

6. BIODIVERSITY – FLORA AND FAUNA

6.1 Introduction

This chapter assesses the likely significant effects (both alone and cumulatively with other projects) that the Proposed Development may have on Biodiversity, Flora and Fauna and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified. The residual impacts on biodiversity are then assessed. Particular attention has been paid to species and habitats of ecological importance. Impacts on avian receptors are considered in Chapter Seven of this EIAR. These include species and habitats with national and international protection under the Wildlife Acts 1976-2019, EU Habitats Directive 92/43/EEC. The full description of the Proposed Development is provided in Chapter 4 of this EIAR.

The chapter is structured as follows

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

The following defines terms utilised in this chapter:

- For the purposes of this EIAR, the entire project is referred to as ‘the Proposed Development’.
- For the purpose of this EIAR, the term ‘Site Boundary’ refers to the study boundary, comprising the entire area shown in Figure 1-1. All elements of the Proposed Development as listed in Section 1.4 have been included as part of this assessment.
- “Key Ecological Receptor” (KER) is defined as a species or habitat occurring within the zone of influence of the development upon which likely significant effects are anticipated.
- “Zones of Influence” (ZOI) for individual ecological receptors refers to the zone within which potential effects are anticipated. ZOIs differ depending on the sensitivities of particular habitats and species and were assigned in accordance with best available guidance and through adoption of a precautionary approach.

Requirements for Ecological Impact Assessment

National Legislation

The Wildlife Act, 1976–2018, is the principal piece of legislation governing protection of wildlife in Ireland. The Wildlife Act provides strict protection for species of conservation value. The Wildlife Act conserves wildlife (including game) and protects certain wild creatures and flora. These species are therefore considered in this report as ecological receptors. Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) are heritage sites that are designated for the protection of flora, fauna, habitats and geological sites. Only NHAs are designated under the Wildlife (Amendment) Act 2017. These sites do not form part of the Natura 2000 network of European sites and the AA process, or screening for same, does not apply to NHAs or pNHAs. Proposed Natural Heritage Areas (pNHAs) were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated¹. However, these sites are considered to be of significance for wildlife and habitats as they may form statutory designated sites in the future (NPWS, 2020).

The Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) lists the species, hybrids and/or subspecies of flora protected under Section 21 of the Wildlife Acts. It provides protection to a wide variety of protected plant species in Ireland including vascular plants, mosses, liverworts, lichens and stoneworts. Under Flora Protection Order.

It is illegal to cut, pick, collect, uproot or damage, injure or destroy species listed or their flowers, fruits, seeds or spores or wilfully damage, alter, destroy or interfere with their habitat (unless under licence).

National Policy

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

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

¹ <https://www.npws.ie/protected-sites/nha> (accessed 23 January 2020).

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

Such policies have informed the evaluation of ecological features recorded within the study area and the ecological assessment process.

European Legislation

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

Annex I of the Habitats Directive lists habitat types whose conservation requires the designation of Special Areas of Conservation (SAC). Priority habitats, such as Turloughs, which are in danger of disappearing within the EU territory are also listed in Annex I. Annex II of the Directive lists animal and plant species (e.g. marsh fritillary, Atlantic salmon, and Killarney fern) whose conservation also requires the designation of SAC. Annex IV lists animal and plant species in need of strict protection such as lesser horseshoe bat and otter, and Annex V lists animal and plant species whose taking in the wild and exploitation may be subject to management measures. In Ireland, species listed under Annex V include Irish hare, common frog and pine marten. Species can be listed in more than one Annex, as is the case with otter and lesser horseshoe bat which are listed on both Annex II and Annex IV. The disturbance of species under Article 12 of the Habitats Directive (and in particular avoidance of deliberate disturbance of Annex IV species, particularly during the period of breeding, rearing, hibernation and migration and avoidance of deterioration or destruction of breeding sites or resting places) has been specifically assessed in this EIAR.

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

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

6.3 Scoping/Review of Relevant Guidance and Sources of Consultation

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

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

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater and Coastal (CIEEM, 2018).

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

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

- The International Convention on Wetlands of International Importance especially Waterfowl Habitat (Concluded at Ramsar, Iran on 2 February 1971)
- S.I. No. 272 of 2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009 and S.I. No. 722 of 2003 European Communities (Water Policy) Regulations 2003 which give further effect to EU Water Framework Directive (2000/60/EC).
- Planning and Development Acts 2000 – 2019.

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

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

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

- > Cork County Development Plan 2014 – 2020.
- > Natura Impact Assessment Report on the Cork County Development Plan, County Council, (2014).

6.3.1 Statement of Authority

Ecological baseline surveys, including bat surveys, were conducted by MKO ecologists; Aoife Joyce (BSc., MSc.), Claire Stephens (BSc.), Luke Dodebier (BSc.), Sara Fissolo (BSc.), Úna Nealon (BSc., PhD.) and Laoise Kelly (B. Sc.). All surveyors have relevant academic qualifications and experience in undertaking habitat and ecological assessments.

Bat surveys were coordinated by Úna Nealon (BSc, PhD). Úna’s primary expertise lies in bat ecology, particularly in relation to wind farm EIA. She completed her PhD with the Centre for Irish Bat Research, examining the impacts of wind farms on Irish bat species. Bat survey data was compiled and assessed by Aoife Joyce and Luke Dodebier. The final bat report was reviewed by John Hynes (B.Sc., M.Sc., MCIEEM).

This EIAR chapter has been prepared by Laoise Kelly (B.Sc.) and reviewed by John Hynes (B.Sc., M.Sc., MCIEEM). Laoise is an experienced ecologist with over 5 years professional experience. John is an experienced ecologist who has over 8 years’ professional experience in environmental management and ecological assessment.

6.4 Methodology

The following sections describe the methodologies followed to establish the baseline ecological condition of the Proposed Development site and surrounding area. Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to and at the time of the project proceeding. Ecological Baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

6.4.1 Desk Study

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

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

6.4.2 Scoping and Consultation

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

Copies of all scoping responses are included in Appendix 2-1 of this EIAR. The recommendations of the consultees have informed the EIAR preparation process and the contents of this chapter. Table 2-3 in Chapter 2 of this EIAR describes where the comments raised in the scoping responses received have been addressed in this assessment. Table 6-1 provides a list of the organisations consulted with regard to biodiversity during the scoping process, and notes where scoping responses were received.

Table 6-1 Organisations consulted with regard to biodiversity

Consultee	Response
An Taisce	No response received to date
Bat Conservation Ireland	No response received to date
BirdWatch Ireland	Acknowledgement received 3 rd December 2019
Department of Culture, Heritage and the Gaeltacht	The Department of Culture, Heritage and the Gaeltacht was consulted during the preparation of this report. The DCHG had no comment to make with regard to biodiversity within the site and requested that

² NPWS, 2019, Online map viewer; Flora Protection Order Map Viewer – Bryophytes. Online, Available at: <http://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=7118df33693f48edbb70369d7fb26b7e>, Accessed: 06/04/2020.

	mitigation measures with regard to archaeology be implemented as part of the Proposed Development.
Inland Fisheries Ireland	<p>Inland Fisheries Ireland were consulted during the preparation of this report. IFI stipulated that measures should be in place with regard to protection of watercourses during construction of the Proposed Development, including:</p> <p>a) There be no drainage or other physical interference with the bed or bank of any watercourse without prior consultation with IFI.</p> <p>(b) Suspended solids and or hydrocarbon contaminated site run-off waters are controlled adequately so that no pollution of surface waters can occur. More specifically IFI feels the following issues should be addressed</p> <ul style="list-style-type: none"> (i) Identifying and zoning the project for environmental impact should a peat slip occur (ii) Setting out contingency plan should a peat movement occur. (iii) Setting out a plan for the control of silt in such a scenario, including measures to be put in place at the initial stages of construction. <p>(c) In the event of any watercourse crossings being bridged or culverted the following general criteria should apply,</p> <ul style="list-style-type: none"> (i) The free passage of fish must not be obstructed. (ii) The original slope of the riverbed should be maintained with no sudden drops on the downstream side. (iii) Bridges are preferable to culverts. (iv) In the event of a crossing being in excess of 1ft in width IFI should be consulted prior to works commencing. (v) All instream works should be carried out only in the April-September period.
Irish Water	<p>Irish Water were consulted during the preparation of this report. IW described the aspects of Water Services to be considered in the scope of an EIAR where relevant which are provided in Chapter 2. This included but not restricted to;</p> <ul style="list-style-type: none"> ➤ Management measures to minimise/stop surface waters from reaching combined sewers, ➤ Assimilative capacity of receiving waters in relation to IW discharge outfalls including changes in dispersion /circulation characterises ➤ Any potential impact on the contributing catchment of water sources either in terms of water abstraction for the development (and resultant potential impact on the capacity of the source) or the potential of the development to influence/ present a risk to the quality of the water abstracted by IW for public supply. ➤ Where a development proposes to connect to an IW network and that network either abstracts water from or discharges waste water to a “protected”/sensitive area, consideration as to whether the integrity of the site/conservation objectives of the site would be compromised.

6.4.3 Field Surveys

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

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

Multidisciplinary walkover surveys were undertaken on the 29th and 30th of July 2019, 22nd, 23rd and 24th January 2020, the 25th of March and the 26th of May 2020. Surveys were conducted all year round and where required were conducted during the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith *et al.*, 2011). No constraint with regard to timing of surveys was identified and a comprehensive walkover survey of the entire site was completed.

The walkover surveys were designed to detect the presence, or likely presence, of a range of protected species. The survey included a search for badger setts and areas of suitable habitat, potential features likely to be of significance to bats and additional habitat features for the full range of other protected species that are likely to occur in the vicinity of the Proposed Development (e.g. otter etc.).

The multi-disciplinary walkover surveys comprehensively covered the entire study area and based on the survey findings, further detailed targeted surveys were carried out for features and locations of ecological significance. These surveys were carried out in accordance with NRA *Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes* (NRA, 2009).

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

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

6.4.3.2 Dedicated Habitat and Vegetation Composition Surveys

The walkover surveys were undertaken in order to ground truth aerial imagery and categorise habitats within the site according to *'A Guide to Habitats in Ireland'* (Fossitt, 2000). Detailed habitat classification and assessment was undertaken by MKO at targeted locations within the development footprint, with relevés undertaken within representative habitats to be impacted by the Proposed Development footprint. Relevés were 2x2 metres for all habitats except for woodland which were 20x20 metres. The extent of each habitat on site was mapped using aerial photography, hand held GPS and smartphone technology. A representative photograph was also taken for each of the habitats recorded on site, including all relevés. The survey findings were then used to create a habitat map in QGIS (Version 3.4.9).

All habitats recorded on site and described in this EIAR chapter have been classified in accordance Fossitt (2000). Full details of all the botanical surveys and results are provided in Appendix 6-1 and an assessment of the potential for the site to support Annex I habitats is also provided in this Appendix.

Botanical surveys for all turbine, road infrastructure, substation and all other infrastructure locations were undertaken on the 29th and 30th of July 2019, 23rd January 2020, the 25th of March and the 26th of May 2020. These surveys provided an understanding of the baseline and informed further survey work following finalisation of the proposed infrastructure layout. The habitat assessment surveys described in this report have been undertaken with reference to the following guidelines and interpretation documents:

- Perrin, P.M, Martin, J.R., Barron, J.R., Roche & O'Hanrahan, B. (2014) *Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland*. Version 2.0. Irish Wildlife Manuals, No. 79. National Parks and Wildlife Service.
- O'Neill, F.H. & Barron, S. J. (2013) Results of monitoring survey of old sessile oak woods and alluvial forests. Irish Wildlife Manuals, No. 71. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

- Commission of the European Communities (2007) Interpretation manual of European Union habitats. Eur 27. European Commission DG Environment.
- NPWS (2013) The Status of EU Protected Habitats and Species in Ireland. Habitat Assessments Volume 2. Version 1.1. Unpublished Report, National Parks and Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 2: *Habitat Assessments*. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O’Neill

Habitats considered to be of ecological significance and in particular having the potential to correspond to those listed in Annex I of the EU Habitats Directive 92/43/EEC were identified and classified as Key Ecological Receptors (KERs).

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

6.4.3.3 Faunal Surveys

The results of the desk study, scoping replies, incidental records of protected species during ecological survey work and multidisciplinary walkover surveys were used to inform the scope of targeted ecological surveys required. Dedicated surveys for bats, otter and badger were undertaken at the times set out below with the methodologies followed also provided below. Given the known occurrence of the Kerry Slug in the area, dedicated surveys for this species were undertaken in March 2020 to determine their occurrence and distribution within the site. Following the completion of ecological walkover surveys, no requirement for further dedicated faunal surveys was identified.

6.4.3.3.1 Badger Survey

Areas identified as providing potential habitat for badger were subject to specialist targeted survey. Dedicated badger surveys were conducted on the 29th and 30th of July 2019, 22nd, 23rd and 24th January 2020 the 25th of March and the 26th of May 2020. The badger surveys covered the entire development footprint and surrounding suitable habitats in the study area. Targeted surveys were also undertaken in areas where incidental badger signs, setts or sightings were recorded during walkover bird surveys of the site. The badger survey was not constrained by vegetation given the nature of the habitats within the site and the timing of the surveys (NRA 2006a).

The badger surveys were conducted in order to determine the presence or absence of badger signs within and outside (areas of identified suitable habitat) the development footprint and study area. This involved a search for all potential badger signs as per NRA (2009) (latrines, badger paths and setts). If encountered, setts would be classified as per the convention set out in NRA (2009) (i.e. main, annexe, subsidiary, outlier).

The badger survey was conducted adhering to best practice guidance (NRA, 2009) and followed the ‘*Guidelines for the Treatment of Badger Prior to the Construction of National Roads Schemes*’ (NRA, 2006a) and CIEEM best practice competencies for species surveys (CIEEM, 2013³).

6.4.3.3.2 Otter Survey

Areas identified as providing potential habitat for otter, i.e. watercourses within and in close proximity to the site, were subject to specialist targeted survey. The otter survey of watercourses was conducted on the 29th and 30th of July 2019, 22nd, 23rd and 24th January 2020, the 25th of March and the 26th of May

³ CIEEM, 2013, *Technical Guidance Series – Competencies for Species Survey*, Online, Available at: <https://cieem.net/resource/competencies-for-species-survey-css/> Accessed: 20.06.2019

2020. Otter surveys were also undertaken during kick sampling surveys that were carried out both within and downstream of the study area on the 22nd and 23rd of January 2020.

The otter survey was conducted as per NRA (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes). This involved a search for all otter signs e.g. spraints, scat, prints, slides, trails, couches and holts. In addition to the width of the rivers/watercourses, a 10m riparian buffer (both banks) was considered to comprise part of the otter habitat (NPWS 2009). The dedicated otter survey also followed the guidance as set out in NRA (2008) ‘Guidelines for the Treatment of Otters Prior to the Construction of National Roads Schemes’ and following CIEEM best practice competencies for species surveys (CIEEM, 2018).

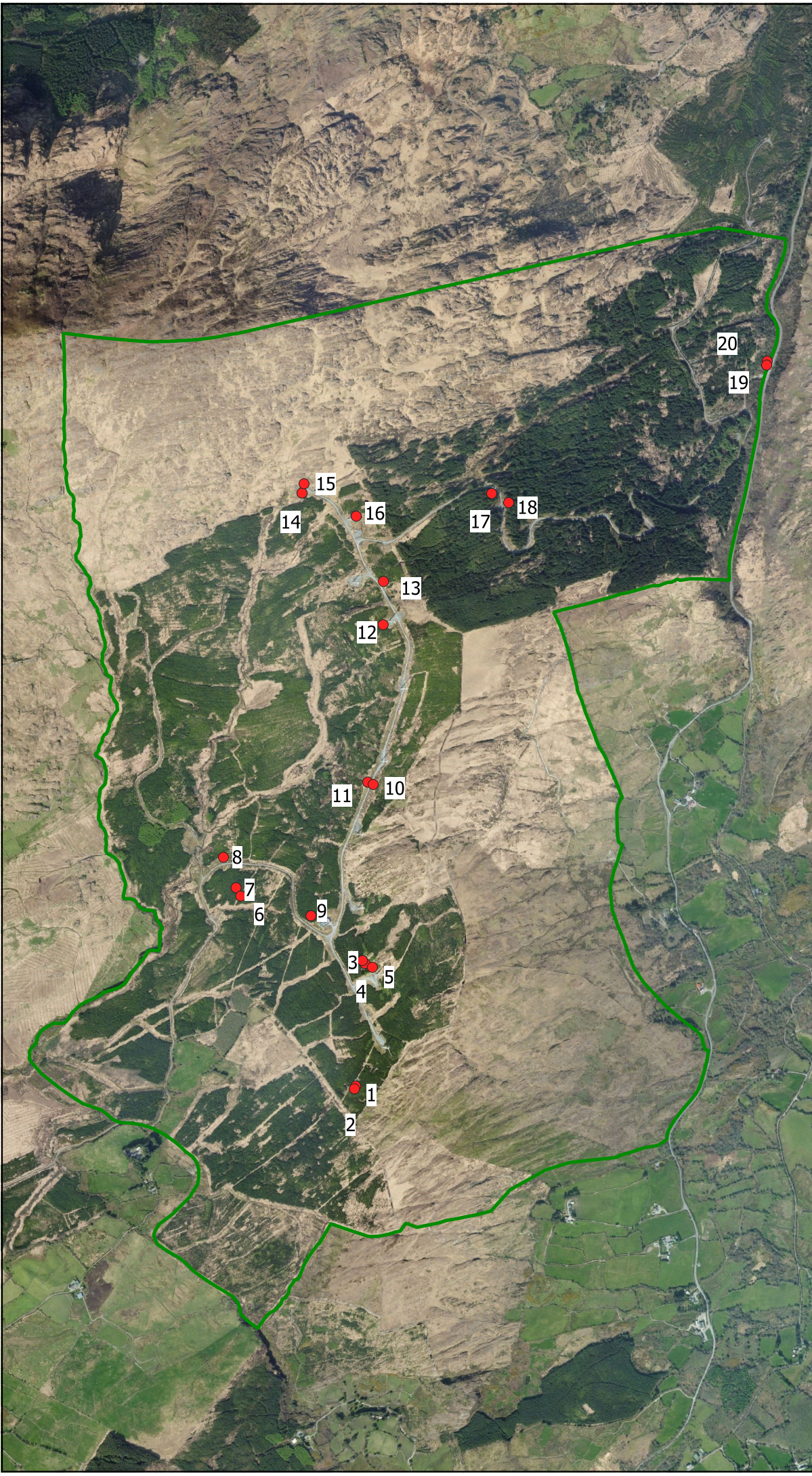
6.4.3.3.3 Kerry Slug Surveys

Given that the Proposed Development falls within the known range for Kerry Slug as highlighted by NPWS data provided in the desk study, a general survey for Kerry Slug was carried out within areas of suitable supporting habitat within the site on the 25th of March 2020. In addition, a designated survey was carried out within the study area by means of trapping. A licence was obtained from NPWS (Licence No.: C71/2020) and metric traps were placed within areas of the Proposed Development footprint and other habitat areas within the study site. This licence is provided in Appendix 6-2.

Surveys for this species comprised a combined methodology based on most recent studies and guidelines. Hand searching is the first stage in determining presence/absence. If no evidence is found, then metric traps should be deployed for a 4-6 week period to confirm absence of the species (McDonnell, 2011). As the purpose of this survey was to determine presence/absence of Kerry Slug within the study area a combined approach was used. Trapping should take place during wet weather on blanket bogs and heaths, and during spells of dry weather in woodlands (O’Donnell 2011). Hand searching was carried out in appropriate weather conditions (damp weather, according to Platts & Speight, 1988 (Reich 2012)) with temperatures at a minimum of 8 degrees celsius on the 25th of March 2020. This comprised searching the surface of rocky outcrops and tree trunks as well as peeling back moss from the tree base to confirm if individuals were present. De Sangosse traps were used which comprised a square of absorbent material with reflective upper surface and perforated dark lower surface measuring 50cm x 50cm. The traps were baited with a piece of carrot approx. 2.5cm in size, moistened with water and placed within conifer plantation, rocky outcrops and other suitable habitat within and adjacent to the Proposed Development footprint. Areas of newly proposed infrastructure such as turbine bases, borrow pits, substation and construction compound were targeted for placement of traps. The traps were secured with string and/or rocks and pegs where placed on the ground. Band traps were also erected around tree trunks. These were placed approximately 1.5m from the ground and secured with string. A map showing the location of the 20 Kerry Slug traps deployed on the 25th March 2020 is shown in Figure 6-1. The results of Kerry Slug recorded are provided in the habitat map shown in Figure 6-5.

