal species, badger and otter are identified as the principal species likely to be affected by the construction of the Project. For badger, the main study area was a distance of approximately 100 m of the proposed turbine and associated infrastructure locations (after NRA 2006 & NRA 2009b). For otter, the main study area was a distance of at least 150 m upstream and downstream of any proposed crossing points of watercourses considered suitable to support otter (after NRA 2008 & NRA 2009b), including the margins of the watercourse to a distance of 10 m width.

For bats, the desk review study area extended to a distance of 10 km for roost sites and to 4 km for known caves. A habitat assessment for bat potential, including assessment of value of trees as bat roosts, was carried out to a distance of 200 m of the locations for the proposed turbines (following BCI Guidelines Ver. 2.8, 2012, NIEA 2021, NatureScot 2021).

## 5.2.4 Zone of Influence

The Zone of Influence (Zol), or distance over which potentially significant effects may occur, will differ across the Key Ecological Receptors (KERs), depending on the potential impact pathway(s). The results of both the desk study and the suite of ecological field surveys undertaken have established the habitats and species present within, and in the vicinity of, the Project. The Zol was then informed and defined by the sensitivities of each of the KERs present, in conjunction with the nature and potential impacts associated with the Development.

The Zol in relation to direct impacts on habitats and flora and fauna species as a result of the Project will be confined to the area within the Redline Boundary of the Development, as well as the Grid Connection Route to Ballyvouskill substation and the Turbine Delivery Route.

The Zol of general construction activities (i.e., risk of spreading/introducing non-native invasive species, dust deposition and disturbance due to increased noise, vibration, human presence and lighting) is not likely to extend more than several hundred metres from the proposed Redline Boundary but could be further for birds and bats.

The Zol of potential impacts on surface water quality in the receiving environment, and associated aquatic flora and fauna, could extend downstream for up to 15 km (following UK guidance, Scott Wilson *et al.* 2006) but more depending on connectivity.

## 5.2.5 Baseline Data Collection

### 5.2.5.1 Desk Study

#### Habitats, flora and terrestrial mammals

A comprehensive desktop review was carried out to identify features of ecological importance within the study area. This included a review of sites designated for nature conservation (European & National) as shown on NPWS website (see [www.npws.ie/protected-sites](http://www.npws.ie/protected-sites)) and protected species datasets held by the National Biodiversity Data Centre (see <http://maps.biodiversityireland.ie>).

#### Bats

The following sources of data on bats were accessed:

### **Bat Conservation Ireland Database**

Bat Conservation Ireland acts as the central depository for bat records for the Republic of Ireland. The bat database is comprised of >60,000 bat records. A 1 km and 10 km radius search was requested for the Irish Grid Reference W1403878722 (central point of wind farm site) in February 2023.

### **Bat Conservation Ireland Landscape Favourability**

Bat Conservation Ireland produced a landscape conservation guide for Irish bat species using their database of species records collated during the 2000 – 2009 survey seasons. An analysis of the habitat and landscape associations of all bat species deemed resident in Ireland was undertaken and reported in Lundy *et al.* 2011. The geographical area suitable for individual species was used to identify the core favourable areas of each species. This was produced as a GIS layer for local authorities and planners in order to provide a guide to the consideration of bat conservation. The island is divided into 5 km squares and the landscape favourability of each 5 km square for each species of bat was modelled. This model was used as part of the desktop study for this report.

### **Previous Survey Data for Inchamore Site**

A full season bat survey was previously completed in 2019 and 2020 by Fehily Timoney. This report was in reference to Inchamore and a second proposed development site at Gortyrhilly, Co. Cork. The full report is included in **Appendix 5.6**.

### **Kerry Slug**

The occurrence of the site for the proposed wind farm within the known range of Kerry Slug (*Geomalacus maculosus*) together with the presence of suitable habitat throughout the site suggested the likely presence of the species.

The Kerry Slug is protected by the Wildlife (Amendment) Act 2000. It is listed under Annex II of the Habitats Directive and seven Special Areas of Conservation (SACs) have been designated for the species with a combined total area of approximately 95,337 hectares. The Kerry Slug is also listed in Annex IV of the Habitats Directive and as such is strictly protected from injury, or disturbance / damage to their breeding or resting place wherever it occurs.

A review of data held by the National Biodiversity Data Centre (September 2021) confirms that the species has previously been reported from the 10 km square that the site intersects

(W17). The proposed wind farm is not located within any site designated for nature conservation. The nearest site designated for the protection of Kerry Slug is the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (NPWS Site Code: 0365).

Based on the habitats recorded during the ecological assessment of the proposed wind farm, the following potentially suitable habitats have been identified:

- wet heath / blanket bog and rock outcrop habitat present throughout much of the site.

### **Marsh Fritillary**

Results from the habitat and flora assessment indicate that the site does not support habitat suitable for Marsh Fritillary (an Annex II listed species), i.e. damp meadows with substantial coverage (at least 25%) of *Succissa pratensis*.

#### **5.2.5.2 Consultation**

As part of the study, consultation was made with the following relevant ecological parties:

- National Parks and Wildlife Services of the Department of Housing, Local Government and Heritage (response received 27<sup>th</sup> October 2022 – see **Appendix 1.1** in **Chapter 1**)
- BirdWatch Ireland (no response received)
- An Taisce (no response received)
- Irish Peatland Conservation Council (no response received)

#### **5.2.5.3 Field Surveys**

##### **Habitats, vegetation and flora**

The site of the proposed wind farm at Inchamore was visited and a walkover survey was conducted over two days, i.e., 7<sup>th</sup> July 2020 and 10<sup>th</sup> June 2021. Further survey was carried out on 20<sup>th</sup> December 2022 to review the locations of turbines in areas of heath and bog. The field survey was mainly concentrated in areas in which it is proposed to site wind farm infrastructure.

The route of the grid connection cable was surveyed in January 2022. This comprised a survey by car, with stops at intervals to review habitats and flora present alongside the roads and tracks. The route passes through open countryside before entering the existing substation at Ballyvouskill – this area was walked to record habitats and flora.

Habitats within the study area were classified after 'A Guide to Habitats in Ireland' (Fossitt, 2000). The dominant plant species present in each habitat type were recorded during the field surveys. This is considered sufficient to allow accurate classification of the habitats present. The extents and details of classified habitats were recorded and input to a GIS and are shown in **Figure 5.1** accompanying this report. Where relevant, linkages with the EU Habitats Directive classification system are given.

During the site survey particular attention was paid to the possible occurrence of plant species listed in either the Flora (Protection) Order, 2022 or the Irish Red Data Book (Curtis and McGough 1988). Vascular plant species nomenclature in this report follows Stace (2010) while that of mosses follows Smith (2004).

The mapping of habitats was assisted by the use of aerial photography (OSI Geohive & BING web-sites).

### **Terrestrial Mammals**

Terrestrial mammal species were detected by direct observations and by search for signs, such as tracks or feeding signs during the multi-disciplinary walkover survey on 10<sup>th</sup> and 11<sup>th</sup> June 2021.

The approach to the badger *Meles meles* survey was developed using NRA (2009b) 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Scheme', Transport Infrastructure Ireland. The extents of the development site was walked and checked for badger signs. Badger signs include setts, latrines, snuffle holes, prints, paths and tree scratching. Within the commercial plantations, search for badger signs was restricted to the margins of the forest stands and any accessible tracks or firebreaks through the plantations. Physical access through the interior of dense closed conifer plantation was not feasible. While conifer plantation on bog or heath provides poor habitat for badger, the areas which could not be surveyed, i.e. interior of closed canopy stands, will be assessed at time of tree felling - should such survey indicate a requirement for protection of badger, mitigation will be provided to comply with all relevant legislation (see **Section 5.6.3**).

## **Bat Field Surveys**

### ***Daytime Inspections***

#### **Building & structure inspection**

A number of buildings on and surrounding the Site were assessed for potential bat usage. Evidence of bat usage is in the form of actual bats or their signs. Inspections are undertaken visually with the aid of a strong torch beam (LED Lenser P14.2) and endoscope (General DC5660A Wet / Dry Scope). These structures were also assessed to determine their suitability as a bat roost and described using the parameters Negligible, Low, Medium or High suitability according to Collins (2016). Daytime inspections were completed on numerous dates in 2022.

#### **Tree potential bat roost (PBRs) inspection**

Deciduous trees located adjacent to buildings within the survey area were inspected (21/12/2022) to determine if they provide a roosting space for bats using the Bat Tree Habitat Key (BTHK, 2018) and the classification system adapted from Collins (2016). The Potential Roost Features (PRFs) listed in BTHK (2018) were used to determine the PBR value of trees. Evidence of bat usage is in the form of actual bats or their signs. A Phase 1 inspection was undertaken visually with the aid of a strong torch beam (LED Lenser P14.2) during the daytime searching for PRFs, if visible.

## **Bat Detector Surveys**

### **Dusk bat surveys – walking and driving transects**

Dusk Surveys were completed from 10 minutes before sunset to 110 minutes post sunset. These dusk surveys were primarily completed by walking transects within the Development area along tracks and conifer plantation edges.

- Dusk Survey on 21/7/2022 from 21:30 hrs to 23:20 hrs;
- Dusk Survey on 28/8/2022 from 21:20 hrs to 23:10 hrs.

Walking transects involved the surveyor(s) walking in survey area along tracks and safe accessible points, noting the time, location and bat species encountered. Mapping of bat encounters was undertaken using QGIS and an excel file produced for mapping purposes (ITM Irish grid reference co-ordinates).

Driving transects were undertaken for large survey areas and were completed along large tracks and local road network in the greater area around the proposed development site (after Aughney et al. 2018).

Walking and Driving transects were undertaken to gather information on local bat populations within and adjacent to the proposed development area. Walking and Driving transects were undertaken on the following dates:

- Driving transect on 21/7/2022 from 22:00hrs to 00:00 hrs;
- Walking transect on 21/7/2022 from 23:20 hrs to 01:30 hrs;
- Walking transect on 29/8/2022 from 21:20 hrs to 02:00 hrs;
- Walking transect on 19/9/2022 from 20:30 hrs to 01:00 hrs.

All bat encounters were noted during surveys.

The following equipment was used: Anabat Walkabout Full Spectrum Bat Detector, Petersson D200 Heterodyne Bat Detector & Bat Logger M2 Full Spectrum Bat Detector and Petersson D200 Heterodyne Bat Detector.

#### **Static bat detector survey**

Static bat detectors were deployed at each turbine location to record bat calls (echolocation). The data collected were analysed using Kaleidoscope Pro. Version 2.1.0. These data were prepared for EcoBat Tool analysis.

Static Surveillance was undertaken in 2022. The location of static units was determined by the proposed location of turbines. The following static unit models were deployed during this static bat detector surveys. Additional static units were deployed to survey habitats in September in order to gather additional information as recommended by SNH, 2021 (i.e. paired habitat surveys).

**Table 5.1: Static Bat Detectors deployed during Static Bat Detector Surveys.**

Static Unit Code	Bat Detector Type	Recording Function	Microphone
<b>SM4 Units 1-8</b>	Wildlife Acoustics SongMeter 4 Bat FS	Full Spectrum	SMM-U2, 4 m cable
<b>SM Mini Bat Units 1-12</b>	Wildlife Acoustics SongMeter Mini Bat	Full Spectrum	SMM-U2

Note: ultrasonic microphone were annually checked to ensure that their sensitivity was accurate for static surveillance.

## Summary Statistics, Mapping & Analysis

Summary statistics of data collated from static surveillance, walking and driven transects and dusk and dawn surveys were completed. All data collected was collated into excel files for each bat species in order to produce distribution maps.

In addition, the nightly number of bat passes recorded per species on the statics units were analysed using the website based tool Ecobat (<http://www.ecobat.org.uk/>).

## Bat habitats & Bat activity analysis

All static recording locations sampled are also classed according to their favourability as a bat habitat within 200 m radius of the static location. Four classifications are used:

- Open – for example, open peat bog. Typically, there is little tall vegetation in this category which is generally required for bat species to forage and commute along (exception to this is Leisler's bats). This category would be considered to have a low potential for the majority of bat species.
- Edge – for example, hedgerows, treelines and woodland edge. Bat species such as *Pipistrellus* species have a preference to fly along linear habitat features. This category would be considered to have a high potential for the majority of bat species.
- Closed – for example woodland. Bat species such as brown long-eared bats have a preference to foraging within woodland habitats. This category would be considered to have a high potential for the majority of bat species.
- Water – while an open habitat, due to the insect resource associated with water, these habitat types are often favoured by foraging bats, especially Daubenton's bat.

Habitats deemed by the author, under guidance of Roche *et al.* (2014) and Lundy *et al.* (2011), as "Bat Habitat" are as follows:

- Mixed broad leaved woodland;
- Water bodies;
- Linear habitat;
- Bog Woodland;
- Mosaic;
- Scrub, and
- Conifer plantation.

Additional QGIS layers were created to aid analysis for this report. Each bat encounter was mapped and bat encounters within 1 km of the proposed turbine locations was extracted to represent the bat encounters of the principal proposed development area. As bats

echolocation calls can be detected some distance from where the actual bat is flying, a 50 m fly zone was created around each bat encounter to represent the general area that individual bat recorded could be located at that point in time. This was named the “**Buffered Bat Encounters**” and represents the potential distance that bat echolocation calls can be detected by an ultrasonic microphone (*i.e.*, bat detector zone).

#### 5.2.5.3.1 Core Sustenance Areas

Bat Conservation Trust (BCT) defines Core Sustenance Zones (CSZs) for different bat species and this is based on an extensive literature review ([www.bats.org.uk](http://www.bats.org.uk)). A CSZ refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost. With reference to development, the CSZ could be used to indicate:

- The area surrounding a communal roost within which development work may impact the commuting and foraging habitat of bats using that roost.
- The area within which it may be necessary to ensure no net reduction in the quality and availability of foraging habitat for the colony.

#### Amphibians and reptiles

Incidental sightings of amphibians, namely the common frog *Rana temporaria* and smooth newt *Lisstriton vulgaris*, were recorded during the survey. Habitats within the study area were evaluated for their potential to support breeding amphibians. Suitable breeding habitat include areas of still freshwater such as pond, drainage ditches and wetlands.

Sightings of reptiles, namely the common lizard *Zootoca vivipara*, were noted during the surveys. Habitats within the study area were evaluated for their potential to support the common lizard. Suitable breeding habitat include bog and heath with exposed rock.

#### Kerry slug

The approach to surveying Kerry slug at the proposed wind farm was live refuge trapping as recommended for use by McDonnell *et al.* (2013) supplemented by targeted diurnal hand searches during site visits. The live refuge trapping method is favoured over other techniques because it enables quantitative sampling (McDonnell and Gormley 2011a, b). In addition, it removes the requirement of undertaking searches during wet weather (in the case of diurnal searches as the species is usually only active in daytime during damp weather), and the health and safety risks associated with nocturnal searches (when species is most active) in remote locations. The metric trap method involves the following:

- The metric traps (0.25 m<sup>2</sup>), manufactured by De Sangosse (Pont du Casse, France), are made up of absorbent material covered with a reflective upper surface and a black perforated plastic on the underside. They are wetted in advance of being laid out and are baited with Carrot. Traps are secured to rock outcrops (outcrop metric traps) or on surface vegetation (in the case of heath) using stones, tent pegs, or nails as appropriate. They can also be wrapped around tree trunks (banded metric traps) when undertaking surveys at wooded sites (not relevant to current survey as the target habitat at the current site is wet heath / blanket bog and rock outcrops). Traps are checked weekly for a period of up to six weeks. If required, traps are re-wetted during site visits using a watering can.

In addition to checking the metric traps, incidental observations of Kerry Slug were recorded during each site visit following hand searches amongst suitable habitat. A summary of the dates, methods, and weather conditions of each site visit undertaken are presented in **Table 5.2**.

**Table 5.2: Kerry Slug assessment: Survey effort at Inchamore**

Date	Site	Survey	Weather
23/07/2020	Inchamore	Hand searches and set traps	Light rain, wet conditions on site.
30/07/2020	Inchamore	Hand searches and check traps	Light persistent rain. Mild and calm.
13/08/2020	Inchamore	Hand searches and check traps	Light rain. Warm
20/08/2020	Inchamore	Hand searches and remove traps	Heavy showers, bouts of strong wind.

After an initial site walkover, the occurrence of suitable Kerry Slug habitat was identified and seven metric traps (see **Plate 5.1**) were deployed amongst wet heath and outcropping rock. The traps were deployed on the 23<sup>rd</sup> of July 2020 in areas of suitably identified habitats for Kerry slug and subsequently checked on three separate occasions with at least a weekly interval before being removed four weeks later. The location of each trap is summarised in **Table 5.3** and illustrated in **Figure 5.2** below.



**Plate 5.1: Slug trap on rock outcrop.**

**Table 5.3: Trap locations and habitats at Inchamore**

Trap	Location (ITM)	Habitat
Trap 1	512468, 578335	Rock outcrop (ER1) in wet heath (HH3) adjacent to a stone wall.
Trap 2	5124181, 578354	Rock outcrop (ER1) in wet heath (HH3) adjacent to a stone wall.
Trap 3	512460, 578537	Rock outcrop (ER1) in wet heath (HH3)
Trap 4	512405, 578583	Rock outcrop (ER1) in wet heath (HH3)
Trap 5	512406, 578594	Halved on wet heath (HH3) and rock outcrop (ER1)
Trap 6	512331, 578672	Halved on wet heath (HH3) and rock outcrop (ER1)
Trap 7	512482, 578615	Rock outcrop (ER1) in wet heath (HH3)



Figure 5.2: Slug trap locations at Inchamore.

### 5.3 ASSESSMENT APPROACH

The ecological evaluation and impact assessment approach used in this report is based on “Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA 2009) and “Guidelines on the information to be contained in Environmental Impact Assessment Reports” (EPA May 2022).

#### 5.3.1 Important Ecological Features

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

##### 5.3.1.1 Determining Importance

The importance of an ecological feature is considered within a defined geographical context. The following frame of reference has been used in this case (based on NRA Guidance 2009), relying on known/ published accounts of distribution and rarity where available, and professional experience:

The following frame of reference has been used in this case:

- International and European;
- National (Ireland);
- County (County Cork), and
- Local (lower value / higher value).

The above frame of reference is applied to the ecological features identified during the desk study and surveys to inform this report.

The value of habitats has been measured against published selection criteria where available. Examples of relevant criteria include: descriptions of habitats listed on Annex 1 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 has therefore been made to published lists and criteria where available. Examples of relevant lists and criteria include: species of European conservation importance (as listed on Annexes II, IV and V of the Habitats Directive); Irish Red Lists, e.g. Ireland Red List No. 3: Terrestrial Mammals, Marnell *et al.* (2019).

For the purposes of this report ecological features of Local importance or greater, and/or subject to legal protection, have been subject to detailed assessment. Effects on other ecological features are considered unlikely to be significant in legal or policy terms.

### 5.3.2 Impact Assessment

The impact assessment process involves the following steps:

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

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

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

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

Consideration of conservation status is important for evaluating the effects of impacts 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.

### 5.3.3 Significant Effects

The concept of ecological significance is addressed in paragraphs 5.24 through to 5.28 of CIEEM guidelines. Significance is a concept related to the weight that should be attached to effects when decisions are made. For the purpose of ecological impact assessment, a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g., for a designated site) or broad (e.g., national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local and the scale of significance of an effect may or may not be the same as the geographic context in which the feature is considered important.

The EPA Guidelines on information to be included in Environmental Impact Assessment Reports (EPA 2022) were adhered to when determining significance and the present assessment is in accordance with those guidelines.

