

6. BIODIVERSITY

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. These include species and habitats with national and international protection under the Wildlife Acts 1976-2019, EU Habitats Directive 92/43/EEC. Impacts on avian receptors are considered in Chapter 7 of this EIAR. The full description of the Proposed Development is provided in Chapter 4 of this EIAR.

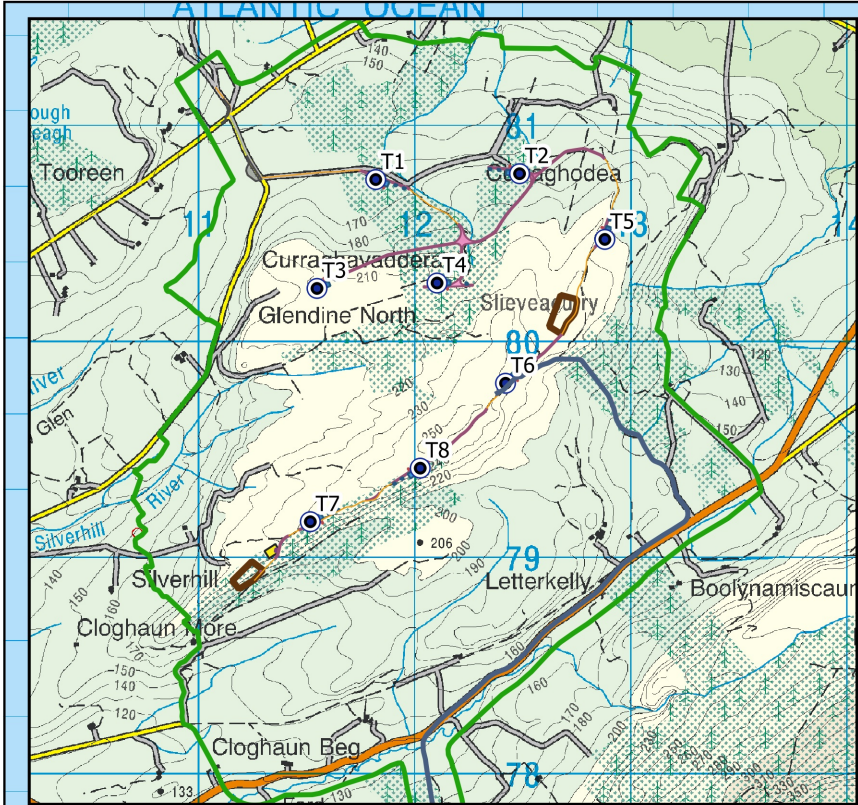
The baseline environment, potential direct, indirect and cumulative impacts of replanting lands on biodiversity has been assessed in the Section 5 of Appendix 4-3 Assessment of Forestry Replacement Lands.

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 Proposed 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 renewable energy development is referred to as 'the Proposed Development'.
- › For the purpose of this EIAR, the term 'EIAR Site Boundary' refers to the site green line boundary, comprising the entire area shown in Figure 6-1.
- › "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.



Map Legend

- EIAR Study Boundary
- Proposed Turbine Locations
- Existing Roads - Upgrade Proposed
- Proposed New Site Roads
- Proposed Turbine Foundations
- Proposed Turbine Hardstands
- Proposed Borrow Pits
- Proposed Temporary Construction Compound
- Met Mast Location
- Proposed Underground Cable Route
- Proposed Extension to Existing Slieveacallan Substation
- Temporary Runover Area
- County Road to be Maintained
- Public Road Expansion Area
- Soft Levelled Area

Drawing Title

Site Location

Project Title
Slieveacurry Renewable Energy Development, Co. Clare

Drawn By Holly Witter	Checked By Sarah Mullen
Project No. 170224	Drawing No. Figure 6-1
Scale 1:100000	Date 23.10.2020

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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:

- › Clare County Development Plan 2017-2023
- › Natura Impact Assessment Report on the Clare County Development Plan 2017-2023 - Variation No. 1, Clare County Council, (2019²).

6.3.1 Statement of Authority

This report has been prepared by David McNicholas (B.Sc., M.Sc., MCIEEM) and Laoise Kelly (B.Sc.). David McNicholas has 10 years' professional ecological consultancy experience and is a full member of the Chartered Institute of Ecology and Environmental Management. Laoise has over 5 years' experience working in environmental consultancy. The report was updated in September 2021 by Pat Roberts (B.Sc. (Env.) MCIEEM and Olivia O' Gorman (B.Sc., M.Sc.) following additional survey works. This report has been reviewed by John Hynes (B.Sc., M.Sc., MCIEEM). John has 10 years' experience in ecological management and assessment. The baseline ecological surveys were undertaken by David McNicholas (B.Sc., M.Sc., MCIEEM), James Owens (B.Sc., M.Sc.), Dr. Erin Johnston (B.Sc., M.Sc., PhD), Dr. Úna Nealon, Laoise Kelly (B.Sc.), Olivia O'Gorman (B.Sc., M.Sc.), Jen Fisher (B.Sc.), Aoife Joyce (B.Sc., M.Sc.), Claire Stephens (B.Sc.). All surveyors have relevant academic qualifications and are competent experts in undertaking the ecological surveys in which they were involved.

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 NPWS Article 17 maps 2019, 2013 and 2007.
- › Review of online web-mappers: National Parks and Wildlife Service (NPWS), EPA (Envision), Water Framework Directive (WFD) and Inland Fisheries Ireland (IFI).
- › Inland Fisheries Ireland (IFI) Reports, where available.
- › Data on potential occurrence of protected bryophytes – as per NPWS online map viewer; Flora Protection Order Map Viewer – Bryophytes³.
- › Review of relevant Plans, including the National Biodiversity Action Plan 2017-2021, County Biodiversity Plan and the All Ireland Pollinator Plan 2015-2020.
- › Review of the Bat Conservation Ireland (BCI) Private Database.

²Clare Co. Co. 2019, *Natura Impact Assessment Report on the Clare County Development Plan 2017-2023 - Variation No. 1*, Online, Available at: <https://www.clarecoco.ie/services/planning/publications/clare-county-development-plan-2017-2023-variation-no-1-natura-impact-report-31603.pdf>, Accessed 17.09.2020

³ NPWS, 2019, *Online map viewer; Flora Protection Order Map Viewer – Bryophytes*. Online, Available at: <http://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e>, Accessed: 26/08/2020.

- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper.
- 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.
- Potential for in-combination effects have been considered in Chapter 2 of this EIAR and Section 6.8 of this Chapter. This was informed by a review of the EIARs prepared for other plans and projects occurring in the wider area.

6.4.2 Scoping and Consultation

MKO undertook a scoping exercise during preparation of this EIAR, as described in Chapter 2, Section 2.5 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 2-6 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	
Department of Agriculture, Food and the Marine (DAFM)	19.03.2020	Under section 6.2.4.9 of the EIAR (Hydrology and Hydrogeology), the DAFM notes that it is important the EIA study evaluates the potential impacts of the required changes to the drainage of the site and the potential to cause additional flooding downstream of the site. It is not sufficient to examine just the existing drainage of the site and site-specific flood risk.
	24.04.2020	<p>If the Proposed Development will involve the felling or removal of any trees, the DAFM states that the developer must obtain a Felling License from this Department before trees are felled or removed.</p> <p>The response further notes that the interaction of proposed works with the environment locally and more widely, in addition to potential direct and indirect impacts on designated sites and water, will need to be assessed. Consultation with relevant environmental and planning authorities may be required where specific sensitivities arise (e.g. local authorities, National Parks & Wildlife Service, Inland Fisheries Ireland, and the National Monuments Service).</p> <p>As this development is within a forest lands, particular attention should be paid to deforestation, turbulence felling and the requirement to afforest alternative lands.</p>
An Taisce	-	No response received to date
Bat Conservation Ireland	-	No response received to date
Birdwatch Ireland	-	No response received to date
Department of Communications, Climate Action and the Environment	-	No response received to date

<p>Department of Culture, Heritage and the Gaeltacht</p>	<p>26.08.20</p>	<p><u>Baseline Data</u> The response noted where information can be found.</p> <p><u>Impact Assessment</u> The impact of the development on the flora, fauna and habitats present should be assessed. In particular the impact of the Proposed Development should be assessed, where applicable, with regard to:</p> <ul style="list-style-type: none"> › ‘Protected species and natural habitats’, as defined in the Environmental Liability Directive (2004/35/EC) and European Communities (Environmental Liability) Regulations, 2008, including Birds Directive – Annex I species and other regularly occurring migratory species, and their habitats (wherever they occur) and Habitats › Directive – Annex I habitats, Annex II species and their habitats, and Annex IV species and their breeding sites and resting places (wherever they occur). Of particular relevance to this site is that the ... Habitats Directive Annex II species Marsh Fritillary has also been recorded in the area, this department expects that these species will be surveyed for at the appropriate times and that any impact of the Proposed Development on them will be assessed. › Features of the landscape which are of major importance for wild flora and fauna, such as those with a “stepping stone” and ecological corridors function, as referenced in Article 10 of the Habitats Directive. › Other habitats of ecological value in a national to local context (such as those identified as locally important biodiversity areas within Local Biodiversity Action Plans and County Development Plans). › Red data book species. › Biodiversity in general <p>Reference should be made to the National Biodiversity Action Plan 2017-2021 and any relevant County Biodiversity Plan, as well as the All Ireland Pollinator Plan 2015-2020.</p> <p>Any losses of biodiverse habitat associated with the Proposed Development (including for example from access roads and cabling) such as blanket bog, heath, woodland, scrub, hedgerows and other habitats should be mitigated for.</p> <p>In particular any impact on water table levels or groundwater flows may impact on wetland sites some distance away. The EIAR should assess cumulative impacts with other plans or projects if applicable. Where negative impacts are identified suitable mitigation measures should be detailed if appropriate.</p> <p><u>Alien Invasive Species</u> The EIAR should also address the issue of invasive alien plant and animal species, such as Japanese Knotweed, and detail the methods required to ensure they are not accidentally introduced or spread during construction.</p> <p><u>Hedgerows and Protected Species</u> Badgers are listed on annex III of the Berne Convention and are protected under the Wildlife Acts. Every effort should be made to retain hedgerows. The EIAR should provide an estimate of the length of hedgerow that will be lost, if any. Where trees or hedgerows have to be removed there should be suitable planting of native species in mitigation. Hedgerows and trees</p>
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	<p>should not be removed during the nesting season (i.e. March 1st to August 31st).</p> <p><u>Bats</u> Bat roosts may be present in trees, buildings and bridges. Bat roosts can only be destroyed under licence under the Wildlife Acts and a derogation under the Birds and Natural Habitats Regulations and such a licence would only be given if suitable mitigation measures were implemented. Where so called bat friendly lighting is proposed as mitigation then it should be proven to work as mitigation. Lighting in woodlands and ecological corridors should be avoided.</p> <p><u>Rivers and Wetlands</u> Any watercourse or wetland impacted on should be surveyed for the presence of protected species and species listed on Annexes II and IV of the Habitats Directive. One of the main threats identified in the threat response plan for otter is habitat destruction (see www.npws.ie/sites/default/files/publications/pdf/2009 Otter TRP.pdf). In addition, a 10 m riparian buffer on both banks of a waterway is considered to comprise part of the otter habitat. Therefore, any proposed development should be located at least 10 m away from the waterway. A suitable riparian habitat should be left along each watercourse. Construction work should not be allowed impact on water quality and measures should be detailed in the EIAR to prevent sediment and/or fuel runoff from getting into watercourses which could adversely impact on aquatic species. Flood plains, if present, should be identified in the EIAR and left undeveloped to allow for the protection of these valuable habitats and provide areas for flood water retention. If applicable the EIAR should take account of the guidelines for Planning Authorities entitled “The Planning System and Flood Risk Management” and published by the Department of the Environment, Heritage and Local Government in November 2009. IFI should be consulted with regard to impacts on fish species.</p> <p><u>Freshwater Pearl Mussel</u> It is important that the needs of the Freshwater Pearl Mussels are considered in relation to water quality. Where Freshwater Pearl Mussels could potentially be impacted by a proposed development, the applicant should have due regard to, and incorporate any measures from, the Freshwater Pearl Mussel sub-basin plans, as appropriate.</p> <p><u>Water quality</u> Ground and surface water quality should be protected during the construction and operation of the proposed development and if applicable the applicant should ensure that adequate sewage treatment facilities are or will be in place prior to any development. The applicant should also ensure that adequate water supplies are present prior to development.</p> <p><u>Bridges and Flora</u> Masonry bridges are a valuable habitat for a myriad of saxicolous vascular, bryophyte and lichen species.</p> <p><u>Bat flight paths</u> As wind turbines can also impact on bats a bat survey will be required.</p> <p><u>Monitoring</u> This Department recognises the importance of pre and post construction monitoring, such as recommended in Drewitt et al.</p>
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	<p>(2006), and Bat Conservation Ireland (2012). The applicant should not use any proposed post construction monitoring as mitigation to supplement inadequate information in the assessment. The EIAR process should identify any pre and post construction monitoring which should be carried out. The post construction monitoring should include bird and bat strikes/fatalities including the impact on any such results of the removal of carcasses by scavengers. Monitoring results should be made available to the competent Authority and copied to this Department. A plan of action needs to be agreed at planning stage with the Planning Authority if the results in future show a significant mortality of birds and/or bat species.</p> <p><u>Turbine specification</u> Should the exact height and rotor diameter of the turbines to be used not be known at EIAR stage then the assessment of impacts must be applicable to a variety of turbine heights and rotor diameters which could be used. This should be made clear in the EIAR.</p> <p><u>Conservation objectives</u> In order to carry out the appropriate assessment screening, and/or prepare the Natura Impact Statement (NIS), information about the relevant Natura 2000 sites including their conservation objectives will need to be collected. Details of designated sites and species and conservation objectives can be found on www.npws.ie/.</p> <p><u>Cumulative and ex situ impacts</u> A rule of thumb often used is to include all Natura 2000 sites within a distance of 15 km. It should be noted however that this will not always be appropriate. In some instances where there are hydrological connections a whole river catchment or a groundwater aquifer may need to be included. Similarly where bird flight paths are involved the impact may be on an SPA more than 15 km away.</p> <p><u>CMPs</u> Complete project details including outline construction management plans (CMPs) need to be provided in order to allow an adequate appropriate assessment to be undertaken. Applicants need to be able to demonstrate that CMPs and other such plans are adequate and effective mitigation, supported by scientific information and analysis, and that they are feasible within the physical constraints of the site. The positions, locations and sizes of construction infrastructure and mitigation, such as settlement ponds, disposal sites and construction compounds, may significantly affect European sites, designated sites, habitats, and species in their own right and could have an effect for example on drainage, water quality, habitat loss, and disturbance. If these are undetermined at time of the assessment, all potential effects of the development on the site are not being considered. If applicants are not in a position to decide the exact location and details of these at time of application, then they need to consider the range of options that may be used in their assessment so that all issues are covered. The CMP should also include methods to ensure invasive alien species are not introduced or spread. This Department understands that it may not be possible to have final cable route details until a grid connection agreement is given. However, if applicants are not in a position to decide the exact location and details at time of application, then they need to consider the range of options that may be used in their assessment so that all issues are covered.</p> <p><u>Licences</u> Where there are impacts on protected species and their habitats, resting or breeding places, licenses may be required under the Wildlife Acts or derogations under the Habitats Regulations.</p>
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		In order to apply for any derogations the results of a survey should be submitted to the National Parks and Wildlife Service of this Department. Such surveys are to be carried out by appropriately qualified person/s at an appropriate time of the year. Details of survey methodology should also be provided. Such licences should be applied for in advance of planning to avoid delays and in case project modifications are necessary. Should this survey work take place well before construction commences, it is recommended that an ecological survey of the development site should take place immediately prior to construction to ensure no significant change in the baseline ecological survey has occurred. If there has been any significant change mitigation may require amendment and where a licence has expired, there will be a need for new licence applications for protected species.
Forest Service	-	No response received to date
Inland Fisheries Ireland	-	No response received to date
Irish Peatland Conservation Council	-	No response received to date
Irish Red Grouse Association	-	No response received to date
Irish Raptor Study Group	-	No response received to date