Kerry Slug survey design was broadly based on the methods described in the following publications:

- Mc Donnell, R.J. and Gormally, M.J. (2011) Distribution and population dynamics of the Kerry Slug, *Geomalacus maculosus* (Arionidae). Irish Wildlife Manual No. 54
- Reich et al. (2013) An assessment of the use of conifer plantations by the Kerry Slug *Geomalacus maculosus* with reference to the potential impacts of forestry operations, Irish Wildlife Manual No 64,
- Johnston et al (2016) Monitoring the EU protected *Geomalacus maculosus* (Kerry Slug): what are the factors affecting catch returns in open and forested habitats
- NRA (2009)



Map Legend

- EIAR Site Boundary
- Kerry Slug Trap Locations



Microsoft product screen shots reprinted with permission from Microsoft Corporation

Drawing Title
Kerry Slug Trap Locations Curraglass

Project Title
Proposed Renewable Energy Development

Drawn By Laoise Kelly	Checked By John Hynes
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Project No. 190301	Figure 6-1 Figure 6-1
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Scale 1:175000	Date 17.06.2020
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6.4.3.3.4 Bat Surveys

A detailed bat survey report is provided in Appendix 6-3 of this EIAR. This document provides a detailed description of survey methodologies undertaken at the site during the survey period in 2019. Full details of the survey times and dates and the methodologies followed are provided in Appendix 6-3 along with details of all the surveyors.

Manual activity surveys comprised walked and driven transects at dusk. The aim of these surveys was to identify bat species using the site and gather any information on bat behaviour and important features used by bats. A search for roosts was undertaken within 200m plus the rotor radius (150m) of the boundary of the Proposed Development (SNH, 2019). The aim was to determine the presence of roosting bats and the need for further survey work or mitigation. Where developments have more than 10 turbines, SNH requires 1 detector per turbine up to 10 plus a third of additional turbines. Given that 7 turbines are proposed 7 detectors were deployed to ensure compliance with SNH guidance. Survey design and effort was undertaken in 2019 in strict accordance with those prescribed in SNH (2019) ‘*Bats and onshore wind turbines: survey, Assessment and mitigation*’. This is in line with standard best practice industry guidelines.

6.4.3.3.5 Aquatic surveys

Habitat suitability for protected aquatic species of conservation interest which are known or suspected to occur within the study area (e.g. fish species, otter etc.) were conducted. Aquatic habitats and species were assessed during the multi-disciplinary walkover surveys. In addition, designated kick sampling was carried out in watercourses both within and downstream of the Proposed Development site. Kick sampling was undertaken on the 22nd and 23rd of January 2020. A full description of the survey methodologies is provided in the standalone report available in Appendix 6-4 Aquatic plant species protected under Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) were searched for during all aquatic surveys.

6.4.3.3.6 Invasive species survey

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

6.4.3.3.7 Survey limitations

The information provided in this EIAR chapter accurately and comprehensively describes the baseline ecological environment; provides an accurate prediction of the likely ecological effects of the Proposed Development; prescribes mitigation as necessary; and, describes the residual ecological impacts. The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines.

No significant limitations in the scope, scale or context of the assessment have been identified.

6.4.4 Methodology for Assessment of Impacts and Effects

6.4.4.1 Identification of Target Receptors and Key Ecological Receptors

The methodology for assessment followed a precautionary screening approach with regard to the identification of Key Ecological Receptors (KERs). Following a comprehensive desk study, initial site

visits (main ecological surveys of the site undertaken 29th and 30th of July 2019, 22nd, 23rd and 24th of January 2020, the 25th of March and the 26th of May 2020, not including bat surveys) and stakeholder consultation; “Target receptors” likely to occur in the zone of influence of the development were identified. The target receptors included habitats and species that were protected under the following legislation:

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

6.4.4.2 Determining Importance of Ecological Receptors

The importance of the ecological features identified within the study area was determined with reference to a defined geographical context. This was undertaken following a methodology that is set out in Chapter 3 of the ‘Guidelines for Assessment of Ecological Impacts of National Roads Schemes’ (NRA, 2009). These guidelines set out the context for the determination of value on a geographic basis with a hierarchy assigned in relation to the importance of any particular receptor. The guidelines provide a basis for determination of whether any particular receptor is of importance on the following scales:

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

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

Any ecological receptors that are determined to be of National or International, County or Local importance (Higher Value) following the criteria set out in NRA (2009) are considered to be Key Ecological Receptors (KERs) for the purposes of ecological impact assessment if there is a pathway for effects thereon. Any receptors that are determined to be of Local Importance (Lower Value) are not considered to be Key Ecological Receptors.

6.4.4.3 Characterisation of Impacts and Effects

The Proposed Development will result in a number of impacts. The ecological effects of these impacts are characterised as per the CIEEM ‘Guidelines for Ecological Impact Assessment in the UK and Ireland’ (2018). These guidelines are the industry standard for the completion of Ecological Impact Assessment in the UK and Ireland. This chapter has also been prepared in accordance with the corresponding EPA guidance (EPA 2017). The headings under which the impacts are characterised follow those listed in the guidance document and are applied where relevant. A summary of the impact characteristics considered in the assessment is provided below:

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

6.4.4.4 Determining the Significance of Effects

The ecological significance of the effects of the Proposed Development are determined following the precautionary principle and in accordance with the methodology set out in Section 5 of CIEEM (2018).

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

When determining significance, consideration is given to whether:

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

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

The terminology used in the determination of significance follows the suggested language set out in the Draft EPA Guidelines (2017) as shown in Table 6-2.

Table 6-2 Criteria for determining significance of effect, based on (EPA, 2017) guidelines

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

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

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

Integrity

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

Conservation status

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

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

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

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

- The conservation status of its typical species is favourable.

The conservation of a species is favourable when:

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

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

6.4.4.5 Incorporation of Mitigation

Section 6.6 of this EIAR assesses the potential effects of the Proposed Development to ensure that all effects on sensitive ecological receptors are adequately addressed. Where significant effects on sensitive ecological receptors are predicted, mitigation is incorporated into the project design or layout to address such impacts. The implemented mitigation measures avoid or reduce or offset potential significant residual effects, post mitigation.

6.4.4.6 Limitations

The information provided in this assessment accurately and comprehensively describes the baseline ecological environment following surveys on numerous dates during all seasons and over 2 years; provides an accurate prediction of the likely ecological effects of the Proposed Development; prescribes best practice and mitigation as necessary; and, describes the residual ecological impacts. The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines. The habitats and species on the site were readily identifiable and comprehensive assessments were made during the field visit. No significant limitations in the scope, scale or context of the assessment have been identified.

6.5 Establishing the Ecological Baseline

6.5.1 Desk Study

The following sections describe the results of a survey of published material that was consulted as part of the desk study for the purposes of the ecological assessment. It provides a baseline of the ecology known to occur in the existing environment. Material reviewed includes the Site Synopses for designated sites within the zone of influence, as compiled by the National Parks and Wildlife Service (NPWS) of the Department of Culture, Heritage and the Gaeltacht, bird and plant distribution atlases and other research publications.

6.5.1.1 Designated Sites

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

The potential for the Proposed Development to impact on sites that are designated for nature conservation was considered in this assessment.

Special Areas of Conservation (SACs) and Special Protection Areas for Birds (SPAs) are designated under the EU Habitats Directive and EU Birds Directive, respectively and are collectively known as ‘European Sites’. The potential for significant effects and/or adverse impacts on the integrity of European Sites is fully assessed in the AA Screening Report and Natura Impact Statement that accompanies this application. As per EPA draft Guidance 2017, “a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement” but should “incorporate their key findings as available and appropriate”. Section 6.6.2 of this EIAR provides a summary of the key assessment findings with regard to European Designated Sites.

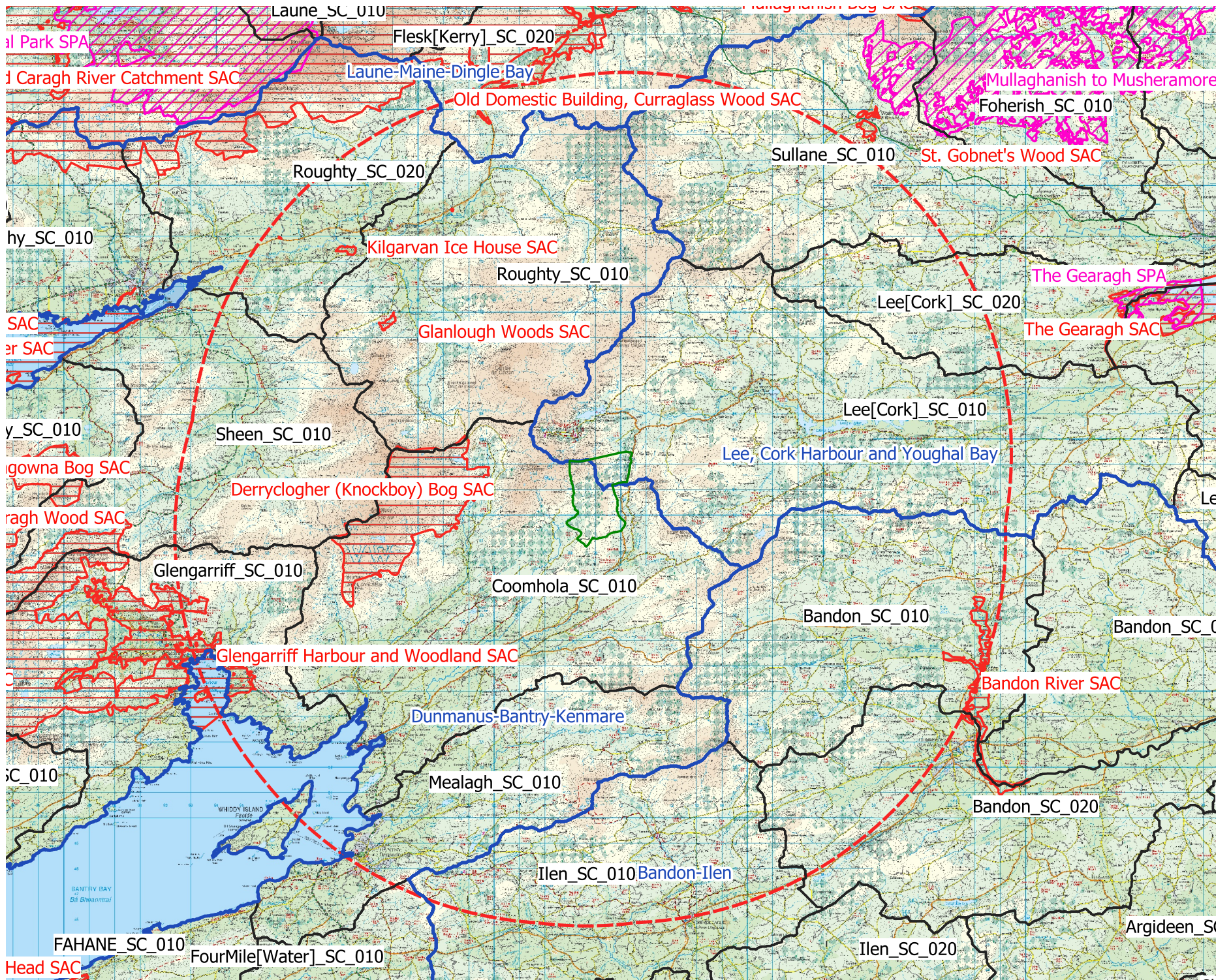
Natural Heritage Areas (NHAs) are designated under Section 18 the Wildlife (Amendment) Act 2000 and their management and protection is provided for by this legislation and planning policy. The potential for effects on these designated sites is fully considered in this EcIA.

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

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

- Initially the most up to date GIS spatial datasets for European and Nationally designated sites and water catchments were downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) on the 31/05/2020. The datasets were utilised to identify Designated Sites which could feasibly be affected by the Proposed Development.
- All designated sites within a distance of 15km surrounding the development site were identified. In addition, the potential for connectivity with European or Nationally designated sites at distances of greater than 15km from the Proposed Development was also considered in this initial assessment.
- A map of all the European Sites within 15km is provided in Figure 6-2 with all Nationally designated sites shown in Figure 6-3.
- Table 6-3 provides details of all relevant Nationally designated sites as identified in the preceding steps and assesses which are within the likely Zone of Impact. All European Designated Sites are fully described and assessed in the Screening for Appropriate Assessment and Natura Impact Statement reports submitted as part of this planning application.
- The designation features of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of preparing this report 31/05/2020.

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

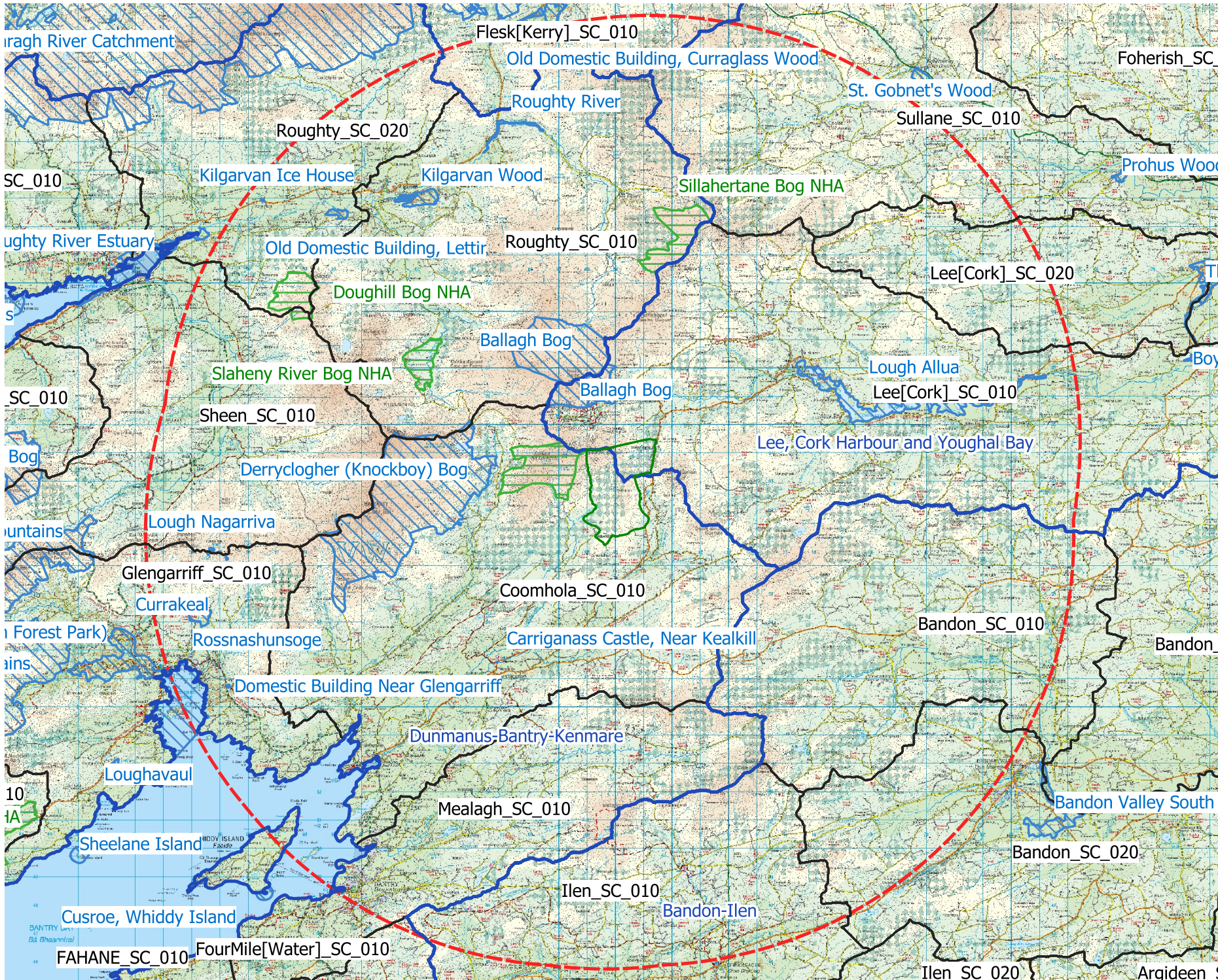








- ### Map Legend
- EIAR Site Boundary
 - Special Area of Conservation
 - Special Protection Area
 - 15km Buffer
 - Water Catchments
 - Water Subcatchments

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Drawing Title	
European Designated Sites within 15km	
Project Title	
Curraglass Renewable Energy Development, Co. Cork	
Drawn By	Checked By
Laoise Kelly	John Hynes
Project No.	Drawing No.
190301	Figure 6-2
Scale	Date
1:195000	08.04.2020

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- ### Map Legend
-  Site Boundary
 -  Natural Heritage Area
 -  Proposed Natural Heritage Area
 -  15km Buffer
 -  Water Catchments
 -  Water Sub-Catchments




Drawing Title
Nationally Designated Sites within 15km

Project Title
Curraglass Renewable Energy Development, Co. Cork

Drawn By Laoise Kelly	Checked By John Hynes
Project No. 190301	Drawing No. Figure 6-3
Scale 1:175000	Date 08.04.2020

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Table 6-3 Nationally Designated sites in the Zone of Influence

Designated sites	Distance from proposed works (Km)	Pathway for Effect
Natural Heritage Areas (NHA)		
Conigar Bog NHA (002386)	5.0 meters north-west of the proposed development site	This NHA is located 5.0 meters from the most north western corner of the Proposed Development site boundary and approximately 980m from the nearest proposed infrastructure. The NHA occurs upgradient of the Proposed Development and there is no surface water connectivity between the site of the Proposed Development and the NHA. The infrastructure proposed is in a location of existing infrastructure therefore no potential for significant drainage impacts on the NHA is anticipated as a result of these works. As a result, there is no requirement for further assessment .
Doughill NHA (001948)	10.8km north-west of the proposed development site	There is no surface water connectivity between the Proposed Development site and the NHAs. Given the lack of connectivity and the separation in distance between the proposal and the designated sites, there is no potential for significant effect and therefore no requirement for further assessment .
Silahertane Bog NHA (001882)	5.9km north-east of the proposed development site	
Slaheny River Bog NHA (000383)	6.0km north-west of the proposed development site	
Proposed Natural Heritage Areas (pNHA)		
Ballagh Bog pNHA [001886]	1.5km north of the proposed development site	There is no surface water connectivity between the Proposed Development site and the pNHAs. Given the lack of connectivity, the topography of the area and the separation in distance between the proposal and the designated sites, there is no potential for significant effect and therefore no requirement for further assessment .
Gouganebarra Lake pNHA [001057]	1.5km north of the proposed development site	
Derryclogher (Knockboy) Bog pNHA [001873]	3.1km west of the proposed development site	
Carriganass Castle, Near Kealkill pNHA [002099]	5.1km south-west of the proposed development site	
Lough Allua pNHA [001065]	5.5km east of the proposed development site	
		There are a number of tributaries which drain from the Proposed Development site that provide hydrological connectivity with the River Lee (EPA Code: 19L03). The River Lee flows in an eastward direction and discharges into Lough Allua pNHA 5.5km (6.9km

Designated sites	Distance from proposed works (Km)	Pathway for Effect
		hydrological distance) to the east of the development site boundary. Due to the surface water hydrological connectivity, there is a requirement for further assessment of this pNHA. Further assessment is provided in Section 6.6.2 of this EIAR
Kilgarvan Wood pNHA [001787]	10.1km north-west of wind farm the proposed development site	There is no surface water connectivity between the Proposed Development site and the pNHA. Given the lack of connectivity and the separation in distance between the proposal and the designated sites, there is no potential for significant effect and therefore no requirement for further assessment.
Kilgarvan Ice House pNHA [000364]	10.9km north-west of the proposed development site	
Roughly River pNHA [001376]	11.1km north-west of the proposed development site	
Old Domestic Building, Lettir pNHA [002040]	12.0km north-west of the proposed development site	
Lough Namaddra and Lough West pNHA [001069]	12.1km west of the proposed development site	
Lough Nagarriva pNHA [001369]	12.6km west of the proposed development site	
Currakeal pNHA [001826]	13.0km south-west of the proposed development site	
Domestic Building Near Glengarriff pNHA [002049]	13.2km south-west of the proposed development site	
Rosnashunsoge pNHA [001537]	13.7km south-west of the proposed development site	
Glengarriff Harbour and Woodland pNHA [000090]	13.9km south-west of the proposed development site	

Designated sites	Distance from proposed works (Km)	Pathway for Effect
Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment pNHA [000365]	14.7km north of the proposed development site	

Conigar Bog NHA (002386) is located approximately 5m to the north west of the proposed development site. The NHA occurs upgradient of the Proposed Development and there is no surface water connectivity between the site of the Proposed Development and the NHA, as a result there is not requirement for further assessment. Lough Allua pNHA [001065] is located approximately 5.5km (6.9km hydrological distance) north east of the Proposed Development site. Due to the surface water hydrological connectivity, there is a requirement for further assessment of this pNHA. Further assessment is provided in Section 6.6.2 of this EIAR. There is no pathway for connectivity between the proposed development and any other nationally designated sites.