**Table 5.4: Criteria for determining the Significance of Effects, based on EPA Guidelines (2022)**

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

#### 5.3.4 Cumulative Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects can occur where a proposed development results in individually insignificant impacts that, when considered in-combination with impacts of other proposed or permitted plans and projects, can result in significant effects.

#### 5.3.5 Avoidance, Mitigation, Compensation and Enhancement

When seeking mitigation or compensation solutions, efforts should be consistent with the geographical scale at which an effect is significant. For example, mitigation and compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved.

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

It is important for the 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.
- Enhancement is improved management of ecological features or provision of new ecological features, resulting in a net benefit to biodiversity, which may be unrelated to a negative impact or is 'over and above' that required to mitigate/compensate for an impact.

## 5.4 BASELINE ECOLOGICAL CONDITIONS

### 5.4.1 Physical and General Ecological Description of Site

The proposed wind farm Development is situated on the border of Counties Cork and Kerry and is approximately 5.9 km west of Ballyvourney. The lands are within the townlands of Inchamore, Mileeny, Derryreag and Derreenaling.

The proposed Development is located within the Derrynasaggart Mountains and situated within a landscape dominated by agricultural land (mainly used for stock grazing), commercial forestry and bog and heath of varying quality. There are a number of established wind farms in the region, including Coomagearlahy Wind Farm (c.2.7 km), Coolknoohil Kilgarvan Wind Farm (4.4 km), Glanlee Wind Farm (4.9 km) and Grousemount Wind Farm (7.5 km) (all southwest of the Site).

The altitude of the site ranges from approximately 300 m to 460 m AOD, with the local peak of Knockwee at 461 m AOD. The mapped geological formation underlying the site is classified as the Gun Point Formation (DUGNPT), which is comprised of Green-grey sandstone and Purple siltstone (see Chapter 8 for details). The primary soil type across the site is blanket peat, with some outcropping bedrock. Peat depth is generally shallow though localised pockets of deeper peat (> 2 m) occur in places.

The topography of the site varies, ranging from mostly gently to occasional steep inclinations. The site for the proposed Development is located within the Lee, Cork Harbour and Youghal Bay catchment. The site lies entirely within the Inchamore Stream sub-catchment where five tributaries flow into the Bardinch River, which then joins the Sullane River, a tributary of the Lee. All surface water drainage from the Site eventually combine in Carrigdrohid Reservoir, from which waters eventually flow to Cork Harbour. The Site itself is characterised by a relatively extensive network of non-mapped natural and artificial drainage channels. The natural streams within the Site are small 1<sup>st</sup> order tributaries which have high gradients and do not provide suitable habitat for fish or larger aquatic organisms. The Water Framework Directive status (2013-2018) for the mapped surface water body / river (Sullane\_010) directly draining the Site is classified as 'Good'.

The Grid Connection Route runs in an east to north-easterly direction from the Inchamore site to the existing Ballyvouskill 220kV substation. Much of the drainage along the route corridor is to the Clydagh River.

Ecologically, the site for the proposed wind farm can be described as being dominated by conifer plantation (WD4 of Fossitt 2000). The unplanted area of the site is mostly wet heath (HH3), with areas of upland blanket bog (PB2) and cutover bog (PB4). Other habitats represented within the Site are dry siliceous heath (HH1), exposed siliceous rock (ER1) and eroding/upland rivers (FW1). The grid connection route is almost entirely along forest tracks.

#### 5.4.2 Sites Designated for Nature Conservation

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

Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are designated under the EU Habitats Directive and EU Birds Directive respectively and are collectively known as 'European Sites' or 'Natura 2000' sites. The potential for significant effects on the integrity of European Sites is fully assessed in the AA Screening Report and Natura Impact Statement that accompanies this application. As per EPA Guidance 2022, *"a biodiversity section of an EIAR, for example, should not repeat the detailed assessment of potential effects on European sites contained in documentation prepared as part of the Appropriate Assessment process, but it should refer to the findings of that separate assessment in the context of likely significant effects on the environment, as required by the EIA Directive"*.

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

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

All Designated Sites that could potentially be affected were identified using a Source-Pathway – Receptor model. To provide context for the assessment, European and National Sites within a distance of 15 km surrounding the development site have been considered and are shown in **Figures 5-3 and 5-4** respectively. The distance of 15 km follows guidance from the Department of Environment, Heritage and Local Government (2010). However,

sites that were further away from the proposed development were also considered, especially where ecological and/or hydrological connectivity exists.

Information on the identified sites according to the site-specific conservation objectives is provided in **Tables 5.5** and **5.6**.

No part of the study site is within an area with a nature conservation designation or is adjacent to an area with such a designation.

### **European designated sites**

A total of 13 European sites are identified where consideration is given for the potential of the proposed project to impact on their qualifying interests and/or Special Conservation Interests. These sites are listed in **Table 5.5** along with the reasons for designation, the distance from the proposed wind farm site and whether any linkages or connectivity exist between the two locations. The designated sites are mapped in **Figure 5.3a and b**.

The European sites are considered in detail in the AA Screening Report / NIS which accompanies this application.

### **National designated sites**

A series of three Natural Heritage Area (NHAs) occur within a 15 km radius of the site (see **Figure 5.4** and **Table 5.6**). The nearest designated Natural Heritage Area to the Inchamore wind site is Sillahertane Bog NHA, which is approximately 5.5 km to the southwest.

### **Proposed designated sites**

A series of proposed Natural Heritage Areas (pNHAs) occur within a 15 km radius of the Inchamore site (see **Figure 5.6** and **Table 5.6**).

**Table 5.5 Relevant European sites, reasons for designation, distances from Inchamore site and summary of ecological connectivity.**

Note that in the following, the use of the term 'Project' includes the grid connection route and turbine delivery route.

European Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023) (*denotes a priority habitat)	Distance from proposed Inchamore Wind Farm Project Area and summary of ecological connectivity
<b>SPECIAL AREAS OF CONSERVATION</b>		
Killarney National Park, Macgillycuddy's Reeks & Caragh River Catchment SAC (site code 000365)	<p>Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110]</p> <p>Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130]</p> <p>Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]</p> <p>Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]</p> <p>European dry heaths [4030]</p> <p>Alpine and Boreal heaths [4060]</p> <p><i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]</p> <p>Calaminarian grasslands of the <i>Violetalia calaminariae</i> [6130]</p> <p>Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410]</p> <p>Blanket bogs (* if active bog) [7130]</p> <p>Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]</p> <p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]</p> <p>Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0]</p> <p><i>Taxus baccata</i> woods of the British Isles [91J0]</p> <p><i>Geomalacus maculosus</i> (Kerry Slug) [1024]</p> <p><i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]</p> <p><i>Euphydrias aurinia</i> (Marsh Fritillary) [1065]</p> <p><i>Petromyzon marinus</i> (Sea Lamprey) [1095]</p> <p><i>Lampetra planeri</i> (Brook Lamprey) [1096]</p> <p><i>Lampetra fluviatilis</i> (River Lamprey) [1099]</p>	<p>The Site at Inchamore is approximately 1.4 km south of the Caragh River component of the SAC. The closest point to the Turbine Delivery Route (along the access road from the N22 entrance) is 1.62 km south east of the SAC.</p> <p>The Site entrance/closest point of the TDR is located 1.75 km south east to the SAC.</p> <p>There are no ecological or hydrological linkages between the Project and the SAC.</p> <p>The location of the Development from the SAC is greater than the normal distance that foraging lesser horseshoe bats would normally fly. McAney (in Lysaght &amp; Marnell 2016) notes that the normal foraging distance is less than 2 km, while Schofield (cited in the NPWS Conservation Objectives for the site) notes that linear features such as hedgerows, treelines and stone walls provide vital connectivity for this species within 2.5 km around each roost.</p> <p>The majority of the grid connection route is located along the route of</p>

European Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023) (*denotes a priority habitat)	Distance from proposed Inchamore Wind Farm Project Area and summary of ecological connectivity
	<p><i>Salmo salar</i> (Salmon) [1106]  <i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303]  <i>Lutra lutra</i> (Otter) [1355]  <i>Trichomanes speciosum</i> (Killarney Fern) [1421]  <i>Najas flexilis</i> (Slender Naiad) [1833]  <i>Alosa fallax killarneyensis</i> (Killarney Shad) [5046]</p> <p>According to this SAC's site Conservation Objectives document (Version 1.0. Department of Culture, Heritage and the Gaeltacht, 23rd October 2017), for each of the listed QIs, the Conservation Objective is to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.</p>	<p>an existing forestry road which runs parallel to the Clydagh River. The closest distance between the cable route corridor and the SAC is 41 m. The route crosses three main streams and numerous drains which flow into the Clydagh.</p> <p><b>It is concluded that hydrological connectivity exists between the Project (by way of the grid connection) and the SAC and that further assessment is required.</b></p>
Mullaghanish Bog SAC (site code: 001890)	<p>Blanket bogs (* if active bog) [7130]</p> <p>According to this SAC's site Conservation Objectives document (Version 1.0. Department of Arts, Heritage Regional, Rural &amp; Gaeltacht Affairs, 16<sup>th</sup> May 2017) for each of the listed QIs, the Conservation Objective is to maintain the favourable conservation condition of the Annex I habitats and/or the Annex II species for which the SAC has been selected.</p>	<p>The Site is approximately 6.9 km south-southwest of the SAC.</p> <p>The Turbine Delivery Route is 7.1 km at its closest point to the SAC. There are no hydrological links between these areas and the SAC.</p> <p>While a section of the grid connection corridor runs within a forest track 632 m from the SAC, the SAC is on higher ground to the forest track with established forestry and open heath in between.</p> <p><b>It is considered that there is no potential for significant effects on this SAC.</b></p>
St Gobnet's Wood SAC (site code: 000106)	<p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]</p> <p>According to this SAC's site Conservation Objectives document (Version 1.0. Department of Housing, Local Government and Gaeltacht, NPWS 11<sup>th</sup> January 2022) for each of the listed QIs, the Conservation Objective is to maintain the favourable conservation</p>	<p>The Site is approximately 5 km west-northwest of the SAC.</p> <p>The Turbine Delivery Route at its nearest point (existing road of the N22) is 185 m northwest of the SAC. However, the</p>

European Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023) (*denotes a priority habitat)	Distance from proposed Inchamore Wind Farm Project Area and summary of ecological connectivity
	<p>condition of the Annex I habitats and/or the Annex II species for which the SAC has been selected.</p>	<p>closest point to proposed works (site entrance) is 6.08 km in distance from the SAC.</p> <p>The closest point along the Grid Connection Route is 5.46 km northwest of the SAC.</p> <p>There are no hydrological links between the TDR and GCR to the SAC.</p> <p>The Site and the SAC are linked hydrologically by the Sullane River (channel length c.8 km).</p> <p>However, the qualifying interest of the SAC, Old Sessile Oak Woods, occurs on ground above the high water mark and could not be affected in any way by potential pollutants from the project site which could be carried in the river water.</p> <p><b>It is concluded that while hydrological connectivity exists between the Project area and the SAC, there is no potential for significant effects on the qualifying interest of this SAC.</b></p>
<p>Blackwater River (Cork/Waterford) (site code 002170)</p>	<p>Estuaries [1130]                      Mudflats and sandflats not covered by seawater at low tide [1140]                      Perennial vegetation of stony banks [1220]                      Salicornia and other annuals colonising mud and sand [1310]                      Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]                      Mediterranean salt meadows (Juncetalia maritimi) [1410]</p>	<p>The site is approximately 11 km southwest of the SAC; the Grid Connection Route is located 4.1 km south of this SAC; the Turbine Delivery route is located 9.0 km south of this SAC; with no hydrological or ecological linkages between the locations and the SAC.</p>

European Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023) (*denotes a priority habitat)	Distance from proposed Inchamore Wind Farm Project Area and summary of ecological connectivity
	<p>Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260]</p> <p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]</p> <p>Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0]</p> <p><i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]</p> <p><i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]</p> <p><i>Petromyzon marinus</i> (Sea Lamprey) [1095]</p> <p><i>Lampetra planeri</i> (Brook Lamprey) [1096]</p> <p><i>Lampetra fluviatilis</i> (River Lamprey) [1099]</p> <p><i>Alosa fallax fallax</i> (Twaite Shad) [1103]</p> <p><i>Salmo salar</i> (Salmon) [1106]</p> <p><i>Lutra lutra</i> (Otter) [1355]</p> <p><i>Trichomanes speciosum</i> (Killarney Fern) [1421]</p> <p>According to this SAC's site Conservation Objectives document (NPWS 31<sup>st</sup> July 2012, Conservation objectives for Blackwater River SAC [002170]. Version 1.0. Department of Arts, Heritage and the Gaeltacht) for each of the listed QIs, the Conservation Objective is to maintain the favourable conservation condition of the Annex I habitats and/or the Annex II species for which the SAC has been selected.</p>	<p><b>It is considered that there is no potential for significant effects on this SAC.</b></p>
<p>Glanlough Woods SAC (site code: 002315)</p>	<p><i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303]</p> <p>According to this SAC's site Conservation Objectives document (NPWS 28<sup>th</sup> September 2018 Conservation objectives for Glanlough Woods SAC [002315]. Version 1.0. Department of Culture, Heritage and the Gaeltacht) for each of the listed QIs, the Conservation Objective is to maintain the favourable conservation condition of the Annex I habitats and/or the Annex II species for which the SAC has been selected.</p>	<p>The Site is approximately 14 km northeast of the SAC. The Turbine Delivery Route is located 16.6 km to the northeast of the SAC. The Grid Connection Route is located to 16.6 km to the northeast of the SAC. There are no hydrological links between these areas and the SAC.</p> <p>The location of the Development from the SAC is greater than the normal distance that foraging lesser horse-</p>

European Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023) (*denotes a priority habitat)	Distance from proposed Inchamore Wind Farm Project Area and summary of ecological connectivity
		<p>shoe bats would normally fly. McAney (in Lysaght &amp; Marnell 2016) notes that the normal foraging distance is less than 2 km, while Schofield (cited in the NPWS Conservation Objectives for the site) notes that linear features such as hedgerows, treelines and stone walls provide vital connectivity for this species within 2.5 km around each roost.</p> <p><b>It is considered that there is no potential for significant effects on this SAC.</b></p>
<p>Kilgarvan Ice House SAC (site code 000364)</p>	<p><i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303]</p> <p>According to this SAC's site Conservation Objectives document (NPWS 6<sup>th</sup> November 2018, Conservation objectives for Kilgarvan Ice House SAC [00364]. Version 1.0. Department of Culture, Heritage, and the Gaeltacht) for each of the listed QIs, the Conservation Objective is to maintain the favourable conservation condition of the Annex I habitats and/or the Annex II species for which the SAC has been selected.</p>	<p>The Site is approximately 10 km northeast of the SAC. The Turbine Delivery Route is located 12.5 km northeast of the SAC. The Grid Connection Route is located 12.3 km northeast of the SAC.</p> <p>There are no hydrological links between the Project and the SAC.</p> <p>The proposed wind farm site location from the SAC is greater than the normal distance that foraging lesser horseshoe bats would normally fly. McAney (in Lysaght &amp; Marnell 2016) notes that the normal foraging distance is less than 2 km, while Schofield (cited in the NPWS Conservation Objectives for the site) notes that linear features such as hedgerows, treelines and stone walls provide vital connectivity for this species within 2.5 km around each roost.</p>

European Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023) (*denotes a priority habitat)	Distance from proposed Inchamore Wind Farm Project Area and summary of ecological connectivity
		<b>It is considered that there is no potential for significant effects on this SAC and no further assessment is required.</b>
Old Domestic Building, Curraglass Wood SAC (site code 002041)	<p><i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303]</p> <p>According to this SAC's site Conservation Objectives document (NPWS 27<sup>th</sup> August 2018, Conservation objectives for Old Domestic Building, Curraglass Wood SAC [002041]. Version 1.0. Department of Culture, Heritage, and the Gaeltacht) for each of the listed QIs, the Conservation Objective is to maintain the favourable conservation condition of the Annex I habitats and/or the Annex II species for which the SAC has been selected</p>	<p>The Site is approximately 8.1km east of the SAC. The Grid Connection Route is located 9.8 km east of the SAC. The Turbine Delivery Route is located 9.8 km east of the SAC. There are no hydrological links between the Project and the SAC.</p> <p>The location of the Site from the SAC is greater than the normal distance that foraging lesser horse-shoe bats would normally fly. McAney (in Lysaght &amp; Marnell 2016) notes that the normal foraging distance is less than 2 km, while Schofield (cited in the NPWS Conservation Objectives for the site) notes that linear features such as hedgerows, treelines and stone walls provide vital connectivity for this species within 2.5 km around each roost.</p> <p><b>It is considered that there is no potential for significant effects on this SAC.</b></p>
The Gearagh SAC (site code 000108)	<p>Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]</p> <p>Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidentation</i> p.p. vegetation [3270]</p> <p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]</p>	<p>The Site is located 16.8 km northwest of the SAC. The Turbine Delivery Route (where works are proposed) is located 18.3 km northwest of the SAC. The Grid Connection Route (at its nearest point) is located 18.3 km northwest of the SAC.</p>

European Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023) (*denotes a priority habitat)	Distance from proposed Inchamore Wind Farm Project Area and summary of ecological connectivity
	<p>Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0]</p> <p><i>Lutra lutra</i> (Otter) [1355]</p> <p>According to this SAC's site Conservation Objectives document (Version 1.0. Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, 15th September 2016) for each of the listed QIs, the Conservation Objective is to maintain the favourable conservation condition of the Annex I habitats and/or the Annex II species for which the SAC has been selected.</p>	<p>The Sullane River, which drains the Site for the proposed wind farm, flows in a south and then east direction for a distance of approximately 24 km before it enters the River Lee system at Coolcour, approximately 3 km downstream of the Lee Bridge, which marks the eastern extremity of the Gearagh SAC. Flow continues eastwards towards Cork Harbour. Taking into account (i) that the flow from the area of the proposed wind farm does not mix with water within the SAC, and (ii) the channel distance of over 20 km between the two locations, there is no realistic potential for water from the wind farm area (which could carry contaminants in absence of mitigation) to have effects on the qualifying interests of the SAC.</p> <p><b>It is considered that there is no potential for significant effects on this SAC.</b></p>
<p>Great Channel (site code 001058) Island SAC code</p>	<p>Mudflats and sandflats not covered by seawater at low tide [1140]</p> <p>Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330]</p> <p>According to this SAC's site Conservation Objectives document (Version 1.0. Department of Arts, Heritage and the Gaeltacht, 6<sup>th</sup> June 2014) for each of the listed QIs, the Conservation Objective is to maintain the favourable conservation condition of the Annex I habitats and/or the Annex II species for which the SAC has been selected.</p>	<p>The Site is located 62.2 km west of the SAC.</p> <p>The nearest point along the Turbine Delivery Route is located 5.9 km from the SAC. The nearest point along the Turbine Delivery Route where works are proposed (site entrance) is a distance of 62.8 km west of the SAC.</p> <p>The closest point along the Grid Connection Route is near the existing</p>

European Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023) (*denotes a priority habitat)	Distance from proposed Inchamore Wind Farm Project Area and summary of ecological connectivity
		<p>220 kV Ballyvouskill Substation at a distance of 51.7 km northwest of the SAC.</p> <p>The Sullane River, which drains the Site for the proposed wind farm, enters the River Lee system at Coolcour, approximately 24 km from the site of the proposed wind farm. The Lee then flows for approximately 40 km before entering Cork Harbour. There is a further 5 km distance across the harbour to the SAC.</p> <p>While there is a total distance of approximately 69 km from the Inchamore site to the SAC, hydrological connectivity does exist. However, in view of the distance between the two locations, it is considered that there is no potential for measurable effects on the qualifying interests of the SAC. Any pollutants or silts entering the drainage network at the site for the proposed wind farm, even in the most extreme scenarios and without mitigation of any form, would be completely attenuated by the dilution, dispersal and settlement that would occur within the river and estuarine system.</p> <p><b>It is considered that there is no potential for significant effects on this SAC.</b></p>
<b>SPECIAL PROTECTION AREAS</b>		

European Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023) (*denotes a priority habitat)	Distance from proposed Inchamore Wind Farm Project Area and summary of ecological connectivity
Mullaghanish to Musheramore Mountains SPA (site code: 004162)	<p>Hen Harrier (<i>Circus cyaneus</i>) [A082]</p> <p>According to the First Order Site-specific Conservation Objectives Version 1.0 for Mullaghanish to Musheramore Mountains SPA (NPWS 2022, Department of Housing, Local Government and Heritage), for each of the listed SCIs, the Conservation Objective is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.</p>	<p>The site of the proposed wind farm at Inchamore is approximately 6 km west of the SPA.</p> <p>Habitats suitable for foraging by hen harrier, including bog, heath, wet grassland and scrub, occur fairly widely between the SPA and the wind farm site.</p> <p>The habitats within the wind farm site have potential to support foraging hen harriers.</p> <p>A section of the grid connection route is located along the route of an existing forestry road which runs north of the SPA. The closest distance between the cable route corridor and the SPA is 170 m.</p> <p>The proposed works on the Turbine Delivery Route are at a distance of 5.6 km west of the SPA.</p> <p><b>As the potential for significant effects on this SPA cannot be excluded, further assessment is required.</b></p>
Killarney National Park SPA (site code 004038)	<p>Merlin (<i>Falco columbarius</i>) [A098]</p> <p>Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]</p> <p>According to the First Order Site-specific Conservation Objectives Version 1.0 for Killarney National Park SPA (NPWS 2022, Department of Housing, Local Government and Heritage), for each of the listed SCIs, the Conservation Objective is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.</p>	<p>The Site is approximately 14.5 km east of the SPA.</p> <p>Habitats suitable for foraging by merlin, including bog, heath, wet grassland and scrub, occur fairly widely between the SPA and the wind farm site.</p> <p>The habitats within the wind farm site have potential to support foraging merlin.</p>

European Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023) (*denotes a priority habitat)	Distance from proposed Inchamore Wind Farm Project Area and summary of ecological connectivity
		<p>From a review of the literature (Cramp 1980, Newton et al. 1978, Orchel 1992, Sale 2016), it can be concluded with certainty that the hunting range of merlins breeding within the Killarney National Park SPA, a nearest distance of 14.5 km from Inchamore, could not extend to the site for the proposed wind farm at Inchamore.</p> <p>Habitats outside of the National Park, or within the vicinity of the Inchamore site, are not suitable for supporting Greenland white-fronted goose (the other SCI for this SPA) and there are no historic or recent records of the species from these areas.</p> <p>The works along the Turbine Delivery Route are located 16.0 km east of the SPA.</p> <p>The Grid Connection Route is located 15.8 km east of the SPA.</p> <p><b>It is considered that there is no potential for significant effects on this SPA.</b></p>
<p>The Gearagh SPA (site code 0004109)</p>	<p>Wigeon (<i>Anas penelope</i>) [A050]                      Teal (<i>Anas crecca</i>) [A052]                      Mallard (<i>Anas platyrhynchos</i>) [A053]                      Coot (<i>Fulica atra</i>) [A125]                      Wetland and Waterbirds [A999]</p> <p>According to the First Order Site-specific Conservation Objectives Version 1.0 for The Gearagh SPA (NPWS 2022, Department of Housing, Local Government and Heritage), for each of the listed SCIs, the Conservation Objective is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.</p>	<p>The Site is 16.8 km northwest of the SPA.</p> <p>The proposed works along the Turbine Delivery Route are located 18.3 km northwest of the SPA.</p> <p>The Grid Connection Route is 18.5 km northwest of the SPA.</p> <p>The Sullane River, which drains the Site for the proposed wind farm, flows in a south and then east direction for a distance of</p>

European Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023) (*denotes a priority habitat)	Distance from proposed Inchamore Wind Farm Project Area and summary of ecological connectivity
		<p>approximately 24 km before it enters the River Lee system at Coolcour, approximately 4 km downstream of the SPA. Flow continues eastwards towards Cork Harbour. Taking into account (i) that the flow from the area of the proposed wind farm is not likely to mix with water within the SPA, and (ii) the channel distance of approximately 28 km between the two locations, there is no realistic potential for water from the wind farm area (which could carry contaminants in absence of mitigation) to have effects on the Special Conservation Interests of the SPA,</p> <p>The habitats within the proposed wind farm site do not have potential to support any of the SCIs of the SPA.</p> <p><b>It is considered that there is no potential for significant effects on this SPA.</b></p>
<p>Cork Harbour SPA (site code 0004040)</p>	<p>Little Grebe (<i>Tachybaptus ruficollis</i>) [A004]                      Great Crested Grebe (<i>Podiceps cristatus</i>) [A005]                      Cormorant (<i>Phalacrocorax carbo</i>) [A017]                      Grey Heron (<i>Ardea cinerea</i>) [A028]                      Shelduck (<i>Tadorna tadorna</i>) [A048]                      Wigeon (<i>Anas penelope</i>) [A050]                      Teal (<i>Anas crecca</i>) [A052]                      Pintail (<i>Anas acuta</i>) [A054]                      Shoveler (<i>Anas clypeata</i>) [A056]                      Red-breasted Merganser (<i>Mergus serrator</i>) [A069]                      Oystercatcher (<i>Haematopus ostralegus</i>) [A130]</p>	<p>The closest point along the Turbine Delivery Route is 14 m from the SPA where the road is already in existence. However, the proposed works (site entrance) is located 57 km northwest of the SPA.</p> <p>The Grid Connection Route is located 57.1 km from the SPA.</p> <p>The Sullane River, which drains the site for the proposed wind farm,</p>

European Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023) (*denotes a priority habitat)	Distance from proposed Inchamore Wind Farm Project Area and summary of ecological connectivity
	<p>Golden Plover (<i>Pluvialis apricaria</i>) [A140]                      Grey Plover (<i>Pluvialis squatarola</i>) [A141]                      Lapwing (<i>Vanellus vanellus</i>) [A142]                      Dunlin (<i>Calidris alpina</i>) [A149]                      Black-tailed Godwit (<i>Limosa limosa</i>) [A156]                      Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]                      Curlew (<i>Numenius arquata</i>) [A160]                      Redshank (<i>Tringa totanus</i>) [A162]                      Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]                      Common Gull (<i>Larus canus</i>) [A182]                      Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183]                      Common Tern (<i>Sterna hirundo</i>) [A193]                      Wetland and Waterbirds [A999]</p> <p>According to the First Order Site-specific Conservation Objectives Version 1.0 for Cork Harbour SPA (NPWS 2022, Department of Housing, Local Government and Heritage), for each of the listed SCIs, the Conservation Objective is to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.</p>	<p>enters the River Lee system at Coolcour, approximately 24 km from the site of the proposed wind farm. The Lee then flows for approximately 40 km before entering Cork Harbour.</p> <p>While there is a total distance of approximately 64 km from the Inchamore site to the SPA, hydrological connectivity does exist. However, in view of the distance between the two locations, it is considered that there is no potential for measurable effects on the SCIS of the SAC. Any pollutants or silts entering the drainage network at the site for the proposed wind farm, even in the most extreme scenarios and without mitigation of any form, would be completely attenuated by the dilution, dispersal and settlement that would occur within the river and estuarine system.</p> <p><b>It is considered that there is no potential for significant effects on this SPA.</b></p>

**Table 5.6: Relevant sites designated under Irish legislation, reasons for designation, distances from subject site and summary of connectivity.**

Note that in the following, the use of the term 'Project' includes the grid connection route and turbine delivery route.

Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023)	Distance from proposed Inchamore Wind Farm site and summary of connectivity
<b>NATURAL HERITAGE AREAS</b>		
Sillahertane Bog NHA (site code: 0001382)	Peatlands (4)	The pNHA site is located approximately 5.5 km to the south-southwest of the site for the proposed wind farm.  There are no linkages, ecological or hydrological, between the NHA and the wind farm site.
Slaheny River Bog NHA (site code: 000383)	Peatlands (4)	The NHA site is located approximately 14 km to the southwest of the site for the proposed wind farm.  There are no linkages, ecological or hydrological, between the NHA and the wind farm site.
Conigar Bog NHA (site code: 0002386)	Peatlands (4)	The NHA site is located approximately 14.5 km to the southwest of the site for the proposed wind farm.  There are no linkages, ecological or hydrological, between the NHA and the wind farm site.
<b>PROPOSED NATURAL HERITAGE AREAS</b>		
Killarney National Park, Macgillycuddy's Reeks & Caragh River Catchment pNHA (site code 000365)	Not Stated.	The proposed wind farm site at Inchamore is approximately 3 km south of the Caragh River component of the pNHA. There are no linkages, hydrological or otherwise, between the two areas.  The majority of the grid connection route is located along the route of an existing forestry road which runs parallel to the Clydagh River. The closest distance between the cable route corridor and the

Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023)	Distance from proposed Inchamore Wind Farm site and summary of connectivity
		<p>pNHA is 41 m. The route crosses three main streams and numerous drains which flow into the Clydagh.</p> <p>It is concluded that hydrological connectivity exists between the Project area and the pNHA.</p>
Mullaghanish Bog pNHA (site code: 001890)	Not stated.	<p>The proposed wind farm site is approximately 7.5 km south-southwest of the pNHA.</p> <p>There are no hydrological links between the two areas.</p> <p>While a section of the grid connection corridor runs within a forest track 632 m from the pNHA, the pNHA is on higher ground to the forest track with established forestry and open heath in between.</p> <p>It is considered that there is no ecological or hydrological connectivity between the Project area and the pNHA</p>
St Gobnet's Wood pNHA (site code: 000106)	Not stated.	<p>The proposed wind farm site is approximately 5 km west-northwest of the SAC.</p> <p>The wind farm and the pNHA are linked hydrologically by the Sullane River (channel length c.8 km).</p> <p>It is concluded that hydrological connectivity exists between the Project area and the pNHA.</p>
Prohus Wood pNHA (site code 001248)	Not stated.	<p>The proposed wind farm site is approximately 13.5 km north-west of the pNHA.</p> <p>There are no ecological or hydrological linkages between the two areas.</p> <p>It is concluded that there is no ecological or hydrological</p>

Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023)	Distance from proposed Inchamore Wind Farm site and summary of connectivity
		connectivity between the Project area and the pNHA.
Lough Allua pNHA (site code: 001065)	Not stated.	<p>The proposed wind farm site is approximately 11 km north-northwest of the pNHA.</p> <p>There are no ecological or hydrological linkages between the two areas.</p> <p>It is concluded that there is no ecological or hydrological connectivity between the Project area and the pNHA</p>
Ballagh Bog pNHA (site code: 001886)	Not stated.	<p>The proposed wind farm site is approximately 11.5 km northeast of the pNHA.</p> <p>There are no ecological or hydrological links between the two areas.</p> <p>It is concluded that there is no ecological or hydrological connectivity between the Project area and the pNHA</p>
Gouganbarra Lake pNHA (site code: 001057)	Not stated.	<p>The proposed wind farm site is approximately 12 km northeast of the pNHA.</p> <p>There are no ecological or hydrological links between the two areas.</p> <p>It is concluded that there is no ecological or hydrological connectivity between the Project area and the pNHA.</p>
Kilgarvan Wood pNHA (site code: 001787)	Not stated.	<p>The proposed wind farm site is approximately 12 km north-east of the pNHA.</p> <p>There are no hydrological links between the two areas.</p> <p>It is concluded that there is no ecological or hydrological</p>

Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023)	Distance from proposed Inchamore Wind Farm site and summary of connectivity
		connectivity between the Project area and the pNHA.
Roughy River pNHA (site code: 001376)	Not stated.	<p>The proposed wind farm site is approximately 7 km northeast of the pNHA.</p> <p>There are no hydrological links between the two areas.</p> <p>It is concluded that there is no ecological or hydrological connectivity between the Project area and the pNHA.</p>
Kilgarvan Ice House pNHA (site code 000364)	Not stated (but expected to include Lesser Horseshoe bat).	<p>The proposed wind farm site is approximately 11 km north-east of the pNHA. There are no hydrological links between the two areas.</p> <p>The proposed wind farm site location is greater than the normal distance (less than 2 km) that foraging bats would normally fly (Lysaght &amp; Marnell 2016).</p> <p>It is concluded that there is no ecological or hydrological connectivity between the Project area and the pNHA.</p>
Old Domestic Building, Lettir pNHA (site code 002040)	Not stated (but expected to include Lesser Horseshoe bat).	<p>The proposed wind farm site is approximately 14 km north-east of the pNHA. There are no hydrological links between the two areas.</p> <p>The proposed wind farm site location is greater than the normal distance (less than 2 km) that foraging bats would normally fly (Lysaght &amp; Marnell 2016).</p> <p>It is concluded that there is no ecological or hydrological connectivity between the Project area and the pNHA.</p>

Site	Reasons for designation (information correct as of 23 <sup>rd</sup> January 2023)	Distance from proposed Inchamore Wind Farm site and summary of connectivity
Old Domestic Building, Curraglass Wood pNHA (site code 002041)	Not stated (but expected to include Lesser Horseshoe bat).	<p>The proposed wind farm site is approximately 7 km west of the pNHA. There are no hydrological links between the two areas.</p> <p>The proposed wind farm site location is greater than the normal distance (less than 2 km) that foraging bats would normally fly (Lysaght &amp; Marnell 2016).</p> <p>It is concluded that there is no ecological or hydrological connectivity between the Project area and the pNHA.</p>
Doo Lough pNHA (site code 00350)	Not stated	<p>The proposed wind farm site is approximately 11 km southeast of the pNHA.</p> <p>There are no ecological or hydrological links between the two areas.</p> <p>It is concluded that there is no ecological or hydrological connectivity between the Project area and the pNHA.</p>

### 5.4.3 Habitats, Vegetation and Flora

The main habitat within the survey area for the wind farm is conifer plantation (WD4). This occupies all but the north-western sector of the site and has been planted on sloping ground which is covered by relatively shallow peat soils. Other main habitats which occur within the site are wet heath (HH3), upland blanket bog (PB2) and cutover bog (PB4). Habitats which occur over small areas of the site are exposed siliceous rock (ER1), dry siliceous heath (HH1) and eroding/upland stream/river (FW1).

In the following sections the vegetation composition of these habitats is described, and the distribution of the principal habitats on site is shown in Figure 1. A list of plant species recorded in the main habitats is presented in **Appendix 5.1**.

### **Wet heath (HH3)**

Wet heath vegetation occurs in the north-western portion of the survey area (see **Plate 5.2**). The vegetation is mostly dominated by varying proportions of purple moor-grass (*Molinia caerulea*), deer grass (*Tricophorum germanicum*) and the moss *Racomitrium lanuginosum*. The habitat has developed on sloping areas where the peat depth is generally between 10 and 50 cm. The vegetation is relatively species-poor, with ling heather (*Calluna vulgaris*), cross-leaved heath (*Erica tetralix*), many-flowered bog-cotton (*Eriophorum angustifolium*) and tormentil (*Potentilla erecta*) among the more frequent associates. The cover of ericoid shrub species (*Erica tetralix* and *Calluna vulgaris*) is in the range of 10 to 20%. The cover of Sphagnum mosses is generally between 10 and 30%, with *Sphagnum capillifolium* and *Sphagnum papillosum* the main species encountered.

The condition of the heath habitat is good<sup>1</sup> in respect of its representativity (i.e. a typical example) and conservation status (i.e. conservation structure and functionality). This is likely to reflect the low levels of livestock grazing evident in the local area. It is likely, however, that the relatively low cover of woody heath species (namely *Erica tetralix* and *Calluna vulgaris*) is a result of a past burning event and possibly over-grazing in previous decades. Small areas of bare peat do occur however the cover is less than 5%. While wet heath vegetation is a relatively widespread habitat in the upland areas of counties Cork and Kerry, the status at a National Level is given as 'Bad and deteriorating' in the review of EU Protected Habitats and Species in Ireland (Department of Culture, Heritage and the Gaeltacht, 2019).

Equivalent EU Annex 1 Habitat – Northern Atlantic wet heaths with *Erica tetralix* (4010)

---

<sup>1</sup> A rating of 'good' follows a scale of 'Excellent', 'Good' and 'Average or Reduced' – this scale is used within the assessment criteria for Natural Habitats within Natura 2000 sites (see Natura 2000 Network – Standard Data Form, Final Version May 1994)



**Plate 5.2: Wet heath on sloping ground in the north-west of the survey area.**

### **Dry siliceous heath (HH1)**

Dry heath is a widespread habitat in the unplanted areas of the site though it does not occur over large areas. Typically, the habitat is most commonly found along the edges of sandstone rock outcrops where the peat depth is less than 10 cm. Western gorse (*Ulex gallii*) is the main species in the vegetation with ling heather (*Calluna vulgaris*), bell heather (*Erica cinerea*), tormentil, hard fern (*Blechnum spicant*) and green ribbed sedge (*Carex binervis*) also occurring. The main mosses occurring in the vegetation are *Hypnum jutlandicum*, *Hylocomium splendens* and *Sphagnum capillifolium*. The habitat grades into adjoining areas of wet heath which occupies the slightly deeper peat soils which are adjacent.

Equivalent EU Annex 1 Habitat – European dry heaths (4030)

### **Upland blanket bog (PB2)**

Upland blanket bog vegetation is confined to areas in the western parts of the site where the slope is relatively flat and the peat depth exceeds 50 cm. In general, the depth of peat within blanket bog habitat at Inchamore is between 1 and 1.5 metres. Purple moor-grass and Deer grass dominate the vegetation, with the cover of these two species generally exceeding 50%. As a result of the dominance of these two species the habitat is often difficult to separate the habitat from *Molinia*-dominated wet heath areas and the two habitats often intergrade with each other. Other frequent vascular plant species include cross-

leaved heath, ling heather, bog asphodel (*Narthecium ossifragum*), many-flowered bog-cotton (*Eriophorum angustifolium*) and hare's tail bog-cotton (*Eriophorum vaginatum*). The moss layer is typically well-developed with *Sphagnum capillifolium*, *Sphagnum papillosum*, *Sphagnum cuspidatum*, *Racomitrium lanuginosum* and the liverwort *Pleurozia purpurea* among the most conspicuous species.