6.4.3 Field Surveys

A comprehensive survey of the biodiversity of the entire site was undertaken on various dates throughout 2017, 2018, 2019, 2020 and 2021. 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 25th May, 16th June, 7th and 25th July, 14th August, 25th & 26th September, 6th and 23rd October 2017, 8th October 2018, 20th May, 13th June and 4th September 2019, and the 30th & 31st July 2020, 4th March 2021 and 30th September 2021. The majority of the survey timings fall within the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith *et al.*, 2011). A comprehensive walkover of the entire site was completed with incidental records also incorporated from other dedicated species/habitat specific surveys including otter, bats, marsh fritillary or quadrat surveys.

The walkover surveys were also 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.). In addition, an inventory of other species of local biodiversity interest was compiled including invertebrates (butterflies, dragonflies, damselflies, beetles), plants, fungi 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

All habitats recorded on site and described in this EIAR chapter have been classified in accordance with Fossitt (2000). In addition, peatland habitats outside of the proposed infrastructure footprint but within the study area are described in detail in this chapter. 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 of the site were also undertaken throughout multidisciplinary walkover surveys carried out in 2017, 2018, 2019 and 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.
- Commission of the European Communities (2013) *Interpretation manual of European Union habitats*. Eur 27. European Commission DG Environment.
- Foss, P.J. & Crushell, P. 2008, *Guidelines for a National Fen Survey of Ireland, Survey Manual*. Report for the National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Ireland.
- 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.
- Martin, J.R., O'Neill, F.H. & Daly, O.H. (2018), *The monitoring and assessment of three EU Habitats Directive Annex I grassland habitats*. Irish Wildlife Manuals, No. 102. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.
- O'Neill, F.H., Martin, J.R., Devaney, F.M. & Perrin, P.M. (2013), *The Irish semi-natural grasslands survey 2007-2012*. Irish Wildlife Manuals, No. 78. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.

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).

6.4.3.2.1 Vegetation composition assessment

Detailed habitat classification and assessment was undertaken by MKO at targeted locations within the development footprint, with relevés undertaken on the 30th & 31st July 2020 and 4th March 2021 within representative habitats at each turbine base, borrow pits and associated infrastructure, see Figure 6-2. The extent of each habitat on site was mapped on site 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 location of all quadrats is shown in Figure 6-2.

The survey results were then analysed in accordance the Irish Vegetation Classification (IVC) system. The IVC is a project with aims to classify, describe, and map in detail all aspects of natural and semi-natural vegetation in Ireland within a single, unified framework. The National Vegetation Database (NVD), upon which the IVC is based, holds data for over 30,000 relevés and is the core resource upon which the classification system is based.

A fundamental requirement of the IVC is to “*aid in definition and **identification** of EU Habitat Directive (92/43/EEC) Annex I habitats*” and to ‘*inform the planning process, for example through environmental impact assessments*’.

The Engine for Relevés to Irish Communities Assignment (ERICA)⁴ is a web application for assigning vegetation data to communities defined by the Irish Vegetation Classification (IVC). Data can be uploaded, checked for errors and analysed and the results can then be downloaded. ERICA works with both quantitative vegetation cover data (such as are recorded in relevés and other types of botanical recording plots) and presence/absence data, such as species lists. ERICA covers grasslands, woodland, duneland, heaths, bogs, fens, mires, freshwater, saline waters, rocky habitats, scrub, strandline, saltmarsh and weed communities (Perrin, 2019).

The data collected from the botanical assessments was uploaded to ERICA on the 4th of July 2020, analysed and the results data downloaded.

The analysis procedure uses a clustering process to assign classification affinity to vegetation plots based on a degree of membership to each of the communities defined by the IVC. Table 6-2 details the categorizing types of plots utilizing the clustering analysis. This categorizing procedure was utilized to determine if the grassland plots within the study area had any affinity to Annex I grassland and whether further assessment was required.

Table 6-2 Categorising types of plots using clustering analysis (after Wiser & de Cáceres, 2013).

Plot Type	Definition
Assigned	The plot has membership ≥ 0.5 for one of the vegetation communities and therefore relates to the core definition of that vegetation community.
Unassigned	The plot has membership ≥ 0.5 for the noise class and is poorly represented by the current classification scheme
Transitional	The plot has membership < 0.5 for all vegetation communities and for the noise class. It falls within the scope of the current classification scheme but does not relate to the core definition of any of the vegetation communities.

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).

⁴ Perrin, 2019, ERICA – Engine for Relevés to Irish Communities Assignment V5.0 User’s Manual, Online, Available at: https://biodiversityireland.shinapps.io/vegetation-classification/w_9cd4889a/manual.pdf, Accessed: 10.10.2020



Map Legend

Quadrat Locations

EIAR Study Boundary

Proposed Turbine Locations

Existing Roads - Upgrade Proposed

Proposed New Site Roads

Proposed Turbine Foundations

Proposed Turbine Hardstands

Proposed Borrow Pits

Proposed Temporary Construction Compound

Met Mast Location

Proposed Underground Cable Route

Proposed Extension to Existing Slievecallan Substation

Temporary Runover Area

County Road to be Maintained

Public Road Expansion Area

Soft Levelled Area

Microsoft product screen shots reprinted with permission from Microsoft Corporation

Quadrat Locations

Project Title

Slievecurry Renewable Energy Development, Co. Clare

Drawn By

Holly Witter

Checked By

Olivia O'Gorman

Project No.

170224

Drawing No.

Figure 1-1

Scale

1:15000

Date

2021-11-16

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6.4.3.3 Terrestrial Fauna 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. Following the completion of ecological walkover surveys, no requirement for further dedicated faunal surveys was identified. During the multidisciplinary walkover surveys, records of invertebrates including butterflies, damselflies, dragonflies, moths, beetles etc. were recorded. Given the known occurrence of the marsh fritillary butterfly in the area, this species was also focused on during the site visits with dedicated surveys undertaken in October 2017 and 2018 to determine the occurrence, distribution and likely size of the population within the study area.

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 25th May, 16th June, 7th and 25th July, 14th August, 25th & 26th September, 6th and 23rd October 2017, 8th October 2018 and 30th & 31st July 2020, 4th March and 30th September 2021. 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, 2013⁵).

6.4.3.3.2 Otter Survey

Following a review of the previously completed ecological surveys and the results of the multidisciplinary walkover survey; areas identified as providing potential habitat for otter were subject to specialist targeted survey. The otter survey of watercourses was conducted on 25th May, 16th June, 7th and 25th July, 14th August, 25th & 26th September, 6th and 23rd October 2017, 8th October 2018, 30th & 31st July 2020 and 4th March 2021.

The otter survey was conducted as per TII (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, 2013⁶).

⁵ CIEEM, 2013, Technical Guidance Series – Competencies for Species Survey, Online, Available at: <https://cieem.net/resource/competencies-for-species-survey-css/> Accessed: 20.06.2020

⁶ CIEEM, 2013, Technical Guidance Series – Competencies for Species Survey, Online, Available at: <https://cieem.net/resource/competencies-for-species-survey-css/> Accessed: 20.06.2020

6.4.3.3.3 Marsh fritillary Surveys

Following the identification of suitable habitat for marsh fritillary within the site during habitat surveys, as well as the results of the desk study, targeted surveys for the species were undertaken by MKO on the 6th October 2017 and 8th October 2018. The survey methodology followed that described in the NRA (2009) best practice guidance document. This involved walked surveys to identify suitable areas of marsh fritillary habitat within or adjacent to the development footprint (the zone of influence). This was achieved by walking transects through areas of potentially suitable habitat. Where suitable habitat did occur, detailed surveys to locate larval webs were undertaken. When webs were located, the grid reference of each web was recorded and mapped. This allowed for an accurate estimate of the population size and distribution within the study area. Areas of suitable habitat were also mapped as part of the survey effort and informed the layout of the Proposed Development. In addition, habitat suitability assessments were undertaken within areas of suitable habitat for the species following those developed by the NBDC⁷. This involved an assessment of the vegetation characteristics at a requisite number of stops within the area of suitable habitat. Records of vegetation height, abundance of devil's bit scabious, presence of structured vegetation, low invading scrub and stock grazing were noted within the relevant recording sheets. Due to the sometimes ephemeral nature of their sub-populations, two successive years of surveys were undertaken within the EIA study area (2017 & 2018).

6.4.3.3.4 Bat Surveys

A full detailed description of survey methodologies undertaken at the site during the survey period 2017 and 2019 are provided in Appendix 6.2 along with details of all the surveyors.

Survey design and effort in 2017 was created in accordance with the best practice guidelines available at the time, '*Bat Surveys: Good Practice Guidelines*' prepared by the Bat Conservation Trust (Hundt, 2012). Surveys undertaken in 2019 were undertaken in strict accordance with those prescribed in NatureScot (2021), (Previously SNH, 2019) '*Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*'. This is in line with standard best practice industry guidelines. The scope of bat work was designed in 2019, prior to the finalising of the proposed layout (i.e., 8 Turbines). The surveys were designed for a potential layout of up to 11 Turbines.