The AA Screening that accompanies this application identifies the following European Sites as being within the Likely Zone of Impact:

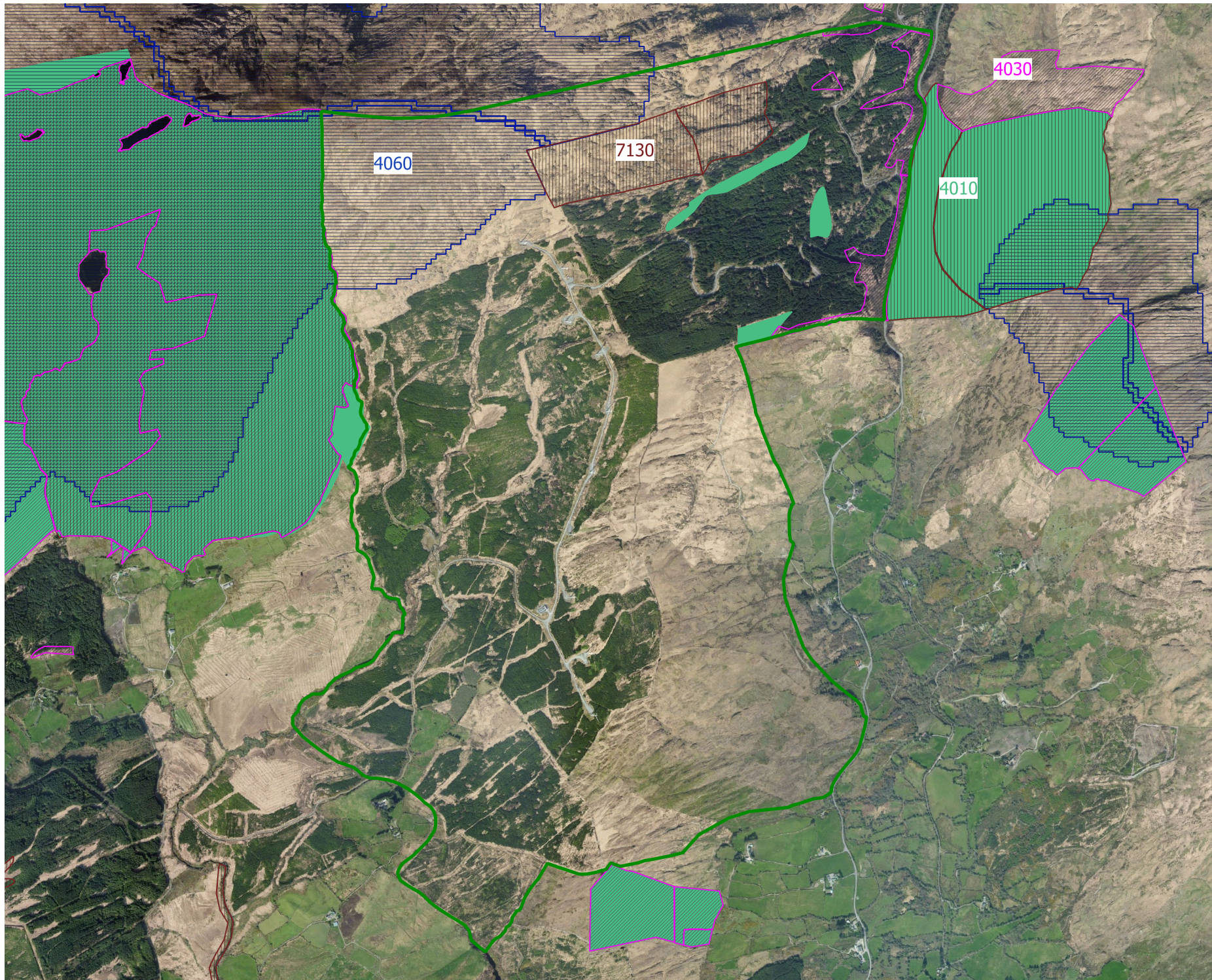
- The Gearagh SAC is located approximately 19.4km from the Proposed Development site (24km hydrological distance) but included on a precautionary basis.
- The Gearagh SPA is located approximately 20.2km from the Proposed Development site (26km hydrological distance) but included on a precautionary basis.

6.5.1.2 NPWS Article 17 Reporting

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

Available NPWS datasets were downloaded and overlain on the Proposed Development study area. A number of polygons classified as Annex I habitat occur within the study area. None of these are located within the Proposed Development footprint. The nearest infrastructure, the existing access road to the site which is proposed for upgrade, is located within an area identified as ‘European dry heaths [4030]’. An area identified as ‘northern Atlantic wet heaths with *Erica tetralix* [4010]’ occurs approximately 80m from a second proposed road upgrade to the north east of the site. An area identified as ‘Blanket bog (*if active bog) [7130]’ occurs approximately 170m to the north east of the proposed Turbine 1. ‘Wet Alpine and Boreal Heath [4060]’ occurs within the north eastern corner of the study site boundary approximately 160m north of Turbine 1. All areas mapped as Annex I occur outside of the proposed development footprint. The mapped Article 17 habitats are shown in Figure 6-4.

The nearest mapped ‘*Old sessile oak woods with Ilex and Blechnum in the British Isles* [91A0]’ occurs approximately 4.7km east of the Proposed Development site. The nearest mapped Annex I grassland, ‘*Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)* [6410]’ is located over 6km north east of the site.



Map Legend

- Northern Atlantic Wet Heaths [4010]
- European Dry Heaths [4030]
- Alpine and Boreal Heaths [4060]
- Blanket Bog (if active bog) [7130]
- EIAR Site Boundary



Drawing Title
Annex I Article 17 Sites NPWS

Project Title
Curraglass Renewable Energy Development, Co. Cork

Drawn By Laoise Kelly	Checked By John Hynes
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Project No. 190301	Drawing No. Figure 6-4
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Scale 1:20004	Date 16.04.2020
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6.5.1.3 National Parks and Wildlife Service Protected Species Records

National Parks and Wildlife Service (NPWS) online records were searched to see if any rare or protected species of flora or fauna have been recorded from hectads W06 and W16. An information request was also sent to the NPWS scientific data unit requesting records from the Rare and Protected Species Database. Table 6-4, Table 6-5 and Table 6-6 list rare and protected species records obtained from NPWS on the 20th of January 2020.

Table 6-4 Records of European protected species for W06 and W16, NPWS

Common Name	Scientific Name	Status
Kerry Slug	<i>Geomlacus maulosus</i>	Annex II, IV
Freshwater pearl mussel	<i>Margaritifera margaritifera</i>	Annex II, Annex V
Common frog	<i>Rana temporaria</i>	Annex V
Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>	Annex II, IV
Reindeer lichen	<i>Cladonia portentosa</i>	Annex V
Killarney Fern	<i>Trichomanes speciosum</i>	Annex II

Annex II, Annex IV, Annex V – Of the EU Habitats Directive

Table 6-5 Records of species protected under the Flora Protection Order 2015 or listed in the Irish Red Data Book for Vascular Plants, NPWS

Common Name	Scientific Name	Status
Lesser Centaury	<i>Centaureum pulchellum</i>	FPO, RL (Vulnerable)
Irish Lady's-tresses	<i>Spiranthes romanzoffiana</i>	FPO, RL (Rare)

Table 6-6 Species protected under the Wildlife Acts 1976-2019, NPWS

Common Name	Scientific Name	Protection Status
Sika Deer	<i>Cervus nippon</i>	WA 1976/2019
Hedgehog	<i>Erinaceus europaeus</i>	WA 1976/2019
Badger	<i>Meles meles</i>	WA 1976/2019
Irish Hare	<i>Lepus timidus hibernicus</i>	WA 1976/2019

WA - Irish Wildlife Acts (1976, 2019).

6.5.1.3.1 National Biodiversity Data Centre Data

A search of the National Biodiversity Data Centre (NBDC) website was conducted prior to the commencement of site surveys. This helped to inform survey effort and provide a baseline of likely species composition in the area. A more recent search of the database has been undertaken for the purposes of this report and was conducted on the 15th of 2020. Records of protected fauna recorded from hectads W06 and W16 are provided in Table 6-7. Table 6-11 includes records of non-native invasive species listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015).

Table 6-7 NBDC records for protected species from hectads W06 and W16

Common name	Scientific name	Designation	Hectad
European Otter	<i>Lutra lutra</i>	Protected Species: Annex II and IV EU Habitats Directive, Wildlife Acts	W06, W16
Common Frog	<i>Rana temporaria</i>	Protected Species: Annex V EU Habitats Directive, Wildlife Acts	W06, W16

Common name	Scientific name	Designation	Hectad
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	Protected Species: Annex IV EU Habitats Directive, Wildlife Acts	W06, W16
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	Protected Species: Annex IV EU Habitats Directive, Wildlife Acts	W06, W16
Daubenton's Bat	<i>Myotis daubentonii</i>	Protected Species: Annex IV EU Habitats Directive, Wildlife Acts	W16
Brown Long-eared Bat	<i>Plecotus auritus</i>	Protected Species: Annex IV EU Habitats Directive, Wildlife Acts	W06
Lesser Noctule	<i>Nyctalus leisleri</i>	Protected Species: Annex IV EU Habitats Directive, Wildlife Acts	W06, W16
Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>	Protected Species: Annex II and IV EU Habitats Directive, Wildlife Acts	W06, W16
Badger	<i>Meles meles</i>	Protected Species: Wildlife Acts	W06, W16
Red Squirrel	<i>Sciurus vulgaris</i>	Protected Species: Wildlife Acts	W06, W16
Pygmy Shrew	<i>Sorex minutus</i>	Protected Species: Wildlife Acts	W06, W16
Smooth Newt	<i>Lissotriton vulgaris</i>	Protected Species: Wildlife Acts	W06
Kerry Slug	<i>Geomalacus maculosus</i>	Protected Species: Annex II and IV EU Habitats Directive, Wildlife Acts	W06, W16
Freshwater Pearl Mussel	<i>Margaritifera margaritifera</i>	Protected Species: Annex II EU Habitats Directive, Wildlife Acts	W06, W16

Annex II, Annex IV, Annex V – Of EU Habitats Directive, WA - Irish Wildlife Acts (1976, 2019).

6.5.1.3.2 Vascular Plants

A search was made in the New Atlas of the British and Irish Flora (Preston *et al*, 2002) to investigate whether any rare or unusual plant species listed under Annex II of the EU Habitats Directive, The Irish Red Data Book, 1, Vascular Plants (Curtis, 1988) or the Flora (Protection) Order (1999, as amended 2015) had been recorded in the relevant 10km squares in which the study site is situated (W06 and W16). Each hectad contains 100 whole one kilometre squares containing terrestrial habitats. Species of conservation concern are given in Table 6-8.

Table 6-8 Species listed designated under the Flora Protection Order or the Irish Red Data Book within Hectad W06 and W16

Common Name	Scientific Name	Conservation Status	Hectad
Killarney Fern	<i>Trichomanes speciosum</i> (sporophyte)	Annex II EU Habitats Directive FPO	W06, W16
Chamomile	<i>Chamaemelum nobile</i>	Near Threatened (NT)	W06, W16
Heath Cudweed	<i>Gnaphalium sylvaticum</i>	Endangered (EN), FPO	W06
Irish Lady's-tresses	<i>Spiranthes romanzoffiana</i>	Near Threatened (NT), FPO	W06
Awlwort	<i>Subularia aquatica</i>	Vulnerable (VU)	W06
Marsh-mallow,	<i>Althaea officinalis</i>	Near Threatened (NT)	W06

Six-stamened waterwort	<i>Elatine hexandra</i>	Near Threatened (NT)	W06
Ivy-leaved Bellflower	<i>Wahlenbergia hederacea</i>	Near Threatened (NT)	W06
<i>Asplenium</i>	<i>Asplenium obovatum</i>	VU (Vulnerable), FPO	W16
Lesser Centaury	<i>Centaurium pulchellum</i>	Near Threatened (NT), FPO	W16

FPO – Flora Protection Order

6.5.1.4 Bryophytes and Liverworts

A search of the NPWS online data map for bryophytes (NPWS, 2018) was also undertaken. Three species of protected bryophyte have been recorded within the site though outside of the Proposed Development footprint. Details of protected bryophyte records are provided in Table 6-9.

Table 6-9 Protected bryophytes within hectads W06 and W16

Scientific Name	Species Type	Conservation Status	Hectad
<i>Plagiochila heterophylla</i>	Liverwort	FPO	W16
<i>Radula holtii</i>	Liverwort	FPO	W16
<i>Hypnum uncinulatum</i>	Moss	FPO	W16

6.5.1.4.1 Bat Conservation Ireland Database

The National Bat Database of Ireland was searched for records of bat activity and roosts within a 10 km radius of the proposed site (IG Ref: E109655, N063555). Available bat records were provided by Bat Conservation Ireland on 12/06/2020. A number of observations have been recorded within 10km; eight roosts, three transects and eleven ad-hoc observations. At least five of Ireland’s nine resident bat species were recorded within 10 km of the proposed works including Common and Soprano pipistrelle, Leisler’s bat, brown long-eared bat and Daubenton’s bat. The results of the database search are provided in Table 6-10.

Table 6-10 National Bat Database of Ireland Records within 10km of the Proposed Development

Record	Species	Grid Reference	Date	Location
Roost	<i>Pipistrellus</i> spp. (45kHz/55kHz)	W1567	N/A	Ballingeary; Macrom; Co. Cork.
Roost	<i>Plecotus auritus</i>	V9955	N/A	Dromkeal; Glengarrif; Co. Cork.
Roost	<i>Pipistrellus</i> spp. (45kHz/55kHz)	W0073	N/A	Kilgarvan; Co. Kerry
Roost	<i>Nyctalus leisleri</i> ; <i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus pygmaeus</i> ; <i>Pipistrellus</i> spp. (45kHz/55kHz); <i>Plecotus auritus</i>	W0255	N/A	Pearson's Bridge; Ballylicky; Bantry; Co. Cork.
Roost	<i>Pipistrellus</i> spp. (45kHz/55kHz)	W1165	N/A	Inchinossig; Ballingeary; County Cork
Roost	<i>Pipistrellus pygmaeus</i> ; <i>Plecotus auritus</i>	W0271	N/A	Kilgarvan; Co. Kerry
Roost	<i>Pipistrellus</i> spp. (45kHz/55kHz)	V9972	N/A	Kilgarvan; CO. Kerry
Roost	<i>Pipistrellus</i> spp. (45kHz/55kHz); <i>Plecotus auritus</i>	V9972	N/A	Kilgarvan; Co. Kerry

Transect	<i>Myotis daubentonii</i> ; Unidentified bat	W0484656566	N/A	Carriganass Bridge R584
Transect	N/A	W0234554515	N/A	Pearson's Bridge Transect
Transect	<i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus pygmaeus</i>	W0076073265	N/A	V96 (11) 2004-2004
Ad-hoc	<i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus pygmaeus</i>	W1354456854	04/09/2008	BATLAS 2010
Ad-hoc	<i>Myotis daubentonii</i> ; <i>Myotis spp.</i> ; <i>Nyctalus leisleri</i> ; <i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus pygmaeus</i>	W1665355170	21/08/2008	BATLAS 2010
Ad-hoc	<i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus pygmaeus</i>	W0885359019	04/09/2008	BATLAS 2010
Ad-hoc	<i>Myotis daubentonii</i> ; <i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus pygmaeus</i>	W1891656093	21/08/2008	BATLAS 2010
Ad-hoc	<i>Myotis daubentonii</i> ; <i>Myotis spp.</i> ; <i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus pygmaeus</i>	W1872856687	21/08/2008	BATLAS 2010
Ad-hoc	<i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus pygmaeus</i>	W0646456642	04/09/2008	BATLAS 2010
Ad-hoc	<i>Pipistrellus pipistrellus</i> (45kHz)	W1638066254	10/06/2018	BATLAS 2020
Ad-hoc	<i>Myotis daubentonii</i> ; <i>Nyctalus leisleri</i> ; <i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus pygmaeus</i>	W1461366623	11/06/2018	BATLAS 2020
Ad-hoc	<i>Nyctalus leisleri</i> ; <i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus pygmaeus</i>	W0060072900	14/09/2019	BATLAS 2020
Ad-hoc	<i>Myotis daubentonii</i> ; <i>Nyctalus leisleri</i> ; <i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus pygmaeus</i>	W1637866399	11/06/2018	BATLAS 2020
Ad-hoc	<i>Myotis daubentonii</i> ; <i>Nyctalus leisleri</i> ; <i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus pygmaeus</i>	W1461266638	10/06/2018	BATLAS 2020

6.5.1.4.2 Freshwater Pearl Mussel (*Margaritifera margaritifera*)

The NPWS *Margaritifera* Sensitive Area map (Version 8, 2017) was consulted during the desk study. In addition to this, a data request was sent to the NPWS Scientific Data Unit to gain access to records for the species in the wider area. The watercourses surveyed within and adjacent to the site were assessed for their suitability to support Freshwater Pearl Mussel.

The Proposed Development site lies within Freshwater Pearl Mussel (*Margaritifera margaritifera*) sensitivity areas; Lee Upper and Owvane. Both catchments are designated as ‘*Catchments of other extant populations*’ of pearl mussel.

There is potential connectivity via surface water from the Proposed Development site and the freshwater pearl mussel populations within the catchment. There are a number of streams and rivers within and in close proximity to the Proposed Development site. Based on point data received from NPWS, the nearest Freshwater Pearl Mussel recorded downstream of the site in the Owvane catchment is approximately 9km (hydrological distance) from the site boundary. The nearest Pearl Mussel recorded within the Lee catchment is located approximately 6km downstream of the Proposed Development site.

6.5.1.4.3 Kerry Slug (*Geomalacus maculosus*)

Kerry Slug is known to occur within hectad W06 and W16 pertaining to the Proposed Development site as shown in the National Biodiversity of Ireland and National Parks and Wildlife Service database records provided in Table 6-4 and Table 6-7. This species is confined to northern Spain and Portugal and three counties in Ireland, namely Cork, Kerry and Galway.

6.5.1.4.4 Inland Fisheries Ireland Online Database

The Water Framework Directive (WFD) was implemented by the EU and applies to rivers, lakes, groundwater, estuaries and coastal bodies. The aim of the directive is for all member states to achieve good water status in all water bodies by 2015. Member states must also ensure that status does not deteriorate in any waters. As part of the WFD, Inland Fisheries Ireland (IFI) have been assigned the responsibility of monitoring fish in 300 sites encompassing lakes, rivers and transitional waters (estuaries) throughout the country on a three year rolling programme. Reports are provided on these surveys and have been reviewed as part of this assessment to inform the ecological baseline with regard to aquatic species with potential to be impacted by the proposed works. The IFI online database was assessed for records of fish species of conservation concern for the Owvane and Lee rivers located downstream of the Proposed Development. Five species were recorded in the River Lee at Inchincossig Bridge approximately 6km downstream of the Proposed Development site during surveys carried out in 2013, namely Brown Trout, Minnow, Lamprey sp., Roach, and Three-spined Stickleback. Five species were recorded in the River Owvane at Piersons Bridge approximately 9.7km downstream of the Proposed Development site during surveys carried out in 2010, namely Brown Trout, Minnow, Sea Trout, Salmon and Eel.

Inland Fisheries Ireland are responsible for carrying out monitoring of protected Red List fish species as part of Irish legislation implemented under the Habitats Directive. A survey was carried out in 2011 in the Lee catchment within which the Proposed Development is located. The River Lee and some of its minor tributaries were sampled at 15 sites along the entire length between the source Gouganearra Lake, and the tidal limits in Cork city. Juvenile Lamprey were absent at seven locations. Four of these sites, all in upland areas, were lacking suitable ammocete nursery habitat. The remaining three sites all upstream of Inchigeelagh, had suitable habitat. Densities were found at eight sites, with densities ranging from 1 to 9.7 individuals per m². The Proposed Development provides connectivity with the River Lee downstream.