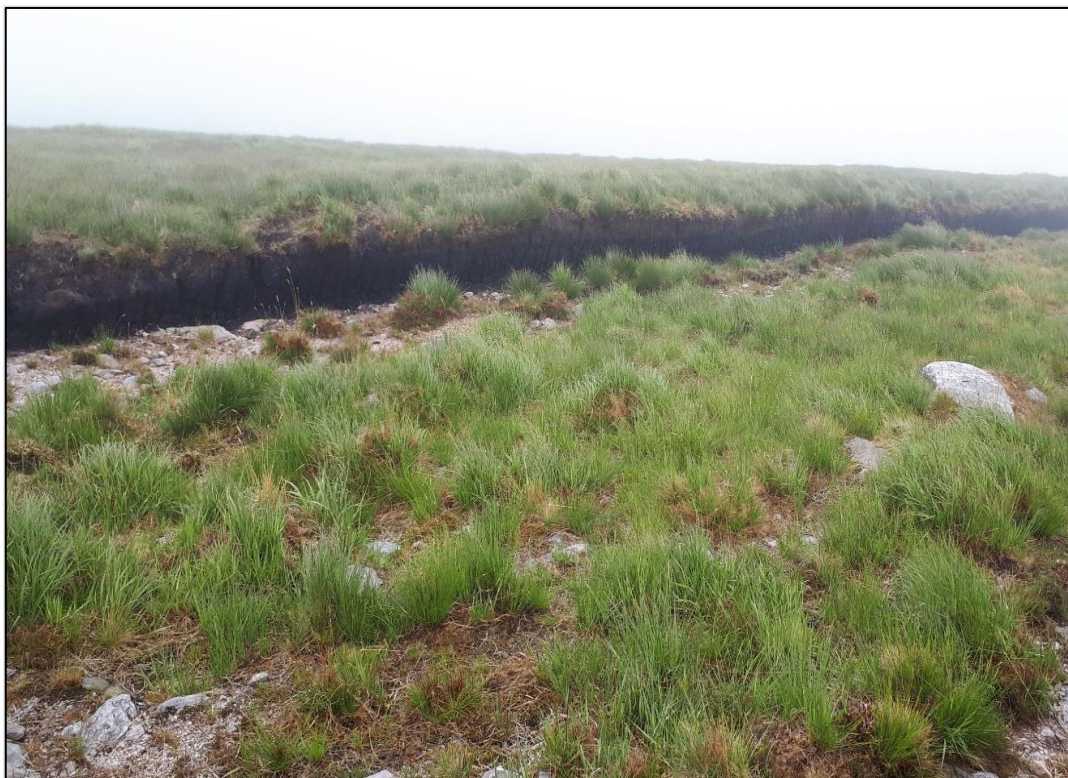
Equivalent EU Annex 1 Habitat – Blanket bog (7130).

#### **Cutover blanket bog (PB4)**

Cutover blanket bog occurs in the south-western portion of the survey area (see **Plate 5.3**), as well as in the area where Turbine no. 3 is located. The vegetation of these areas is characterised by a type of degraded grassy heath vegetation dominated by purple moor-grass, deer grass, mat grass (*Nardus stricta*), heath rush (*Juncus squarrosus*), common bog cotton and the mosses *Racomitrium lanuginosum* and *Campylopus introflexus*.

These cutover bog areas are prone to erosion and overgrazing by livestock. As a result, the cover of bare peat/stone is generally between 10% and 40%.

No Equivalent EU Annex 1 Habitat.



**Plate 5.3: Cutover bog surface dominated by *Molinia caerulea*, with outcropping bedrock visible. Uncut, shallow blanket bog is visible in the background.**

**Dry humid acid grassland (GS3)**

Small areas of dry humid acid grassland occur on shallow soils close to rock outcrops in the north-west of the survey area. The vegetation is dominated by a range of grass species, especially velvet bent (*Agrostis canina*), sweet vernal grass (*Anthoxanthum odoratum*) and mat grass (*Nardus stricta*). Other frequent species in the low-growing vegetation include heath bedstraw (*Galium saxatile*), tormentil, heath rush and mosses such as *Rhytidiadelphus loreus*, *Hylocomium splendens* and *Pleurozium schreberi*.

No Equivalent EU annex 1 Habitat.

**Wet grassland (GS4)**

A few small fields of wet grassland occur in the south of the survey area. These fields are dominated by soft rush (*Juncus effusus*) with frequent creeping buttercup (*Ranunculus repens*), creeping bent (*Agrostis stolonifera*), Yorkshire fog (*Holcus lanatus*) and white clover (*Trifolium repens*). The fields have been utilised for stock grazing until recently and are semi-improved in places.

No Equivalent EU Annex 1 Habitat.

**Coniferous woodland (WD4)**

Conifer plantation is a widespread habitat within the survey area, covering approximately 128.3 ha. Most of the plantation areas are now between 6 and 10 metres tall, with planting occurring between the mid-1980's to the mid-1990's. Sitka spruce and Lodgepole pine are the main planted tree species, with occasional shrubs of eared willow (*Salix aurita*), downy birch (*Betula pubescens*) and common gorse (*Ulex europaeus*) along the plantation margins.

The ground layer of these woodland areas is mostly heavily shaded, species-poor and dominated by a deep layer of conifer needles. The few plant species which occur are scattered tufts of purple moor-grass and hard fern, along with mosses such as *Hypnum jutlandicum*, *Plagiothecium undulatum* and *Rhytidiadelphus loreus*.

In recent years, areas of coniferous woodland have been established in the south/centre of the survey area. Prior to planting these areas were dominated by a range of grassland habitats including dry humid acid grassland (GS3), Improved grassland (GA1) and Wet grassland (GS4). Planting of these areas took place between 2 and 10 years ago, with Sitka spruce the main species planted.

No Equivalent EU Annex 1 Habitat.



**Plate 5.4: Species-poor conifer plantation in the east of the survey area.**

#### **Exposed siliceous rock**

Exposed sandstone bedrock occurs sparingly within the survey area and is largely confined to the western sector. The vegetation of exposed rock surfaces is typically sparse. In suitable rocky crevices plant species such as hard fern (*Blechnum spicant*), broad buckler fern (*Dryopteris 45rticula*), St. Patrick's cabbage (*Saxifraga spathularis*) and Wilson's filmy fern (*Hymenophyllum wilsonii*) are characteristic.

Equivalent EU Annex 1 Habitat – Siliceous rocky slopes with chasmophytic vegetation (8220).

#### **Eroding/upland stream (FW1)**

Short lengths of eroding upland stream (First order tributaries) occur within grassland areas in the south of the survey area. These streams flow through steeply sloping ground and have a stony bed. They support a typical, species-poor vegetation which includes bulbous rush (*Juncus bulbosus*) and lesser spearwort (*Ranunculus flammula*).

No Equivalent EU Annex 1 Habitat.



**Plate 5.5: View of typical stream in survey area.**

**Table 5.7: Summary of the main habitats occurring at turbine and substation and borrow pit locations.**

<b>Turbine location</b>	<b>Main habitats occurring within infrastructure footprint</b>
No. 1	Wet heath (HH3) / Blanket bog (PB2)
No. 2	Wet heath (HH3) / Conifer plantation (WD4)
No. 3	Cutover bog (PB4) / Conifer plantation (WD4)
No. 4	Conifer plantation (WD4)
No. 5	Conifer plantation (WD4)
No. 6	Conifer plantation (WD4)
<b>Substation area</b>	Conifer plantation (WD4)
<b>Borrow Pit</b>	Conifer plantation (WD4)

### **Grid route corridor description**

The route is dominated by forest tracks. Habitat descriptions follow, along with a description of the section which traverse open countryside leading towards the Ballyvouskill substation.

### **Forest tracks (BL3)**

Forestry tracks (BL3) dominate the proposed cable route corridor between the site for the proposed Inchamore Wind Farm and the existing substation at Ballyvouskill. The forestry

tracks along the survey route are dominated by gravel and generally have a very low cover of vegetation. Any vegetation that does occur is patchy and is located in narrow strips along the track margins which are not subject to vehicular movement. The sparse vegetation of forest tracks is dominated by a mixture of ruderal and grassland species (see **Appendix 5.2**). The main species include *Agrostis stolonifera*, *Juncus articulatus*, *Juncus effusus*, *Cirsium palustre*, *Plantago major*, *Ranunculus repens*, *Prunella vulgaris* and *Trifolium repens*.

A notable plant species which was recorded growing along track margins is *Filago minima* (Least cudweed). The species is considered to be Near Threatened in Ireland (Wyse Jackson *et al.* 2016) and had been listed in the Flora (Protection) Order, 2015 but is not listed in the Flora (Protection) Order, 2022. Approximately 10 flowering heads of the species were noted at two locations in the townland of Derryreagh, where forest track runs through areas of recently felled and replanted coniferous plantation. In the Republic of Ireland, the species has a scattered distribution which includes the Killarney region, areas west of Cork city, Co. Wexford, South Wicklow, Co. Cavan and South Mayo.



**Plate 5.6: View of typical forest track through recently felled conifer plantation in Derryreagh townland.**



**Plate 5.7: View of forest track through an area of tall conifer plantation in Glashacormick.**

#### **Other habitats traversed by grid route**

Between the N22 (chainage 16,200) and the forest road leading to the wind farm location (chainage 16,750), the cable route passes through a strip of grazed wet heath (HH3) alongside the N22 and then through conifer plantation (WD4).

To the north-west of Ballyvouskill substation (**see Figure 5.5**) the cable route passes through a field of improved grassland (GA1). The proposed route then crosses through an area of wet heath (HH3) on sloping ground. This heath vegetation is dominated by *Molinia caerulea* and *Calluna vulgaris*, with frequent *Erica tetralix*, *Erica cinerea*, *Potentilla erecta*, *Tricophorum germanicum*, *Carex panicea*, *Juncus squarrosus* and the moss *Sphagnum capillifolium*. The heath has an uneven surface topography which suggests overgrazing/erosion in the past.



**Plate 5.8: View of wet heath vegetation on sloping ground, looking back towards Ballyvouskill substation.**

The proposed route then follows an old stony track through wet heath which is dominated by *Juncus effusus*, *Agrostis capillaris*, *Juncus articulatus*, *Polytrichum* sp. And *Nardus stricta* which eventually joins with the main forest road further west.



**Plate 5.9: View of old track running through wet heath.**

### **Invasive species**

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

No species listed on this schedule were recorded during the surveys.

#### **5.4.4 Terrestrial Mammals**

Irish hare *Lepus timidus hibernicus* was observed on the heath and bog areas within the site and is expected to breed on site. Deer are widespread throughout the site and especially within the afforested areas. Several sightings indicated Sika deer *Cervus nippon* though fallow deer *Dama dama* and sika/red hybrids could also occur as these are widespread in the south-west.

While full search for badger *Meles meles* presence could not be carried out in the afforested areas of the site, no signs were observed in those areas which could be searched (*i.e.* margins of conifer plantations and tracks or firebreaks within the planted areas). It is noted that peat habitats and conifer plantation provide relatively poor habitat for badger as they normally require well drained soils to excavate setts and in Ireland setts are particularly associated with clay banks with hedgerows, native woodland and scrub (Smal 1991).

Pine marten *Martes martes* had been recorded within the local conifer plantations during the 2019/20 bird surveys but there were no signs of its presence during the baseline surveys in 2021. The preferred habitat of pine marten in Ireland is deciduous woodland or scrub with good ground cover, though mixed woodland and coniferous thickets are also used (Hayden and Harrington 2000). Pine martens may nest within larger trees with hollows, rock clefts or outbuildings. Taking into account the low suitability of the habitats within the Site for pine marten, it is considered that the Site is likely to be within a pine marten territory (which can be up to 80 ha) but that breeding on site is not likely.

There is no significant habitat on site to support otter *Lutra lutra*. This reflects the small size of the tributary streams and the absence of fish or larger aquatic organisms. However, otter occurs widely in the main channel of the Sullane River and it is possible that otter might at times travel upstream to the site.

### 5.4.5 Amphibians

The common frog *Rana temporaria* is widespread on site including within forest drains and in wet bog. Habitat suitable for the smooth newt *Lissotriton vulgaris* is absent within the site.

### 5.4.6 Reptiles

The common lizard *Zootoco vivipara* was recorded in June 2021 on a rock outcrop within the site and is expected to occur at low densities throughout the heath dominated areas of the site.

### 5.4.7 Bats

#### 5.4.7.1 Desk review

##### 5.4.7.1.1 Bat Conservation Ireland Database

A 1 km and 10 km radius search was requested from the Bat Conservation Ireland Database for the Irish Grid Reference W1403878722 in February 2023. There were no records on the database for the 1 km search while the records at a 10 km search are presented on the map below (**Figure 5.6**). The nearest BCireland database recorded is 2.5 km from the boundary of the proposed development site.

**Table 5.8: BCireland Bat Records for 10 km radius search.**

Bat Species	Records	Roost Records	Transect Records	Ad Hoc Records
Brown long-eared bat	8	5	0	3
Common pipistrelle	17	0	4	13
Daubenton's bat	6	0	0	6
Leisler's bat	10	0	1	9
Lesser horseshoe bat	7	5	0	2
Nathusius' pipistrelle	0	0	0	0
Natterer's bat	3	1	0	2
Soprano pipistrelle	13	0	1	12
Whiskered bat	4	0	0	4
Pipistrellus species	7	1	0	6



**Figure 5.6: Bat Conservation Ireland Database Records (10 km radius).**

**5.4.7.1.2 Bat Conservation Landscape Favourability**

The BCIreland Bat Landscape Favourability Model (Lundy *et al.*, 2011) identified the 5 km square within which the proposed development is located as having a Low to Medium favourability for bats. For the bat species recorded during this bat survey, the 5 km square has a Low or Low to Medium favourability value for eight recorded bat species recorded during the surveys.

**Table 5.9: Bat Conservation Ireland Bat Landscape Favourability Model – 5 km Square value.**

Bat species	5 km Square
Common pipistrelle	26% (Low to Medium)
Soprano pipistrelle	23% (Low to Medium)
Nathusius' pipistrelle	0% (Low)
Leisler's bat	17% (Low)
Brown long-eared bat	13% (Low)
Daubenton's bat	11% (Low)
Natterer's bat	17% (Low to Medium)
Whiskered bat	13% (Low to Medium)
Lesser horseshoe bat	5% (Low to Medium)

### 5.4.7.1.3 Previous Survey Data

A previous bat survey report includes the proposed development area as part of the survey area (see **Appendix 5.6**): *Fehily Timoney (2020) Gortyrhilly and Inchamore Wind Farms Bat Survey 2019/2020 Report. Unpublished report prepared for SSE Renewables.*

This bat survey completed the following bat survey elements:

- Spring Static Surveillance: 10 static units, 11 nights surveillance;
- Summer Static Surveillance: 10 static units, 10 nights surveillance;
- Autumn Static Surveillance: 10 static units, 26 nights surveillance;
- 1 extra static unit was deployed on 30/7/2019 for 24 nights;
- Daytime assessment of 4 buildings;
- Daytime assessment of trees;
- Dusk bat emergence surveys;
- Walking transects along pre-mapped routes.

This bat survey recorded all nine resident bat species during the surveys. The majority of the bat survey data was recorded by the static surveillance surveys. A total of 22,877 recordings over the 46 nights of surveys were recorded on the static units. The most commonly recorded species was common pipistrelle, followed by soprano pipistrelle, and Nathusius' pipistrelle.

**Table 5.10: 2019 Static Surveillance Results (Calculations based on recordings over 46 nights).**

Bat Species	No. of Recordings	Percentage	No. of Recordings/ Night
Brown long-eared bat	419	1.84%	9.11
Common pipistrelle	16,180	70.29%	616.09
Daubenton's bat	563	2.55%	22.33
Leisler's bat	872	3.84%	18.96
Lesser horseshoe bat	39	0.17%	0.85
Nathusius' pipistrelle	1,001	4.41%	21.76
Natterer's bat	174	0.89%	4.41
Soprano pipistrelle	3,219	14.17%	69.98
Whiskered bat	381	1.68%	8.28

### 5.4.7.2 Field surveys

#### 5.4.7.2.1 Daytime Inspections

##### Building & structure inspection

Four sets of buildings were inspected, one set of buildings is located within the Site, but not in area of proposed infrastructure, while the remaining three are located outside the Site (**Figure 5.6**). Daytime inspections were undertaken on 21/12/2022 and 6/1/2023 of the buildings and the results of these inspections are presented in the table below. In addition, static units were deployed in three of the buildings and left in-situ (recording from sunset to sunrise from 21/12/2022 to 6/1/2023).

Building 2, located within the Site (see **Figure 5.7**), was recorded as a bat roost for three species of bat: lesser horseshoe bat (bat droppings), Natterer's bat (bat droppings and audio files) and brown long-eared bat (audio files). The level of droppings and the number of audio files recorded (4 bat encounters, see **Table 5:11**) indicates that this building is used as a night roost for these three species of bat. Turbine 5 is the closest turbine to Building 2 (423 m).

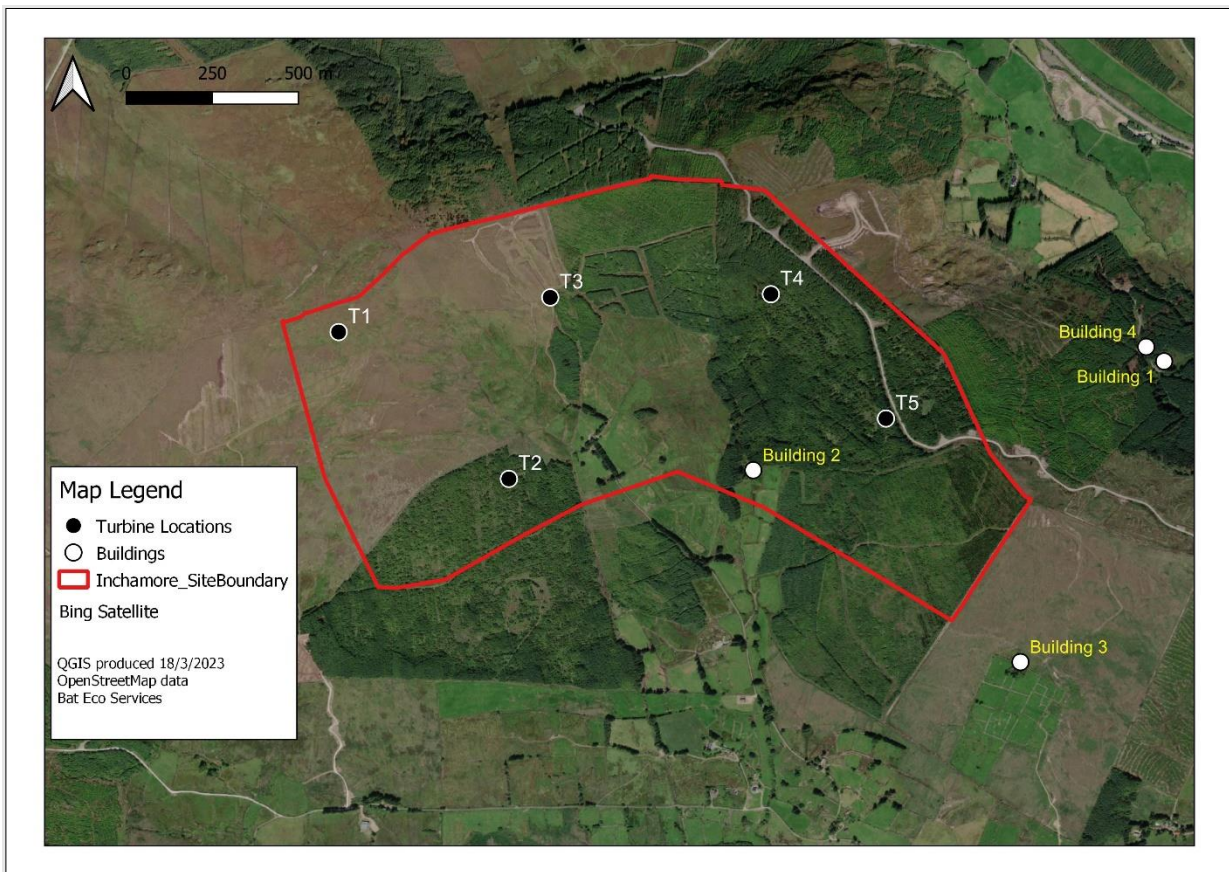
**Table 5:11: Buildings / Structures inspection results.**

Building Code	Description	Grid Reference (ITM)	Daytime Inspection	Static Unit Results
<b>Building 1</b>	2-storey dwelling and 5 single storey sheds. Natural stone walls, mixed roofs (slate and corrugated iron). No evidence of bat usage.	514755, 578855	No bat evidence recorded during daytime inspection  Suitability: Low to Medium level	No bats recorded on static unit
<b>Building 2</b>	2-storey derelict house, slate roof, timber fascia, small lean-too shed with corrugated roof	513562, 578539	Small number of bat droppings on ground floor room (Lesser horseshoe bat) and in lean-too shed (Myotis spp.).  Suitability: Medium to High level	Static Recordings - Main House: Natterer's bat and Brown long-eared bat. Lean-too: Natterer's bat.
<b>Building 3</b>	2-storey derelict dwelling (slate roof in poor	514338, 577982	No bat evidence recorded during daytime inspection	Unknown - permission

Building Code	Description	Grid Reference (ITM)	Daytime Inspection	Static Unit Results
	condition) and numerous stonewall ruins.		Suitability: Low to Medium level	refused to collect static unit
<b>Building 4</b>	Single storey shed.	514703, 578897	No bat evidence recorded during daytime inspection Suitability: Low level	Not applicable

**Table 5.12: Static unit results of winter surveillance of Building 2.**

Date	Time	Bat Species	Survey Type	Bat Detector Model
21/12/2022	23:52:00	Natterer's bat	Statics in buildings	Mini Bat
<b>27/12/2022</b>	16:57:00	Brown long-eared bat	Statics in buildings	Mini Bat
<b>28/12/2022</b>	20:57:00	Natterer's bat	Statics in buildings	Mini Bat
<b>29/12/2022</b>	19:29:00	Natterer's bat	Statics in buildings	Mini Bat



**Figure 5.7: Location of buildings surveyed.**

#### **5.4.7.2.2 Tree Potential Bat Roost (PBRs) Inspection**

There is an area of mature trees surrounding Building 2 within the proposed development area. All of the trees within this located were inspected on 21/12/2022 for features such as tree holes, spilt limbs etc. that can provide roosting features for bats. The majority of trees in this area are conifer trees and therefore do not have a Potential Bat Roost or PBR value for local bat populations.