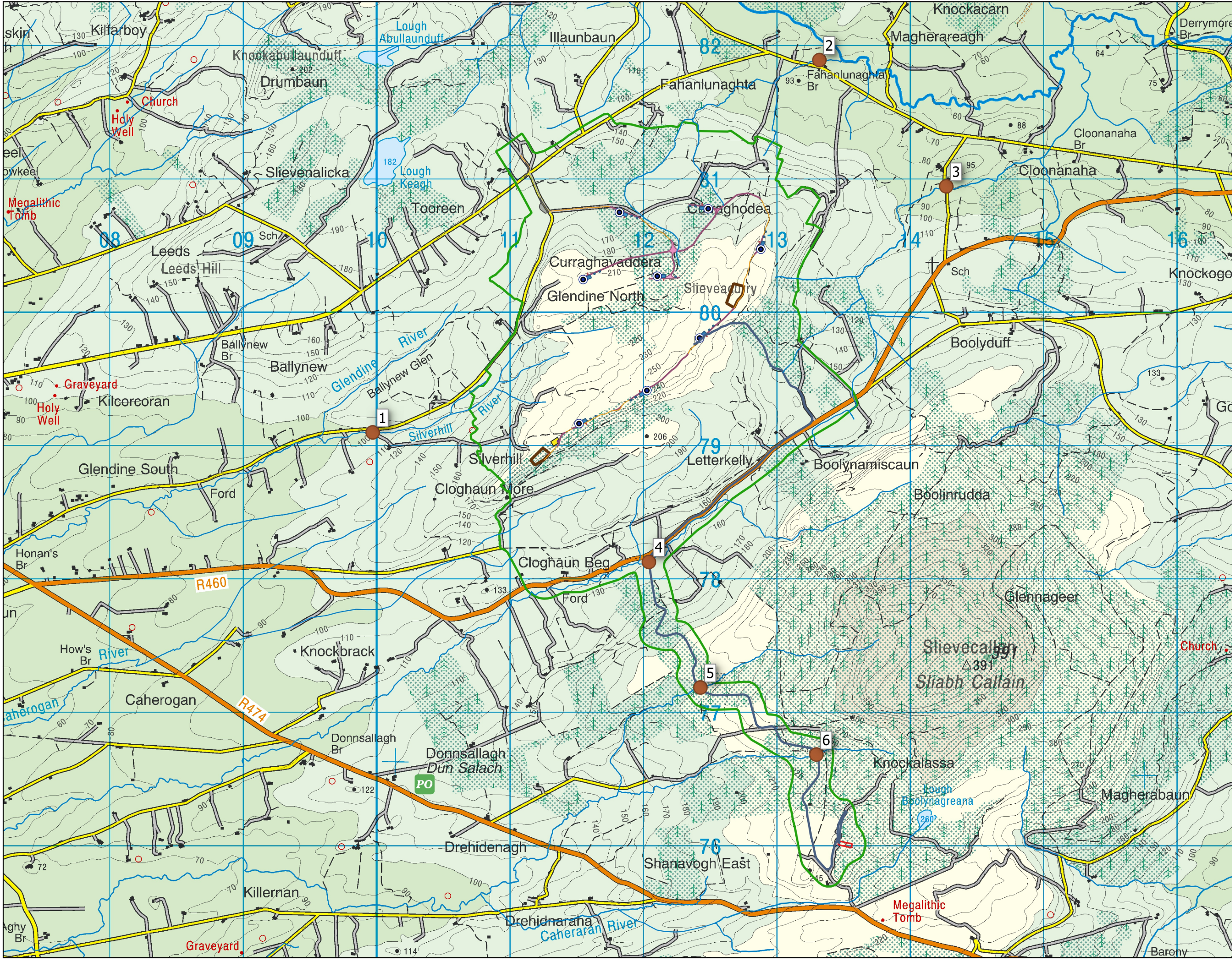
The mitigation outlined in this report has been designed in accordance with the Northern Ireland Environment Agency (NIEA) Natural Environment Division (NED) Guidance (2021)⁸ which was produced in August 2021, following the completion of the bat surveys at the Proposed Development site.

6.4.3.3.5 Squirrel Surveys

Dedicated squirrel surveys were undertaken within areas of suitable habitat (coniferous plantation forestry) occurring in close proximity to the proposed infrastructure. Areas of conifer plantation in particular, occurring within the development site, were searched for signs of squirrel activity.

⁷ NBDC, 2019, *Habitat Condition Assessment for Marsh Fritillary*, Online, Available at: <http://www.biodiversityireland.ie/wordpress/wp-content/uploads/Marsh-Fritillary-Habitat-Condition-Form.pdf>, Accessed, 20 March 2020

⁸ Northern Ireland Environment Agency Natural Environment Division (NED) published *Guidance on Bat Surveys, Assessment and Mitigation for Onshore Wind Turbine Developments in Northern Ireland* (NIEA, 2021).



Map Legend

- Kick Sample Locations
- EPA Mapped Watercourses
- EIAR Study Boundary
- Proposed Turbine Locations
- Existing Roads - Upgrade Proposed
- Proposed New Site Roads
- Proposed Turbine Foundations
- Proposed Turbine Hardstands
- Proposed Borrow Pits
- Proposed Temporary Construction Compound
- Met Mast Location
- Proposed Underground Cable Route
- Proposed Extension to Existing Slieveacallan Substation
- Temporary Runover Area
- County Road to be Maintained
- Public Road Expansion Area
- Soft Levelled Area

North Arrow

Drawing Title

Kick Sample Locations

Project Title	
Slieveacurry Renewable Energy Development, Co. Clare	
Drawn By	Checked By
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6.4.3.3.6 **Aquatic surveys**

Kick sampling was carried at watercourses both within and downstream of the proposed works site in order to inform baseline conditions. These were carried out on the 30th & 31st July 2020. Representative locations along watercourses that drain the site were chosen for the assessment. The locations of each watercourse surveyed are provided in Figure 6-3.

Biological water quality was assessed through kick-sampling each of these watercourses. Macro-invertebrate samples were converted to Q-ratings as per Toner et al. (2005)⁹. The applied Q ratings followed the EPA water quality classes and Water Framework Directive status categories. All riverine samples were taken with a standard kick sampling hand net (250mm width, 500µm mesh size) from areas of riffle/glides utilising a two-minute sample, as per ISO standards for water quality sampling (ISO 10870:2012). Large cobble was also washed at each site where present. The results of the surveys are provided in Appendix 6-3.

6.4.3.3.7 **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).

6.4.3.3.8 **Survey limitations**

Seasonal factors that affect distribution patterns and habits of species were taken into account when conducting the surveys. The potential of the site to support certain populations (in particular those of conservation importance that may not have been recorded during the field survey due to their seasonal absence or nocturnal/cryptic habits) was assessed.

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 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 25th May, 16th June, 7th and 25th July, 14th August, 25th & 26th September, 6th and 23rd October 2017, 8th October 2018, 30th & 31st July 2020, 4th March and 30th September 2021 (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.

⁹ Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C., & MacGarthaigh, M. (2005). *Water quality in Ireland*. Environmental Protection Agency, Co. Wexford, Ireland.

- › 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 6-3.

Table 6-3 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.

Effect Magnitude	Definition
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 EcIA, ‘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 6.7 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.

6.5 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 Ecological Impact 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.

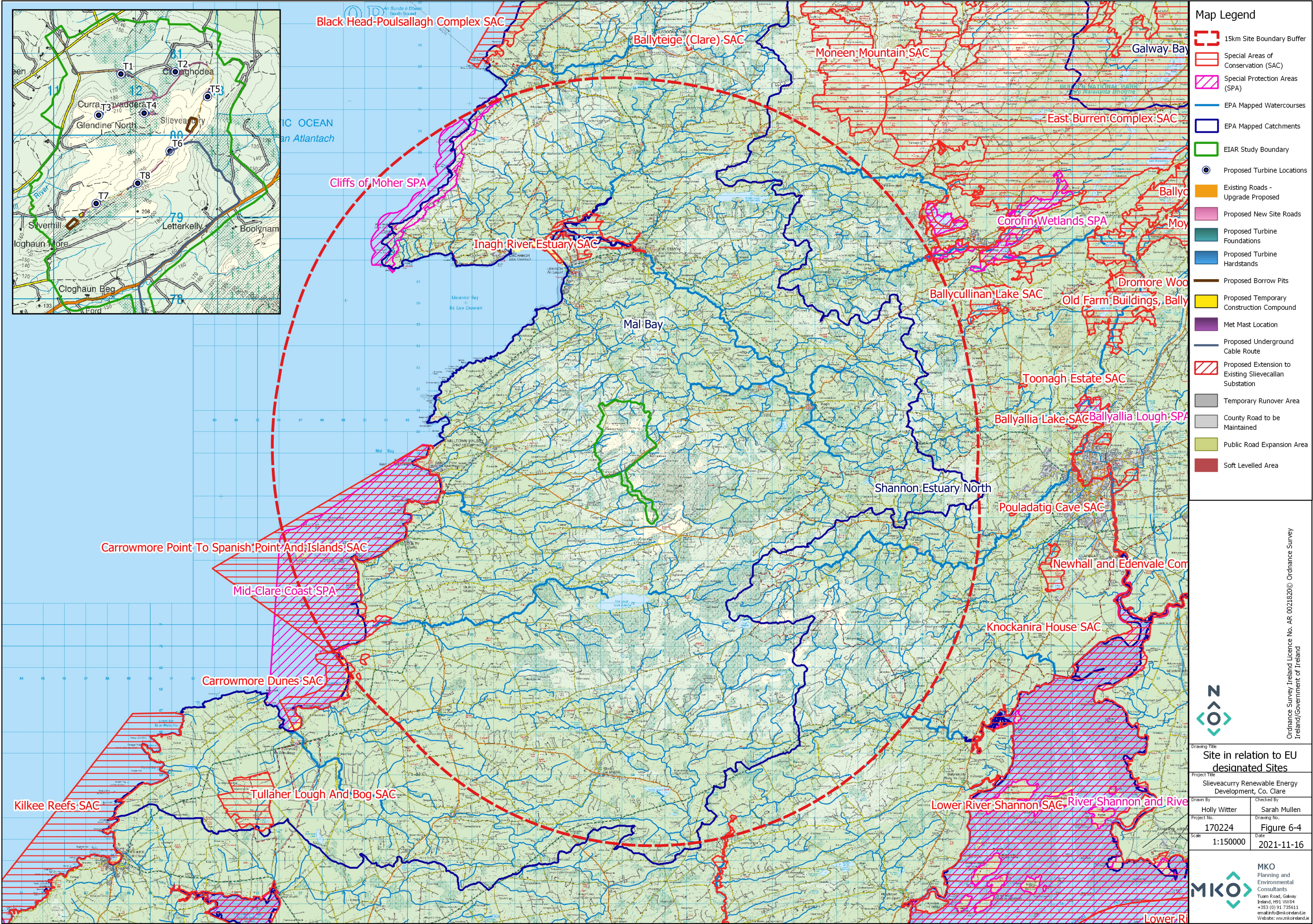
Proposed Natural Heritage Areas (pNHAs) were designated on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, the potential for effects on these designated sites is fully considered in this EcIA.

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 09/10/2020. 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 Proposed 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 6.4 with all Nationally designated sites shown in Figure 6.5.
- › Table 6-4 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 09/10/2020.

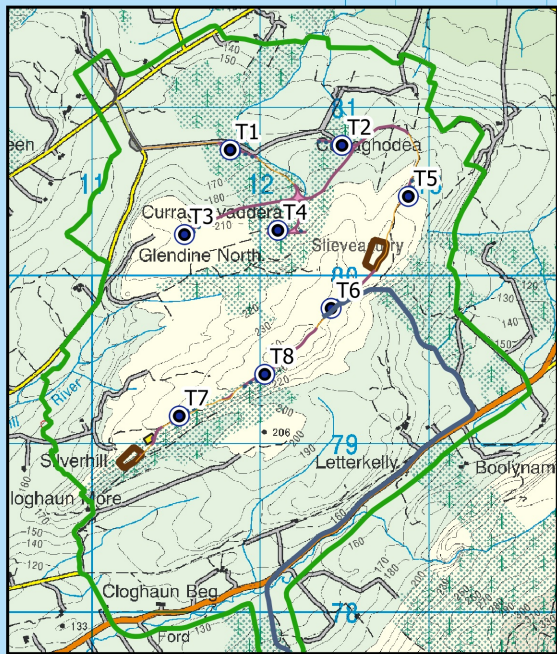
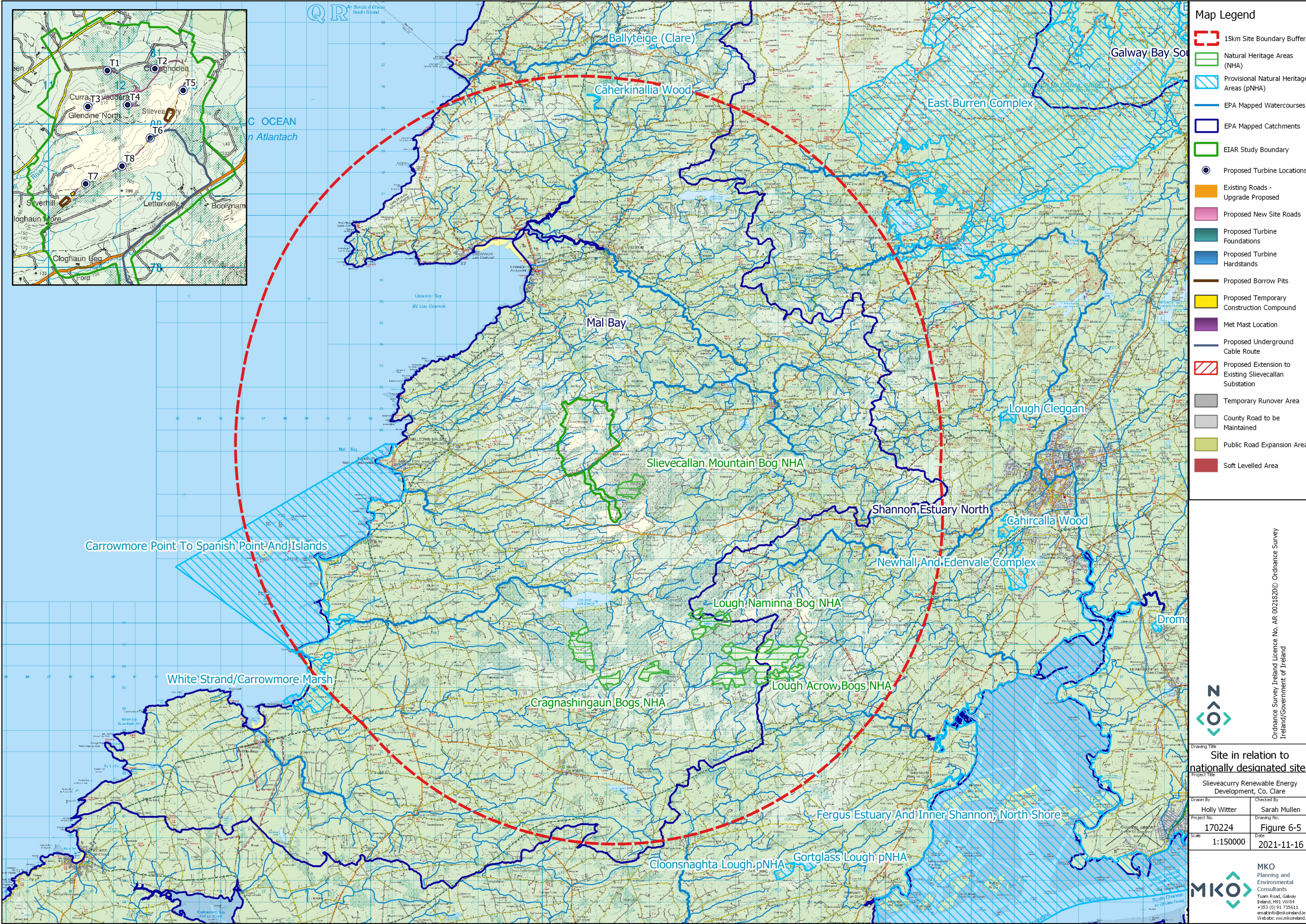
Where potential pathways for Significant Effect are identified, the site is included within the Likely Zone of Impact and further assessment is required.