6.5.1.5 Invasive Species

The NBDC database also contains records of invasive species identified within the relevant hectads. Records of ‘high impact’ invasive species for hectads W06 and W16 are provided in Table 6-11.

Table 6-11 Third Schedule non-native invasive species records for hectads W06 and W16

Common Name	Scientific Name	Hectad
Japanese Knotweed	<i>Fallopia japonica</i>	W06, W16
Giant Rhubarb	<i>Gunnera tinctoria</i>	W06
Himalayan Balsam	<i>Impatiens glandulifera</i>	W16
Himalayan Knotweed	<i>Persicaria wallichii</i>	W16
Rhododendron	<i>Rhododendron ponticum</i>	W16
New Zealand Pigmyweed	<i>Crassula helmsii</i>	W16
Bank Vole	<i>Myodes glareolus</i>	W06
Sika Deer	<i>Cervus nippon</i>	W06, W16
American Mink	<i>Mustela vison</i>	W06

6.5.1.5.1 Baseline Hydrology

The site is situated within the south-western river basin district. Regionally, the proposed development site is located across two surface water catchments, the Lee-Cork Harbour-Youghal Bay catchment and the Dunmanus-Bantry-Kenmare catchment, of Hydrometric Areas 19 and 21.

In terms of local hydrology, the western section of the site is drained by a number of small unnamed watercourses (order 1, order 2), these flow into a larger (order 3) waterbody which in turn drains to the Owenbeg (Owvane, Cork) waterbody (EPA Code: 21O03). The Owenbeg (Owvane, Cork) watercourse drains to the Owvane (Cork) (EPA Code: 21O07) which flows to the sea. Proposed turbine locations T1, T3-T7 and the associated substation are located within the Dunmanus-Bantry-Kenmare catchment.

The eastern section of the site is similarly drained by several small unnamed waterbodies. The Curraglass watercourse (EPA Code: 21C83) also drains this section of the site. These waterbodies flow into the Owvane (Cork) (EPA Code: 21O07). The sections of the Owvane River draining the western and eastern areas of the proposed site merge approximately 5km from the point at which they flow into the sea. There are no turbines or associated infrastructure located within the eastern section of the proposed site.

The northeastern section of the site is located within the Lee, Cork Harbour and Youghal Bay catchment. The northeastern section of the site is drained by a number of unnamed waterbodies that drain into the River Lee (EPA Code: 19L03). The River Lee flows in an eastward direction through the Lough Allua pNHA approx. 5.5 km northeast of the Proposed Development and also through the Gearagh Special Area of Conservation and Special Protection Area approximately 24km and 26km (hydrological distance) respectively northeast of the Proposed Development site. A local hydrology map is shown as Figure 1, Chapter 9 of this EIAR.

6.5.1.6 Water Quality

The EPA Envision map viewer was consulted on the 6th of May 2020 regarding the water quality status of the rivers which run within and directly adjacent to the Study Area. The online EPA Envision map viewer provides access to water quality information at individual waterbody status for all the River Basin Districts in Ireland. The WFD River Waterbody Status 2013 – 2018 for the watercourses which flow through the site have been assessed in Table 6-12.

Table 6-12 Watercourses on site with relevant water quality statuses

Name	Location	Status	Risk
Lee (Cork)_10	A number of unnamed first and second order streams flow into a third order stream that runs along the north eastern boundary of the site. This in turn flows into the River Lee downstream. These streams are assigned the same status and risk level.	High	Not at risk
Owenbeg (Owvane_10)	The eastern and southern boundary of the site are drained by a number of first order streams that flow into the Owvane River. The Owenbeg River runs almost the entire length of the western boundary of the site and also flows into the Owvane River approx. 9km downstream. These streams and rivers are assigned the same status and risk level at the locations nearest to the Proposed Development site.	High	Not at risk

The Biotic Index of Water Quality (BIWQ) was developed in Ireland by the Environmental Protection Agency (EPA). Q-values are assigned using a combination of habitat characteristics and structure of the macro-invertebrate community within the waterbody. Individual macro-invertebrate families are classified according to their sensitivity to organic pollution and the Q-value is assessed based primarily on their

relative abundance within a sample. The closest site/sampling stations and their respective Q values are provided in Table 6-13.

Table 6-13 Water quality monitoring stations and associated Q values

Name	Location	Status	Risk
LEE (CORK) - Ford (Br) S of Gortafludig	E111600; N65872	4-5 (High)	2019
Br E of Maugha	E107123; N60134	4-5 (High)	2018
Br SW of Cappaboy	E108849; N59017	4-5 (High)	2018

6.5.1.7 Ecological Reporting for previous development at the site

The EIS prepared for the previous wind farm granted in 2002 was also reviewed as part of this desk study. The only mammal and amphibian species observed during the field study for the project were Rabbit (*Oryctolagus cuniculus*), Frog (*Rana temporaria*) and Smooth Newt (*Truturus vulgaris*). Evidence of Otter (*Lutra lutra*) was also recorded. Overall the site was regarded as low ecological interest and of poor habitat quality. The EIS concluded that there would be no significant effect on flora and fauna.

6.5.1.8 Conclusions of the Desktop Study

The desktop study has provided information about the existing environment in Hectad W06 and W16, within which the Proposed Development site is located. The site is situated within the Lee-Cork Harbour-Youghal Bay catchment and the Dunmanus-Bantry-Kenmare catchment.

A number of watercourses that drain the study area, lead to the following downstream EU Designated Sites, and are further considered in the Natura Impact Statement prepared for the Proposed Development:

- The Gearagh SAC (located 24km hydrological distance downstream but included on a precautionary basis).
- The Gearagh SPA (located 26km downstream but included on a precautionary basis).

The desk study identified that a variety of protected faunal species have the potential to occur within or downstream the study area, including bats, Kerry slug, otter, freshwater pearl mussel, badger and red squirrel. A review of bat roost records for the area did not identify any roosts within or immediately adjacent to the Proposed Development.

The desk study also provided useful information to inform the ecological surveys undertaken on site as well as the identification of pathways for potential impact on sensitive ecological receptors.

6.5.2 Field Assessment

6.5.2.1 Overview of the site

The Proposed Development site is located in an upland area, within the townlands of Cappaboy Beg, Derreendonee and Curraglass. The proposed turning area upgrade is located approximately 1.7km to the north east of the site along the R548 road. The primary land use within the study area is commercial forestry with upland peatland habitats occurring in the wider study area. The site is also the location of a former operational wind farm. Planning permission was granted for the previous development in 2002 and the site became operational in 2006 and the turbines were removed in June

2018. The original wind farm consisted of 10 turbines, with a hub height of 50m and a total tip height of 75m. The current proposal has been designed to minimise impacts on the receiving environment and maximises the use of existing infrastructure at the site including internal access tracks and hard stand locations of former turbines. Consequently, the Proposed Development footprint is dominated by modified habitats associated with the existing infrastructure and conifer plantation.

Turbines 1 and 3 are proposed at former turbine locations and Turbines 4 and 6 are in close proximity to former turbine locations. Turbines 2, 5 and 7 are at new locations but access to these areas will primarily be facilitated by the network of internal tracks. The temporary compound also makes use of existing hard stand area.

The following sections provide a detailed description of the habitats recorded within the study area and Proposed Development footprint.















6.5.2.2 Habitats and Flora in the Existing Environment

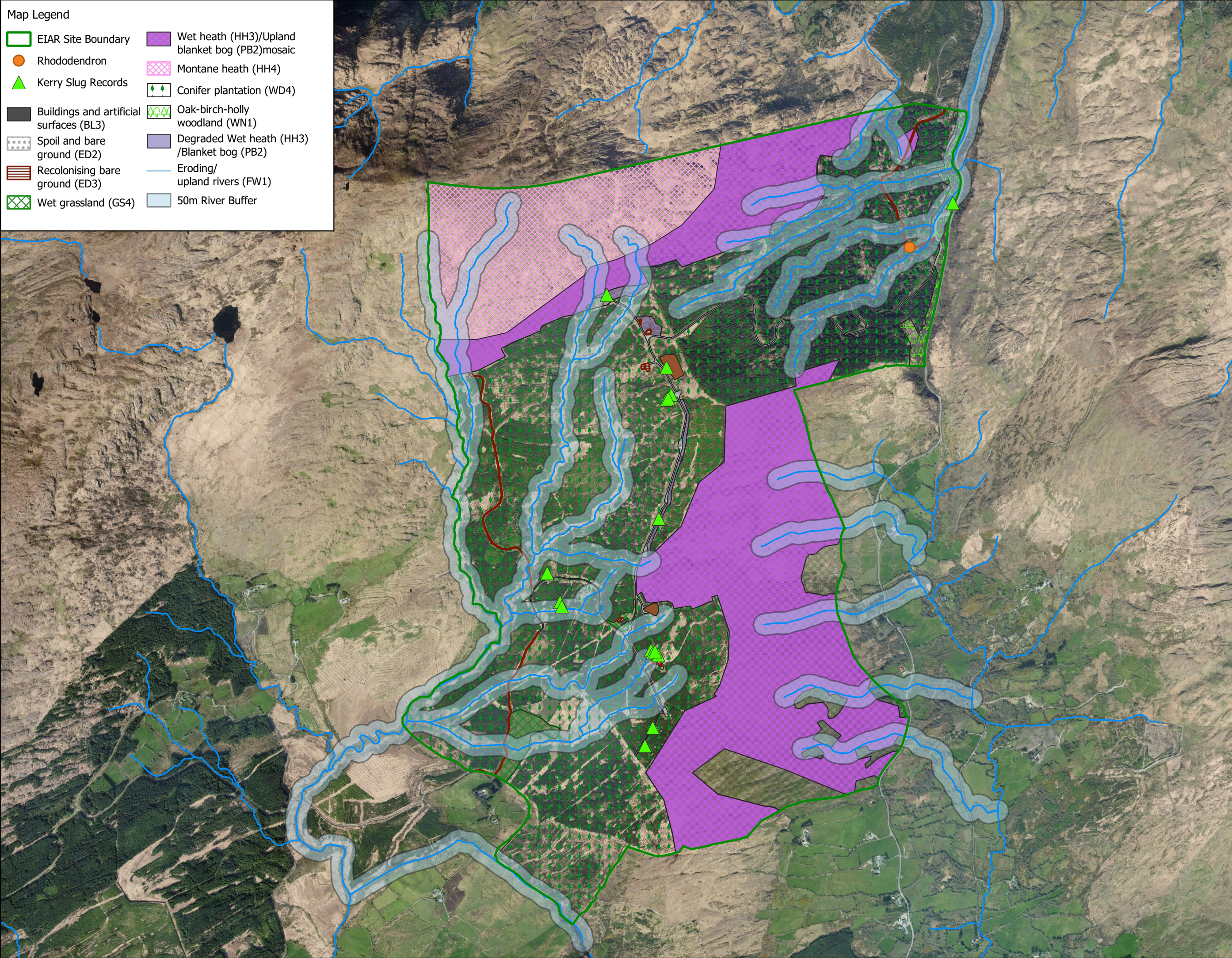
Walk-over surveys of the development site were undertaken in July 2019, January 2020, March and May 2020. The habitat classifications and codes utilised in section correspond to those described in ‘*A Guide to Habitats in Ireland*’ (Fossitt 2000). A total of thirteen habitats were recorded within the study area (Table 6-14). Detailed botanical assessments of the turbine bases and other infrastructure were undertaken and the result of these surveys are provided in Appendix 6-1. A habitat map of the site is provided in Figure 6-5. This map includes the results of Kerry Slug recorded within the proposed development site as discovered both incidentally and using metric traps. A habitat map is also provided with the proposed infrastructure footprint overlain as shown in Figure 6-6.

Table 6-14 Habitats recorded within the study area

Habitat Name	Fossitt Code
Conifer Plantation & Recently felled/replanted forestry	WD4
Spoil and Bare Ground	ED2
Recolonising Bare Ground	ED3
Buildings and Artificial Surfaces	BL3
Wet Heath/Upland Blanket Bog/ Exposed Siliceous Rocks	HH3/ PB2/ER1
Montane Heath/Exposed Siliceous Rocks	HH4/ER1
Oak- Birch-Holly Woodland	WN1
Dy Humid Acid Grassland	GS3
Wet Grassland	GS4
Scrub	WS1
Dense Bracken	HD1
Eroding/Upland Rivers	FW1
Drainage Ditches	FW4

Map Legend

 EIAR Site Boundary	 Wet heath (HH3)/Upland blanket bog (PB2)mosaic
 Rhododendron	 Montane heath (HH4)
 Kerry Slug Records	 Conifer plantation (WD4)
 Buildings and artificial surfaces (BL3)	 Oak-birch-holly woodland (WN1)
 Spoil and bare ground (ED2)	 Degraded Wet heath (HH3) /Blanket bog (PB2)
 Recolonising bare ground (ED3)	 Eroding/upland rivers (FW1)
 Wet grassland (GS4)	 50m River Buffer



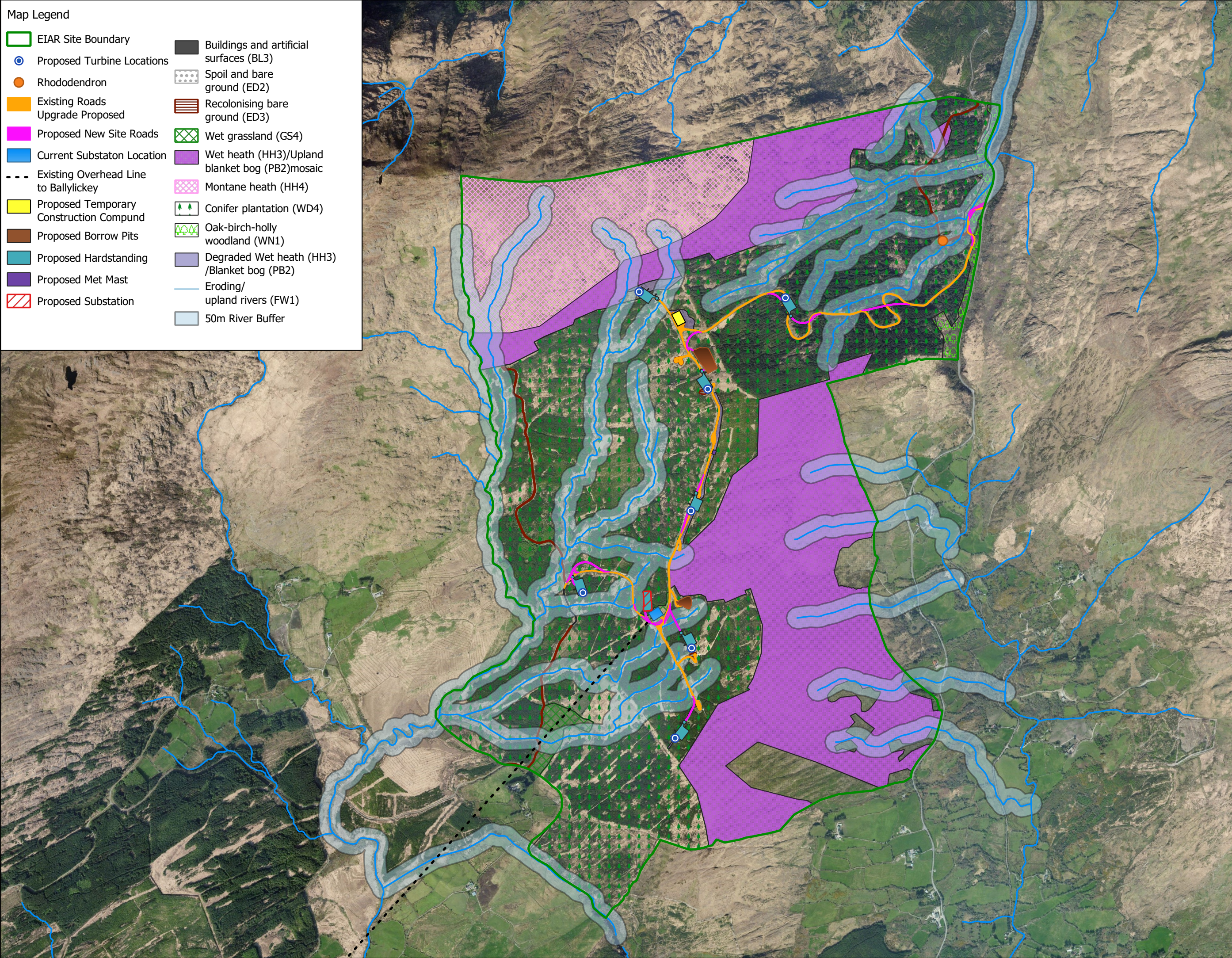
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Drawing Title	
Habitat Map Curraglass	
Project Title	
Curraglass Renewable Energy Development, Co. Cork	
Drawn By	Checked By
Laoise Kelly	John Hynes
Project No.	Drawing No.
190301	Figure 6-5
Scale	Date
1:15315	06.05.2020

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Map Legend

- EIAR Site Boundary
- Proposed Turbine Locations
- Rhododendron
- Existing Roads Upgrade Proposed
- Proposed New Site Roads
- Current Substation Location
- Existing Overhead Line to Ballylickey
- Proposed Temporary Construction Compund
- Proposed Borrow Pits
- Proposed Hardstanding
- Proposed Met Mast
- Proposed Substation
- Buildings and artificial surfaces (BL3)
- Spoil and bare ground (ED2)
- Recolonising bare ground (ED3)
- Wet grassland (GS4)
- Wet heath (HH3)/Upland blanket bog (PB2)mosaic
- Montane heath (HH4)
- Conifer plantation (WD4)
- Oak-birch-holly woodland (WN1)
- Degraded Wet heath (HH3) /Blanket bog (PB2)
- Eroding/upland rivers (FW1)
- 50m River Buffer



Drawing Title	
Habitat Map with Development Footprint	
Project Title	
Curraglass Renewable Energy Development, Co. Cork	
Drawn By	Checked By
Laoise Kelly	John Hynes
Project No.	Drawing No.
190301	Figure 6-6
Scale	Date
1:15315	06.05.2020

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6.5.2.2.1 Conifer Plantation (WD4)

This category is used for areas that support dense stands of planted conifers where the broadleaved component is less than 25% and the overriding interest is commercial timber production. Conifer plantations are characterised by even-aged stands of trees that are usually planted in regular rows, frequently within angular blocks.

The proposed study area largely comprises forestry that is being actively used for commercial purposes. Existing and recently felled plantation were classified as Conifer Plantation (WD4). The dominant commercial species planted were Sitka Spruce (*Picea sitchensis*), with smaller areas of Lodgepole Pine (*Pinus contorta*) and Japanese Larch (*Larix kaempferi*) recorded.

In areas the conifer plantation was fringed with narrow planted bands of Alder (*Alnus* sp). Given that these areas did not constitute more than 25% of the overall conifer plantation area they have been mapped under the WD4 classification.

An example of the coniferous forestry within the site is shown in Plate 6-1.



Plate 6-1 Conifer Plantation (WD4) to the centre of the study area

6.5.2.2.2 Spoil and Bare Ground (ED2)

The unsealed network of existing forestry and original wind farm tracks have been classified as Spoil and Bare Ground (ED2). Most of these have been maintained and regularly resurfaced. Also included are some small areas of yards (i.e. surrounding the existing substation and former turbine locations). The Proposed Development maximises the use of the existing access network.

An example of spoil and bare ground habitat is shown in Plate 6-2.



Plate 6-2 Existing access road categorised as Spoil and Bare Ground (ED2) looking towards the south of the site.

6.5.2.2.3 Recolonising Bare Ground (ED3)

There are a number of existing areas of hardstanding associated with the original wind farm located within the site. These areas have begun to be recolonised by species such as Mat-grass (*Nardus stricta*), Creeping Bent-grass (*Agrostis stolonifera*), Foxglove (*Digitalis purpurea*), Fescue (*Festuca spp.*), Yorkshire Fog (*Holcus lanatus*), Ling Heather (*Calluna vulgaris*), Mouse-eared Chickweed (*Cerastium fontanum*) and Soft Rush (*Juncus effusus*). An example of recolonising habitat at the location of proposed Turbine 1 is shown in Plate 6-3.