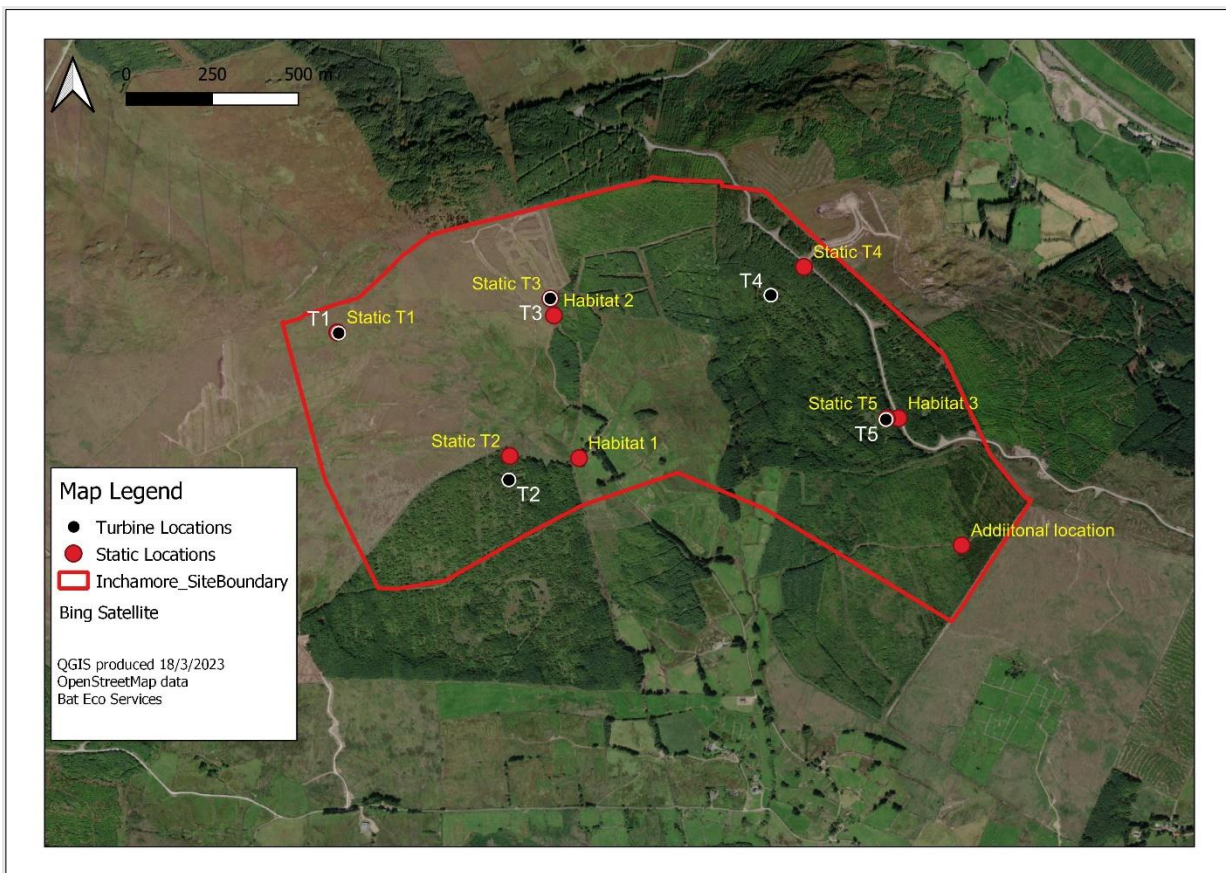
#### **5.4.7.3 Field Survey Results – Bat Detector Surveys**

##### **5.4.7.3.1 Dusk Bat Surveys, Walking & Driving Transects**

The bat encounters recorded for these surveys (completed on 21/7/2022, 28/8/2022, 29/8/2022 and 19/9/2022) are reported as part of overall summary maps for each of the bat species. The following bat species were recorded during dusk surveys and the transects: soprano pipistrelle, common pipistrelle, Leisler's bat, Natterer's bat, Daubenton's bat, *Myotis* species and brown long-eared bat. This information provides distribution results for the bat species recorded, which are presented in the full report (**Appendix 5.3**). Full breakdown of the nightly data is provided in the appendices.

**5.4.7.3.2 Static Bat Detector Survey**

The tables presented in the full bat report (**Appendix 5.3**) summarise the results recorded on the static units deployed over four surveillance periods (see **Figure 5.8**). The information collated by the static surveillance is analysed using the EcoBat Tool (discussed under that section of the report). Figures are provided to show the location of each of the static unit in relation to the proposed turbine locations. The location of static units was determined by the proposed location of turbines. All static units were deployed for a minimum of 10 days and therefore meet the level of surveillance recommended by guidance documents.



**Figure 5.8: Location of static units deployed during static surveillance relative to proposed turbine locations.**

The following bat species were recorded during the static surveillance: soprano pipistrelle, common pipistrelle, Leisler’s bat, Natterer’s bat, whiskered bat, Daubenton’s bat, *Myotis* species, lesser horseshoe bat and brown long-eared bat. These records were also used to prepare distribution maps for the individual bat species recorded.

In summary, the total number of common pipistrelles bat passes recorded during all four static surveillance periods was 10,980 while soprano pipistrelles (720 bat passes) and Leisler's bats (650 bat passes) were the second and third most frequently recorded bat species, respectively. However, overall, common pipistrelles accounted for 85% of the recordings.

In relation to distribution across the static unit locations and during all surveillance periods, common pipistrelle was the most frequently recorded bat species, *i.e.* recorded on all static units deployed. The highest level of common pipistrelle bat passes was recorded on the static located in the easternmost part of the site (labelled in Figures as additional location) during the Spring Surveillance. All other bat species were recorded at a lower level of bat passes and less frequently across static surveillance locations. These totals included the three additional static units deployed in the second Autumn Surveillance.

In order to compare with Table 3 in Section 4.2.1 (see full bat report in **Appendix 5.3**), only data from the static units deployed at the proposed turbine locations are used for the following summary table. Apart from the common pipistrelles and Leisler's bats, the level of recordings detected was less in 2022 compared to 2019 for all other bat species noted. No *Nathusius'* pipistrelles were recorded in the 2022 static surveillance.

**Table 5.13: 2022 Static Surveillance Results at proposed turbine locations only (250 nights / 6 static units = mean of 42 nights).**

Bat Species	No. of Recordings	Percentage	No. of Recordings/ Night
Brown long-eared bat	86	0.81%	2.05
Common pipistrelle	9,061	84.94%	215.74
Daubenton's bat	75	0.7%	1.79
Leisler's bat	636	5.96%	15.14
Lesser horseshoe bat	1	0.01%	0.02
Natterer's bat	75	0.7%	1.79
Soprano pipistrelle	584	5.47%	13.9
Whiskered bat	47	0.44%	1.12
Myotis species	103	0.97	2.45

Four static surveillance periods were undertaken in 2022. This was a total of 2,688 hours of surveillance. In order to provide an overall visual in relation to the total level of bat activity recorded at the static units a series of graphs were prepared (see **Appendix 5.3**).

The bat species were divided into two groups:

- Common bat species: common pipistrelle, soprano pipistrelle and Leisler's bat;
- Less Common bat species: all remaining Irish bat species.

The principal summary points from the graphs are as follows:

- Common pipistrelles were consistently recorded across the survey site in high bat activity levels during all four static surveillance periods but particularly high levels were recorded during the spring surveillance.
- Common pipistrelle bat activity levels was highest at the additional location (see Figure 5.8).
- During the 2<sup>nd</sup> Autumn Surveillance, common pipistrelle bat activity levels was higher on the static located adjacent to one of the 'habitat' sites surveyed. This 'habitat' was the road access through the conifer plantations and therefore is indicative of commuting individuals along the open roads through a generally cluttered environment.
- Generally, Leisler's bat activity levels recorded was low and therefore are likely to indicate commuting individuals through the landscape. The highest level of bat activity for this specie was recorded at the additional location during the Spring surveillance.
- Soprano pipistrelle bat activity levels was consistently low during all static surveillance period at all proposed turbine locations.
- T1 was not an important location for the less common bat species and this is primarily a reflection of the habitats at this location (*i.e.* no tall tree vegetation). For all other turbine locations, the level of bat activity for the less common bat species was consistent during each of the surveillance periods.
- Habitat 1 (mature deciduous treeline) was particularly important for brown long-eared bats during the 2<sup>nd</sup> Autumn Static Surveillance.

#### **5.4.7.3.3 Bat Survey Results - Summary**

The figures provided in Appendix 5.3 illustrate the location of bat encounters recorded during all of the bat surveys completed. A total of eight bat species were recorded within the Site. The only Irish resident bat species not recorded during these surveys was Nathusius' pipistrelle. While the Auto-Id function of the audio file analysis reported the presence of this bat species, manual inspection of such files confirmed such calls as low-echolocating common pipistrelles.

While a large array of night-time surveys were undertaken, an overall low level of bat activity was recorded during dusk and dawn surveys and walking/driving transects. For less common bat species, the bat encounters recorded were primarily on static units as these were left in the “field” for a minimum of 10 days and therefore provide a greater opportunity to record bat species.

#### 5.4.7.4 Field Survey Results – EcoBat Tool Results

All of the static surveillance results were entered into the “Per Night” forms and submitted for analysis using the EcoBat tool<sup>2</sup>. These forms were collated for the three seasonal surveillance periods – Spring, Summer and Autumn 2022.

The reference range datasets were stratified to include:

- Only records from within 30 days of the survey date.
- Only records from within 100 km<sup>2</sup> of the survey location.
- Records using any make of bat detector.

The Ecobat tool provides a series of summary tables to enable analysis of the bat activity level at each static location. These are presented in **Appendix 5.3** and categorisation of activity level is based on the following table:

**Table 5.14: Percentile score and categorised level of bat activity.**

Percentile	Bat Activity
81 to 100	High
61 to 80	Moderate to High
41 to 60	Moderate
21 to 40	Low to Moderate
0 to 20	Low

Additional figures are presented in the appendices which provide information on the spread of nightly activity according to the five percentile ranges in the above table.

<sup>2</sup> The ECOBAT tool has been offline since November 2022. Only four of the six static units for the summer surveillance data were analysed prior to this. The analysis carried out for the present assessment was carried out in line with the ECOBAT tool using the professional judgment of Dr Aughney.

#### **5.4.7.4.1 Summer Surveillance 2022 – Preliminary EcoBat Tool Analysis**

Bat surveys were conducted at Summer 5, Summer additional location, Summer 1, Summer 4, for 11 nights between 2022-07-21 and 2022-07-31, using Wildlife Acoustics static bat detectors. The maximum of passes recorded in a single night was 111 passes, and 8 species were recorded.

The reference range dataset was stratified to include:

- Only records from within 30 days of the survey date.
- Only records from within 100 km<sup>2</sup> of the survey location.
- Records using any make of bat detector.

Only one species had a High level of bat activity according to the Median Percentile value (highlight in table below).

Differences in activity between static detector locations split by species and location were analysed (see details in **Appendix 5.3**). The analyses indicate that, in general, the level of bat activity varied greatly from static location and that there was not a consistent of species activity from night to night.

#### **5.4.7.4.2 Summer Surveillance 2022 – Preliminary EcoBat Tool Analysis**

The EcoBat Tool analysis demonstrated that levels of bat activity is reported as “High” when the number of nightly passes is greater than 40. Therefore, using this information, all of the static surveillance data collected in 2022 for each individual bat species recorded was examined to complete analysis in absence of the EcoBat Tool. Only the nightly bat activity level of common pipistrelles exceeded this criteria and therefore this species is used to determine the assessment of the proposed location of the turbines.

The number of nights when the number of nightly passes was greater than 40 for common pipistrelles was calculated (raw data are presented in the appendices). Over the course of the 2022 surveillance, at the proposed turbine locations for T1, T4 and T5 were deemed to have a Low level of bat activity. T3 was deemed to have a Medium level of bat activity while T2 and the additional location were deemed to have a High level of bat activity.

**Table 5.15: Summary table showing the number of nights recorded bat activity fell into High activity band for common pipistrelles only.**

<b>Turbine No.</b>	<b>No. of Nights &gt;40 bat passes</b>	<b>No. of Nights of Surveillance</b>	<b>Percentage</b>	<b>Activity Level</b>
<b>T1</b>	0 nights	37 nights	0%	Low
<b>T2</b>	23 nights	47 nights	49%	High
<b>T3</b>	18 nights	47 nights	38%	Medium
<b>T4</b>	1 night	34 nights	3%	Low
<b>T5</b>	2 nights	34 nights	6%	Low
<b>Additional location</b>	21 nights	37 nights	57%	High

#### 5.4.8 Summary of Important Ecological Features and Conservation Value of Site

##### 5.4.8.1 Habitats, vegetation and flora

The north-western sector of the site comprises a mosaic of wet heath and upland blanket bog, which is part of a larger area of bog and heath which continues to the west. The heath and bog habitat mosaic within the site is of good quality as it appears largely intact (uncut) and has not been burned or over-grazed in recent times. However, the low cover of woody heath species such as cross-leaved heath and ling heather present may reflect past events of burning and/or over-grazing. Both wet heath and blanket bog are Annex I listed habitats, with active blanket bog having priority status. In addition, the Annex I listed habitats dry heath and exposed siliceous rock occur scattered throughout the unplanted sector of the site, typically in association with each other and/or wet heath. The total area of this heath/bog area within the Red-line study area is approximately 22 ha. As the condition of the heath and bog habitat is good, in respect of representativity (*i.e.* a typical example) and conservation status (*i.e.* conservation structure and functionality), the area is assigned a rating of County Importance. It is noted that while wet heath and blanket bog are relatively widespread habitats throughout much of the upland areas of counties Cork and Kerry, the status at a National Level for both habitats is given as 'Bad and deteriorating' in the review of EU Protected Habitats and Species in Ireland (Department of Culture, Heritage and the Gaeltacht, 2019). Reasons given for the 'Bad and deteriorating' rating are new forestry, paths, tracks and land clearance, while overgrazing, burning, wind farm development and erosion continue to be issues for these habitats.

The condition of the area of cutover bog habitat on site is poor due to ongoing erosion caused by peat-cutting and subsequent livestock grazing/poaching. It was observed during field surveys that sheep tend to graze preferentially on the cutover areas of the site rather than the wetter heath and bog habitats. The cutover bog habitat is assigned an overall rating of Local Importance (lower to higher value).

The other habitats recorded on site are assigned overall ratings varying from Local Importance (lower value) to Local Importance (higher value) – these comprise dry humid acid grassland, wet grassland and eroding/upland rivers. The conifer plantation is a non-native habitat managed entirely by man, is species-poor and is not of conservation importance.

There were no plant species listed in the Flora (Protection) Order 2022 recorded within the survey area. There is a ten-kilometre-square record (W17) for the protected species Killarney fern (*Vandenboschia speciosa*) (see <https://bsbi.org/maps>), however the species was not recorded from within the survey area during the present survey.

The Project area supports a number of plant species which have a relatively restricted distribution in Ireland, *i.e.* large-flowered butterwort (*Pinguicula grandiflora*) and St. Patrick's cabbage (*Saxifraga spathularis*). These species are considered to be locally common in suitable habitats in the south-west of Ireland (Parnell and Curtis, 2012).

The project area supports least cudweed *Filago minima*, a species which had been legally protected on the Flora (Protection) Order 2015. This occurs within a section of forest track which will support the grid connection cable.

#### **5.4.8.2 Terrestrial mammals, amphibians and reptiles**

The study site supports a typical mammalian fauna of open bog/heath habitat and conifer plantation. All mammal species recorded on site or expected to occur on site are listed as 'Least Concern' on the Irish Red List (Marnell *et al.* 2019).

The Irish hare, pine marten and all deer species are protected under the Wildlife Acts 2007-2022 as amended.

The common frog and the common lizard are protected under the Wildlife Acts, though both are listed as 'Least Concern' on the Irish Red List (King *et al.* 2011).

### 5.4.8.3 Bats

A total of eight bat species were recorded within the Site. The only Irish resident bat species not recorded during these surveys was Nathusius' pipistrelle.

While a large array of night-time surveys were undertaken, an overall low level of bat activity was recorded during dusk and dawn surveys and walking/driving transects. For less common bat species, the bat encounters recorded were primarily on static units as these were left in the "field" for a minimum of 10 days and therefore provide a greater opportunity to record bat species.

A bat roost occurs within a building on site though this is not at or near a location for wind farm infrastructure development – there was evidence of three species of bat using the building, including lesser horseshoe bat.

All bats recorded are listed as 'Least Concern' on the Irish Red List and protected under the EU Habitats Directive Annex IV and Wildlife Acts. One species, Lesser Horseshoe, is listed as 'Annex II' under the EU Habitats Directive.

### 5.4.8.4 Kerry Slug

The Kerry slug (*Geomalacus maculosus*) is protected by the Wildlife (Amendment) Act 2000 and is listed under Annex II of the Habitats Directive. The Kerry slug is also listed in Annex IV of the Habitats Directive and as such is strictly protected from injury, or disturbance / damage to their breeding or resting place wherever it occurs.

Historically, the Kerry Slug has been considered to be restricted to Devonian Old Red Sandstone areas of Kerry and West Cork where it occurs most commonly in either of three distinct habitats:

- deciduous woodlands in particular those with rocky outcrops or boulders;
- rock outcrops associated with heath or blanket bog; and
- lake shores.

Within these habitats, the species tends to only be present if there is outcropping Devonian Old Red Sandstone, humid conditions and lichen, liverwort and / or mosses in which the species shelters and feeds (Platts and Speight 1988).

The overall conservation status of the species has been reported as 'favourable and improving' and it is not currently considered threatened within its range (NPWS 2019).

Based on the 2020 survey, it is considered that the habitat types "wet heath / blanket bog and rock outcrop habitat" at the Site support an important population of Kerry Slug, which is rated as County Importance.