- Map Legend**
- 15km Site Boundary Buffer
 - Special Areas of Conservation (SAC)
 - Special Protection Areas (SPA)
 - EPA Mapped Watercourses
 - EPA Mapped Catchments
 - EIAR Study Boundary
 - Proposed Turbine Locations
 - Existing Roads - Upgrade Proposed
 - Proposed New Site Roads
 - Proposed Turbine Foundations
 - Proposed Turbine Hardstands
 - Proposed Borrow Pits
 - Proposed Temporary Construction Compound
 - Met Mast Location
 - Proposed Underground Cable Route
 - Proposed Extension to Existing Slievecavan Substation
 - Temporary Runover Area
 - County Road to be Maintained
 - Public Road Expansion Area
 - Soft Levelled Area



Drawing Title	
Site in relation to EU designated Sites	
Project Title	
Slievecurry Renewable Energy Development, Co. Clare	
Drawn By	Checked By
Holly Witter	Sarah Mullen
Project No.	Drawing No.
170224	Figure 6-4
Scale	Date
1:150000	2021-11-16
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- ### Map Legend
- 15km Site Boundary Buffer
 - Natural Heritage Areas (NHA)
 - Provisional Natural Heritage Areas (pNHA)
 - EPA Mapped Watercourses
 - EPA Mapped Catchments
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Site in relation to nationally designated sites

Project Title: Slievecurry Renewable Energy Development, Co. Clare

Drawn By: Holly Witter	Checked By: Sarah Mullen
Project No.: 170224	Drawing No.: Figure 6-5
Scale: 1:150000	Date: 2021-11-16

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Table 6-4 Identification of Nationally designated sites within the Likely Zone of Impact

Designated Site	Distance from Proposed Development (km)	Likely Zone of Impact Determination
Special Area of Conservation		
Inagh River Estuary SAC (000036)	6.8 km	Potential for impact on: <ul style="list-style-type: none">Inagh River EstuaryCarrowmore Point to Spanish Point and Islands SAC was identified in the AASR and are assessed in full in the Natura Impact Statement.
Carrowmore Point to Spanish Point and Islands SAC (001021)	7.2km	
Carrowmore Dunes SAC (002250)	13.7km	These SACs are located within a separate catchment and no connectivity exists. The SACs are not identified as occurring within the Likely Zone of Impact.
Lower River Shannon SAC (002165)	14km	
East Burren Complex SAC (001926)	14.6km	
Natural Heritage Areas		
Slievecallan Mountain Bog NHA	0.21km from the development site.	This NHA is designated for upland blanket bog and occurs upgradient of the underground cabling route at Slievecallan. Therefore, there is no potential for impact on this NHA and it is not within the Likely Zone of Impact.
Cragnashingaun Bogs NHA	5 km from the development site.	These NHAs are in a separate water catchment with no hydrological connectivity to the Proposed Development site. Therefore, they are not within the Likely Zone of Impact.
Lough Naminna Bog NHA	5.4 km from the development site.	
Lough Acrow Bogs NHA	7.6 km from the development site.	
Proposed Natural Heritage Area (pNHA)		
Inagh River Estuary	6.8 km from the development site.	The north-eastern part of the site drains to the Inagh [Ennistymon] River which ultimately enters the Inagh River Estuary pNHA. For this reason, the pNHA is located within the Likely Zone of Impact and further assessment is required.
Carrowmore Point To Spanish Point And Islands	7.2 km from the development site.	The western part of the site drains to the Annagh [Clare] River which ultimately enters the Carrowmore Point To Spanish Point And Islands pNHA to the west. For this reason, the pNHA is located within the Likely Zone of Impact and further assessment is required.

Designated Site	Distance from Proposed Development (km)	Likely Zone of Impact Determination
Cliffs Of Moher	12.3 km from the development site.	No potential for impact was identified on this pNHA as it is located along the Atlantic Ocean and no pathway for significant effect has been identified.
Caherkinallia Wood	13.4 km from the development site.	These pNHAs are in a separate water catchment with no hydrological connectivity to the Proposed Development site. They are not within the Zone of Likely Impact.
White Strand/Carrowmore Marsh	13.7 km from the development site.	
Lough Goller	14.4 km from the development site.	
East Burren Complex	14.6 km from the development site.	

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 Heath, Bogs and Mires, Irish Semi-Natural Grassland Survey datasets, National Survey of Native Woodlands and Ancient and Long-Established Woodland datasets was carried out as part of this assessment (reviewed 25/09/2020).

Available NPWS datasets were downloaded and overlain on the Proposed Development study area. None of the NPWS GIS datasets contain polygon or point data within the EIAR Study Area and there are no records for Annex I bog or heath habitats recorded within these datasets within or immediately adjacent to the Proposed Development. The nearest Article 17 mapped habitats recorded to the Proposed Development site comprise of an area of bog containing both Dry Heath and Alpine and Subalpine Heath. This is located approximately 300m north east of the proposed underground cable route on the summit of Slieve Callan.

6.5.1.3 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 (R17 and R18). Each hectad contains 100 whole one kilometre squares containing terrestrial habitats. Species of conservation concern are given in Table 6-5. No species listed in Annex II of the Habitats Directive or the Flora (Protection) Order are shown in the atlas for squares R17 and R18.

Table 6-5 Species listed designated under the Flora Protection Order or the Irish Red Data Book within Hectad Q92 & Q93

Common Name	Scientific Name	Hectad	Status
Small white orchid	<i>Pseudorchis albida</i>	R18	VU

Near Threatened (NT), Vulnerable (VU), Critically Endangered (CR), Regionally Extinct (RE)

6.5.1.4 Bryophytes

A search of the NPWS online database for bryophytes (non-vascular land plants comprising of mosses, hornworts and liverworts) was also undertaken with no protected bryophytes recorded within or adjacent to the Proposed Development (NPWS, 2020).

6.5.1.5 National Biodiversity Data Centre (NBDC) Records

A search of the National Biodiversity Data Centre (NBDC) website was conducted on the 12/09/2020. This helped to inform survey effort and provide a baseline of likely species composition in the area. Records of protected fauna recorded from hectads R17 and R18 are provided in Table 6-6.

Table 6-6 NBDC records for species of conservation interest in hectads R17 and R18

Common name	Scientific name	Designation	Hectad
Large white-moss	<i>Leucobryum glaucum</i>	HD Annex IV	R17, R18
Marsh fritillary	<i>Euphydryas aurinia</i>	HD Annex II	R17, R18
Common frog	<i>Rana temporaria</i>	HD Annex V, WA	R17, R18
Common Lizard	<i>Zootoca vivipara</i>	WA	R17, R18
Brown long-eared bat	<i>Plecotus auritus</i>	HD Annex IV, WA	R17
Fallow Deer	<i>Dama dama</i>	WA	R17, R18
Leisler's bat	<i>Nyctalus leisleri</i>	HD Annex IV, WA	R17, R18
Daubenton's bat	<i>Myotis daubentonii</i>	HD Annex IV, WA	R18
Natterer's bat	<i>Myotis nattereri</i>	HD Annex IV, WA	R17, R18
Common pipistrelle	<i>Pipistrelle (Pipistrellus sensu lato)</i>	HD Annex IV, WA	R17, R18
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	HD Annex IV, WA	R17
Otter	<i>Lutra lutra</i>	HD Annex II, IV, WA	R17, R18
Pine marten	<i>Martes martes</i>	HD Annex V, WA	R17, R18
West European Hedgehog	<i>Erinaceus europaeus</i>	WA	R18
Badger	<i>Meles meles</i>	WA	R17, R18
Red squirrel	<i>Sciurus vulgaris</i>	WA	R18

HD = EU Habitats Directive; WA = Wildlife Acts (Ireland).

6.5.1.6 Bat Records

The National Bat Database of Ireland was searched for records of bat activity and roosts within a 10 km radius of the Proposed Development site (IG Ref: E112228 N180037). Available bat records were provided by Bat Conservation Ireland on 30/06/2020. A number of observations have been recorded including roosts (n=3), transects (n=2) and ad-hoc observations (n=23). At least seven of Ireland's nine resident bat species were recorded within 10 km of the proposed works including Common pipistrelle, Soprano pipistrelle, Leisler's bat, Daubenton's bat, Natterer's bat, Brown long-eared bat, Whiskered bat and several records of unidentified bats. The results of the database search are provided in Table 6-7.

Table 6-7 National Bat Database of Ireland records within 10km

Survey Type	Location	Species	Survey	Designation
Roost	Inagh, Co. Clare	Roost type: Bridge Species: <i>Myotis daubentonii</i>	Unknown	Annex IV
	Inagh, Co. Clare	Roost type: Private Species: <i>Plecotus auritus</i>	Unknown	Annex IV
	Inagh, Co. Clare	Roost type: Private Species: <i>Myotis mystacinus</i>	Unknown	Annex IV
Transect	Inagh Bridge Transect	<i>Myotis daubentonii</i> , <i>Pipistrellus pygmaeus</i> , Unidentified bat	Waterways Survey	Annex IV
	Moananagh Bridge Transect	<i>Myotis daubentonii</i> , Unidentified bat	Waterways Survey	Annex IV
Ad-hoc	R2082881326	<i>Myotis daubentonii</i> ; <i>Myotis mystacinus</i> ; <i>Nyctalus leisleri</i> ; <i>Pipistrellus pygmaeus</i> ; <i>Plecotus auritus</i>	EIS & Other surveys	Annex IV
	R1560784220	<i>Pipistrellus</i> (45kHz)	BATLAS 2010	Annex IV
	R1700284837	<i>Myotis nattereri</i>	BATLAS 2010	Annex IV
	R1593882024	<i>Nyctalus leisleri</i> ; Unidentified bat	BATLAS 2010	Annex IV
	R1956885157	<i>Pipistrellus pygmaeus</i>	BATLAS 2020	Annex IV
	R2126374106	<i>Nyctalus leisleri</i> ; <i>Pipistrellus pipistrellus</i> (45kHz)	BATLAS 2020	Annex IV
	R0944087774	<i>Nyctalus leisleri</i> ; <i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus</i> spp. (45kHz/55kHz)	BATLAS 2020	Annex IV
	R2114275833	<i>Myotis daubentonii</i> ; <i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus pygmaeus</i>	BATLAS 2020	Annex IV
	R1301388346	<i>Myotis daubentonii</i> ; <i>Pipistrellus pygmaeus</i>	BATLAS 2020	Annex IV
	R1842883757	<i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus pygmaeus</i>	BATLAS 2020	Annex IV
	R0458077070	<i>Pipistrellus pygmaeus</i> ; <i>Pipistrellus</i> spp. (45kHz/55kHz); Unidentified bat	BATLAS 2020	Annex IV
	R1699184892	<i>Myotis daubentonii</i> ; <i>Pipistrellus</i> spp. (45kHz/55kHz)	BATLAS 2020	Annex IV
	R1833986313	<i>Pipistrellus pygmaeus</i>	BATLAS 2020	Annex IV
	R1453975060	N/A	BATLAS 2020	Annex IV
	R0438487826	N/A	BATLAS 2020	Annex IV
	R1752478022	<i>Nyctalus leisleri</i> ; <i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus pygmaeus</i>	BATLAS 2020	Annex IV
	R1238088730	<i>Myotis daubentonii</i> ; <i>Pipistrellus pipistrellus</i> (45kHz); <i>Pipistrellus pygmaeus</i>	BATLAS 2020	Annex IV