Plate 6-3 Existing hardstanding area at T1 categorised as Recolonising Bare Ground (ED3)

6.5.2.2.4 **Buildings and Artificial Surfaces (BL3)**

There are a number of areas of existing infrastructure within the site including previous turbine locations and the existing substation. These areas of built infrastructure were categorised as Buildings and Artificial Surfaces (BL3). An example of this habitat is shown in Plate 6-4



Plate 6-4 Existing substation categorised as Buildings and Artificial Surfaces (BL3)

6.5.2.2.5 Wet Heath (HH3)/Upland Blanket Bog (PB2)/Exposed Siliceous Rocks (ER1)

Peatland is the dominant habitat type in the wider study area. This peatland habitat formed a mosaic between Wet Heath (HH3) and Upland Blanket Bog (PB2). Intermittent patches of Exposed Siliceous Rock (ER1) were also recorded in association with this peatland habitat mosaic. Due to the numerous locations of exposed siliceous rock recorded it has not been mapped as an individual habitat but rather is accepted as occurring in association with the peatland habitat throughout the site. Species within this habitat included Purple Moor-grass (*Molinia caerulea*), Western gorse (*Ulex gali*), Ling Heather, (*Calluna vulgaris*), Bell Heather (*Erica cinerea*), Cross-leaved Heath (*Erica tetralix*), Tormentil (*Potentilla erecta*), Deergass (*Trichophorum germanicum*), Heath Milkwort (*Polygala serpyllifolia*), Marsh Violet (*Viola palustris*), Bog Asphodel (*Narthecium ossifragum*), Heath Rush (*Juncus squarrosus*), Heath Bedstraw (*Galium saxatile*), Common Cottongrass (*Eriophorum angustifolium*), Black Bog-rush (*Schoenus nigricans*) and *Cladonia spp.* lichen. The bryophyte layer included such species as *Sphagnum cuspidatum*, *Sphagnum capillifolium*, *Sphagnum papillosum*, *Rhytideus triquetrus*, *Calliergonella cuspidata*, *Polytrichum commune* and *Rhytidiadelphus loreus*.

Wet heath areas had a peat depth of less than 0.5m. Peat depth in the site often went from quite shallow supporting areas of exposed rock, to deeper peat measuring over 0.5m deep thus a mosaic of these habitats occurred throughout the site. The peatland habitat was assessed in accordance with Perrin (2014) as *Calluna vulgaris-Molinia caerulea-Sphagnum capillifolium* wet/damp heath WH3 and *Calluna vulgaris-Eriophorum spp.* bog typical sub-community BB5a blanket bog. These peatland habitats correspond with Annex I habitat ‘northern Atlantic wet heath with *Erica tetralix* [4010]’ and ‘Blanket bogs (*if active bog) [7130]’. The Proposed Development has been designed to avoid all areas of intact peatland habitat located to the north, south and east of the Proposed Development site have been avoided by the proposed. An example of wet heath/upland blanket bog is shown in Plate 6-5.

Fragmented areas of wet heath were recorded within the site boundary along the existing road infrastructure. The degraded fragments occurred adjacent to the existing infrastructure and along forestry edges. The fragmented habitat areas were modified and subject to drainage. Vegetation was typical of wet heath on thin soils, the major components being Ling Heather (*Calluna vulgaris*), Purple Moor Grass (*Molinia caerulea*), Deergass (*Trichophorum germanicum*), Bell Heather (*Erica cinerea*) and Cross-leaved Heath (*Erica tetralix*). An example of fragmented wet heath habitat along the access road is shown in Plate 6-6.



Plate 6-5 Wet Heath (HH3)/Upland Blanket Bog (PB2) located to the south of the site.



Plate 6-6 Fragmented Wet Heath (HH3) along the existing access road

6.5.2.2.6 **Montane Heath (HH4)/Exposed Siliceous Rocks (ER1)**

The desk study revealed that the Annex I habitat Alpine and Boreal Heath [4060] occurs within the north eastern corner of the study area, to the north of T1. The entirety of this habitat area occurs outside the development footprint approximately 138m north west of the nearest turbine infrastructure, i.e. Turbine 1.

The habitat has a substantial cover of dwarf shrubs and occurs at high altitudes on mountains and in other exposed locations to the north of the study area. Montane heath is associated with shallow mineral soils or peats that are eroding and unstable. It can also be found on areas of loose rock and

coarse sediment on mountain tops and ridges. High rainfall and humidity mean that montane heath is kept very wet even if soils are free-draining or rocky. Vegetation is characterised by stunted and wind-contoured dwarf shrubs. Species in this habitat included Ling Heather (*Calluna vulgaris*), Bell Heather (*Erica cinerea*), Cross-leaved Heath (*Erica tetralix*) and *Racomitium lanuginosum*. The habitat formed a mosaic with Exposed Siliceous Rocks (ER1).

An example of Montane Heath (HH4) is shown in Plate 6-7.



Plate 6-7 Montane Heath (HH4) located in the north western corner of the site

6.5.2.2.7 Oak- Birch Holly Woodland (WN1)

A linear band of Oak-Birch-Holly Woodland (WN1) is located along the north eastern boundary of the site between the existing local road and conifer plantation. This habitat contained species including Ash (*Fraxinus excelsior*), Hazel (*Corylus avellana*), Birch (*Betula pubescens*), and Alder (*Alnus glutinosa*). The understory comprised such species as Holly (*Ilex aquifolium*) and Willow (*Salix spp.*). Ground flora species included Foxglove (*Digitalis purpurea*), Bilberry (*Vaccinium myrtillus*), Hard Fern (*Blechnum spicant*), Wood Sorrel (*Oxalis acetosella*) with moss species comprising such species as *Thuidium tamariscinum*, *Rhytidiadelphus loreus*, *Polytrichum commune*, *Isoetecium myosuroides* and *Polytrichum formosum*. Only three Oak (*Quercus petraea*) trees were recorded in this habitat.

This habitat had been mapped as Annex I habitat ‘European dry heaths [4030]’ according to the latest Article 17 data as shown in Figure 6-4. However, on surveying the site it was clear that this habitat did not conform with Dry Heath. The Irish Vegetation Classification tool, ERICA, was utilised to provide a more accurate description of this habitat. The woodland to the north of the existing access road had a 55% maximum affinity with the habitat: Sessile Oak – Bilberry Woodland as per the Irish Vegetation Classification tool. The section of woodland to the south of the site entrance was more Hazel dominated and had a 40% maximum affinity with with Sessile Oak-Hazel Woodland. Based on these results and the lack of Oak trees within the canopy potential links with Annex I woodland Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] was discounted. More detail on the species recorded within this habitat is provided in Appendix 6-1.

There will be minimal encroachment on this habitat as part of the road widening proposed at the existing entrance to the site. An example of this woodland type is shown in Plate 6-8.



Plate 6-8 Oak-Birch-Holly Woodland (WN1) located along the north eastern boundary of the site.

6.5.2.2.8 Dry-Humid Acid Grassland (GS3)

Dry-Humid Acid Grassland (GS3) occurs within the study area. It is utilised for agricultural purposes and is heavily grazed. This habitat often forms a mosaic with peatland habitat within the site. Species recorded within this habitat included Creeping Bent-grass (*Agrostis stolonifera*), Perennial Ry-grass (*Lolium perenne*), Mat-grass (*Nardus stricta*), Yorkshire Fog (*Holcus lanatas*), Red Fescue (*Festuca rubra*), Creeping Buttercup (*Ranunculus repens*), Heath Bedstraw (*Galium saxatile*), Devil's-bit scabious (*Succisa pratensis*), Cat's Ear (*Hypochaeris radicata*), Clover (*Trifolium spp.*), Violet (*Viola spp.*). Moss species included *Polytrichum commune*, *Rhytidiadelphus loreus* and *Calliergonella cuspidata*.

When assessed in accordance with Perrin (2014) this habitat was categorised as *Nardus stricta* – *Galium saxatile* upland grassland typical sub-community UG2a. This habitat does not correspond with Annex I Species rich *Nardus stricta* grassland. Although Devil's-bit Scabious was recorded within this habitat this was in low numbers and did not provide suitable habitat for Annex II species Marsh Fritillary (*Euphydryas aurinia*). An example of a Dry-Humid Acid Grassland (GS3) agricultural field towards the east of the site is shown in Plate 6-9.



Plate 6-9 Dry-Humid Acid Grassland (GS3) located along the eastern boundary of the site.

6.5.2.2.9 Wet Grassland (GS4)

Wet Grassland (GS4) occurs throughout the study area in association with agricultural land as well as forestry and peatland edges. Wet grassland was dominated by species including Soft Rush (*Juncus effusus*), Conglomerate Rush (*Juncus conglomeratus*) and Creeping Bent-grass (*Agrostis stolonifera*) as shown in Plate 6-10.



Plate 6-10 Wet Grassland (GS4) recorded along conifer plantation and the existing access road.

6.5.2.2.10

Scrub (WS1)

Scrub (WS1) occurred throughout the site and was largely dominated by species such as Willow (*Salix spp.*), Gorse (*Ulex europaeus*), and Bramble (*Rubus fruticosus agg.*) An example of Scrub habitat is shown in Plate 6-11.



Plate 6-11 Example of Willow, Gorse and Bramble Scrub (WS1) located near T5

6.5.2.2.11 **Dense Bracken (HD1)**

Occasional areas of *Pteridium aquilinum* dominated categorised as Dense Bracken (HD1) were recorded within the site. This typically occurred on the banks of rivers and in association with field boundaries as shown in Plate 6-12.



Plate 6-12 Dense Bracken (HD1) growing along the banks of a tributary to the Lackavane River towards the west of the site

6.5.2.2.12 **Eroding/Upland River (FW1)**

A number of small streams occur within the site and were categorised as Eroding/Upland Rivers (FW1). These were dominated by bedrock, boulders, cobble, sand and gravel. The streams to the west are located in the Dunmanus-Bantry-Kenmare catchment while the streams to the east drain to the Lee-Cork Harbour-Youghal Bay catchment.

Typical species within the watercourses included Broad-leaved Pondweed (*Potamogeton natans*), Common Water-starwort (*Callitriche stagnalis*) Lesser Spearwort (*Ranunculus flammula*) and aquatic moss, *Fontinalis antipyretica*. An example of one such watercourse is shown in Plate 6-13.



Plate 6-13 Example of Eroding/Upland River (FW1) located near Turbine 1 which drains to the Lackavane and Owenbeg River downstream.

6.5.2.2.13 **Drainage Ditches (FW4)**

A number of Drainage Ditches (FW4) are located within the Proposed Development site boundary. These were predominantly located within conifer plantation and occasionally along roadsides. An example of a typical drainage ditch within the site is shown in Plate 6-14.



Plate 6-14 Typical example of a Drainage Ditch (FW4) recorded in association with conifer plantation

6.5.2.3 Substation and Battery Storage

The proposed electrical substation and battery storage compound is to be located to the west of the existing substation in an area categorised as **Conifer Plantation (WD4)**. The forestry is mature and the forest floor heavily shaded with occasional patches of *Thuidium mariscus* moss and boulders present as shown in Plate 6-15.



Plate 6-15 Conifer Plantation (WD4) in the footprint of the proposed substation.

6.5.2.4 Meteorological Mast

The proposed meteorological mast will be located to the north of Turbine 4 between the existing access road and conifer forestry. The footprint of the mast will be in an area of degraded wet heath that has been drained as a result of the road and forestry plantation. Species within this habitat included Purple Moor-grass (*Molinia caeruleae*), Ling Heather (*Calluna vulgaris*), Bell Heather (*Erica cinerea*), Cross-leaved Heath (*Erica tetralix*), Soft rush (*Juncus effusus*), Hard Fern (*Blechnum spicant*), Tormentil (*Potentilla erecta*) and Alder (*Alnus glutinosa*). Bryophyte species included *Rhytidiadelphus loreus*, *Sphagnum capillifolium*, *Thuidium tamariscinum* and *Polytrichum commune*. The location of the proposed mast is shown in Plate 6-16.



Plate 6-16 Location of proposed meteorological mast.

6.5.2.5 Borrow Pits

It is proposed to develop 2 No. on-site borrow pits as part of the Proposed Development. Borrow Pit 1 is located approximately 70 metres northeast of Turbine No. 3 and measures approximately 7184.8 metres square. This borrow pit is located in an area categorised as Recolonising Bare Ground (ED3), Exposed Siliceous Rock (ER1), and Conifer Plantation (WD4) as shown in Plate 6-17.



Plate 6-17 Borrow Pit near Turbine 3

Borrow Pit 2 is located further south within the site, approximately 180 metres north of Turbine No. 6, and measures approximately 2518 meters square (Grid Ref: E109002 N06211). This borrow pit is located in Conifer Plantation (WD4) as shown in Plate 6-18.



Plate 6-18 Conifer Plantation (WD4) in which Borrow Pit 2 will be constructed

6.5.2.6 Temporary Construction Compound

The proposed temporary construction compound is located at an existing hardstanding area categorised as Recolonising Bare Ground (ED3). The area to the east of this has been cut away and comprises a mosaic of Wet Grassland (GS4) and degraded Wet Heath (HH3). The location of the proposed temporary construction compound is shown in Plate 6-19.



Plate 6-19 Location of proposed temporary construction compound

6.5.2.6.1 **Proposed New Road near Turbine 2**

The access road within the site is proposed for upgrade and there will be some new road realignment in places as shown on Figure 6.5. The footprint of the new road will pass through areas of existing Conifer Plantation (WD4) at various stages of the forestry cycle. An example of habitat within the proposed new road footprint is shown in Plate 6-20.



Plate 6-20 Example of Conifer Plantation (WD4) to be impacted by the footprint of the proposed new roads

6.5.2.7 Proposed Road Widening at Site Entry

The habitat recorded adjacent to the existing access to the site was categorised as Oak-Birch-Holly Woodland (WN1). This habitat is described in more detail in Section 6.5.2.2.7. and in the Botanical Study provided in Appendix 6-1. There will be minimal encroachment on this habitat as part of the road widening works proposed. The widening will be in the existing verges with minimal encroachment on this habitat. The existing entrance to be widened is shown in Plate 6-21.



Plate 6-21 Existing access to the Proposed Development site to be widened.

6.5.2.8 Proposed Turning Area

It is proposed to temporarily widen an existing field access point to provide for an additional turning area approximately 1.7km to the north east of the Proposed Development site along the R584. The fields on either side of this access point were categorised as Improved Agricultural Grassland (GA1) and Wet Grassland (GS4) with gorse (*Ulex europeaus*) and Willow (*Salix spp.*) Scrub (WS1) margins. The adjacent habitats at the proposed turning area are shown in Plate 6-22 and Plate 6-23.



Plate 6-22 Wet Grassland (GS4) and Scrub (WS1) located to the west of the proposed turning area on the R548



Plate 6-23 Improved Agricultural Grassland (GA1) and Scrub (WS1) located to the east of the proposed turning area on the R548

6.5.2.9 Grid Connection

A connection between the proposed substation and the national electricity grid will be necessary to export the electricity generated by the Proposed Development.

The Proposed Development will connect to the existing 38kV overhead line within the site. This overhead line connects into Ballylickey Substation, located approximately 12 kilometres southwest of the site. The connection will comprise of an internal underground cable, approximately 120m in

length, which will connect the proposed substation to the existing overhead line infrastructure within the site. This route traverses a small section of Conifer Plantation (WD4) and Recolonising Bare Ground (ED3).

6.5.2.10 Invasive Species

During field surveys, a search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) was conducted. Third schedule species *Rhododendron (Rhododendron ponticum)* was recorded at one location to the north of the site outside of the Proposed Development footprint. The location of this plant is shown on Figure 6.5 and provided in Table 6-15 below. The *Rhododendron* plant identified is shown in Plate 6-24.

Table 6-15 Third Schedule Invasive Species within the Study Area

Common Name	Scientific Name	Location
Rhododendron	<i>(Rhododendron ponticum)</i>	To the north of the site boundary outside of the Proposed Development footprint (E110185; N63822)



Plate 6-24 Third Schedule species *Rhododendron* to the north of the site boundary outside of the Proposed Development footprint (E110185; N63822)

6.5.2.10.1 Protected Flora

The footprint of the Proposed Development maximises the use of the existing infrastructure within the site. No botanical species protected under the Flora (protection) Order (1999, as amended 2015) including those listed in the desk study were recorded during the site surveys. In addition, no supporting habitat for such species was recorded within the development footprint.

6.5.2.11 Significance of Habitats

Ecological evaluation follows a methodology that is set out in Chapter 3 of the ‘*Guidelines for Assessment of Ecological Impacts of National Roads Schemes*’ (NRA, 2009). The habitats within and adjacent to the development site were evaluated in accordance with the criteria developed by the NRA (2009b), which classifies sites in terms of their ecological importance, *i.e.* ‘*international importance*’,

‘national importance’, ‘county importance’, ‘local importance (higher value)’ or ‘local importance (lower value)’.

Areas of Montane heath, all of which are located outside the development footprint, correspond to the Annex I habitat Alpine and Boreal Heath [4060]. These intact and viable habitats areas are assigned **National Importance**.

Areas of intact and viable Wet Heath (HH3)/Upland Blanket Bog (PB2) were recorded outside the development footprint. The peatland habitat was assessed in accordance with Perrin (2014) as *Calluna vulgaris-Molinia caerulea-Sphagnum capillifolium* wet/damp heath WH3 and *Calluna vulgaris - Eriophorum spp.* bog typical sub-community BB5a blanket bog. These peatland habitats correspond with Annex I habitat ‘northern Atlantic wet heath with *Erica tetralix* [4010]’ and ‘Blanket bogs (*if active bog) [7130]’. Intact areas of habitat, all of which are located outside the development footprint, were assigned **National Importance**.

Remnant and degraded bog and heath habitats recorded along the edge of existing roads and edges of forestry plantation are subject to drainage and do not confirm to viable habitat areas. Therefore, these areas have been classified as **Local Importance (Higher Value)**.

The Oak-Birch -Holly Woodland (WN1) to the north east boundary of the site was assigned **County Importance** as it contains semi-natural habitat with a high biodiversity in a county context and a high degree of naturalness as well as species that are uncommon within the county.

The Eroding/Upland (FW1) rivers and streams within/downstream of the site are essential in maintaining links and ecological corridors between features of higher ecological value. These watercourses were assigned **Local Importance (higher value)**.

The remaining habitats within the site, namely, Conifer Plantation (WD4), Spoil and Bare Ground (ED2), Recolonising Bare Ground (ED3), Buildings and Artificial Surfaces (BL3), Dry/Humid Acid Grassland (GS3), Wet Grassland (GS4), Dense Bracken (HD1), Drainage Ditches (FW4) and Scrub (WS1) were common in a local and regional context and were therefore considered to Local Importance (lower value).

6.5.2.12 Fauna

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

- > 29th and 30th of July 2019
- > 22nd, 23rd, 24th January 2020
- > 25th of March 2020
- > 26th of May 2020

In addition to the above targeted surveys, additional faunal signs/sightings were also recorded during other surveys including bat surveys. Details of these survey dates are provided in Appendix 6-3.

6.5.2.12.1 Badger

The majority of the development footprint is dominated hard stand areas associated with the previous development on the site. Such areas do not provide suitable habitat for the species. No badger breeding or resting sites were recorded during the dedicated surveys

No signs of badger presence including snuffle hole, latrines, tracks, prints or recorded. However, taking a precautionary approach it is assumed that that species may occur, at least on occasion, within the study area.

6.5.2.12.2 Otter

The majority of the development footprint is dominated hard stand areas associated with the previous development on the site. Such areas do not provide suitable habitat for the species. A survey of watercourses within and adjacent to the Proposed Development footprint was carried out in relation to otter. No otter breeding or resting sites were recorded during the dedicated surveys and no signs of otter in the form of prints, slides or spraints were recorded. However, given the presence of suitable habitat within the wider study area and the ubiquitous nature of the species; it is assumed that it may utilise watercourses in the study area for commuting and foraging purposes.

In addition, no signs of otter were recorded during the dedicated aquatic macroinvertebrate surveys carried out along watercourses outside of the Proposed Development site

6.5.2.12.3 Bats

A dedicated bat survey and assessment report is provided in Appendix 6-3 of this EIAR. The following provides a summary of the key findings. Bat surveys were undertaken in 2019, in accordance with Scottish Natural Heritage Guidance (SNH 2019) and form the core dataset for the assessment of effects on bats at the Proposed Development site. Bat surveys included roost survey, manual transect surveys and ground-level static surveys.

Roost Surveys

No roost sites or potential roost features were identified during the site walkover inspections in spring, summer and autumn 2019. The surrounding habitats were assessed as largely unsuitable for roosting bats and no evidence of bat use was recorded during the preliminary walkover assessment.