## **5.5 ASSESSMENT OF EFFECTS**

### **5.5.1 The 'Do-Nothing' Impact**

Without the proposed wind farm development proceeding, it is expected that the present main landuses on site, namely livestock grazing and forestry, will continue. It is possible that further afforestation would occur on the site in the future.

The ecology of the site would be expected to remain fairly similar as at present though any increase in grazing pressure could be detrimental to the quality of peatland habitats on site. Also, any further afforestation on heath and bog habitats would be detrimental.

### **5.5.2 Potential Impacts on European Conservation Sites**

The Appropriate Assessment report that accompanies this planning application has shown objectively that for 11 of the European sites identified within the zone of influence, there are no realistic Source-Pathway-Receptor linkages and hence there is no potential for effects on qualifying interests or Special Conservation Interests as a result of the proposed Inchamore Wind Farm project. These sites are:

- Mullaghanish Bog SAC (code 001890)
- St. Gobnet's Wood SAC (code 00106)
- Blackwater River (Cork/Waterford) SAC (code 002170)
- Glanlough Woods SAC (code 002315)
- Kilgarvan Ice House SAC (code 000364)
- Old Domestic Building, Curraglass Wood SAC (code 002041)
- The Gearagh SAC (code 000108)
- Great Island Channel SAC (code 001058)
- Killarney National Park SPA (code 004038)
- The Gearagh SPA (code 004109)
- Cork Harbour SPA (code 004040)

In the absence of mitigation, likely significant effects on two of the European listed in Table 5.5 could not be excluded during the construction, operational and/or decommissioning stages of the proposed development:

- Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (code 000365)
- Mullaghanish to Musheramore Mountains SPA (code 004162)

For the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC impacts of potential concern may arise as a result of contaminants originating within the project area, and specifically the grid connection route, reaching the designated site and causing harmful effects on relevant qualifying interests for the site. The significance of any effect would be dependent on the magnitude and duration of a pollution event. Full details are presented in the accompanying NIS.

For the Mullaghanish to Musheramore Mountains SPA, a section of the route for the grid connection cable will pass within 170 m of the SPA. Construction works along the grid connection route carried out during the breeding season could have disturbance effects on hen harriers breeding within the SPA. The significance of an effect is unknown as such would be dependent on the locations of the nesting sites and the foraging ranges of the breeding pairs at the time of the works.

### 5.5.3 Potential Impacts on National Conservation Sites

There are three Natural Heritage Areas within a 15 km radius of the proposed wind farm site (see **Table 5.6**), namely Sillahertane Bog NHA (5.5 km distance), Slaheny River Bog NHA (14 km distance) and Conigar Bog NHA (14.5 km distance). All three sites are designated for 'Peatlands'.

As these sites are geographically separated from the proposed Inchamore wind farm site, and without any ecological or hydrological connectivity between the sites and the proposed wind farm location, it can be concluded with full scientific certainty that the proposed wind farm project could not have any impacts on these three NHA sites.

### 5.5.4 Potential Impacts on proposed Natural Heritage Areas

There are 13 No. proposed Natural Heritage Areas within a 15 km radius of the proposed wind farm site (see **Table 5.6**). For eleven of these sites, there are substantial geographical separation distances and/or no ecological or hydrological linkages – these sites are:

- Mullaghanish Bog pNHA (c.300 m distance)

- Prohus Wood pNHA (13.5 km distance)
- Lough Allua pNHA (11 km distance)
- Ballagh Bog pNHA (11.5 km distance)
- Gouganbarra Lake pNHA (12 km distance)
- Kilgarvan Wood pNHA (12 km distance)
- Roughty River pNHA (7 km distance)
- Kilgarvan Ice House pNHA (11 km distance)
- Old Domestic Building, Leitir pNHA (14 km distance)
- Old Domestic Building, Curraglass Wood pNHA (7 km distance)
- Doo Lough pNHA (11 km distance)

It can be concluded that the proposed wind farm project could not have any impacts on these ten pNHA sites.

For the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment pNHA impacts of potential concern may arise as a result of contaminants originating within the project area, and specifically the grid connection route, reaching the designated site and causing harmful effects on relevant qualifying interests for the site. The significance of any effect would be dependent on the magnitude and duration of a pollution event. Mitigation is required to avoid or minimise any risk to the designated site.

The St. Gobnet's Wood pNHA has hydrological connectivity to the site for the proposed wind farm via the Sullane River. While there is a channel distance of approximately 8 km from the wind farm site to the pNHA, there is still a risk that contaminants generated on site during the construction, operational and/or decommissioning phase could flow to the pNHA and possibly have adverse effects on water quality of the river within the pNHA. Mitigation is therefore required to avoid or minimise this risk.

### **5.5.5 Impacts on Habitats, Vegetation and Flora**

The construction of the proposed development will result in the following:

- permanent loss of habitat;
- disturbance to habitat , and
- changes to existing habitats.

For this assessment on habitats, the worse-case scenario is assumed for the turbine range in respect to turbine foundation diameter (22-25.5 m)

### **5.5.5.1 Permanent loss of habitat**

The permanent loss of habitat to facilitate the construction of the project is estimated at 30.75 ha. This will result from the following:

- Turbines foundations and hardstand areas
- Foundation for substation
- Foundation for met mast
- Wind farm road system

The majority of the affected habitat, approximately 26.13 ha, is conifer plantation. As conifer plantation is a non-native habitat that is not classed as a key ecological receptor, the permanent loss of this habitat is rated as Not Significant.

The construction of turbine T1 will result in the permanent loss of 2.32 ha of wet heath and wet heath/blanket bog mosaic. A small area of wet heath (0.2 ha) will be lost as a result of the T2 construction. The total loss of wet heath and wet heath/blanket bog mosaic is approximately 2.5 ha. The peatland habitat within the site is part of a larger complex of heath/bog habitats, which is rated as of County Importance. The loss of 2.5 ha of Annex I listed habitats, which have good representivity and conservation status and functionality, is rated as a Significant Adverse effect of Permanent duration. Compensation for loss of heath and bog habitats will be provided through a Habitat Enhancement Plan (see Appendix 5.5).

The construction of turbine T3, and associated roads, will result in the loss of 1.63 ha of cutover bog. However, the cutover bog at this site is of poor quality (rated as being of Local Importance, higher-lower value). The significance of the effect is rated as Slight Adverse of Permanent duration.

### **5.5.5.2 Disturbance to habitats**

Areas adjoining the infrastructure will be disturbed by the construction works, including the need for construction of a drainage system and for the insertion of the electrical cabling including along the grid connection route.

Such disturbance within the conifer plantation and along the forest tracks and roads is rated as Not Significant due to the low ecological importance of this habitat.

Disturbance to wet heath and wet heath/blanket bog mosaic will occur around the location of T1 and its hardstand, and along part of the hard stand of T2. The extent of the zone of disturbance will vary, with both direct physical disturbance of heath/bog and probable indirect drying effects on adjoining heath/bog due to hydrological changes. Areas of heath and bog that may become drier would be expected to support more vigorous growth of ling heather *Calluna vulgaris* and less development of bog mosses. As the habitats affected by this impact are listed as Annex I habitats, disturbance is rated as a Significant Adverse effect of Medium-term duration. Mitigation to minimise disturbance of heath and bog as a result of construction works will be implemented.

#### **5.5.5.3 Changes to existing habitats**

The proposed borrow pit will result in removal of existing conifer plantation (c.42.6 ha). This will be reinstated using surplus inert material from the site, such as peat and subsoil and allowed to revegetate naturally. It is expected that a vegetation dominated by rushes will develop. Depending on the portion of peat, some bog plants, such as *Molinia caerulea*, are likely to become established in the long-term. Scrub (brambles / willows) and self-seeded conifers would also be expected in the long-term.

Further conifer plantation will be removed from the location of the proposed compound (0.36 ha), from alongside the road and other infrastructure (to facilitate construction works) and from the stretch of grid route between chainage 16,420 to 16,750 m. After the works are complete, including removal of the compound, these areas are expected to regenerate to a mix of rush and scrub vegetation, with self-seeded conifers becoming established over time.

The loss of conifer plantation (a non-native habitat) and replacement with more open habitat which support native plant species will be of benefit to small mammals, birds and insects, and overall the creation of open habitat will be of more value to local biodiversity than the existing conifer plantation. The impact of this change in habitat is rated as a Positive effect of Moderate significance of Long-term duration.

#### **5.5.6 Potential Impact on terrestrial mammals, amphibians and reptiles**

The effect on terrestrial mammal species by the loss and disturbance of habitats due to the proposed development is considered to be not significant on the basis that the species involved are all widespread species of the countryside which occur in similar habitats in the immediate and wider environs.

Pre-construction survey will take place to confirm possible badger presence before any felling of conifer plantation occurs. Should a sett be located, appropriate mitigation will be implemented (see **Section 5.6.3**).

The local otter populations associated with the Sullane River downstream of the Site could be affected adversely if there was a water pollution incident that affected their prey items (fish etc.). With appropriate mitigation to maintain water quality during the construction and operational phases of the proposed development (see CEMP in Appendix 2.1, Chapter 9: Hydrology and Hydrogeology and Chapter 6: Aquatic Ecology), the risk to the otter population is minimised.

Construction activity may cause larger mammals such as the Irish hare and deer to remain in cover. However, this will be a localised and temporary effect (and not generally relevant to nocturnal mammal activity) and the effect is considered to be Not significant.

The common frog and common lizard populations would be affected by loss of habitat during the construction works and some individuals may be killed.

In the absence of mitigation, the significance of the effect on amphibian and reptile species within the site is rated as Significant.

### **5.5.7 Impact on Bats**

For this assessment on bats, the worse-case scenario is assumed for the turbine range, in respect to overall ground to blade tip height (177-185 m), rotor diameter (149-155 m) and hub height (102.5-110.5).

#### **5.5.7.1 Bat Species Recorded and Sensitivity**

Eight species of bat and additional records for *Myotis* species group were recorded during the 2022 bat surveys. This represents eight of the nine bat species known to be resident in County Kerry. The ninth bat species, Nathusius' pipistrelle, was recorded in previous bat surveys completed in 2019/2020.

The table below provides an ecological valuation of each of the nine bat species and the collision risk factor in relation to wind farms. Three of the bat species recorded are considered to be High risk.

**Table 5.16: Evaluation of the bat species recorded during the bat survey.**

Yellow = low population vulnerability

Orange = medium population vulnerability

Red = high population vulnerability

Bat Species	Ecological Value / Geographical Scale of Importance	Irish Status	Bat Risk	Population Numbers / Core Area
Leisler's bat	International	Least Concern	High	Common
Natterer's bat	County	Least Concern	Low	Widespread
Whiskered bat	Regional	Least Concern	Low	Rare
Nathusius' pipistrelle	Regional	Least Concern	High	Rare
Daubenton's bat	County	Least Concern	Low	Common
Brown long-eared bat	County	Least Concern	Low	Widespread
Common pipistrelle	Local	Least Concern	High	Common
Soprano pipistrelle	Local	Least Concern	High	Common
Lesser horseshoe bat	National	Least Concern	Low	Rare

### 5.5.7.2 EcoBat Tool Evaluation

While the static surveillance data collected during 2022 was only partially analysed using the EcoBat Tool, this partial analysis was used to form an analysis to continue the evaluation process and was sufficient for assessment purposes. This identified locations where a high value of bat activity for specific bat species was recorded. Over the course of the 2022 surveillance, the proposed turbine locations for T1, T4 and T5 were deemed to have a Low level of common pipistrelle bat activity. T3 was deemed to have a Medium level of common pipistrelle bat activity, while T2 was deemed to have a High level of common pipistrelle bat activity.

Therefore, in summary, the following proposed turbine locations are considered to be important in relation to level of bat activity recorded during static surveillance and their potential impact on local bat populations:

- T2 and T3.

**5.5.7.3 Site Risk Assessment**

The Site Risk Assessment is calculated according to SNH, 2021. The assessment value (i.e. Turbine Risk value) is compared to the ranges below:

- Low (green) 0-4;
- Medium (amber) 5-12, and
- High (red) 15-25.

While Leisler’s bat can be considered as common in Ireland, its status as an “Internationally Important” population, ranks it higher than the two common *Pipistrellus* species. However, both the bat activity level of Leisler’s bat and soprano pipistrelle was low during the 2022 surveillance while the majority of bat passes recorded was identified as common pipistrelle. Therefore, the Risk Assessment were completed for this bat species only (i.e. for common pipistrelle).

**Common pipistrelle**

With reference to the nightly bat activity at each of the static locations, T1, T4 and T5 were deemed to have a Low level of common pipistrelle bat activity. T3 was deemed to have a Medium level of common pipistrelle bat activity while T2 was deemed to have a High level of common pipistrelle bat activity. In order to complete the table below, the Bat Activity Category (using similar values as per EcoBat Tool) is valued as follows:

- Low = 1 point;
- Medium = 3 points, and
- High = 5 points.

**Table 5.17: Risk assessment for each proposed turbine location for local bat populations using Common pipistrelle bat activity levels.**

Turbine No.	Site Risk Value	Bat Activity Category	Turbine Risk
			Site Risk x Bat Activity Category
1	3	1	3
2	3	5	15
3	3	3	9
4	3	1	3
5	3	1	3

In summary, for common pipistrelles, the proposed turbine locations have the following Risk Factor:

- Low: T1, T4, T5
- Medium: T3
- High: T2

#### 5.5.7.4 *Impact Assessment*

The impact assessment takes into consideration the following:

- Eight bat species were recorded during the 2022 and 2023 bat surveys of the proposed development site.
- Three of these species are considered to be High Risk bat species in relation to wind turbines: Leisler's bat, common pipistrelle and soprano pipistrelle.
- The remaining five species are Low Risk: Natterer's bat, Daubenton's bat, whiskered bat, lesser horseshoe bat and brown long-eared bat.
- Partial Eco Bat Analysis results highlighted turbine locations with High Risk and Medium Risk for common pipistrelle, as this bat species were recorded at High levels of bat activity during static surveillance.
- Spread of bat encounter records within the proposed development site, particularly, in relation to infrastructure.
- Bat habitats present within 200 m of turbine locations and along infrastructure routes.

#### **Potential Impact on Local Bat Populations**

One set of buildings is located within the proposed development area and this was recorded as a bat roost for three bat species: lesser horseshoe bat, Natterer's bat and brown long-eared bat (Building 2). However, all three bat species recorded roosting are considered to be Low Risk bat species in relation to wind farms and there is no proposed turbine or infrastructure adjacent to the buildings (the nearest turbine, T5, is 423 m from the roost).

The following table summarises the result of the impact assessment for each of the turbine locations. If no mitigation measures are implemented, there are two High Risk turbines (T2 and T6) and one Medium Risk turbine (T3).

**Table 5.18: Summary table showing the number of nights recorded bat activity fell into High activity band for common pipistrelles only.**

Turbine No.	Risk Assessment: Common pipistrelle	Other bat species recorded within 200 m of turbine	If no mitigation is applied, what is the potential impact level?
T1	Low	SP, BLE, Leis, Daub	Low
T2	High	SP, BLE, Leis, Daub, Natt, Whis	High
T3	Medium	SP, BLE, Leis, Daub, LHB, Natt, Whis	Medium
T4	Low	SP, BLE, Leis, Daub, Natt	Low
T5	Low	SP, BLE, Leis, Daub, Natt, Whis	Low

The above table summarises the result of the impact assessment for each of the turbine locations. If no mitigation measures are implemented, there is one High Risk turbine (T2) and one Medium Risk turbine (T3).

### **Cumulative Impacts of Existing Forestry Operations**

Forestry operations will continue within sections of the proposed development site outside of the felling required to enable the development of the Project and the turbine buffer zones throughout the life span of the proposed development. Such operations include clear felling and new planting. The cumulative impact of these forestry operations in combination with the proposed development will not cause a significant increase to potential impacts of the proposed development identified above.

#### **5.5.8 Impact on Kerry slug**

The development of the Project could potentially impact on the local population of Kerry Slug due to loss and disturbance of suitable habitat. Based on the likely extent of habitat loss (see terrestrial habitats section) throughout the wind farm site, this impact is likely to be minor and localised as only a small proportion of suitable Kerry Slug habitat (primarily the mosaic of heath and outcropping rock) within the site will be impacted. It is noted that the species is known to populate extensive areas of this type of habitat throughout the wider landscape and has a favourable conservation status across its range (NPWS 2019). However, during construction, works could also result in the death of individual Kerry Slugs due to machinery movements in areas of suitable habitat. Mitigation is required to minimise potential loss of individual slugs.

### 5.5.9 Decommissioning Phase Potential Effects

The applicant is applying for a consent for a period of 35 years for the operation of the wind farm. A detailed Decommissioning Plan is included as part of the CEMP in **Appendix 2.1**. Briefly, decommissioning will involve the following:

- Removal of five wind turbines and concrete plinths.
- Removal of permanent meteorological mast.
- Removal of all associated underground electrical and communications cabling connecting the wind turbines to the wind farm substation. Ducting is to remain *in-situ*

All other elements of the proposed development will remain in-situ. The Site Access Roads and associated drainage systems will serve ongoing forestry and agriculture activity in the area. All other hard surfaced areas will be allowed to revegetate naturally.

Cranes of similar size to those used for construction will disassemble each turbine using the same crane hardstands. The towers, blades and all above ground components will be removed from site and reused, recycled, or disposed of in a suitably licenced facility.

Turbines will be cut on site so as to fit on articulated trucks, therefore allowing the use of the civil construction delivery route for removal.

The key targets of the Plan are as follows:

- Ensure decommissioning works and activities are completed in accordance with mitigation and best practice approach presented in the accompanying Environmental Impact Assessment Report (EIAR) and associated planning documentation.
- Ensure decommissioning works and activities have minimal impact/disturbance to local landowners and the local community. This will relate to transport, particularly of material off site with noise and dust also impacting on receptors at time of decommissioning to a lesser extent.
- Ensure decommissioning works and activities have minimal impact on the natural environment. Disturbance to habitats will be avoided and the use of existing infrastructure and drainage will ensure silt does not enter waterways.
- Adopt a sustainable approach to decommissioning. This means comparing alternative methods for turbine disassembly and taking the approach with the least impact on the natural environment; and,
- Provide toolbox talks, environmental training and awareness of sensitive receptors and waste management within the Site for all project personnel.

From the perspective of terrestrial ecology, the anticipated potential impacts would be:

- Disturbance to peatland habitats, namely wet heath, blanket bog and cutover bog at T1, T2 and T3 locations;
- Disturbance to breeding birds and protected mammal species which may be on site at the time;
- Potential pollution of local waterways, and
- Creation of new habitats on site.

#### **5.5.9.1 Disturbance of peatland habitats**

The Annex I listed heath and bog habitats are of ecological importance (County level), while cutover bog is of Local importance. Any disturbance to these habitats during the works to dismantle turbines no. 1, 2, and 3 would be an adverse impact of potential significance. The Decommissioning and Restoration Plan has a target of minimal impact on the natural environment and it is not anticipated that personnel will need to traverse out onto the bog surface for any reason. The Plan also highlights a target of providing training on sensitive receptors on site to all involved personnel.

With work carried out in accordance with the Plan, it is not expected that the decommissioning works will have adverse effects on the peatland habitats on site.

#### **5.5.9.2 Disturbance of fauna species**

Particular care will be taken to ensure that the decommissioning works do not cause disturbance to animal species occurring on site at the time. Pre-construction baseline surveys will be carried out for species identified of conservation importance at the present time (2023), as well as for further species of importance which may be on site at the time of the works. Relevant legislation relating to flora and fauna in force at the time will be strictly adhered to.