Survey Type	Location	Species	Survey	Designation
	R1699184892		BATLAS 2020	Annex IV
	R0309070955	Nyctalus leisleri; Pipistrellus spp. (45kHz/55kHz)	BATLAS 2020	Annex IV
	R0368377225	Pipistrellus pipistrellus (45kHz)	EIS & Other surveys	Annex IV
	R1329076960	Myotis nattereri; Myotis spp.; Pipistrellus pipistrellus (45kHz); Pipistrellus pygmaeus; Pipistrellus spp. (45kHz/55kHz); Plecotus auritus; Unidentified bat	EIS & Other surveys	Annex IV
	R1128077415	Myotis nattereri; Myotis spp.; Nyctalus leisleri; Pipistrellus pipistrellus (45kHz); Pipistrellus pygmaeus; Plecotus auritus; Unidentified bat	EIS & Other surveys	Annex IV
	R1392075260	Pipistrellus pipistrellus (45kHz); Pipistrellus pygmaeus; Unidentified bat	EIS & Other surveys	Annex IV

6.5.1.1 NPWS 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 R17 and R18. An information request was also sent to the NPWS scientific data unit requesting records from the Rare and Protected Species Database on the 19th March 2020. A response was received on the 25th March 2020. Table 6-8 lists rare and protected species records obtained from NPWS.

Table 6-8 NPWS records for rare and protected species

Common name	Scientific name	Designation	Hectad
Marsh fritillary	<i>Euphydryas aurinia</i>	HD Annex II	R17
Common Lizard	<i>Zootoca vivipara</i>	WA	R17, R18
Irish Hare	<i>Lepus timidus subsp. Hibernicus</i>	Annex V, WA	R18
Small-white orchid	<i>Pseudorchis albida</i>	FPO	R18
Badger	<i>Meles meles</i>	WA	R17, R18
Pine marten	<i>Martes martes</i>	HD Annex V, WA	R18
Common frog	<i>Rana temporaria</i>	HD Annex V, WA	R17, R18
Viviparous Lizard	<i>Lacerta vivipara</i>		R17, R18
Reindeer Moss	<i>Cladonia rangiferina</i>	HD Annex V	R17
	<i>Cladonia ciliate</i>		R17
Grey Heron	<i>Ardea cinerea</i>	N/A	R18
Otter	<i>Lutra lutra</i>	HD Annex II, IV, WA	R18

Common name	Scientific name	Designation	Hectad
Hedgehog	<i>Erinaceus europaeus</i>	WA	R18

FPO = Flora Protection Order; RL = Red List, VU = Vulnerable, WA = Wildlife Act

6.5.1.2 Inland Fisheries Ireland Data

The IFI online database was reviewed for fish species records within the catchments downstream of the EIAR study area boundary. The Proposed Development site drains into both the Annagh [Clare] River and the Inagh [Ennistymon] River. The Annagh [Clare] River feeds into the Carrowmore Point to Spanish Point and Islands SAC while the Inagh [Ennistymon] feeds into the Inagh River Estuary. A search of the Inland Fisheries Ireland (IFI) online database was carried out to determine the species richness of the Annagh [Clare] River and the Inagh [Ennistymon] River. The results are presented in Table 6-9¹⁰.

The Annagh [Clare] watercourse located within the Mal Bay water catchment is hydrologically connected to the Proposed Development. The Glendine River a tributary of the Annagh [Clare] has been recorded as providing suitable habitat for a variety of aquatic species including European eel (*Anguilla anguilla*), brown trout (*Salmo trutta*), and salmon (The Central and Regional Fisheries Board, 2008).

Atlantic Salmon is listed in Annexes II and V of the EU Habitats Directive and in the Irish Red List for reptiles, amphibians and freshwater fish (King *et al.*, 2011) as Vulnerable, while European Eel is listed as Critically Endangered in the Irish Red List. All three species of lamprey are listed in Annex II of the Habitats Directive.

Table 6-9 Water quality monitoring stations and associated Q value

Station Name	Species	Q Status	Assessment Year
Knockloskeraun Bridge,	Brown trout; European eel; Salmon	Moderate	2009
Knockloskeraun Br.,	Brown Trout; European eel	Moderate	2013

6.5.1.2.1 Water Quality

River Basin Management Plans (RBMPs) have been published for all River Basin Districts in Ireland in accordance with the requirements of the Water Framework Directive. 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 EPA Envision map viewer was consulted on 17th September 2020 regarding the water quality status of the river which run within and directly adjacent to the Study Area. The WFD River Waterbody Status 2013 – 2018 for the watercourses which flow through the site have been assessed in Table 6.10.

Table 6-10 Watercourses on site with relevant water quality statuses

Name	Location	Status	Risk
Fahanlunaghtamore – Tributary of Inagh [Ennistymon] River	Flowing from the North of the site in a northerly direction	Moderate	Not at risk

¹⁰ IFI National Research Survey Programme, Online, Available at: <https://ifigis.maps.arcgis.com/apps/webappviewer/index.html?id=9a31fedb077c4fb2991184842b7ef025>, Accessed: 17/09/2020

Name	Location	Status	Risk
Curraghodea – Tributary of the Inagh [Ennistymon] River	Flowing from within the eastern boundary of the site in an east north-east direction	Moderate	Not at risk
Ballynew – Tributary of the Annagh (Clare) River	Exits the site on the western boundary, feed by three smaller streams within the site	Poor	Not at risk
Kildeema and Kildeema North - Tributaries of the Annagh (Clare) River	Crossed by the underground cabling at the south of the site flowing in a south-westerly direction	Good	Not at risk
Annagh [Clare]	Crossed by the underground cabling, south end of site, flowing in a south-west direction	Moderate	At risk
Doonsallagh East - Tributary of the Annagh (Clare) River	Crossed by the underground cabling, south end of site, flowing in a south-west direction	Moderate	At risk

Status– WFD River Waterbody Status 2013-2018 Risk – WFD River Waterbodies Risk

Table 6.11 illustrates the respective Q-value status results from monitoring stations located along rivers which flow through the site or along rivers which are fed directly by watercourses which flow through or around the site.

Table 6-11 Water quality monitoring stations and associated Q values

Watercourse Name	Sampling Station	Location	Sampling Year	Q-Value & Water Quality Status
Derrymore 28 [EPA Code: 28D03]	Derrymore - Cloonanaha Br	E114181 N181573	1991	4-5 (High)
	Derrymore - Derrymore Bridge	E114516 N181524	1991	5 (High)
Glendine [Clare] [EPA Code: 28G02]	Glendine (Clare) - Br u/s confl with S. Branch	E109603 N179105	1991	4 (Good)
Kildeema [EPA Code: 28K01]	Kildeem - Doonsallagh Bridge	E109382 N176773	2006	3-4 (Moderate)
Annagh [Clare]	Br E.S.E. of Doonsallagh Ho	E111293 N175991	2018	3-4 (Moderate)

6.5.1.3 Invasive Species

The NBDC database also contains records of invasive species identified within the relevant hectad. Records of 'high impact' invasive species for hectads R17 and R18 are provided in Table 6.12.

Table 6-12 NBDC records for invasive species (hectads R17 and R18)

Common Name	Scientific Name	Hectad
Japanese knotweed	<i>Fallopia japonica</i>	R17, R18
Himalayan knotweed	<i>Persicaria wallichii</i>	R17, R18
Giant knotweed	<i>Fallopia sachalinensis</i>	R18

Common Name	Scientific Name	Hectad
Rhododendron	<i>Rhododendron ponticum</i>	R17, R18
Brazilian giant-rhubarb	<i>Gunnera manicata</i>	R18
Zebra mussel	<i>Dreissena (Dreissena) polymorpha</i>	R17
Fallow deer	<i>Dama dama</i>	R17, R18

Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) include legislative measures to deal with the introduction, dispersal, dealing in and keeping of non-native species. Japanese knotweed (*fallopian japonica*) and Rhododendron (*rhododendron ponticum*) are two species subject to restrictions under Regulations 49 and 50 and are included in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011).

6.5.1.4 Freshwater Pearl Mussel (*Margaritifera margaritifera*)

The NPWS *Margaritifera* Sensitive Area map (Version 8, 2017) was consulted during the desk study. There is no surface water connectivity between the Proposed Development site and any *Margaritifera* catchment.

The Proposed Development site boundary is located 0.38km northwest of the Annageeragh *Margaritifera* Sensitive Area, 5km north of the Creegh *Margaritifera* Sensitive Area, 5.8km northwest of the Doonbeg *Margaritifera* Sensitive Area and 11.7km northwest of the Shannon-Cloon *Margaritifera* Sensitive Area with no connectivity to either.

6.5.1.5 Marsh Fritillary (*Euphydryas aurinia*)

The closest NBDC records for marsh fritillary were located in the hectad R17 within which the Proposed Development is located. As a result, dedicated surveys for marsh fritillary were undertaken at the site on the 6th of October 2017 and on the 8th of October 2018. The survey results are provided in Section 6.6.1.4.7 of this EIAR.

6.5.1.6 Conclusions of the Desktop Study

The desktop study has provided information about the existing environment in Hectad R17 and R18, within which the Proposed Development site is located. The Proposed Development site drains into both the Annagh [Clare] River and the Inagh [Ennistymon] River. 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:

- › Inagh River Estuary SAC (000036)
- › Carrowmore Point to Spanish Point and Islands SAC (001021)

The desk study identified that a variety of protected faunal species are known to occur within the study area, including bats, marsh fritillary, otter, badger and red squirrel. The mammal species recorded during the desk study informed the survey methodologies undertaken during the site visits. The mammal species recorded within the relevant hectad have widespread range and distributions in Ireland and are likely to be recorded frequently throughout Ireland (Marnell et al, 2009¹¹). The site is not located within a freshwater pearl mussel 'sensitive area'.

¹¹Marnell, F., Kingston, N. & Looney, D. (2009) Ireland Red List No. 3: Terrestrial Mammals, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

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.

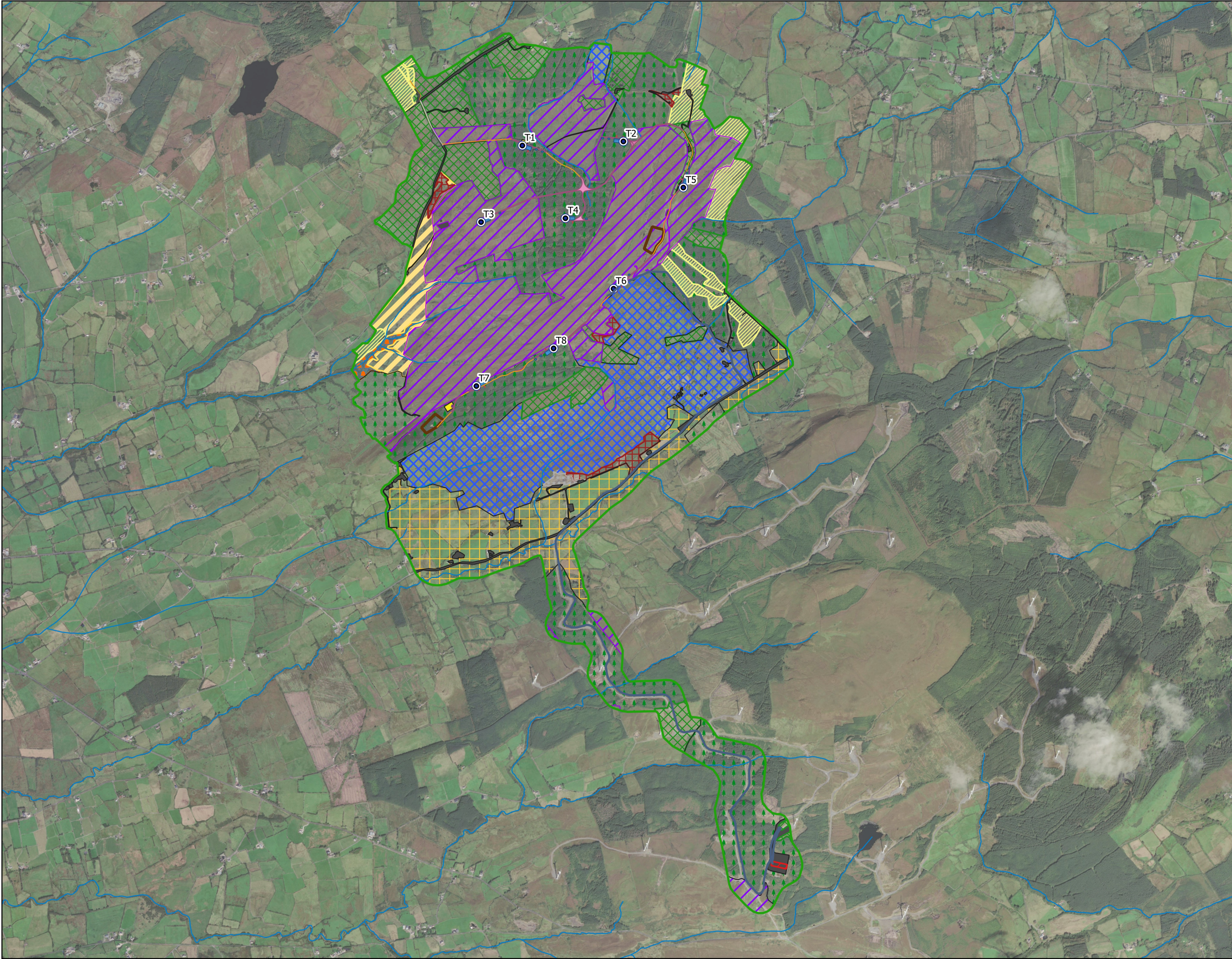
6.6 Ecological Walkover Survey Results

6.6.1 Description of Habitats, Flora & Fauna within the Ecological Survey Area

A total of sixteen habitats were recorded within the Proposed Development site (Table 6.13). Peatland and grassland habitats have been categorised to plant communities from the National Survey of Upland Habitats (Perrin et al. 2014) and the Irish Vegetation Classification. Detailed botanical data from relevés recorded in peatland and grassland habitats are provided in Appendix 6.1 of this report. A habitat map of the site is provided in Figure 6-6.