Manual Transects 2019

Manual transects were undertaken twice in July and once in October 2019. Bat activity was recorded on all surveys. In general, common pipistrelle (n=240) was recorded most frequently, followed by soprano pipistrelle (n=18), Leisler's bat (n=5) and *Myotis* sp. (n=3). However, species composition and activity levels varied significantly between surveys. Transect survey results were calculated as bat passes per km surveyed (to account for differences in survey effort). Plate 4.1, Appendix 6-3 of the EIAR 'bat report' presents results for individual species per survey period.

Ground-level Static Surveys 2019

In total, 8,410 bat passes were recorded across all deployments. In general, common pipistrelle (n=6,004) occurred most frequently, followed by *Myotis* sp. (n=1,100), Leisler's bat (n= 768), brown long-eared bat (n=294) and soprano pipistrelle (n=204). Instances of Lesser horseshoe bat (n=34) and Nathusius' pipistrelle (n=6) were significantly less. Plate 4.4, Appendix 6-3 of the EIAR 'bat report' presents results for individual species per survey period.

6.5.2.12.4 Kerry Slug (*Geomalacus maculosus*)

The desk study revealed that the Proposed Development is located within the known geographical range of the Annex II and IV species Kerry Slug. The species occurs in two main natural habitats in Ireland: woodland, and blanket bog/wet heathland (NPWS 2019). In recent studies by Johnson et al. (2018) it has been shown that Kerry Slug can also be abundant in conifer plantation.

The majority of the development footprint is dominated hard stand areas associated with the previous development on the site. Hard stand areas, including internal access tracks and former turbine locations, do not provide optimal feeding habitat or suitable refugia for the species. However, in light of the desk study results and given the presence of potential suitable habitat within the wider study area; further surveys were deemed necessary to determine the presence or absence of the species.

Target surveys were conducted on the 25th of March 2020 and involved hand searching and the deployment of metric traps in heath/blanket bog and conifer plantation habitat areas. Survey were conducted under NPWS licence number C71/2020. Hand searches were conducted during suitable weather conditions (i.e. damp weather) on the 25th March 2020. The hand searches confirmed the presence of Kerry Slug within the study area and a total of 19 observations were recorded in a range of habitats through the study area, see Table 6-16 below). Seventeen records of Kerry Slug were obtained on collection of the metric traps on 26th May 2020 the results of which are shown in Table 6-17. The overall locations of Kerry Slug recorded in the site are shown in Figure 6-5.

Table 6-16 Incidental records of Kerry Slug recorded within the study area

Turbine Location	Habitat	Grid reference/ Location	No. Kerry Slug Recorded
1	Rocky outcrop, boulder	E108796; N063602	3
2	Felled conifer plantation	N/A	N/A
3	Boulders at existing turbine base	E109091; N063144	3
4	Rocky outcrop/boulder	E109035; N062576	1
5	Conifer tree near proposed hardstanding area at T5	E108589; N062175	1
6	Individual boulders near T6	E109007; N061959, E109017; N061968 E109031; N061952	3 3 3
7	Boulder (proposed road to T7) Conifer tree	E109006; N061619 E108970; N061536	1 1

Table 6-17 Kerry Slug recorded in metric traps

Location/Grid reference	Habitat	No. Kerry Slug Recorded
Near north eastern boundary E110385 N064022	Oak-Birch-Holly Woodland	1
Proposed Borrow Pit no. 2 E109072 N063267	Rocky outcrop, boulder adjacent to Conifer Plantation (WD4)	2
T3 E109071 N063121	Recolonising Bare Ground (ED3) adjacent to Conifer Plantation (WD4)	1
T5 E108583 N062193	Tree in Conifer Plantation (WD4)	1
Conifer Plantation at proposed new road near T5 E108526 N062327	Tree in Conifer Plantation (WD4)	5
Conifer Plantation (WD4) near T6 E108988 N061873	Tree in Conifer Plantation (WD4)	1
Rock Near proposed T6 E109007 N 061964	Individual boulder near T6	2
Conifer Plantation (WD4) near T7	Tree in Conifer Plantation (WD4)	4

6.5.2.12.5 Aquatic Fauna

These watercourses were mostly small in nature however they did provide suitable spawning habitat for salmonids in the form of gravels. Freshwater Pearl Mussel are known to occur in the Owvane River

approximately 9km (hydrological distance) downstream of the Proposed Development site. All watercourses within the site provide a conduit to larger watercourses downstream.

In addition to the multidisciplinary walkover surveys and targeted species surveys, additional targeted surveys were also undertaken for aquatic invertebrates in order to provide a baseline of water quality within and in close proximity to the site. A detailed aquatic survey was undertaken in January 2020 and is provided in Appendix 6-4. The location of all survey sites is provided in Figure 2.1, Appendix 6-4.

6.5.2.12.6 **Reptiles and Amphibians**

Common frog (*Rana temporaria*) was recorded in wet areas within the site (including in drains and pools and in bog habitats). The species is likely to breed within the study area. Common lizard (*Zootoca vivipara*) and smooth newt (*Lissotriton vulgaris*), while not recorded during the site visits, are likely to occur within the study area.

The Proposed Development will not result in a significant loss of suitable habitat for reptiles, amphibians or invertebrates. Suitable habitat is widespread in the study area and beyond. No likely significant effects on these species are anticipated and therefore further survey/ assessment was not necessary.

6.5.2.12.7 **Other Fauna**

Incidental records of mammals were also made during the respective surveys carried out within the site. Evidence of Hare (*Lepus timidus hibernicus*) and Deer were recorded in the study area in the form of droppings.

In addition to the above species (or signs thereof) that were recorded, it is likely that other species also occur on or around the site but were not recorded during the site surveys that were undertaken. These include small mammal species such as pygmy shrew (*Sorex minutus*) and wood mouse (*Apodemus sylvaticus*) but also larger mammals such as stoat (*Mustela erminea*). No signs of any of these species were recorded during the walkover surveys and no requirement for dedicated surveys or further assessment was identified. No suitable supporting habitat for Marsh Fritillary butterfly was recorded at the development site.

In general, given the current use of the site for commercial forestry, and previous use as a wind farm site, there is limited suitable habitat for protected faunal species. No signs of any additional protected fauna were recorded within the study area during the field survey.

6.5.2.13 **Significance of Fauna**

6.5.2.13.1 **Otter**

Although otter were not recorded within the study area during the surveys carried out, it is anticipated that they utilise the watercourses within and in proximity to the site for commuting and foraging. Otter are protected under Annex II and Annex IV of the European Habitats Directive (92/43/EEC). The site is likely to be utilised by a population of otter of Local Importance (higher value).

6.5.2.13.2 **Badger**

Although no evidence of badger was recorded there is potential for this species to occur in the wider study area due to the presence of suitable habitat. The wider study area is likely to be utilised by a Badger population of Local Importance (Higher value) There is an abundance of suitable habitat for this species within the wider landscape. Significant effects are not anticipated, and further assessment was not deemed necessary.

6.5.2.13.3 **Irish hare**

Irish hare was recorded within the study area. Taking a precautionary approach Irish Hare as an Ecological Receptor has been assigned Local Importance (higher value) due to presence of a resident population of species protected under the Wildlife Acts and Annex V of the EU Habitats Directive. Irish Hare is a native species (endemic sub-species), widely distributed and not considered threatened.

There is an abundance of suitable habitat for this species within the development site boundary and wider area. Significant effects are not anticipated and further assessment was not deemed necessary.

6.5.2.13.4 **Bats**

The habitats surrounding the proposed works location is used by a bat population of Local Importance (higher value). All bat species in Ireland are protected under both national legislation – (Wildlife Act, 1976, as amended in 2017) and European legislation – (Habitats Directive (92/43/EEC). Bats species were recorded foraging and commuting within the vicinity of the Proposed Development. No potential bat roosting features were identified within or adjacent to the development footprint.

6.5.2.13.5 **Kerry Slug**

Kerry Slug (*Geomalacus maculosus*) is protected under Annex II and Annex IV of the European Habitats Directive (92/43/EEC). This species current distribution status is restricted to the counties of Cork, Kerry and Galway and it is also found in northern Spain and Portugal. This species was recorded within the Proposed Development footprint in both conifer plantation and rocky outcrops within peatland habitat. Kerry Slug is anticipated to occur throughout the site. The local population of this species has been assigned Local Importance (Higher value).

6.5.2.13.6 **Fisheries and Aquatic fauna**

The downstream watercourses and fauna within them is assigned Local Importance (Higher Value) due to the known populations of salmon, trout, freshwater crayfish, lamprey, European Eel and freshwater pearl mussel that are known to be present downstream of the study area.

6.5.2.14 **Identification of Key Ecological Receptors**

Table 6-18 lists all identified receptors and assigns them an ecological importance in accordance with the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009). This table also provides the rationale for this determination and identifies the habitats that are Key Ecological Receptors (KER). These ecological receptors are considered in Section 6.6 of this report and mitigation/ measures will be incorporated into the Proposed Development where required, to avoid potential significant impacts on the features. The significance attributed to each of the habitats on site is provided in Figure 6-6 and includes the proposed infrastructure overlain.

Table 6-18 Key Ecological Receptors identified during the assessment

Ecological feature or species	Reason for inclusion. / exclusion as a KER	KER
Designated Sites	<p>European Designated Sites</p> <p>The following EU sites are identified in the AA Screening as being within the Likely Zone of Impact and are assessed fully in the NIS that accompanies this application:</p> <ul style="list-style-type: none"> > The Gearagh SAC. > The Gearagh SPA <p>These sites are assigned International importance and included as a KER due to the potential for indirect effects.</p>	Yes
	<p>Nationally Designated Sites</p> <p>Lough Allua pNHA [001065], was identified within the Zone of influence as surface water connectivity was identified between the Proposed Development site and the pNHA. This site is located approximately 6.9km (hydrological distance) downstream of the Proposed Development. This site is assigned National Importance and included as a KER due to the potential for indirect effects.</p>	Yes
Aquatic Habitats and related species	<p>Rivers and Streams (FW1)</p> <p>The site of the Proposed Development is drained by a number of small streams. In addition, the Lackavane River runs along the south western boundary of the site and the Owvane is located downstream of the south eastern boundary.</p> <p>These watercourses are assigned Local Importance (Higher Value). The watercourses are classified as a KER due to the potential for indirect effects.</p>	Yes
	<p>Drainage Ditches (FW4)</p> <p>The site of the Proposed Development is drained by numerous drainage ditches. These are small man-made channels that are often devoid of vegetation and regularly maintained or choked with vegetation and are slow flowing.</p> <p>These drains are assigned Local Importance (Lower Value) and are not classified as a KER.</p>	No
	<p>Aquatic Fauna – Including Fisheries, Freshwater Pearl Mussel and Invertebrate</p> <p>The aquatic species that are associated with the rivers, streams and wetlands that are located within and surrounding the site assigned Local Importance (Higher Value) in that they have a high biodiversity value in the local context. There is potential for indirect effect on these features and they are collectively classified as a KER.</p>	Yes
	<p>Intact and Viable Areas containing mosaics of Wet Heath (HH3), Blanket Bog (PB2) Exposed Siliceous Rock (ER1) and Montane Heath (HH4)</p>	No

Ecological feature or species	Reason for inclusion. / exclusion as a KER	KER
Peatland Habitats and Exposed Siliceous Rock	<p>The peatland mosaic of wet heath (HH3)/blanket bog (PB2) and montane heath (HH4) occurs in the northern, eastern and south eastern section of the site and were categorised as National Importance as they provide prime examples of Annex I habitat.</p> <p>These features have been entirely avoided in the design of the Proposed Development and no potential for any direct or indirect effect on them is identified. Consequently, they are not classified as a KER and no further assessment is required.</p>	
	<p>Remnant and degraded bog (PB2) and heath habitats (HH3)</p> <p>Remnant and degraded bog and heath habitats recorded along the edge of existing roads and edges of forestry plantation are subject to drainage and do not confirm to viable Annex I habitat areas. Therefore, these areas have been classified as Local Importance (Higher Value).</p> <p>These areas of degraded habitat are classified as a KER.</p>	Yes
Oak-Birch Holly Woodland (WN1)	<p>This woodland along the north eastern boundary of the site was assigned County Importance.</p> <p>There will be minimal marginal encroachment on this woodland associated with road widening/upgrade works. Taking a precautionary approach this habitat is classified as a KER.</p>	Yes
Conifer Plantation (WD4)	<p>Plantation forestry is of low ecological importance due to the dominance of coniferous species (predominantly Sitka Spruce and Lodgepole Pine) and lack of biodiversity within the habitat and was therefore assigned Local Importance (lower value). This habitat is not classified as a KER.</p>	No
Grassland, Scrub and Dense Bracken habitats	<p>Dry-Humid Acid Grassland (GS3)</p> <p>This habitat often formed a mosaic with peatland habitat within the site. Sheep grazing was evident on those areas used for agriculture.</p> <p>This habitat was common in both a local and a national context and was assigned Local Importance (Lower Value).</p> <p>This habitat is not classified as a KER.</p>	No
	<p>Wet Grassland (GS4), Scrub (WS1) Dense Bracken (HD1)</p> <p>These habitats were recorded both along road margins and as part of agricultural fields and forestry edges.</p> <p>These habitats contained small areas of natural habitat that are of some local importance for wildlife and were assigned Local Importance (Lower Value).</p> <p>This habitat is not classified as a KER.</p>	No
Built and man-made habitats	<p>Spoil and Bare Ground, Recolonising Bare Ground and Buildings and Artificial Surfaces</p> <p>These habitats are not of ecological significance and are not classified as a KER</p>	No

Ecological feature or species	Reason for inclusion. / exclusion as a KER	KER
Otter	Otter is assigned Local Importance (higher value) as there is likely to be a regularly occurring population of local importance at the watercourses within and downstream of the site boundary. Although no direct impacts are anticipated there is potential for indirect effect as a results of water quality deterioration. Therefore, this species is classified as a KER.	Yes
Badger	No evidence of badger was recorded within the development site. Significant effects are not anticipated, and further assessment was not deemed necessary. The species is not classified as a KER	No
Irish Hare	There is an abundance of suitable habitat for this species within the development site boundary and wider area. Significant effects are not anticipated, and further assessment is required. The species is not classified as a KER	No
Bats	Bat species has been assessed as a receptor of Local Importance (higher value) as they represent a resident or regularly occurring populations assessed to be important at the local level. Potential for direct and indirect impact on this species exists. Therefore, the species is classified as a KER	Yes
Kerry Slug	Kerry Slug has been assessed as a receptor of Local Importance (higher value) as they represent a resident or regularly occurring populations assessed to be important at the local level. Potential for direct and indirect impact on this species exists. Therefore, the species is classified as a KER.	Yes
Additional protected fauna	The site surveys did not identify any other protected faunal species with the potential to be significantly affected by the Proposed Development at the population level	No

6.6 Ecological Impact Assessment

6.6.1 Do-Nothing Effect

If the Proposed Development were not to proceed, no changes would be made to the current land-use practice of forestry and the site would continue to be managed under the existing commercial forestry arrangements.

The biodiversity on the site would likely remain similar to its current state as activity levels and land use would not change significantly.

6.6.2 Effects on Designated Sites

None of the elements of the Proposed Development are located within the boundaries of any Nationally or European designated sites important for nature conservation (Figure 6.2 and Figure 6.3). There will be no direct effects on any designated site as a result of the construction, operation and decommissioning of the proposed development.

There are a number of watercourses which drain from the Proposed Development site that provide hydrological connectivity with the River Lee (EPA Code: 19L03). The River Lee flows in an eastward direction and discharges into Lough Allua pNHA 5.5km (6.9km hydrological distance) to the east of the development site boundary.

Whilst no significant effects on water quality are anticipated, potential for effects on water quality associated with the construction and operational phase drainage of the site has been fully mitigated through appropriate design and mitigation as fully described in Section 9.5 of Chapter 9: Hydrology and Hydrogeology and Section 6 of the CEMP. Consequently, no significant effects on Lough Allua pNHA are predicted.

No other nationally designated sites were identified as being within the zone of influence or as KERs.

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

As per the aforementioned EPA draft Guidance (2017), “a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement” but should “incorporate their key findings as available and appropriate”. This section provides a summary of the key assessment findings with regard to Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

The Screening for Appropriate Assessment concluded as follows:

“It cannot be concluded beyond reasonable scientific doubt, in view of best scientific knowledge, on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the Proposed Development, individually or in combination with other plans and projects, would not be likely to have a significant effect on the following sites:

- *The Gearagh SAC*
- *The Gearagh SPA*

As a result, an Appropriate Assessment is required, and a Natura Impact Statement shall be prepared in respect of the Proposed Development’.

The findings presented in the NIS are that, *it can be objectively concluded that the Proposed Development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site.*

6.6.3 Likely Significant Effects During Construction Phase

6.6.3.1 Effects on Habitats During Construction

Table 6-19 below provides details of the extent of the recorded habitats on the site, the extent of the habitat that will be lost to facilitate the Proposed Development and the percentage of the total area of that habitat on the site that it represents. Habitats such as scrub, dense bracken and drainage ditches were common and scattered throughout the site therefore they have not been mapped as individual habitats. There will be minimal impact on these unmapped non-KER habitats as a result of the Proposed Development.

Table 6-19 Extent of habitat lost to the Proposed Development and the percentage of the total area of that habitat on site

Habitat	Total area on the site	Area to be lost	Percentage of total to be lost
KER Habitats			
Remnant and degraded bog (PB2) and heath habitats (HH3)	236.92ha (total bog/heath on site)	0.41 ha degraded heath to be lost	0.17%
Oak-Birch Holly Woodland (WN1)	6.09ha	0.09ha comprising narrow linear strip	1.5%
Rivers and Streams (FW1)	19.6km	0	0%
Total			1.67%
Non KER Habitats			
Intact and Viable Areas containing mosaics of Wet Heath (HH3), Blanket Bog (PB2) Exposed Siliceous Rock (ER1) and Montane Heath (HH4)	236.92ha	0	0%
Conifer Plantation (WD4)	350ha	3.39ha	0.97%
Dry-Humid Acid Grassland (GS3)	18.35ha	0	0%
Wet Grassland (GS4)	3.72ha	0.04ha	1.07%
Spoil and Bare Ground (ED2)	3.73ha	0.32ha	8.58%
Recolonising Bare Ground (ED3)	1.47ha	0.02ha	1.36%
Buildings and Artificial Surfaces (BL3)	0.05ha	N/A	0%
Total			

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

Table 6-20 Potential for Impact on Rivers and Streams, and Sensitive Aquatic Species

Description of Effect	<p>This section assesses the potential for likely significant effects on aquatic receptors including aquatic habitats (i.e. watercourses), salmonids, lamprey, coarse fish, white-clawed crayfish, European eel, aquatic invertebrates, molluscs (including Freshwater Pearl Mussel) and other aquatic species.</p> <p>The current proposal has been designed to minimise impacts on the receiving environment and maximises the use of existing infrastructure at the site including internal access tracks and hard stand locations of former turbines. Consequently, the Proposed Development footprint is dominated by modified habitats associated with the existing infrastructure and conifer plantation. No significant direct effects on sensitive aquatic habitats and species will occur. The only potential for impact relates to indirect effects on water quality which could in turn effect the supporting habitat for aquatic species.</p> <p>Turbine locations have been selected to avoid natural watercourses. The access road track to Turbine no. 6 will traverse a forestry drain as part of providing access to the turbine area. The crossing of this drain will be completed using a piped culvert system. Apart from</p>
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	<p>this, only minor culvert upgrade works are proposed. Therefore, there is no potential for the Proposed Development to result in any barrier to the movement of aquatic species.</p> <p>There will be a requirement to upgrade existing drainage culverts where road upgrade works are proposed. Such works will be small scale and will be conducted during periods of low flow.</p> <p>There is potential for the construction activity to result in the run-off of silt, nutrients and other pollutants such as hydrocarbons and cementitious material into land drains and minor watercourses. This represents a potential indirect effect on the identified aquatic receptors in the form of habitat degradation through water pollution.</p> <p>These effects on water quality are fully described in Chapter 9 of this EIAR and are described here and below in relation specifically to ecology.</p>
Characterisation of unmitigated effect	In the absence of mitigation, the indirect effect of water pollution on aquatic receptors during construction has the potential be a short-term reversible impact on watercourses which act as a conduit to downstream habitats. The magnitude of any such impact is likely to be at worst moderate, given that the all new major infrastructure such as turbine bases and substation etc. are located over 50 metres from any significant watercourse.
Assessment of Significance prior to mitigation	In the absence of mitigation and following the precautionary principle, there is potential for the Proposed Development to result in significant indirect effects on the identified aquatic habitats and species at a local geographic scale in the form of pollution during the construction phase of the Proposed Development.
Mitigation	A detailed drainage maintenance plan for the Proposed Development is provided in Section 4.6 of this EIAR. This plan provides details of how water quality will be protected during the construction of the Proposed Development. In addition to this, specific mitigation is provided in relation to water quality in Chapter 9: Hydrology and Hydrogeology of this EIAR. The Construction and Environmental Management Plan (CEMP) that is provided as Appendix 4-3 provides details of culvert installation methodology and exactly how mitigation measures will be implemented during construction.
Residual Effect following Mitigation	Following the implementation of mitigation, there will be no significant effect on aquatic habitats or species, at any geographic scale, as a result of the Proposed Development.
Potential for Cumulative Effect	The Proposed Development will not result in any significant effect on aquatic habitats or species of biodiversity value. It therefore cannot contribute to any cumulative effect in this regard.