Mitigation measures described in the present report to avoid or minimise disturbance to protected fauna species will be implemented as necessary.

With the above approach followed, it is not expected that the decommissioning works will cause significance disturbance to fauna species associated with the site.

### 5.5.9.3 *Maintenance of water quality*

The issue of potential impacts on hydrology is reviewed in **Chapter 9. Hydrology and Hydrogeology** (Section 9.4.7). The assessment notes the following:

There will not be a requirement for additional drainage measures to be implemented during the decommissioning phase and with the passage of time, the Site is expected to revert to a more natural drainage regime. All anticipated impacts are similar in nature to those already highlighted during the Construction Phase of the Development, i.e., release of hydrocarbons, waste water / sanitation and suspended soils through the excavation of material in order to remove cabling from joint bay locations. The works to be completed during the decommissioning phase are expected to be an imperceptible to slight, neutral, permanent impact on the hydrological and hydrogeological setting surrounding the Site.

On this basis, it can be expected that the decommissioning works will not result in adverse impacts on local watercourses and associated species, including otter.

### 5.5.9.4 *Creation of new habitat*

The Plan specifies that the turbine plinths and hard stands will be allowed to naturally revegetate. At the time of decommissioning, parts of the hardcore surface will likely already support a sparse flora of annual and perennial species (this is normal at operational wind farms after a few years and indeed often attracts sheep to graze the tender shoots). The amount of vegetation that will eventually colonise will depend on the physical and chemical character of the gravel surface. Such recolonising surfaces, which retain warmth in sunshine compared to surrounding areas of soil, tend to attract insects (butterflies etc) as well as passerine bird species such as skylark and various finches, with the birds feeding on seeds from plants. The habitat that would be expected to develop is likely to fall into a mosaic of semi-natural grassland (GS) and artificial stone surfaces (BL3).

The natural re-vegetation of the above-mentioned surfaces is rated as a Positive effect of Moderate significance.

## 5.6 **MITIGATION MEASURES**

### 5.6.1 **Designated sites**

The present report has identified pathways between the site of the proposed wind farm project and two European sites and four proposed Natural Heritage Areas. The pathways are via the River Clydagh and the Sullane River.

In the absence of mitigation, there is a risk that contaminants generated on site during the construction phase could enter local watercourses and ultimately flow to the designated sites where there could be resultant adverse effects on water quality and aquatic life and relevant qualifying interests within the sites. Mitigation is therefore required to minimise this risk.

The mitigation proposed to maintain water quality in the drainage channels and watercourses which drain the site is detailed in **Chapter 9: Hydrology and Hydrogeology**. The implementation of mitigation through avoidance principles, pollution control measures, surface water drainage measures and other preventative measures have been incorporated into the project design in order to minimise potential significant adverse impacts on water quality at the Site. A 50 m stream buffer zone will be implemented at the Site which will largely result in the avoidance of sensitive hydrological features. Direct discharges to surface waters of dewatered loads will not be permitted under any circumstances. This in turn will avoid or reduce the potential for adverse impacts on downstream designated sites.

All of the mitigation measures described in Chapter 9 are contained in the Construction and Environmental Management Plan (CEMP) (appended to the EIAR in **Appendix 2.1**). The CEMP provides a contractual commitment to mitigation and monitoring, and reduces the risk of pollution whilst improving the sustainable management of resources. The environmental commitments of the Project will be managed through the CEMP and will be secured in contract documentation and arrangements for construction and later phases, such that there will be a robust mechanism in place for their implementation. The CEMP addresses the construction phase, and will be continued through to the commissioning, operation and final decommissioning phases.

It is noted that an Ecological Clerk of Works (ECoW)/Environmental Manager with experience in overseeing wind farm construction projects will be appointed by the Contractor for the duration of the construction phase to ensure that the CEMP is effectively implemented. The Contractor will be required to appoint an Environmental Manager.

With such mitigation in place and rigorously enforced, it can be concluded that there would not be any significant effects on the qualifying interests of the identified designated sites as a result of the proposed wind farm project.

## 5.6.2 Habitats and flora

### 5.6.2.1 *Mitigation for habitat disturbance*

The construction works will cause substantial disturbance to adjoining wet heath and blanket bog habitats around the turbine, hardstand and access road for the T1 turbine, as well as the cutover bog at the T3 turbine. To minimise disturbance to the heath and bog habitats and to ensure good recovery, as well as to minimise areas of bare peat which would be prone to erosion, the following approach will be adhered to during the construction phase:

#### **Restricted access to bog and heath**

At the commencement of works at the T1 and T3 locations, the required work footprint on the bog will be identified and the area will be marked by a rope fence (using range poles or similar) and with appropriate signage. No activities of any type will be allowed outside of this agreed work area. The ECoW will inspect the area regularly whilst works are on-going at T1 and T3. Excavated peat and other material will be removed to the approved storage area with no storage of spoil or materials on unplanted bog or heath. The fence will remain in place until the works are fully complete.

#### **Revegetation of bare surfaces**

An ecological objective is to minimise the area of exposed peat surface and to encourage revegetation. This will be achieved by the removal from suitable areas of the vegetated heath and bog surface (cut out as sods or 'turves') within the work footprint at T1, the storage of this material, and subsequent reuse around the turbine and hardstand margins.

The surface turves of vegetated bog and heath will be dug out to a depth of 30 cm or more using a dumper/digger with a bucket. Care will be taken to keep the turve as intact as possible and the vegetated side upwards (though this is not always possible). The turves will be loaded to a trailer and transported to a pre-identified storage area. The storage area will be located in an area of site (not heath or bog) where disturbance during the storage period will not occur. The turves will be off-loaded from the trailer and placed side by side and vegetation side upwards. They will be placed in single layers, *i.e.* not piled on top of each other. Should storage be for prolonged periods (months), the turves will need to be watered during dry spells (as determined by the ECoW). When ready for placement at the finished turbine/hardstand, they will be lifted with a dumper and bucket and taken to the destination. Here they will be off-loaded, placed side by side on the disturbed peat surface with vegetation side up. The turves will be bedded in with the bucket of a dumper so that

they form a continuous layer without gaps between them. This approach will provide almost immediate cover of the bare surfaces. All of the above will be monitored by the ECoW.

It is noted that where adequate peat depth is not available to dig out turves, as well as in the cutover bog at T3, the surface peat will be scraped off and stored in piles in a location similar to that for turves. This material will contain root stock, rhizomes and seed of peatland plant species and will be spread on disturbed surfaces when works are complete to assist in revegetation.

### 5.6.3 Badgers

As the interior of the conifer plantations on site could not be physically accessed at the time of the baseline surveys, a pre-construction survey for badger will be carried out just before and during the time of the tree felling operations within a minimum of 50 m of the working/construction corridor. Surveys will be undertaken by an ecologist with experience of badger surveys and working in association with the tree felling contractor. Before any felling commences, the ecologist will survey marginal areas around the plantation and internal tracks and firebreaks for signs of badger presence. Once felling commences, the ecologist will monitor the progression of the works as the required trees are cleared to facilitate the proposed Development.

Should there be any evidence of a badger sett within the works area or within 50 m of the works area, all felling work will cease immediately and a buffer zone will be established where felling works will be restricted. The surveyor will determine whether the sett is active and whether closure of the sett is necessary to avoid disturbance to the animals. Note that since closure of active setts is prohibited during the badger breeding season (December to June inclusive), appropriate scheduling of the tree felling process will occur to avoid delays.

Furthermore, should 3 years elapse between the time of the baseline surveys (in 2021) and the commencement of construction works, the entire site will be re-surveyed for badger presence as the local distribution may have changed since then.

### 5.6.4 Otter

Otter was not recorded on site and are not likely to occur due to the small size of the watercourses within the site and the absence of fish and larger aquatic organisms (see **Chapter 6: Aquatic Ecology**). However, they are present within the main channel of the Sullane River system downstream of the site.

The mitigation proposed to maintain water quality in the aquatic zones (as detailed in **Chapter 9: Hydrology and Hydrogeology**, **Chapter 5: Aquatic Ecology** and the CEMP) will ensure that the food supplies for otters are not affected.

### 5.6.5 Common frog

Areas where construction works are due to commence during the period February to August will be checked by the ECoW for the presence of frog spawn, tadpoles and adult frogs. If present, these will be removed under licence from NPWS and transferred to suitable ponds, drains or wetlands in the vicinity.

### 5.6.6 Bats

In order to reduce the potential impact of the proposed development on local bat populations the following mitigation is proposed.

#### 5.6.6.1 Construction Phase

Mitigation is best achieved through avoidance especially in relation to bat fauna. It is proposed that the following measures be put in place to avoid or lessen the degree of impacts on local bat populations.

#### **Minimum buffer zone**

To minimize risk to bat populations, a buffer zone will be implemented around any forestry, treeline, hedgerow or woodland feature, into which no part of the turbine will intrude. Using the formula quoted below, the minimum distances of wind turbines for bat mitigation are calculated for each of the potential turbine models (information supplied by Jennings O'Donovan). 50 m is used in the formula as it is considered an average of the distance a bat species will be detected on standard ultrasonic microphones (NatureScot 2021).

$$\text{formula: } \text{Buffer distance} = \sqrt{(50 + b1)^2 - (hh - fh)^2}$$

where  $b1$  = blade length,  $hh$  = hub height,  $fh$  = feature height (all in meters)

The dimensions of the potential wind turbine models proposed to be used are provided in the table below.

Feature height is 25 m (typical conifer plantation height, the predominant habitat type present within the survey area). Dimensions of Blade length and Hub height were provided and the calculation is as follows:

$$\text{Buffer distance} = \sqrt{(50 + 77.5)^2 - (102.5 - 25)^2}$$

**Buffer distance = 101.24 m**

**Construction Phase Bat Mitigation Measures**

Following the formula in the above section, ensure that the required minimum distance from tall vegetation is achieved.

**Table 5.19: Bat Mitigation Measures recommended during the Construction Phase**

<p><b>HcoBat Tool High Level Turbine Locations</b> This applies to T2</p>	<p><b>EcoBat Tool Medium Level Turbine Locations</b> This applies to T3 This also applies to remaining Internal Road Network</p>	<p><b>EcoBat Tool Low Level Turbine Locations</b> This applies to T1, T4 &amp; T5</p>
<p>Ensure that wind turbine is 101.2 m away from plantation edge.</p>	<p>Ensure that wind turbine is 101.2 m away from plantation edge.</p>	<p>Ensure that wind turbine is 101.2 m away from plantation edge.</p>
<p>A zone of 101 m around the wind turbines (from the tip of the blade) will be cleared of tall vegetation (shrubs, trees, scrub etc.) to reduce favourability of this zone for foraging and commuting bats.</p> <p>A low level of vegetation will be maintained for the entire operational phase. This will be monitored to ensure that scrub vegetation does not develop within the zone around the turbines.</p>	<p>A zone of 50 m around the wind turbines (from the tip of the blade) will be cleared of tall vegetation (shrubs, trees, scrub etc.) to reduce favourability of this zone for foraging and commuting bats.</p> <p>A low level of vegetation will be maintained for the entire operational phase. This will be monitored to ensure that scrub vegetation does not develop within the zone around the turbines.</p>	<p>A zone of 50 m around the wind turbines (from the tip of the blade) will be cleared of tall vegetation (shrubs, trees, scrub etc.) to reduce favourability of this zone for foraging and commuting bats.</p> <p>A low level of vegetation will be maintained for the entire operational phase. This will be monitored to ensure that scrub vegetation does not develop within the zone around the turbines.</p>
<p>Clearance work will be completed at least 6 months prior to installation of wind turbines. Studies have shown that bats are attracted to clear felled forestry areas due to increase insect loading. This has been shown to occur for a period of 3-6 months before the insect loading reduces to pre-cleared felled levels.</p>	<p>Clearance work will be completed at least 6 months prior to installation of wind turbines. Studies have shown that bats are attracted to clear felled forestry areas due to increase insect loading. This has been shown to occur for a period of 3-6 months before the insect loading reduces to pre-cleared felled levels.</p>	<p>Clearance work will be completed at least 6 months prior to installation of wind turbines. Studies have shown that bats are attracted to clear felled forestry areas due to increase insect loading. This has been shown to occur for a period of 3-6 months before the insect loading reduces to pre-cleared felled levels.</p>
<p>Building 2 and mature trees surrounding the building will not be removed during construction of the proposed development. This area will be protected from any construction works proposed to be undertaken in vicinity of this area. This area will also be protected during the operation of the proposed development.</p>		

### 5.6.6.2 Operational Phase

#### Feathering of blades

The operation of the turbines should be in a manner that will restrict the rotation of turbine blades as much as possible below the manufacturer's cut-in speed (e.g. by feathering the blades during low wind levels - changes in blade feathering by altering the angle of the blade and therefore preventing the blades from rotating during low wind situations). This would prevent freewheeling or idling of the blades. Therefore, to ensure that blades of turbines are prevented from freewheeling (idling/spinning), feathering of the blades during low wind conditions will be implemented for all turbines.

#### Turbine cut-in speeds

There are bat mitigation measures available in relation to wind farms to reduce fatalities. One successful measure applied to wind farms in Europe is to increase the cut-in speeds of the individual turbines. This is important in order to protect High Risk species (Leisler's bat, soprano and common pipistrelle) foraging/commuting in vicinity of turbine locations.

Increasing the cut-in speed to 5.5 m/s from 30 minutes prior to sunset and to 30 minutes after sunrise to reduce bat collisions with turbines will be employed where required, *i.e.* at turbine locations where surveillance recorded high bat activity levels for High Risk and Medium Risk bat species and/or bat carcasses were recorded. The duration required depends on the level of bat mitigation required for individual turbine sites (*i.e.* full bat activity season or confined to spring & autumn months – this will be determined by first year surveillance – see below). A risk assessment will be undertaken using the surveillance data and analysed using best practice e.g. assessment of static data should be completed using the online tool *EcoBat* (<http://www.mammal.org.uk/science-research/ecostat/>) as recommended by SNH, 2021 or other equivalent tool depending on most up to-date recommendations at the time of monitoring.

Where cut-in speeds are required, they will be operated according to specific weather conditions. In a previous bat survey undertaken by the author, static units were erected on an anemometer at 4 m and 50 m level. The number of bat passes recorded on the static units was analysed according to temperature and wind speed recorded at similar height levels. During this survey, it was determined that:

1. The vast majority of bat passes were recorded at the temperatures of 8°C and greater. Therefore, when the air temperature was less than 7°C there was no bat activity recorded below this temperature during the surveys completed.

2. In general, bat activity was highest at low wind speeds (<5.5 m/s). It has been shown that curtailing the operations of wind turbines at low wind speeds can reduce bat mortality dramatically, especially during the late summer and early autumn months.
3. SNH (2021) recommend that curtailment is implement for 10°C and above.

Reducing fatalities can be reduced by changing the speed trigger or cut-in speeds of the turbines (i.e. meaning that the turbine is not operational during low wind speeds) or by changing the turbine blades angles which will mean that higher wind speeds are needed to start the wind turbine blades moving. Modern remotely operated wind turbines allow such cut-in speeds to be controlled centrally and automatically. Due to the high levels of bat activity, cut-in speed is required at T2.

- a. Surveillance will be undertaken at the High and Medium Risk turbine (T3) over a period of three years (first three years of operation, but an annual review is required to determine the cut-in speeds after 1 year of operation). If the *Common pipistrelle* activity remains moderate to high at the T3 Medium Risk turbine after the first year of surveillance then the cut-in speeds (coupled with carcass search results) will be put in place immediately. High and Medium Risk turbines surveillance will continue to review the situation at each individual turbine location for the remaining two years. This will allow refinement of the curtailment regime.

For all other turbines, operation without cut-in speeds coupled with 3 years of surveillance (according to SNH, 2021 guidelines) to determine if cut-in speeds are required at these turbine locations.

As recommended by SNH, 2019 if curtailment is put into operation, *“then the effectiveness of curtailment needs to be monitored in order to determine (a) whether it is working effectively (i.e. the level of bat mortality is considered to be incidental), and (b) whether the curtailment regime can be refined such that turbine down-time can be minimised whilst ensuring that it remains effective at preventing casualties”*.

*“Where the need for curtailment has been identified, a curtailment regime should be developed and presented as a part of the supporting Environmental Statement for the project. The proposed operating regime should specify, and be designed around the values for the key weather parameters and other factors that are known to influence collision risk which may include any or 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)*

Post construction acoustic surveys provide additional information which, when used in conjunction with appropriate carcass search data, can support any proposed changes to pre-application predictions concerning the need for curtailment or adjustments to an agreed curtailment regime.

This surveillance and annual review should be carried out by an independent experienced bat ecologist and all reports should be issued to the Local Authority and NPWS for review.

**Table 5.20: Bat Mitigation Measures proposed during the Operational Phase.**

<b>EcoBat Tool High Level Turbine Locations</b> This applies to T2	<b>EcoBat Tool Medium Level Turbine Locations</b> This applies to T3 This also applies to remaining Internal Road Network	<b>EcoBat Tool Low Level Turbine Locations</b> This applies to T1, T4 & T5
Operate the wind turbines in a manner that reduces the movement of the blades below the cut-in speed (e.g. by feathering the blades).	Operate the wind turbines in a manner that reduces the movement of the blades below the cut-in speed (e.g. by feathering the blades).	Operate the wind turbines in a manner that reduces the movement of the blades below the cut-in speed (e.g. by feathering the blades).
Operate the wind turbine from 30 minutes prior sunset to 30 minutes after sunrise at a cut-in speed of 5.5 m/s during specified weather conditions and during the active bat season (April to October) when air temperatures are 10°C or more at the nacelle height.  Undertake monitoring the first three years of operation to determine bat activity levels post construction. Review the results of monitoring at individual High Risk turbines after Year 1.  Operate wind farm with specific cut-in speeds from Day 1 of Year 2, if required, and review after surveillance/monitoring is completed.	Put in a monitoring programme for the first year of operation to ensure that bat activity is at a low level in vicinity of these turbines.  Review monitoring results to determine if further bat mitigation measures are required (e.g. cut-in speeds).	

<b>EcoBat Tool High Level Turbine Locations</b> This applies to T2	<b>EcoBat Tool Medium Level Turbine Locations</b> This applies to T3 This also applies to remaining Internal Road Network	<b>EcoBat Tool Low Level Turbine Locations</b> This applies to T1, T4 & T5
Undertake a carcass search for 3 years post operation of the wind farm to determine whether a higher cut-in speed of the blades is required.  Review after Year 1 along with bat activity monitoring.	Undertake a carcass search for 3 years post operation of the wind farm.	Undertake a carcass search for 3 years post operation of the wind farm.
Annual inspection of each buffer zone around each turbine will be undertaken and any regenerating trees or tall shrubs will be cut back.	Annual inspection of each buffer zone around each turbine will be annually inspected and any regenerating trees or tall shrubs will be cut back.	Annual inspection of each buffer zone around each turbine will be annually inspected and any regenerating trees or tall shrubs will be cut back.

Bat mitigation measures during the Operational Phase will be reviewed by implementing a strict surveillance programme for the first three years of operation of the wind farm in order to identify if there exists a substantial risk at a particular turbine location or during a particular time-period (3 years - as per recommendation of SNH, 2021 guidelines). This surveillance required is as follows (following SNH 2021 guidelines):

a) Bat activity surveillance

The level of bat activity will be monitoring for a minimum of 10 nights at each turbine location (ground level) during three of the eight month activity period (March/April to October/November). The surveillance periods will be divided into three survey periods to represent the three main periods where bat collisions have been documented: Spring (April/May); Summer (June/July) and Autumn (August/September).

b) Carcass search

During the surveillance periods of specific wind turbines, carcass search is proposed for a minimum of 1 morning per turbine (i.e. 3/4 mornings in total over the 1 year surveillance i.e. one per surveillance period). For each turbine, the search area will be 100 m radius after ideal bat foraging weather conditions (mild, calm and dry weather and greater than 10°C). A scavenger trial is required to facilitate analysis (as per SNH, 2021 guidelines).

c) Assessment of static data will be completed using the online tool *EcoBat Tool* (<http://www.mammal.org.uk/science-research/ecostat/>) as recommended by SNH, 2021 or other equivalent tool depending on most up to-date recommendations at the time of monitoring.