Table 6-13 Habitats recorded on the Proposed Development site

Habitat Name	Fossitt Code
Wet grassland	GS4
Improved agricultural grassland	GA1
Conifer plantation	WD4
Scrub	WS1
Oak-birch-holly woodland	WN1
Buildings and artificial surfaces	BL3
Recolonising bare ground	ED3
Spoil and bare ground	ED2
Eroding/upland rivers	FW1
Drainage ditches	FW4
Upland blanket bog	PB2
Cutover bog	PB4
Eroding blanket bog	PB5
Wet heath	HH3
Exposed siliceous rock	ER1
Transition mire and quaking bog	PF3



Map Legend

Buildings and artificial surfaces (BL3)

Spoil and bare ground (BL2)

Improved agricultural grassland (GS1)

Wet grassland (GS4)

Conifer plantation (WD4)

Improved Agricultural Grass-land (GS1)/ Wet Grassland (GS4) mosaic

Wet Grassland (GS4)/ Cut-over Bog (PB4) mosaic

Wet Grassland (GS4)/ Scrub (WS1) mosaic

Cutover Bog (PB4)/ Upland Blanket Bog (PB2)/ Wet Heath (HH3)/ Exposed siliceous rock (ER1) mosaic

Oak-birch-holly woodland (WN1)

Scrub (WS1)

Eroding/upland rivers (FW1)

EIAR Study Boundary

Proposed Turbine Locations

Met Mast Location

Existing Roads - Upgrade

Proposed

Proposed Turbine Hardstands

Proposed New Site Roads

Proposed Turbine Foundations

Proposed Temporary Construction Compound

Proposed Borrow Pits

Proposed Underground Cable Route

Proposed Extension to Existing Slievecullan Substation

County Road to be Maintained

Public Road Expansion Area

Microsoft product screen shots reprinted with permission from Microsoft Corporation

Drawing Title

Habitat Map

Project Title

Slieveacurry Renewable Energy Development, Co. Clare

Drawn By

Holly Witter

Checked By

Sarah Mullen

Project No.

170224

Drawing No.

Figure 6-6

Scale

1:22000

Date

2021-11-16

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6.6.1.1 Habitats within the EIAR Study Area Boundary

The study area comprises of areas of plantation forestry (WD4), comprising mainly of Sitka spruce (*Picea sitchensis*) and Lodgepole pine (*Pinus contorta*), and areas of degraded peatland assessed as Upland blanket bog (PB2) and Wet heath (HH3). The site is accessible via a network of local roads, existing forestry access tracks and forestry rides. The remainder of the Proposed Development infrastructure is dominated by Wet grassland (GS4) and Scrub (WS1).

6.6.1.1.1 Conifer plantation (WD4)

Turbines 1, 2 and 4, the temporary construction compounds and borrow pit 1 are all located within Conifer plantation (WD4) habitat, (Plate 6-1 to Plate 6-3). Turbines 7 and 8 are partially located within conifer forestry habitat, see Plate 6-2. There is a mix of forestry (WD4) of various ages within the EIAR study area boundary, see Plate 6-3. Sitka spruce and Lodgepole pine are the dominant species, typically 8-10m tall. Mature conifer plantation is interspersed with immature stands. The understorey is typically species-poor in forestry plantations and vegetation normally restricted to a few bryophytes and ferns which include, hard fern (*Blechnum spicant*) and *Thuidium tamariscum*.

Forestry rides or areas where forestry failed to achieve closed canopy are dominated by ling heather (*Calluna vulgaris*), heath rush (*Juncus squarrosus*), purple moor-grass (*Molinia caerulea*) and *Sphagnum palustre*. These areas make up a very small area of the overall forestry plantation.



Plate 6-1 Example of Conifer plantation (WD4) forestry within the study area



Plate 6-2 – Example of established forestry (WD4) at which Turbine no. T8 is located.



Plate 6-3 Example of recently planted Conifer plantation (WD4) within the south of the study area.

6.6.1.1.2 Peatland Habitats

Turbines T3, T5 & T6, part of T7 & T8, and borrow pit no. 2 are located on degraded peatland habitats. These habitats comprise of a mosaics of Cutover bog (PB4), degraded Upland blanket bog (PB2), Wet heath (HH3) and small areas of Exposed siliceous rock (ER1). The Wet heath habitat typically occurs on moderate/gentle slopes with Cutover bog (PB4)/Blanket bog (PB2) habitats occurring on gentle slopes and level ground. Where Wet heath (HH3) habitat is present on site, the peat depths vary from over 50 cm, where the habitat forms an intimate mosaic with blanket bog (PB2), to very shallow peat occurring on subsoil (see Plates 6-6 and 6-7). In areas where the peat depth is in excess of 50cm, the habitat was categorised as Upland blanket bog (PB2). The area in which borrow pit no. 2 has been located, has already been subject to significantly degradation with much of the peat mass removed as a result of turf cutting, see Plates 6-10 & 6-11.

Small areas of Transition mire and quaking bog (PF3) occurs on deeper peat where ground conditions are waterlogged, however, these areas are small and only occur at a few locations within the EIAR study area boundary and away from the proposed infrastructure. Historic and some recent peat extraction has been undertaken extensively across the study area. Therefore, much of the peatland habitat within the site has been assessed as Cutover bog (PB4). Unvegetated areas within the rock outcrops correspond to the exposed siliceous rock (ER1) habitat. Figure 6-6 maps some of these peatland habitats as a mosaic. These peatland habitats are all degraded to some extent by drainage, grazing, burning and/or fragmentation.

Upland Blanket Bog (PB2)

Upland blanket bog (PB2) habitat occurs within the site. This habitat is typically degraded, associated with ongoing grazing pressure, predominantly cattle, and historic turbary in places. As per the Fossitt (2000) classification system, this Upland blanket bog is found at altitudes of 150 metres or more, with more than 0.5m depth of peat, less than 25% heath cover and with Black bog-rush (*Schoenus nigricans*) absent or infrequent.

The Upland blanket bog (PB2) habitat occurring within the Proposed Development footprint was classified to communities using the Irish Vegetation Classification (IVC) following analysis using ERICA¹². The Upland blanket bog (PB2) recorded on site was identified as confirming to the *Calluna vulgaris* - *Eriophorum* spp. (BG2E) communities. The community occurs at a mean altitude of 371 metres (Perrin, 2017). However, the altitude where it is located at the study site is between 150-250m.

Some area of Upland blanket bog (PB2) occurring within the study area, notably around the Turbine no. 3 footprint, has been heavily degraded in places and has thus been assessed as Eroding blanket bog (PB5) (see Plate 6-5). The habitat in this area includes areas where vegetation cover is low due to historic peat extraction, recent and ongoing grazing pressure (by cattle), poaching and associated erosion, see Plate 6-4.

The vegetation is often dominated by purple moor-grass (*Calluna vulgaris*) and heather (*Calluna vulgaris*), with some bell heather (*Erica cinerea*) and cross-leaved heath (*Erica tetralix*). Other regularly occurring species also include common cottongrass (*Eriophorum angustifolium*), tormentil (*Potentilla erecta*) and heath rush (*Juncus squarrosus*). In places, *Racomitrium lanuginosum* occurs on hummocks within the sward, with *Sphagnum cuspidatum* and *Sphagnum capillifolium* occurring where wetter conditions persist.

This vegetation conforms to the Irish Vegetation Classification (IVC) community BG1D *Common Cottongrass – Heath Star-moss bog* (Perrin, 2017). Some areas of bare peat have been colonised with the non-native moss *Campylopus introflexus* which has become typical of this habitat type. The blanket bog is present on the flatter areas within the site with Wet heath habitat (HH3) occurring where the

¹² Engine for Relevés to Irish Communities Assignment (ERICA)

ground is more sloping or where there are rock outcrops. In places, these habitats occur in an intimate mosaic, particularly where the peat depth varies due to the topography.

Where vegetation is more intact on the Upland blanket bog (PB2), the vegetation has been assessed as confirming to the IVC community BG2C *Cross-leaved Heath – Purple Moor-grass – Reindeer Lichen bog/heath*, see Plate 6-4. This habitat occurs in areas of less intensively grazed peatland, notably on the sloping ground to the southwest of T6.



Plate 6-4 Example of Eroding blanket bog (PB5)/Wet heath (HH3) mosaic occurring around T3 with large areas of exposed peat due to heavy grazing and associated erosion.



Plate 6-5 Example of Eroding blanket bog (PB5)/degraded Wet heath (HH3) mosaic occurring to the north of Turbine no. 3. This area includes large areas of exposed peat due to heavy grazing and associated erosion.



Plate 6-6 Example of blanket bog (PB2)/Wet heath (HH3) mosaic conforming to BG2C Cross-leaved Heath – Purple Moor-grass – Reindeer Lichen bog/heath - located in the study area south of Turbine no. 3, where grazing pressure has not damaged the vegetation/underlying peat (foreground).



Plate 6-7 Example of Upland Blanket Bog (PB2)/Wet heath (HH3) mosaic, conforming to the IVC community BG2E Heather – Cottongrass bog, located at Turbine 6.

Cutover bog (PB4)

Some peatland areas within the site have been assessed as Cutover bog (PB4) as part of the original mass of peat has been removed through turf cutting. As per Fossitt (2000), ‘cutover can be associated with all peatforming systems’, including ‘some areas of wet heath - HH3’. For this reason, damaged areas of Wet heath (HH3) have been included in this classification.

The majority of the cutover bog on the site has revegetated with dominant cover of purple moor grass and low cover of associated heathland species. The majority of the cutover bog on the site has revegetated with dominant cover of purple moor grass and low cover of associated heathland species. There were areas within the cutover bog that supported a diversity of heathland species such as deergrass (*Trichophorum spp.*), cross leaved heath (*Erica tetralix*), heath rush (*Juncus squarrosus*), carnation sedge (*Carex panicea*) and common cotton grasses (*Eriophorum angustifolium*.) (Plate 6-8). Turbines no. 6 is located in this habitat.



Plate 6-8 Example of revegetated Cutover bog (PB4) habitat within the study area

Wet heath (HH3)

This peatland habitat within the infrastructure footprint was dominated by Purple moor-grass (*Molinia caerulea*) and heather (*Calluna vulgaris*) with some cross-leaved heath (*Erica tetralix*) (Plate 6-9). Other regularly occurring species included hare's-tail cotton grass, tormentil (*Potentilla erecta*) and some deergrass (*Trichophorum germanicum*). Although *Sphagnum* species were present, they occur in low abundance within the drier and degraded parts of this habitat. In the wetter areas within the development footprint, it was recorded at a maximum of 20%, see Appendix 6-1 'Botanical Study'. Unvegetated areas within the rock outcrops correspond to the exposed siliceous rock (ER1) habitat.

Some of this peatland was classified as inactive where *Sphagnum*s were absent. In wettest areas, the peatland habitat formed a mosaic with Transition mire and quaking bog (PF3) which are described in the sections below.

The *Calluna vulgaris* - *Hylocomium splendens* (HE3A) community is a heath community (Perrin, 2017¹³) and is normally found higher altitudes also, over 450m. The high abundance of ling heather is likely to be an indicator of drying-out and past degradation and turbary activity is present in the surrounding area. Although the *Calluna vulgaris* - *Hylocomium splendens* (HE3A) is considered a dry heath community, as peat depths across the peatland were between 1.0-2.2m, the habitat is considered to be blanket bog.