6.6.3.1.2 Assessment of Potential Effects on Wet Heath/Blanket Bog

Table 6-21 Loss of Wet Heath/Blanket Bog

Description of Effect	<p>The current proposal has been designed to minimise impacts on the receiving environment and maximises the use of existing infrastructure at the site including internal access tracks and hard stand locations of former turbines. Consequently, the Proposed Development footprint is dominated by modified habitats associated with the existing infrastructure and conifer plantation.</p> <p>Intact and viable areas of wet heath and lowland blanket bog have been totally avoided and will not be impacted by the Proposed Development.</p> <p>Direct impacts on degraded bog/heath habitats have also been largely avoided in the design of the windfarm development. Approximately 0.41ha of degraded bog/heath habitats along the edge of an existing forestry track and plantation will be lost. The</p>
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	<p>degraded peatland areas are classified as no greater than local importance due to their highly modified and degraded state.</p> <p>The overall loss of peatland associated with the development amounts to less than 0.17% of the overall amount of the habitat recorded within the study area.</p> <p>Potential indirect effects include drainage associated with the construction phase of the development. The effect will be localised and is not considered significant given the peatland habitat is already disturbed, degraded and subject to drainage associated with previous development at the site and forestry activities.</p>
Characterisation of unmitigated effect	<p>This is a permanent and irreversible impact on habitats of Local Importance. The magnitude of this impact is <i>Not Significant</i> as it affects only degraded areas of this habitat type.</p>
Assessment of Significance prior to mitigation	<p>The loss of this small footprint of degraded wet heath/blanket bog habitat is not deemed significant as the habitat has been assessed as degraded as described above. Representative examples of Annex I Wet Heath and Upland Blanket Bog within the site boundary have been deliberately avoided as part of the design of the Proposed Development.</p>
Mitigation	<p>The Proposed Development has been deliberately designed to avoid loss of peatland habitat within the site. Turbine locations have been restricted, for the most part, to existing areas of hardstanding associated with previous turbine locations within the site and/or to locations within conifer forestry. Road infrastructure as well as the proposed substation, borrow pits and temporary construction compound have all been designed so as not to impact on peatland habitat within the site.</p>
Residual Effect following Mitigation	<p>Following the specific design of the Proposed Development footprint and its restriction to habitat predominantly outside peatland areas, there will be no significant effect on the peatland habitat mosaic within the site.</p>
Potential for Cumulative Effect	<p>The Proposed Development will not result in any significant negative effect on the wet heath/blanket bog habitat within the site. It therefore cannot contribute to any cumulative effect in this regard.</p>

6.6.3.1.3 Assessment of Potential Effects on Oak-Birch-Holly Woodland (WN1)

Table 6-22 Loss of Oak-birch-holly woodland (WN1)

<p>Description of Effect</p>	<p>The current proposal has been designed to minimise impacts on the receiving environment and maximises the use of existing infrastructure at the site including internal access tracks and hard stand locations of former turbines. Consequently, the Proposed Development footprint is dominated by modified habitats associated with the existing infrastructure and conifer plantation.</p> <p>The existing road network passes through and area of Oak-Birch-Holly Woodland (WN1). The existing road requires upgrade and widening at this location, but his work will be conducted within existing road verge and no significant direct or indirect impact on the adjacent woodland habitat will occur.</p>
<p>Characterisation of unmitigated effect</p>	<p>The design of the development has deliberately avoided significant direct or indirect effects on natural woodland. Any encroachment on the margins of this habitat will be minimal and will not result in any significant direct habitat loss or indirect effects.</p>
<p>Assessment of Significance prior to mitigation</p>	<p>The magnitude of this impact is <i>Not Significant</i> as it affects only the edge of this habitat type.</p>
<p>Mitigation</p>	<p>The footprint of the Proposed Development will be clearly marked out and fenced off prior to works commencing by a qualified ecologist. There will be no access to the wider woodland area. All machinery will work from the existing access road corridor. Vegetation removal will be conducted in line with the provisions of the Wildlife Act.</p>
<p>Residual Effect following Mitigation</p>	<p>Following the mitigation measures above, there will be no significant effect on the Oak-Birch-Holly Woodland (WN1) as a result of the Proposed Development site.</p>
<p>Potential for Cumulative Effect</p>	<p>The Proposed Development will not result in any significant negative effect on the Oak-Birch-Holly Woodland (WN1) habitat within the site. It therefore cannot contribute to any cumulative effect in this regard.</p>

6.6.3.2 Effects on Protected Fauna During Construction

The current proposal has been designed to minimise impacts on the receiving environment and maximises the use of existing infrastructure at the site including internal access tracks and hard stand locations of former turbines. Consequently, the Proposed Development footprint is dominated by modified habitats associated with the existing infrastructure and conifer plantation. Consequently, the Proposed Development does not have the potential to result in significant habitat loss and disturbance impacts on faunal species including KER and Non-KER species. Given the extensive area of habitat that will remain undisturbed throughout the site and the avoidance of the most significant areas of faunal habitat, no significant effects on non-KER faunal biodiversity is anticipated as a result of the Proposed Development.

The potential for significant effects on aquatic species is restricted to indirect effects on their habitat resulting from water pollution. This has been assessed in Section 6.6.3.1.1. above and is not repeated below.

6.6.3.2.1 Assessment of Potential Effects on Otter

Table 6-23 Assessment of Potential Impacts on Otter

<p>Description of Effect</p>	<p>The current proposal has been designed to minimise impacts on the receiving environment and maximises the use of existing infrastructure at the site including internal access tracks and hard stand locations of former turbines. Consequently, the Proposed Development footprint is dominated by modified habitats associated with the existing infrastructure and conifer plantation.</p> <p>Potential for effects on Otter has been considered with regard to NPWS Threat Response Plan⁴ (TRP) which identifies four significant threats facing Otter in an Irish context: Habitat destruction, Water pollution, Disturbance (Recreational sources) and Accidental death/persecution</p>
<p>Characterisation of unmitigated effect</p>	<p>No evidence of otter was recorded during the dedicated Otter surveys. Therefore, there will be no significant habitat destruction, no loss of breeding or resting places and no direct mortality related impacts on this species. Turbine locations have been selected to avoid natural watercourses. One forestry drain crossing will be required on site as part of the Proposed Development, along the new access track to Turbine 6. Apart from this, only minor culvert upgrade works are proposed. Therefore, there is no potential for the Proposed Development to result in any barrier to the movement of otter.</p> <p>Taking a precautionary approach, it is assumed that Otter may occur in the study area on occasion. There is potential for the construction activity to result in the run-off of silt, nutrients and other pollutants such as hydrocarbons and cementitious material into land drains and minor watercourses. This represents a potential indirect effect on Otter in the form of habitat degradation through water pollution.</p> <p>In relation to disturbance, Otter are predominantly crepuscular in nature and it is anticipated that construction activity will mostly be confined to daytime hours, thus minimizing potential disturbance related impacts to the species. Channin P (2003) provides a literary review with regard to anthropogenic disturbance and refers to several reports which have found that disturbance is not detrimental to Otters (Jefferies (1987), (Durbin 1993). (Green & Green 1997). The report also describes successful breeding in towns, under ferry terminals and under the jetties of one of Europe’s largest oil and gas terminals at Sullom Voe in North Scotland. Irish Wildlife Manual No 76 (National Otter Survey of Ireland 2010/2012) notes that the occurrence of Otter was unaffected by perceived levels of disturbance at the survey sites. It also notes that there is little published evidence demonstrating any consistent relationship between Otter occurrence and human disturbance (Mason & Macdonald 1986, Delibes et al. 1991; Bailey & Rochford, 2006).</p>
<p>Assessment of Significance prior to mitigation</p>	<p>Significant effects regarding habitat destruction, barrier effect, disturbance and mortality are not anticipated.</p> <p>In the absence of mitigation, the indirect effect of water pollution on otter during construction has the potential be a short-term reversible impact. The magnitude of any such impact is likely to be at worst moderate, given that extensive infrastructure already present at the site and that the majority of new infrastructure such as turbine bases, substation and construction compounds are located over 50metres from any significant watercourse.</p>
<p>Mitigation</p>	<p>A detailed drainage maintenance plan for the Proposed Development is provided in Section 4.6 of this EIAR. This plan provides details of how water quality will be protected during the construction of the Proposed Development. In addition to this, specific mitigation is provided in relation to water quality in Chapter 9: Hydrology and Hydrogeology of this EIAR. In addition, the Construction Environmental Management</p>

⁴ NPWS (2009)Threat Response Plan: Otter (2009-2011). National Parks & Wildlife Service, Department of the Environment, Heritage & Local Government, Dublin.

	Plan (CEMP) that is provided as Appendix 4-3 provides the details of exactly how the measures will be implemented during construction.
Residual Effect following Mitigation	Following the implementation of mitigation, any effects on otter will be negligible and will not result in any significant effect.
Potential for Cumulative Effect	Any residual effects on otter as a result of the Proposed Development (if any) will be negligible at most and therefore cannot contribute to any cumulative effect in this regard.

6.6.3.2.2 Assessment of Potential Effects on Kerry Slug

Table 6-24 Assessment of Potential Impacts on Kerry Slug

Description of Effect	<p>The current proposal has been designed to minimise impacts on the receiving environment and maximises the use of existing infrastructure at the site including internal access tracks and hard stand locations of former turbines. Consequently, the Proposed Development footprint is dominated by modified habitats associated with the existing infrastructure and conifer plantation.</p> <p>Suitable habitat for this species was recorded within and adjacent to the Proposed Development footprint. Therefore, there is potential for direct impact on the species as a results of habitat loss and mortality.</p>
Characterisation of unmitigated effect	<p>The species occurs in two main natural habitats in Ireland: woodland, and blanket bog/wet heathland (NPWS 2019). In recent studies by Johnson et al . (2018) it has been shown that Kerry Slug can also be abundant in conifer plantation.</p> <p>The majority of the development footprint is dominated hard stand areas associated with the previous development on the site. Hard stand areas, including internal access tracks and former turbine locations, do not provide optimal feeding habitat or suitable refugia for the species. Consequently, the potential for habitat loss and mortality related effect relates to areas where new development is proposed outside the footprint of the existing on-site infrastructure.</p>
Assessment of Significance prior to mitigation	<p>In the absence of mitigation/best practice, potential for a permanent Not significant Effect through the loss of potentially suitable supporting habitat for this species was identified. There is an abundance of suitable habitat for the species in the area and this will remain in place post construction.</p> <p>In the absence of mitigation there is potential for a short term slight negative effect on the local Kerry Slug population as a result of mortality. This effect is fully reversible and the mitigation described below will be employed to ensure that there is no such effect on this species and the species is protected throughout the proposed works.</p>
Mitigation	<p>A pre-commencement survey and trapping exercise, immediately before construction works commence, will be conducted within the development footprint. Metric trapping and hand searches of the footprint will be conducted by a qualified ecologist. Any Kerry slug encountered within the development footprint will be translocated to an alternative area of suitable habitat outside the development footprint. The trapping and translocation will be conducted under a derogation licence from the NPWS</p> <p>Following trapping, the extent of the development footprint will be clearly marked to prevent any encroachment on Kerry slug habitat located outside the works area and to ensure that no Kerry slug re-enter the works area.</p>

Residual Effect following Mitigation	Following the incorporation of the above avoidance and mitigation measures, the Proposed Development will not have a significant effect on Kerry Slug.
Potential for Cumulative Effect	As there will be no negative residual effect on the species at any geographic scale as a result the Proposed Development, it can be concluded that there is no potential for it to contribute in any cumulative negative effect in this regard.

6.6.3.2.3 Assessment of Potential Effects on Bats

Table 6-25 Assessment of Potential Impacts on Bats

Description of Effect	<p>The current proposal has been designed to minimise impacts on the receiving environment and maximises the use of existing infrastructure at the site including internal access tracks and hard stand locations of former turbines. Consequently, the Proposed Development footprint is dominated by modified habitats associated with the existing infrastructure and conifer plantation.</p> <p>As per SNH Guidance, wind farms present four potential risks to bats:</p> <ul style="list-style-type: none"> • Collision mortality, barotrauma and other injuries; (Operational Phase Impact) • Loss or damage to commuting and foraging habitat; • Loss of, or damage to, roosts; • and Displacement of individuals or populations. <p>For each of these four risks, the detailed knowledge of bat distribution and activity within the study area has been utilised to predict the potential effects of the proposed development on bats.</p>
Characterisation of unmitigated effect	<p>Loss or damage to commuting and foraging habitat</p> <p>In absence of appropriate design, the loss or degradation of commuting/foraging habitat has potential to reduce feeding opportunities and/or displace bat populations. The Proposed Development footprint is dominated by modified habitats associated with the existing infrastructure and conifer plantation. The development, including the creation of new road infrastructure, will have not significantly alter landscape features that may be utilised by bats for commuting or foraging.</p> <p>Loss of, or damage to, roosts</p> <p>The Proposed Development footprint is dominated by modified habitats associated with the existing infrastructure and conifer plantation. Overall no roosting sites suitable for maternity colonies, swarming or hibernation will be impacted by the Proposed Development.</p> <p>Displacement of individuals or populations</p> <p>The Proposed Development footprint is dominated by modified habitats associated with the existing infrastructure and conifer plantation. There will be no net loss of linear landscape features for commuting and foraging bats and there will be no loss of any roosting site of ecological significance. The habitats on the site will remain suitable for bats.</p>
Assessment of Significance prior to mitigation	<p>No significant effects with regard to loss of commuting and foraging habitat are anticipated.</p> <p>No significant effects with regard to loss of, or damage to, roosts are anticipated.</p>

	No significant displacement of individuals or populations is anticipated.
Mitigation & Best Practice	A full suite of best practice measures in relation to noise restrictions, lighting restrictions and buffering are provided in the Bat Report (Appendix 6-3)
Residual Effect following Mitigation	There is no potential for the construction of the Proposed Development to result in significant effects on the local bat population at any geographic scale.
Potential for Cumulative Effect	The development will not result in any significant effect on bats. It therefore cannot contribute to any cumulative effect in this regard.

6.6.3.3 Pre-Construction General Best Practice

Mammal Surveys

Prior to any works being carried out, a pre-construction Badger and Otter survey will be undertaken by a qualified ecologist to ensure that Badger and Otter have not taken up residence within or close to the proposed works area.

It is not anticipated that any setts or holts will require to be excluded as part of project based on the findings of the mammal surveys undertaken. However, should any sett or holt be encountered during the pre-construction surveys, it will be subject to exclusion procedures as outlined in the TII/NRA guidelines (2005 and 2006).

The requirement for a preconstruction survey comes from NRA (2005b) Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes and NRA (2006b) Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes. The function of the preconstruction survey is to assess any changes to the baseline conditions of the site that may have occurred between the planning consent and construction stage. This measure does not represent a lacuna in the assessment and is in accordance with industry best practice.

Invasive Species

A preconstruction invasive species survey will be carried out by a qualified ecologist prior to works commencing. This is to identify any potential invasive species that may have become established on the site between the planning consent and construction stage. Should any Third Schedule invasive species be identified a site-specific invasive species management plan will be required prior to construction activities commencing. Machinery will be washed down prior to arrival on site to avoid the risk of introducing Third Schedule species from elsewhere.

6.6.4 Likely Significant Effects During Operational Phase

6.6.4.1 Effects on Habitats during Operation

The operation of the Proposed Development will not result in any additional land take and as such there is no potential for any significant effects in this regard. These habitats are not considered to be a KER in the context of the operation of the Proposed Development.

Potential for effects on rivers, streams and sensitive aquatic species remains a KER during operation and is assessed in detail in the following subsections.

6.6.4.1.1 Effects on Rivers and Streams and sensitive aquatic faunal species.

Table 6-26 Assessment of Potential Impacts on Rivers, Streams and Sensitive Aquatic Faunal Species

<p>Description of Effect</p>	<p>This section assesses the potential for likely significant effects on aquatic receptors including aquatic habitats (i.e. watercourses), salmonids, lamprey, coarse fish, white-clawed crayfish, European eel, aquatic invertebrates, molluscs (including Freshwater Pearl Mussel) and other aquatic species.</p> <p>The current proposal has been designed to minimise impacts on the receiving environment and maximises the use of existing infrastructure at the site including internal access tracks and hard stand locations of former turbines. Consequently, the Proposed Development footprint is dominated by modified habitats associated with the existing infrastructure and conifer plantation.</p> <p>The small-scale increase in the amount of hard standing associated with the proposed infrastructure has the potential to result in faster water runoff from the site to the surrounding watercourses. This may have the indirect effect of causing erosion, which could lead to deterioration of surface water and supporting habitat quality. Additionally, there is the potential for the faster run off of any pollutants that may be associated with vehicular usage on the site.</p> <p>These impacts on water quality are fully described in Chapter 9: Hydrology and Hydrogeology of this EIAR and are described here in relation specifically to biodiversity.</p>
<p>Characterisation of unmitigated effect</p>	<p>Impact on water quality during the operational phase of the Proposed Development has been assessed as a long-term slight-moderate negative effect in the absence of mitigation. The magnitude of this impact is slight because the all new major infrastructure will be located over 50 metres from any significant watercourse and the footprint of the Proposed Development will be minimal when compared to the overall size of the site.</p>
<p>Assessment of Significance prior to mitigation</p>	<p>Significant effects on water quality are not anticipated at any geographic scale during the operation of the Proposed Development.</p>
<p>Mitigation</p>	<p>Whilst no significant effects on water quality are anticipated, potential for effects on water quality associated with the operational phase drainage of the site has been fully mitigated through appropriate design and mitigation as fully described in Section 9.5 of Chapter 9: Hydrology and Hydrogeology and Section 6 of the CEMP.</p>
<p>Residual Effect following Mitigation</p>	<p>Following the implementation of the mitigation measures outlined above, no potential for significant effect has been identified at any geographic scale as a result of the Proposed Development.</p>

<p>Potential for Cumulative Effect</p>	<p>There will be no significant residual effect at any geographic scale, it can therefore be concluded that there is no potential for the Proposed Development to contribute in a cumulative effect in this regard</p>
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6.6.4.2 Effects on Fauna during Operation

The operation of the Proposed Development will not result in any additional habitat loss or deterioration.

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

It is not anticipated that the operation of the Proposed Development will have any effect on Kerry slug or habitat for the species during the operation of the Proposed Development. The development footprint maximises the existing infrastructure within the site. The site currently exists as a commercial forestry site, any maintenance works associated with the operation of the project will be confined to hardstanding areas within the site.

It should be noted that no significant habitat for salmonids, lamprey, freshwater pearl mussel, European eel, or other aquatic species was recorded within the footprint of the Proposed Development and all new major infrastructure such as turbine bases are located over 50 metres from the watercourses within the site. The potential for significant effects on the above aquatic species is restricted to indirect effects on their habitat resulting from water pollution. This has been assessed in Section 6.6.4.1.1 and is not repeated below.

Potential for effects on bat species resulting from the operation of the Proposed Development was identified and therefore, these taxa were are discussed and assessed in relation to the operational phase below.