### 5.6.7 Kerry Slug

The following measures will be implemented for Kerry Slug:

- Areas of suitable habitat that occur outside of the footprint of the development will be avoided during the course of construction thereby minimising the loss and disturbance of Kerry Slug habitat.
- Immediately prior to undertaking works in areas of suitable habitat (wet heath / blanket bog / rock outcrop), the project ecologist will check for the presence of Kerry Slug. Should slugs be discovered, then they will be transferred to suitable habitat in the surroundings. Similar on-going monitoring of suitable habitat within works areas will continue throughout the construction phase. Such monitoring will be undertaken during periods of wet weather when slugs are most active and feeding on the surface and therefore at greater risk of impacts by movement of machinery. The transfer of Kerry Slugs will be subject to a derogation licence from the Department of Housing, Local Government and Heritage.

Subject to the above mitigation being implemented it is concluded that impacts of significance on the conservation status of Kerry Slug will not arise, i.e. the effect of the proposed development on Kerry Slug would be Not Significant.

## 5.7 RESIDUAL EFFECTS OF THE DEVELOPMENT

With mitigation measures as presented implemented in full, and specifically preservation of water quality in local watercourses and avoidance of disturbance to breeding hen harrier, it is considered that the significance of the effect of the predicted impact on designated sites as a result of the proposed wind farm project will be 'Not Significant'.

With mitigation measures as presented implemented in full, it is considered that the significance of the predicted effect on wet heath and blanket bog habitats as a result of the proposed wind farm development will be a Significant Long-term adverse effect. However, compensation will be provided for the loss of habitat through a Habitat Enhancement Plan (see section 5.9).

With mitigation measures as presented implemented in full, including preservation of water quality in local watercourses, it is considered that the significance of the predicted impact on terrestrial mammal species as a result of the proposed wind farm development will be Not significant.

As long as the mitigation measures presented are implemented in full, the impact of the proposed development on local bat populations is considered to be a Slight to Imperceptible residual negative effect. The conservation status of each of the local bat species will remain unaffected.

With mitigation measures as presented implemented in full, it is considered that the significance of the predicted impact on the Kerry Slug population as a result of the proposed wind farm development will be Not significant.

## 5.8 CUMULATIVE EFFECTS

There are 26 wind farms within 20 km<sup>3</sup> of the Inchamore proposed development (an area of 1,256 km<sup>2</sup>). **Figure 5.12** shows the location of proposed, permitted and operational wind farms within a 20 km radius of the Inchamore site and further information on these wind farms is provided in the accompanying EIAR (**Appendix 2.3, Chapter 2**). Of the 26, 18 no. are operational (175 turbines total), 6 no. are permitted (25 turbines), 1 no. is at pre-planning stage (17 turbines) and 1 no. is proposed (14 turbines).

The nearest operational wind farms to the Inchamore site is Coomagearlaghy, Kilgarvan Wind Farm (15 turbines), which is located 2.7 km to the south-west, and Inchee, Poulbatha & Foilgreana (6 turbines), which is located 3.3 km to the south-west. The permitted Gortnakilla, Clonkeen, Killarney Wind Farm is located 1.87 km to the west of the Inchamore site.

Most of the wind farms are clustered to the north-east, south and south-west of the Inchamore site.

The Inchamore project will add a further 5 turbines to the total of 231 turbines. Based on the locations of the 26 wind farms (see **Figure 5.12**), it is expected that most are on heath and/or bog habitats and the construction of such projects would have (or will) caused loss and disturbance of peatland habitats. The proposed wind farm project at Inchamore will contribute to further loss of heath and bog habitats (from T1 and T2).

A detailed inventory of permitted projects within a 3 km radius of the site for the Inchamore wind farm and 50 m either side of the grid connection route has been compiled (see **Appendix 2.5, Chapter 2**). These projects received planning permission between 2017

---

<sup>3</sup> A distance of 20 km is taken as a precautionary distance for potential in-combination effects to occur – such a distance is beyond the normal foraging range of bird species associated with SPAs.

and 2022. Most of the projects are domestic scale developments or agricultural related developments and no potential pathways to European sites are identified. Potentially relevant projects which have received planning permission are:

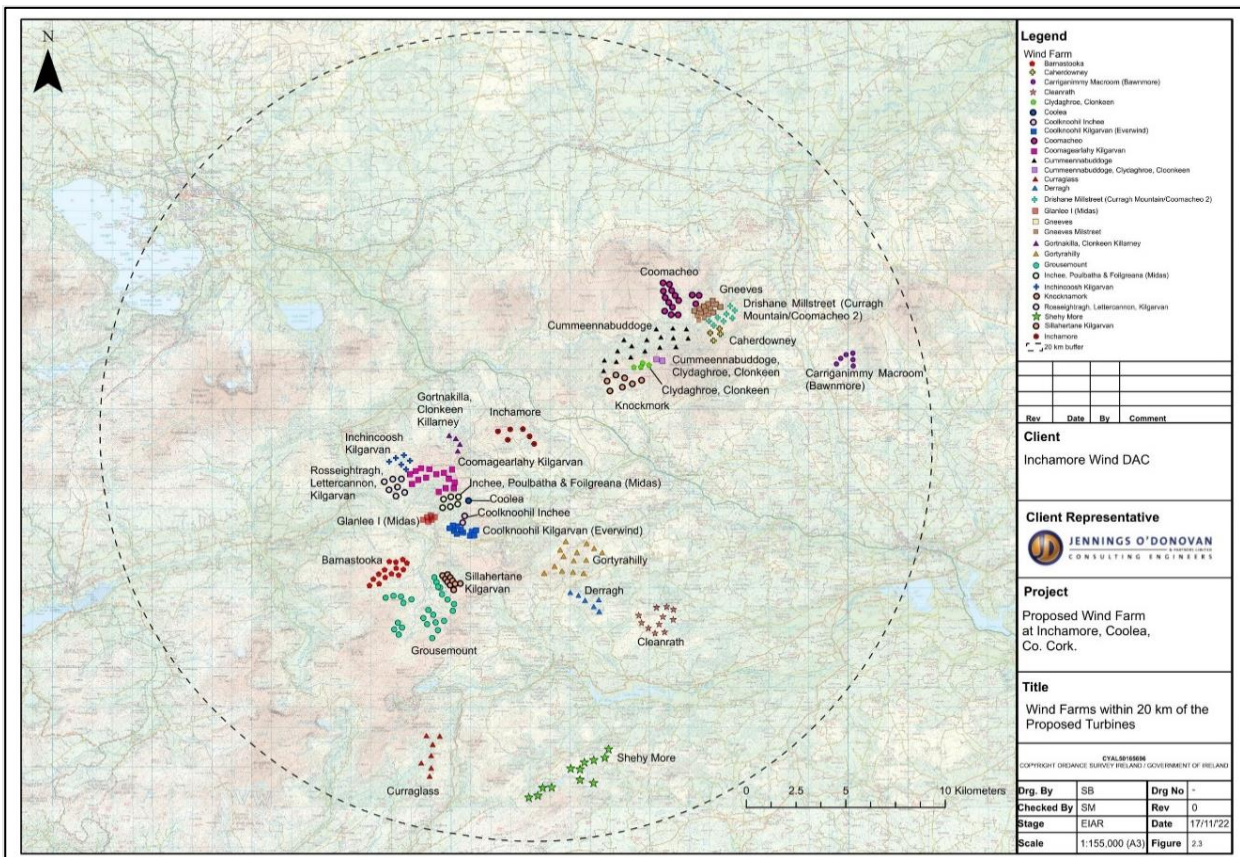
Planning Ref. 174167 – A solar photovoltaic panel array consisting of up to 37,800 m<sup>2</sup> of solar panels on ground mounted steel frames and all associated infrastructure and site works. Located at Coumaclovane, Coolea, Co Cork, approximately 4 km south-southwest of the Inchamore site. Permission granted by Cork County Council 01/07/2017.

Planning Ref. 215127 – The erection of a temporary meteorological mast for a period of 5 years, located at Inchamore, Coolea, Co. Cork (within the site for the proposed Inchamore Wind Farm). This consists of a 100 m high lattice mast and associated stay wires. Permission granted by Cork County Council 31/08/2021.

Planning Ref. 217318 – A 30 m high telecommunications structure together with antennas, dishes and associated telecommunications equipment and all associated works. Located at Derreenaling, Ballyvourney, Co. Cork, approximately 2 km east of the Inchamore site. Permission granted by Cork County Council 15/02/2022.

All of the wind farm and other projects will have been assessed by the competent authority for potential adverse effects on designated sites and habitats and species of conservation importance. As it has been demonstrated in this report that the Project, with mitigation in place, will not have adverse effects on the integrity of any designated site, it can be concluded that there is no pathway for it to act in-combination with other plans and projects to give rise to cumulative effects.

The peatland habitat in much of the Site has been severely degraded by afforestation. The construction of the proposed wind farm will contribute to an existing and ongoing adverse effect on the peatland resource of the site and county.



**Figure 5.12: Distribution of wind farm sites within a 20 km distance of the proposed Inchamore Wind Farm.**

**5.9 PROPOSED BIODIVERSITY ENHANCEMENT**

The Habitat Enhancement Plan is presented in **Appendix 5.5**. The Plan will restore and enhance an area of blanket bog habitat that has been severely eroded following over-grazing by sheep. This will provide compensation for the loss of heath and bog habitats on site as a result of wind farm construction (total of 2.5 ha intact heath and bog and 1.6 ha of cutover bog). The total area of the HEP, which includes some relatively intact blanket bog and some cutover bog, is 10.8 ha.

The objectives of the Plan are as follows:

**Objectives - primary**

- To enhance existing areas of blanket bog (Annex I habitat) which are subject to ongoing erosion.
- To increase the vegetation cover in areas of cutover blanket bog that have been intensively grazed by livestock in the recent past.

**Objectives - secondary**

- To enhance existing habitats for peatland associated species such as Red Grouse, (Red-listed), Snipe (Red-listed), Meadow Pipit (Red-listed) and the Irish Hare.

The objectives for the Plan are achievable as similar work has been carried out successfully at other sites in Ireland. The Plan will be underwritten by a detailed monitoring programme, which will allow modifications to ensure that the objectives are being achieved (See **Appendix 5.6**).

**5.10 MONITORING****5.10.1 On-going monitoring during construction**

An Ecological Clerk of Works (ECoW) and Environmental Manager will be on site as required during the construction phase. As required, a consultant ecologist with expertise in peatland habitats will assist the ECoW and Environmental Manager. The consultant ecologist will be employed by the developer and will be independent of the Contractor.

The ECoW will ensure that all mitigation relating to ecological impacts is being implemented throughout the construction phase of the project.

Mitigation for Kerry Slug, as described in **Section 5.6.7**, will involve monitoring of potential Kerry Slug habitat prior to any works commencing. This will be carried out by an ecologist with proven expertise in the ecology of Kerry Slug and will be under licence.

**5.10.2 Pre-construction bat survey**

Should three years lapse from between planning-stage surveys in 2022 and installation of the wind turbines, it will be necessary to repeat one full season of surveys during the activity period (EUROBATS, 2014). Future survey work should be completed according to best practice guidelines available. The most current guidance document for Irish wind farms is from NatureScot (NatureScot, 2021) (NIEA, 2021)

**5.10.3 Pre-construction badger survey**

Should three years lapse since the 2021 baseline survey before construction commences, all work areas will be subject to a pre-construction survey for badger. This survey will give particular focus to the afforested part of site where badger is most likely to occur (and where full survey was not achieved in the 2021 baseline survey due to difficulty of access through dense conifer plantation).

#### 5.10.4 Bat monitoring

Bat mitigation measures during the Operational Phase can be reviewed by implementing a strict surveillance programme for the first three years of operation of the wind farm in order to identify if there exists a substantial risk at a particular turbine location or during a particular time-period (3 years - as per recommendation of SNH, 2021 guidelines). This surveillance will then be repeated at Year 10 and Year 20 of the operation of the wind farm to ensure the efficacy of the mitigation being implemented. This surveillance required is as follows:

- **Bat activity surveillance**

The level of bat activity will be monitored for a minimum of 10 nights at each turbine location (ground level) during three of the eight-month activity period (March/April to October/November). The surveillance periods will be divided into three survey periods to represent the three main periods where bat collisions have been documented: Spring (April/May); Summer (June/July) and Autumn (August/September).
- **Carcass search**

During the surveillance periods of specific wind turbines, carcass search will be conducted for a minimum of 1 morning per turbine (i.e. 3/4 mornings in total over the 1 year surveillance i.e. one per surveillance period). For each turbine, the search area will be 100 m radius after ideal bat foraging weather conditions (mild, calm and dry weather and greater than 10°C). A scavenger trial is required to facilitate analysis (as per SNH, 2021 guidelines).
- **Assessment of static data** will be completed using the online tool *EcoBat Tool* (<http://www.mammal.org.uk/science-research/ecostat/>) as recommended by SNH, 2021 or other equivalent tool depending on most up to-date recommendations at the time of monitoring.

#### 5.11 SUMMARY OF SIGNIFICANT RESIDUAL EFFECTS

From the perspective of Biodiversity, the principal residual effect as a result of the proposed wind farm project is the permanent loss of approximately 2.5 ha of wet heath and blanket bog habitat, which includes areas of dry heath and outcropping silicious rock (all Annex I listed habitats) – this adverse effect is considered Significant and of Long-term duration at the County Level. With implementation of a Habitat Enhancement Plan to compensate for the loss of habitat, the significance of the loss is reduced.

## 5.12 REFERENCES

- Andrews, H. (2016) *Bat Tree Habitat Key* (3rd Edition). AEcol, Bridgewater.
- BCI. (2010) *Bats and Lighting. Guidance Notes for Planners, Engineers, Architects and Developers*. Noticenature.
- BCI. (2012) *Wind Turbine/Wind Farm Development Bat Survey Guidelines, Version 2.8*. Bat Conservation Ireland.
- BCT. (2018) *Bats and artificial lighting in the UK. Guidance Note 08/18*. ILP.
- European Commission (2013) *Interpretation Manual of European Union Habitats EUR28*
- CIEEM (2022) *Guidelines for Ecological Impact Assessment: Terrestrial, Freshwater, Coastal and Marine. Version 1.2*. Chartered Institute of Ecology and Environmental Management
- Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> edn.)*. The Bat Conservation Trust, London.
- Curtis, T.G.F. & McGough, H.N. (1988) *The Irish Red Data Book. 1 Vascular Plants*. Stationary Office, Dublin.
- Department of Culture, Heritage and the Gaeltacht (2019) *The Status of Protected Habitats and Species in Ireland*.
- EC (2007b) *Interpretation Manual of European Union Habitats. Version EUR 27*. European Commission, DG Environment.
- EPA (2022) *Guidelines on the information to be contained in Environmental Impact Assessment Reports*. Published by the Environmental Protection Agency, Johnstown Castle Estate, Co. Wexford, Ireland.
- Fossitt, J. A. (2000). *A Guide to Habitats in Ireland*. Dublin: The Heritage Council.
- Hayden, T. & Harrington, R. (2000) *Exploring Irish Mammals*. Town House, Dublin.
- Kearney, J., (2010). Kerry slug (*Geomalacus maculosus* Allman 1843) recorded at Lettercraffroe, Co. Galway. – *Irish Naturalists' Journal* 31: 68-69.
- King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J., Fitzpatrick, U., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. & Cassidy, D. (2011) *Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- Marnell, F., Looney, D. & Lawton, C. (2019) *Ireland Red List No. 12: Terrestrial Mammals*, National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Dublin, Ireland.
- Mathews, F.M. (2013) Effectiveness of search dogs compared with human observers in locating bat carcasses at wind turbine sites: a blinded randomized trial. *Wildlife Society Bulletin* 37: 34-40.

- McDonnell, R.J. and Gormally, M.J. (2011a). Distribution and population dynamics of the Kerry Slug, *Geomalacus maculosus* (Arionidae). Irish Wildlife Manuals, No. 54. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- McDonnell, R.J. & Gormally, M.J. (2011b) Identification of a live trapping method for the protected European slug, *Geomalacus maculosus* Allman 1843 (Arionidae). Journal of Conchology 40: 483-485.
- McDonnell, R., O'Meara, K., Nelson, B., Marnell, F., and Gormally M. (2013). Revised distribution and habitat associations for the protected slug *Geomalacus maculosus* (Gastropoda, Arionidae) in Ireland. Basteria (Journal of the Netherlands Malacological Society) 77 (1-3): 33-37.
- NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill
- NPWS Online map for protected bryophytes, <http://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e> Online, Accessed: November 2021.
- NPWS Protected Site Synopses and maps available on <http://www.npws.ie/en/ProtectedSites/>. Last accessed January 2023.
- NRA (2008) Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes. Dublin: Transport Infrastructure Ireland.
- NRA (2009a) Guidelines for Assessment of Ecological Impacts of National Road Schemes. Dublin: Transport Infrastructure Ireland.
- NRA (2009b) Ecological Surveying Techniques for Protected Flora and Fauna during the planning of National Road Schemes. Dublin: Transport Infrastructure Ireland.
- Platts, E.A & Speight, M.C.D. (1988) The taxonomy and distribution of the Kerry Slug, *Geomalacus maculosus* Allman, 1843 (Mollusca Arionidae) with a discussion of its status as a threatened species. *Irish Naturalists' Journal* **22** :417-30.
- Preston, C., Pearman D. and Dines. T. (2002). *New Atlas of the British and Irish Flora*. Oxford University Press.
- Reich, I., O'Meara, K., Mc Donnell, R.J. and Gormally, M.J. (2012). An assessment of the use of conifer plantations by the Kerry Slug (*Geomalacus maculosus*) with reference to the impact of forestry operations. Irish Wildlife Manuals, No. 64. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.
- Rodrigues, L., Bach, L., Dubourg-Savage, M., Karapandza, B., Kovac, D., Kervyn, T. & Mindermann, J. (2015) Guidelines for consideration of bats in wind farm projects. Revision 2014. EUROBATS.
- Stace, C. (2010). *New Flora of the British Isles* (3rd edition). Cambridge University Press.

- 
- Smal, C.M. (1991) The National Badger Survey: preliminary results for the Irish Republic. In: Hayden, T.J. (ed.) *The Badger*. Pp. 9-22. Royal Irish Academy, Dublin.
- Smith, A.J.E. (2004). *The Moss Flora of Britain and Ireland* (2<sup>nd</sup> edition). Cambridge University Press.
- Parnell, J. and Curtis, T. (2012). *Webb's An Irish Flora* (8<sup>th</sup> edition). Cork University Press.
- Wellig, S.D. (2018) Mitigating the negative impacts of tall wind turbines on bats: Vertical activity profiles and relationships to wind speed. PLOS ONE, 13.
- Whilde, A. (1993) *Irish Red Data Book 2: Vertebrates*. HMSO, Belfast.
- Wyse Jackson, M., Fitzpatrick, U., Cole, E., Jebb, M., McFerran, D., Sheehy-Skeffington, & Wright, M. (2016). *Ireland Red List No. 10: Vascular Plants*. NPWS, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs. Dublin.