¹³ Perrin, P., 2017, IVC - *Calluna vulgaris* - *Hylocomium splendens* (HE3A) <https://www.biodiversityireland.ie/wordpress/wp-content/uploads/HE2B.pdf>, Accessed, 15.03.2021



Plate 6-9 – Example of heath habitat located to the north of T3 conforming to the IVC community HE4E *Molinia caerulea* - *Calluna vulgaris* - *Erica tetralix*.



Plate 6-10 Example of revegetating Wet heath (HH3) habitat within the proposed borrow pit. This vegetation confirms to the IVC community HE4E *Molinia caerulea* - *Calluna vulgaris* - *Erica tetralix*.



Plate 6-11 Example of revegetating Wet heath (HH3) habitat with areas of exposed subsoils within the proposed borrow pit no. 2.

Transition mire and quaking bog (PF3)

In areas the bog grades into Transition mire and quaking bog (PF3), which occur as small features where there was deeper peat on flat ground (Plate 6-12). This was recorded to the north of T3. The species composition of this habitat primarily consisted of bogbean (*Menyanthes trifoliata*), common cottongrass (*Eriophorum angustifolium*), round-leaved sundew (*Drosera rotundifolia*), bog asphodel (*Narthecium ossifragum*), bottle sedge (*Carex rostrate*), *Sphagnum fallax*, *Sphagnum papillosum* and some bog cranberry (*Vaccinium oxycoccos*). The proposed infrastructure has been designed to completely avoid this habitat. Quadrats recorded within this habitat were assigned to the IVC community *Menyanthes trifoliata* – *Sphagnum recurvum* agg. mire (FE2E).



Plate 6-12 Transition mire and quaking bog (PF3) located to the north of T3

Exposed siliceous rock (ER1)

Areas of unvegetated rock outcrop occur within the EIAR study area boundary but are not extensive. It occurs in areas of wet heath and bog habitats, see Plate 6-13 Vegetated ledges and crevices within these areas generally held elements of the surrounding wet heath vegetation, including *Molinia*, *Racomitrium lanuginosum* and red fescue (*Festuca rubra*).



Plate 6-13 Example of exposed salacious rock (ER1) occurring within the EIAR study area boundary but away from the proposed infrastructure, between Turbines no. T7 & T8.

6.6.1.1.3 Wet Grassland (GS4)

The fields on the outskirts of the site predominantly comprise Wet grassland (GS4) currently used for agriculture. A number of these fields supported cattle and showed signs of grazing. Species within the wet grassland included soft rush (*Juncus effusus*), lesser spearwort (*Ranunculus flammula*), creeping bent-grass (*Agrostis stolonifera*), creeping buttercup (*Ranunculus repens*) and sedges (*Carex spp.*). Within the northwest of the site, southwest to Turbine no. 6, wet grassland has established on what would have been peatland due to intensive grazing, notably cattle, see Plate 6-14.

Where Wet heath transitions into Wet grassland (GS4) within the south of the site (southwest of T6), this area is characterised by tall and sometimes tussock dominated vegetation dominated by purple moor-grass (*Molinia caerulea*) and Yorkshire fog (*Holcus lanatus*), see Plate 6-15. Other species recorded in this habitat include rough hawkbit (*Leontodon hispidus*), compact rush (*Juncus conglomeratus*) and occasional occurrences of star sedge (*Carex echinate*). The ground layer also contains a high proportion of *Polytrichum commune* (moss) due to the underlying wet conditions. Examples of this community occur to the southwest of Turbine no. 6 within old abandoned field systems defended by earthen embankments and were not observed to be subject to any formal grazing/management regime. Further to the south, these areas of wet grassland grade into a mosaic of *Molinia* meadows/degraded wet heath/wet grassland mosaic, where there is a greater occurrence of meadow thistle (*Cirsium dissectum*) and an absence/reduction in occurrence of heather, see Plate 6-16. The habitat confirms to the EU Habitats Directive Annex I habitat *Molinia* meadows [6410] and the IVC community GL1C - Purple Moor-grass – Devil's-bit Scabious grassland. This habitat does not occur within the development footprint. At its closest point it is located over 100m from the proposed infrastructure (south of T8) and will not be impacted in any regard by the development.

Where Wet grassland (GS4) also occurs within the south of the EIAR study area boundary, particularly along the R460 and associated local roads. These lands are subject to agricultural management and are 'improved' with species such as perennial ryegrass (*Lolium perenne*) and Yorkshire fog (*Holcus*

lanatus) dominating along with regularly occurring soft rush (*Juncus effusus*), broad leaved dock (*Rumex obtusifolius*) and common sorrel (*Rumex acetosa*), see Plate 6-17.



Plate 6-14 Wet grassland (GS4) grading into Wet heath (HH3) within the northwest of the EIAR study area boundary.



Plate 6-15 Wet grassland conforming to the IVC community GL1D *Molinia caerulea* - *Potentilla erecta* - *Agrostis stolonifera*. Photo taken to the southwest of Turbine no. 6 within old abandoned field systems defended by earthen embankments.



Plate 6-16 Wet grassland, conforming to the Annex I habitat *Molinia* meadow [6410], where heather becomes absent from the sward (note the occurrence of heather on the raised earthen embankments in the background, a remnant of historic agricultural management/field boundaries).



Plate 6-17 Improved Wet grassland (GS4) occurring within the south of the EIAR study area boundary, close to the R460.

6.6.1.1.4 Scrub

Scrub habitat occurs throughout the site in varying forms, from gorse (*Ulex europaeas*) dominated scrub within areas of heath, see Plate 6-18, to small areas of willow (*Salix* spp.) occurring in wetter areas of peatland or along the boundaries of the wet grasslands within the study area, see Plate 6-19.

Many of the areas of gorse or willow dominated scrub occurring on site are as a result of farm abandonment or significant decreases in stocking densities. An extensive area of gorse dominated scrub occurs along the south of the site within an area of degraded heath. This area is characterised by small field systems enclosed by low earthen embankments indicating historic agricultural management. However, these fields, once likely to comprise of wet grassland, are not becoming dominated by gorse.



Plate 6-18 Area of gorse dominated scrub occurring within the south of the site, note the earthen embankments of old field systems.



Plate 6-19 Example of willow dominated scrub occurring along drainage ditches within the EIAR study area boundary.

6.6.1.1.5 Spoil and bare ground (ED2)

Unbound forestry tracks throughout the site were categorised as Spoil and bare ground (ED2). The access track verges across much of the site comprised of wet grassland or surrounding peatland habitats (Plate 6-20). Species recorded comprised mainly of sweet vernal grass (*Anthoxanthum odoratum*), daisy (*Bellis perennis*), dandelion (*Taraxacum officinale* agg.), colt's-foot (*Tussilago farfara*), soft rush (*Juncus effusus*), purple moor-grass, *Carex* ssp, crested dogs-tail (*Cynosurus cristatus*) and heather (*Calluna vulgaris*). Upgrading of existing forestry tracks is proposed across the site, as shown in Figure 4-1, Chapter 4 of the EIAR.



Plate 6-20 Example of existing unbound tracks categorised as Spoil and bare ground (ED2) through heath habitat

6.6.1.1.6 Buildings and Artificial Surfaces (BL3)

There are some farm buildings within the Proposed Development site comprise of agricultural sheds. These were categorised as Buildings and artificial surfaces (BL3), see Plates 6-21.



Plate 6-21 Example of agricultural sheds categorised as Buildings and artificial surfaces (BL3)

6.6.1.1.7 Eroding/upland rivers (FW1)

A number of watercourses drain the Proposed Development site. These streams are generally small, up to a metre wide, high-energy and with boulder and cobble substrate.

The Silverhill River/Ballynew Stream (FW1) drains much of the northwest of the site, see Plates 6-22 & 6-23. This is a tributary of the Glendine stream which is in turn a tributary of the Annagh River which enters the Atlantic Sea south of Spanish Point. This watercourse is densely shaded by woodland for almost its entire length. Trees species recorded included Ash (*Fraxinus excelsior*), Hazel (*Coryllus avellana*), Pedunculate Oak (*Quercus robur*) and Hawthorn (*Crataegus monogyna*). Bankside vegetation included Bramble (*Rubus fruticosus agg.*), Ivy (*Hedera helix*) and Bracken (*Pteridium aquilinum*). The river was fast flowing and included areas of both riffle and glide. The substrate comprised bedrock, boulder, cobble, gravel and fine gravel. No instream or emergent macrophytes were recorded.

The Kildeema [EPA code; 28K01], located to the south of the study area where the proposed underground cable route leaves the R460 and enters the existing Slievecallan Wind Farm, was also assessed during site visits. No instream or emergent macrophytes were recorded and the stream was fast flowing and had a substrate of cobble, gravel and fine gravels. Bankside vegetation was dominated by bramble (*Rubus fruticosus agg.*), willow (*Salix*), yellow flag (*Iris pseudacorus*) and bracken (*Pteridium aquilinum*).

Additional details of representative watercourses that drain the EIAR study area boundary is provided in Table 4-3 and Appendix 4-7, Chapter 4 of the EIAR.



Plate 6-22 A tributary of the Ballynew Stream (FW1) occurring within the southwest of the site (northwest of T7)



Plate 6-23 Ballynew stream (FW1) that drains much of the west of the site

6.6.1.1.8 **Oak-birch-holly woodland (WN1)**

This habitat occurs as a linear feature along the Glendine River, see Plate 6-24 and other established watercourses in the wider area. The woodland is dominated by hazel, some ash and to a lesser extent pedunculate oak and hawthorn also occurring throughout. The ground layer is species rich with bluebell (*Hyacinthoides non-scripta*), wild strawberry (*Fragaria vesca*), male fern (*Dryopteris filix-mas*), ivy (*Hedera helix*), honeysuckle (*Lonicera periclymenum*), bracken (*Pteridium aquilinum*), bramble (*Rubus fruticosus* agg), mosses dominated by *Thuidium tamariscinum* and a range of bryophytes, see Plate 6-23 above. This habitat is located entirely outside of the Proposed Development footprint and will not be affected.



Plate 6-24 Example of Oak-birch-holly woodland (WN1) along the Glendine River

6.6.1.2 Habitats Along the Haul Route

The proposed haul road is shown in Figure 4-1, Chapter 4 of the EIAR. Starting at Fahanlunaghta More Road (to the northwest of the site), the haul route comprises mainly of existing bound roads assessed as Buildings and artificial surfaces (BL3). In order to facilitate turbine delivery, minor junction modifications are required at this location. This will involve an alteration to small areas of adjacent Wet grassland (GS4) habitat at two locations along the Fahanlunaghta More Road.

The proposed haul route will continue to follow the existing road (BL3) south until it enters the wind farm site through Conifer plantation (WD4) and on to existing forestry tracks (ED2). The existing road is bordered by Conifer plantation (WD4), soft rush dominated Wet grassland (GS4) and Cutover bog (PB4) along its length, before reaching Turbine no. 1. There will be no loss of hedgerow associated with the proposed junction modifications along the proposed haul route as these areas comprise primary of earthen embankments with some individual scattered willows (*Salix* spp.) or sapling Sitka spruce.

6.6.1.2.1 L1074 / Fahanlunaghta More Road junction

The temporary local road widening required at this location will be involve some minor alteration to the existing habitat at this location. The vegetation at this location is primarily soft rush dominated within a wet grassland and associated earthen embankment, see Plate 6-25a.

6.6.1.2.2 Fahanlunaghta More Road / forestry access road junction

The temporary local road widening required at this location will be involve some minor alteration to the existing habitat at this location to accommodate the wind turbine vehicles. The works will involve the removal of an existing vegetated earthen embankment, including a number of immature Sitka spruce. The vegetation on to the western side of the embankment comprises wet grassland, see Plate 6-25b.



Plate 6-25a Example of the L1074 / Fahanlunaghta More Road junction where there will be some minor alteration required, resulting in the loss of a small area of soft rush dominated vegetation.



Plate 6-25b Example of the earthen embankment to be removed, including immature Sitka spruce. The area of Wet grassland is located to the west (left of photo).

6.6.1.3 Habitats along the Underground Cabling Route

The proposed underground cable route is approximately 7.1km. The proposed underground cable route will leave the site of the Proposed Development to the west of Turbine no. 6, initially passing through a short section of existing access track, categorised as Spoil and bare ground (ED2), before entering plantation coniferous forestry (WD4). The underground cable route then joins a local road, categorised as Buildings and artificial surfaces (ED2), for approximately 220 metres before joining the R460. The underground cable route runs along the R460 for approximately 1.5km (see Plate 6-26a) before joining the existing unbound access road to Slievecallan 110kV substation (see Plate 6-26b).

A list of the stream crossings along the underground cable route and the proposed crossing method at each location is provided in Table 4-3, Chapter 4 of this EIAR. The stream crossing locations are shown in Figure 4-21, Chapter 4. The crossing locations for all culvert crossings are also shown on the underground cable route drawings included as Appendix 4.1, Chapter 4 of the EIAR. Details of all culvert crossing are also provided in Appendix 4-7 of this EIAR.