6.6.4.2.1 Assessment of Potential Effects on Bats during operation

Table 6-27 Assessment of Potential Impacts on Bats

<p>Description of Effect</p>	<p>The current proposal has been designed to minimise impacts on the receiving environment and maximises the use of existing infrastructure at the site including internal access tracks and hard stand locations of former turbines. Consequently, the Proposed Development footprint is dominated by modified habitats associated with the existing infrastructure and conifer plantation.</p> <p>As per SNH Guidance, wind farms present four potential risks to bats:</p> <ul style="list-style-type: none"> • Collision mortality, barotrauma and other injuries; • Loss or damage to commuting and foraging habitat; • Loss of, or damage to, roosts; • and Displacement of individuals or populations. <p>No effects in relation to 1) Loss or damage to commuting and foraging habitat; 2) Loss of, or damage to, roosts; and 3) Displacement of individuals or populations is anticipated as a result of the operation of the development.</p>
<p>Characterisation of unmitigated effect</p>	<p>Collision Risk</p> <p>Activity levels for low risk species at the site including Myotis species, brown long eared bat and lesser horseshoe bat were low. As per SNH guidance, these species are not identified as being particularly vulnerable to collision mortality. Given the low levels of activity recorded, no significant effects are anticipated.</p> <p>The following high-risk species were recorded during the dedicated surveys:</p> <ul style="list-style-type: none"> • Leisler’s Bat; • Common pipistrelle; and • Soprano pipistrelle. <p>Overall Risk for each species was determined, in accordance with Table 3b of SNH guidance (Appendix 4), by a cross-tablature of the site risk level (i.e. Medium) and Ecobat bat activity outputs for each species. A Medium collision risk level was assigned to the local populations of each species. The magnitude of this effect, in respect of local bat populations, in the absence of mitigation is moderate. This is due to the fact that no significant roosts were identified in the immediate vicinity of the turbines and the median level of activity is considered moderate (on a precautionary basis).</p>
<p>Assessment of Significance prior to mitigation</p>	<p>Death may occur through collision with turbine blades or as a result of barotrauma. Fatalities may negatively affect local bat populations. Significant effects are not anticipated at the county or national scale.</p> <p>To date, no studies have conclusively linked pre-construction activity surveys to post-construction fatality rates (Hein et al. 2013). However, there is a strong positive correlation between post-construction activity and fatality at wind farms (Kunz et al. 2007, Baerwald and Barclay 2009, Amorim et al. 2012, Korner-Nievergelt et al. 2013).</p> <p>A Medium collision risk level was assigned to the local populations of high-risk species. Therefore, provided there is no significant change in activity as a result of the Proposed Development, a significant negative effect is not predicted.</p>
<p>Mitigation</p>	<p>In order to reduce the value of the habitat for bat species in the areas surrounding the turbines, a buffer of at least 50m between the tip of the blade and any trees or other tall vegetation that could provide high quality foraging habitat for bat species will be</p>

	<p>implemented. Details of this mitigation and how it is calculated is provided in Appendix 6-3.</p> <p>It is noted in the SNH (2019) guidelines that bat activity on windfarm sites is highly liable to change following construction of a wind farm due to the changes in habitat that occur to facilitate construction. Therefore, continued monitoring of operational wind farms for up to three years' post construction is recommended in the guidelines and will be undertaken at this site, to verify the predicted post construction effects on the local bat populations. Full details of the proposed monitoring programme are provided in Appendix 6-3 and include measurement of bat activity, weather conditions and any correlation between the two. The monitoring will also include corpse searching in the areas surrounding the turbines to gather data on any actual collisions. The results of post construction monitoring shall be utilised to assess changes in bat activity patterns and to inform the design of any advanced site specified mitigation requirements, to ensure that there are no significant effects on bat species.</p>
<p>Residual Effect following Mitigation</p>	<p>Following the implementation of the monitoring and mitigation described above, there is no potential for significant effects on bat species.</p>
<p>Potential for Cumulative Effect</p>	<p>There is no significant residual effect on bats associated with the Proposed Development. It therefore cannot contribute to any cumulative effect in this regard.</p>

6.6.5 Likely Significant Effects During Decommissioning phase

There will be no additional habitat loss associated with the decommissioning of the Proposed Development and therefore there will be no significant effects in this regard. In addition, the removal of the infrastructure will involve similar operations to those involved in construction but without the large-scale earth moving or excavations as the turbine bases and roads etc. will be left in place. These works would therefore be of a smaller scale but would have similar impacts on ecology to those experienced during construction. In addition, and as detailed in Chapter 2 Section 2.7, the existing substation on the site will be decommissioned under the provisions of the previously granted permission. There would be no additional or ancillary impacts associated with the decommissioning phase.

The same mitigation to prevent significant impacts on water quality and associated aquatic fauna, Kerry slug, and other terrestrial fauna during construction will be applicable to the decommissioning phase. Any measures to minimise or avoid disturbance will also be applicable. The CEMP for the project provides the details of the mitigation and best practice that will be employed to avoid any potential for significant effects on biodiversity during decommissioning of the proposed development.

6.7

Cumulative impact

Cumulative effects arising from two or more developments may be:

- **Additive** (i.e. a multiple independent additive model)
- **Antagonistic** (i.e. the sum of impacts are less than in a multiple independent additive model)
- **Synergistic** (i.e. the cumulative impact is greater than the sum of the multiple individual effects)

Data for this assessment of cumulative effects was compiled on the relevant developments near the proposed development site. This included a review of online Planning Registers and identified past and future projects, their activities and their predicted environmental effects. The Proposed Development was considered in combination with other plans and projects in the area that could result in cumulative impacts on European Sites, Nationally designated sites and protected species. This included a review of online Planning Registers and served to identify past and future plans and projects, their activities and their predicted environmental effects. The projects considered are listed in Chapter 2: Background of the Proposed Development. In summary,

Table 6-28 describes those wind farm developments within 20km of the Proposed Development. This table also includes the Freshwater Pearl Mussel Catchment in which the respective project is located. This was assessed in terms of potential for cumulative impact with the Proposed Development as described below

Table 6-28 Other Wind Farms within 20km

No.	Other Wind Farms	Status	No. of Turbines	Freshwater Pearl Mussel Catchment
1	Cleanrath Wind Farm	Existing (9 constructed)	11	Bandon/Caha and Lee Upper
2	Coomaghearlahy Wind Farm	Existing	15	Roughy
3	Currabwee Wind Farm	Existing	7	Bandon
4	Derragh Wind Farm	Existing	6	Lee Upper and Lee Toon
5	Inchincoosh Wind Farm	Existing	6	Roughy
6	Grousemount Wind Farm	Existing	24	Roughy
7	Killaveenogue Wind Farm	Existing	10	Ilen, Bandon and Bandon/Caha
8	Knockeenboy Wind Farm	Permitted	6	Bandon and Bandon/Caha
9	Lettercannon Wind Farm	Existing	7	Roughy
10	Midas Wind Farm	Existing	23	Roughy and Lee-Sullane
11	Millane Hill Wind Farm	Existing	9	Ilen and Bandon/Caha

12	Sillahertane Wind Farm	Existing	10	Roughy
13	Derreenacrinnig West Wind Farm	Permitted	7	Ilen and Mealagh
14	Carrigarierk Wind Farm	Permitted (Under Construction)	5	Bandon/Caha – Lee Upper
15	Glanta Commons Wind Farm	Existing	21	Leamawaddra and Ilen
16	Knocknamork Wind Farm	Permitted	7	Lee-Sullane
17	Shehy More Wind Farm	Permitted (Under Construction)	11	Lee Upper and Bandon/Caha

The Proposed Development site is located in the Owvane and Lee river catchment. Six other wind farm projects are either existing (Cleanrath, , Derragh, Midas) or have been permitted/are under construction (Carrigarierk, Knocknamork, Shehy-More) within the Lee catchment which also pertains to the Proposed Development site. These wind farms have undergone their own environmental impact assessment. In the documentation reviewed, there were no identified significant residual effects on KERs that could potentially result in a cumulative effect when considered in combination with the currently proposed development.

6.7.1 Assessment of Plans

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

- Cork County Development Plan 2014-2020 (and draft new County Development Plan 2022-2028),
- Natura Impact Assessment Report on the Cork County Development Plan, County Council, (2014).

The Cork County Development Plan 2014 (CCDP) was adopted on 8th December 2014 and came into effect on 15th January 2015. Cork County Council is commencing the preparation of a new County Development Plan (2022-2028), this process remains in the pre-draft stage with various background documents having been released to inform the public discourse. No specific updates in relation to Biodiversity had been released at the time of writing of this report.

The review focused on policies and objectives that relate to designated sites for nature conservation, biodiversity and protected species. An overview of the search results with regard to plans is provided in Table 6-29.

Table 6-29 Assessment of Plans

Cork County Development Plan 2014-2020	
Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
<p>County Development Plan Objective HE 2-1: <u>Site Designated for Nature Conservation</u> Provide protection to all natural heritage sites designated or proposed for designation under National and European legislation and International Agreements, and to maintain or develop linkages between these. This includes Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas, Statutory Nature Reserves, Refuges for Fauna and Ramsar Sites.</p> <p>County Development Plan Objective HE 2-2: <u>Protected Plant and Animal Species</u> Provide protection to species listed in the Flora Protection Order 1990, on Annexes of the Habitats and Birds Directives, and to animal species protected under the Wildlife Acts in accordance with relevant legal requirements. These species are listed in Volume 2, Chapter 4 of the plan.</p> <p>County Development Plan Objective HE 2-3: <u>Biodiversity outside Protected Areas</u> Retain areas of local biodiversity value, ecological corridors and habitats that are features of the County’s ecological network, and to protect these from inappropriate development. This includes rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and seminatural grasslands as well as coastal and marine habitats. It particularly includes habitats of special conservation significance in Cork as listed in Volume 2 Chapter 3 Nature Conservation Areas of the plan.</p> <p>County Development Plan Objective HE 2-4: <u>Protection of Wetlands</u> Ensure that an appropriate level of assessment is completed in relation to wetland habitats subject to proposals which would involve drainage or reclamation. This includes lakes and ponds, watercourses, springs and swamps, marshes, heath, peatlands, some woodlands as well as some coastal and marine habitats.</p> <p>County Development Plan Objective HE 2-5: <u>Trees and Woodlands</u> a) Protect trees the subject of Tree Preservation Orders.</p>	<p>The Cork County Development plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the Natura 2000 network and other natural heritage interests. No potential for cumulative impacts when considered in conjunction with the current proposal were identified.</p> <p>No potential for cumulative impacts when considered in conjunction with the current proposal were identified.</p> <p>There will be no impact on designated sites as a result of deterioration in water quality or biodiversity loss. Best practice preventative measures will be implemented to avoid effects on water quality, as outlined in section 6.6 of this chapter, the hydrology chapter and in the CEMP. There will be no adverse effects on sensitive aquatic receptors listed as QIs/SCIs of European Sites, as a result of deterioration in water quality.</p> <p>There will be no impact on European designated sites as a result of the Proposed Development. The development will not affect the conservation status of any QI species or habitat or SCI species of any EU designated site. The development will not prevent the QIs/SCIs of the European Sites from achieving favourable conservation status in the future as defined in Article 1 of the EU Habitats Directive.</p>

Cork County Development Plan 2014-2020	
Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
<p>b) Preserve and enhance the general level of tree cover in both town and country. Ensure that development proposals do not compromise important trees and include an appropriate level of new tree planting and where appropriate to make use of tree preservation orders to protect important trees or groups of trees which may be at risk or any tree(s) that warrants an order given its important amenity or historic value</p> <p>c) Where appropriate, to protect mature trees/groups of mature trees and mature hedgerows that are not formally protected under Tree Preservation Orders.</p> <p>County Development Plan Objective HE 2-7: <u>Control of Invasive Species</u> Control the spread of invasive plant and animal species within the county</p>	<p>There will be no impact on species listed under the Flora Protection Order or trees protected under the Tree Preservation Order as a result of the Proposed Development. Mitigation measures are in place to avoid the spread and prevent the introduction of invasive species within the Proposed Development site.</p>
<p>County Development Plan Objective ED 1-1: <u>Energy</u> Ensure that through sustainable development County Cork fulfils its optimum role in contributing to the diversity and security of energy supply and to harness the potential of the county to assist in meeting renewable energy targets.</p> <p>County Development Plan Objective ED 3-1: <u>National Wind Energy Guidelines</u> Development of on-shore wind shall be designed and developed in line with the ‘Planning Guidelines for Wind Farm Development 2006’ issued by DoELG and any updates of these guidelines.</p> <p>County Development Plan Objective ED 3-2: <u>Wind Energy Projects</u> On-shore wind energy projects should focus on areas considered ‘Acceptable in Principle’ and Areas ‘Open to Consideration’ and generally avoid “Normally Discouraged” areas in this Plan.</p> <p>County Development Plan Objective ED 3-3: <u>Wind Energy Generation</u> Support a plan led approach to wind energy development in County Cork and identify areas for wind energy development. The aim in identifying these areas is to ensure that there are no significant environmental constraints, which could be foreseen to arise in advance of the planning process</p>	<p>The County Development Plan objectives for the County include that Cork develop on-shore wind energy developments while keeping with the guideline, and ensuring there are no significant environmental constraints. There will be no impact on designated sites as a result of deterioration in water quality. Best practice preventative measures will be implemented to avoid effects on water quality, as outlined in section 6.6 of this chapter, the hydrology chapter and in the CEMP. There will be no adverse effects on sensitive aquatic receptors listed as QIs/SCIs of European Sites, as a result of deterioration in water quality.</p> <p>There will be no impact on European designated sites as a result of the Proposed Development as it will be constructed where it can avoid adverse impacts on Natura 2000 Sites (SPA and SAC), Natural Heritage Areas (NHA’s) or adjoining areas affecting their integrity. The development will not affect the conservation status of any QI species or habitat or SCI species</p>

Cork County Development Plan 2014-2020	
Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
<p>County Development Plan Objective ED 3-5: <u>Open to Consideration</u> Commercial wind energy development is open to consideration in these areas where proposals can avoid adverse impacts on:</p> <ul style="list-style-type: none"> • Residential amenity particularly in respect of noise, shadow flicker and visual impact; • Urban areas and Metropolitan/Town Green Belts; • Natura 2000 Sites (SPA and SAC), Natural Heritage Areas (NHA's) or adjoining areas affecting their integrity. • Architectural and archaeological heritage; • Visual quality of the landscape and the degree to which impacts are highly visible over wider areas. 	<p>of any EU designated site. The development will not prevent the QIs/SCIs of the European Sites from achieving favourable conservation status in the future as defined in Article 1 of the EU Habitats Directive.</p>

6.7.2 Assessment of Projects

As described in Section 2.4 of the EIAR, relevant projects have been assessed in-combination with the proposed development and include planning applications in the vicinity of the site and other wind energy applications within the wider area. These have not been repeated here to reduce the duplication of information within this EIAR. However, they have been fully considered in this assessment in terms of their potential for impact on biodiversity.

Forestry and Replanting

A portion of the Proposed Development site currently comprises a coniferous forestry plantation, with approximately 53% percent of the site under forestry. As part of the Proposed Development, tree felling will be required within and around the development footprint to allow the construction of turbines, hardstanding and access roads where necessary as delineated in Figure 4-13 of Chapter 4 of the EIAR.

Turbulence felling may also be required in the vicinity of turbine locations, the purpose of which is to avoid turbulence that can be created by the forest canopy and which can affect the performance and efficiency of the turbines.

A total of 11.73 hectares of forestry will have to be permanently felled within and around the footprint of the Proposed Development. An additional 4.59 hectares of trees will be required to be temporarily felled around all turbines in order to facilitate infrastructure construction and turbine erection. It is assumed, for the purposes of assessment within the EIAR, that another 25 hectares of trees will be required to be temporarily felled in order to prevent those trees causing a turbulence effect around the proposed turbine locations. If the amount of turbulence felling is determined to be greater or less prior to felling, this will not change the assessment. The total extent of turbulence felling required will be determined by the turbine manufacturer which will not be known until prior to the construction phase. The amount of tree felling required on the site is therefore approximately 41.32 hectares or 12% of the currently forested area. Figure 4-12 shows the extent of the area to be felled as part of the Proposed Development.

The tree felling activities required as part of the Proposed Development will be the subject of two Limited Felling Licence (LFL) applications to the Forest Service, as per the Forest Service's policy on granting felling licenses for wind farm developments. The policy requires that a copy of the planning permission for the Proposed Development be submitted with the felling licence applications; therefore the felling licenses cannot be applied for until such time as planning permission is obtained for the Proposed Development.

One LFL will be applied for to cover felling required around the footprint of the Proposed Development footprint, for example along access roads and at turbine bases. A second LFL will be applied for to cover temporary felling. Should a requirement for turbulence felling be identified by the selected turbine manufacturer, a separate LFL will be applied for to cover same.

In line with the Forest Service's published policy on granting felling licences for wind farm developments, areas cleared of forestry for turbine bases, access roads, and any other wind farm-related uses will have to be replaced by replanting at an alternative site.

The Forest Service policy requires replanting on a hectare for hectare basis for the footprint of the turbines and the other infrastructure developments. In the case of the area to undergo turbulence felling, there is a requirement for replanting on a hectare for hectare basis within the site plus an additional 10% offsite.

Approximately 14.23 hectares of forestry will be replanted as a condition of any felling licence that might issue in respect of the Proposed Development. Replanting is a requirement of the Forestry Act

and is primarily a matter for the statutory licensing processes that are under the control of the Forest service.

The Forest Service policy states that where turbulence felling is necessary, a ‘short rotation forestry’ (SRF) approach will be made a condition of the felling licence. The SRF approach recommends the use of lodgepole pine or another suitable species as the replanting choice. The north coastal variety of lodgepole pine is preferred because it is unlikely to reach ten metres in height, the height at which the trees would again have to be felled to prevent turbine turbulence effects, over the 30-year lifetime of the project.

In accordance with the Forest Service policy and requirements, the 4.59 hectares and 25 hectares that will be temporarily felled for infrastructure construction and possible turbulence respectively, will be replanted in the same location with the north coastal variety of lodgepole pine or similar species.

The replacement replanting of the remaining 11.73 hectares of forestry and the 10% of the overall assumed turbulence felling (2.5ha), totalling 14.23 ha can occur anywhere in the State subject to licence. Two replanting areas, located in Cloghaun More, Co. Clare and Sheehaun, Co. Roscommon have been identified for assessment purposes, with a total availability of 24.95 hectares. These lands have been granted Forest Service Technical Approval for afforestation, and these or similarly approved lands will be used for replanting should the Proposed Development receive planning permission. A description of the proposed replanting land and an assessment of the potential impacts including cumulative impacts associated with afforestation at this location are provided in Appendix 4-2 of the EIAR.

6.7.3 Assessment of Cumulative Effects

The residual construction, operational and decommissioning impacts of the Proposed Development are considered cumulatively with other plans and projects as described above. Particular focus has been placed on those plans and projects that are in the same water catchment (Lee and Owvane) as the Proposed Development and those that could be potentially affected via downstream surface water.

The Proposed Development will result in the loss of approximately 0.41ha of degraded wet heath/blanket bog which is equivalent to 0.17% of all peatland habitats recorded within the study area. There will be minimal encroachment on the oak-birch-holly woodland associated with the main entrance to the site. This loss amounts to 0.09ha which equates to 1.5%, a very small percentage of this overall habitat. This does not represent a significant loss of peatland or woodland. As such, there is no potential for the Proposed Development to contribute to any significant cumulative habitat loss when considered in combination with any other plans and projects.

The potential for the Proposed Development to contribute to a cumulative effect on water quality in the Lee and Owvane catchments was considered in this chapter and also in Chapter 9 of this EIAR. Following detailed surveys, the watercourses on the site were assessed to be of low ecological significance, with the watercourses becoming increasingly more ecologically sensitive further downstream. The Proposed Development includes a range of measures that are in place to prevent any water pollution or hydrological effects outside the development footprint. The implementation of these measures ensures that there is no potential for significant cumulative effects on any downstream receptors, whether the Proposed Development is considered on its own or in combination with other plans or projects including the six wind farms also in the Lee catchment referred to in Section 6.7

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

The Proposed Development will not result in any significant residual effects on biodiversity and will not contribute to any cumulative effect when considered in combination with other plans and projects.

In the review of the projects that was undertaken, no connection that could potentially result in additional or cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the Proposed Development.

6.8

Conclusion

Following consideration of the residual effects (post mitigation) it is concluded that the Proposed Development will not result in any significant effects on any of the identified KERs. No significant effects on receptors of International, National or County Importance were identified.

The potential for effects on the European designated sites are fully described in the Natura Impact Statement that accompanies this application. The NIS concludes that in view of best scientific knowledge and on the basis of objective information, the Proposed Development either individually or in combination with other plans or projects, is not likely to have significant effects on the European Sites that were assessed as part of the Appropriate Assessment process. No Nationally designated sites were identified as KERs and no potential pathways for effect were identified.

Provided that the proposed development is constructed and operated in accordance with the design, best practice and mitigation that is described within this application, significant individual or cumulative effects on ecology are not anticipated at the international, national or county scales or on any of the identified KERs.