Plate 6-26a Example of the R460 assessed in which part of the underground cabling is to be located, categorised as Buildings and artificial surfaces (ED2).



Plate 6-26b Example of the unbound access road (ED2) to Slievecallan windfarm along which the proposed underground cabling route will travel. The junction with the R460 is shown in the background.

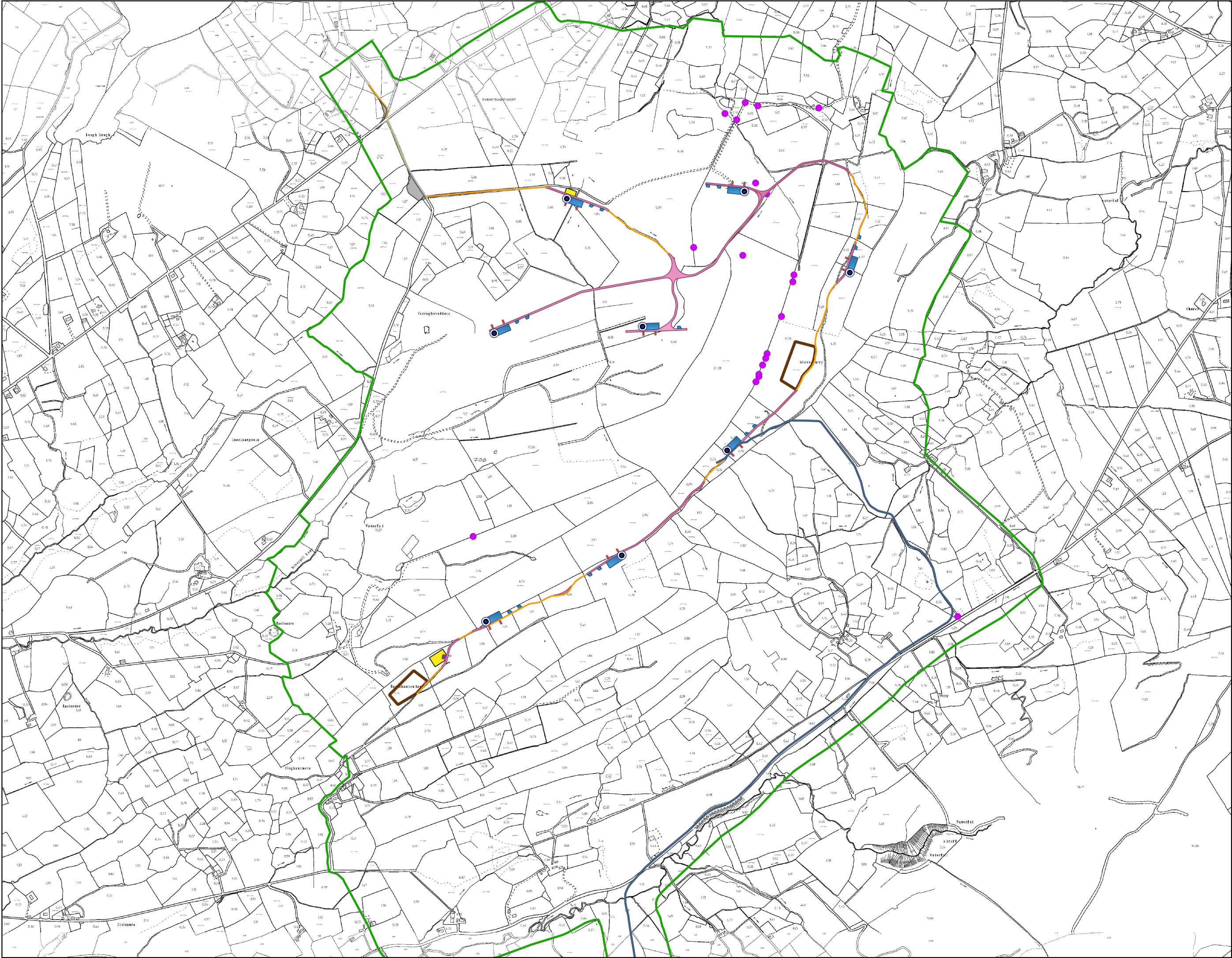
6.6.1.3.1 Protected Flora

No botanical species listed under the Flora (protection) Order (1999, as amended 2015), listed in the EU Habitats Directive (92/43/EEC), or listed in the Irish Red Data Books were recorded on the site. All species recorded are common in the Irish landscape. No rare and protected plant species recorded in the desk study, including those obtained from NPWS data request, were recorded within the study area.

6.6.1.3.2 *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. A number of Rhododendron stands (*Rhododendron ponticum*) were recorded within the Proposed Development site as shown in Figure 6-7. However, all records were located away from the Proposed Development infrastructure and as such will not be affected. Therefore, no specific invasive species management plan is required.

No additional species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 were recorded during the surveys.



Map Legend

- Rhododendron Records
- EIAR Study Boundary
- Proposed Turbine Locations
- Existing Roads - Upgrade Proposed
- Proposed New Site Roads
- Proposed Turbine Foundations
- Proposed Turbine Hardstands
- Proposed Borrow Pits
- Proposed Temporary Construction Compound
- Met Mast Location
- Proposed Underground Cable Route
- Proposed Extension to Existing Slieveacallan Substation
- Temporary Runover Area
- County Road to be Maintained
- Public Road Expansion Area
- Soft Levelled Area



Drawing Title:

Invasive Species Records

Project Title:

Slieveacurry Renewable Energy Development, Co. Clare

Drawn By:
Holly Witter

Checked By:
Sarah Mullen

Project No.:
170224

Drawing No.:
Figure 6-7

Scale:
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6.6.1.4 Fauna in the Existing Environment

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

- › 25th May, 16th June, 7th & 25th July, 14th August, 25th & 26th September, 6th & 23rd October 2017,
- › 8th October 2018,
- › 20th May, 13th June and 4th September 2019,
- › 30th and 31st July 2020,
- › 4th March and 30th September 2021.

In addition to the above targeted surveys, additional faunal signs/sightings were also recorded during other surveys including habitat assessments, bat surveys and bird surveys. The site was also visited on numerous additional occasions during the undertaking of bat surveys throughout 2017 and 2019.

The walkover survey was designed to detect the presence, or likely presence, of a range of protected species, including birds, bats, otter and badger. Potential suitable habitats were investigated for signs of animal presence. The following subsections provide a breakdown of the species recorded within the Proposed Development site boundary during the site visits and assessments.

6.6.1.4.1 Badger

Dedicated surveys for this species were undertaken on the above dates between 2017, 2018, 2020 & 2021, in addition to incidental records recorded during other species-specific surveys. During dedicated badger surveys of the site, signs of badger i.e. badger foraging signs, latrines etc. were searched for. A number of badger signs i.e. prints and foraging signs, were recorded across the site, see Figure 6-8. One badger sett, comprising of 3 active entrances and one inactive/blocked entrance, was recorded within the wide EIAR study area, see Plate 6-27 and Figures 6-9 in Confidential Appendix 6-4. Due to the amount of bedding material around the 3 active entrances, this sett was determined to be a main sett (Smal, 1999), likely associated with a small population in this upland context. This sett is located over 190metres from the proposed windfarm and its associated infrastructure. In addition, it is separated from the sett by commercial forestry and peatland habitats. No badger sett was recorded within or immediate adjacent to the Proposed Development footprint (including felling areas). The *'Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes'* (TII/NRA) includes a section entitled *'Guidelines for Site Works in the Vicinity of Badger Setts'* This section provides a maximum buffer distance (for blasting and piling works) of 150m. As stated above, the proposed development is located outside this distance and is physically separated from the sett by coniferous woodlands and peatlands.



Plate 6-27 Example of two badger sett entrances recorded within the EIAR study area – Located approximately 10 metres apart.

6.6.1.4.2 Otter

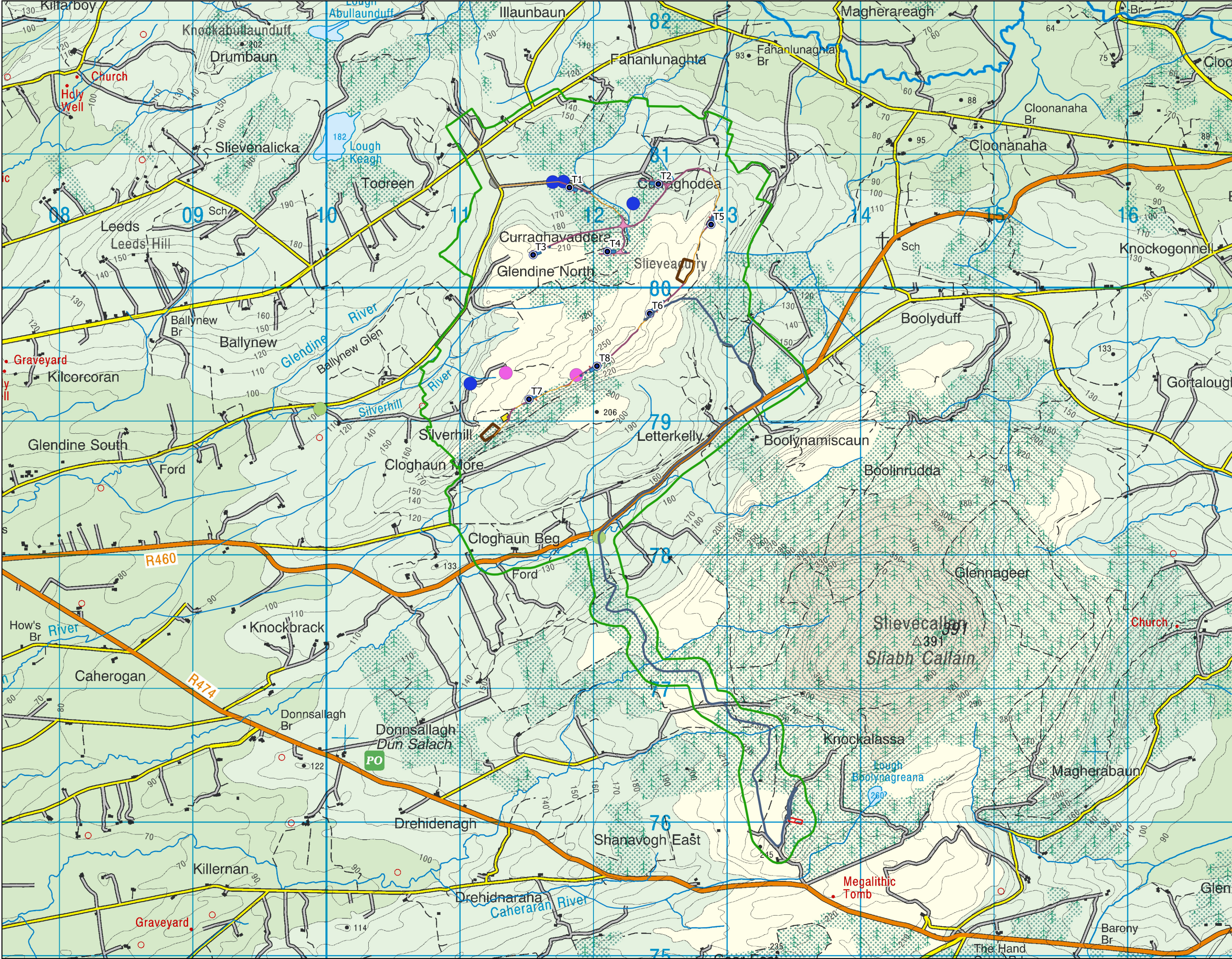
No otter signs were recorded within close proximity to the proposed wind turbines, hardstands, access roads and borrow pits. However, otter spraints were recorded during dedicated surveys of the

Kildeema River (EPA code; 28K01) along the underground cable route, where it leaves the R460 within Slievecallan wind farm in July 2020. In addition, an otter spraint was also recorded near the confluence of the Silverhill and Glendine Rivers, outside the west of the EIAR study area boundary on the 04 March 2021, see Figure 6-8.

The watercourses within the lower part of the catchment were assessed as providing suitable commuting and foraging habitat for the species and it suggests that otter may occur within the EIAR site boundary, at least on occasion. The prey availability is poor in the upper reaches of watercourses within the site, therefore otter are more likely to utilise the lower reaches of the watercourses, downstream of the Proposed Development site.

6.6.1.4.3 **Red Squirrel**

Dedicated red squirrel (*Sciurus vulgaris*) surveys were undertaken, including walked transects through coniferous plantation forestry (WD4). No evidence of the species was recorded.



Map Legend

- EPA Mapped Watercourses
- Badger foraging signs
- Badger print
- Otter spraint
- EIAR Study Boundary
- Proposed Turbine Locations
- Existing Roads - Upgrade Proposed
- Proposed New Site Roads
- Proposed Turbine Foundations
- Proposed Turbine Hardstands
- Proposed Borrow Pits
- Proposed Temporary Construction Compound
- Met Mast Location
- Proposed Underground Cable Route
- Proposed Extension to Existing Slievecallan Substation
- Temporary Runover Area
- County Road to be Maintained
- Public Road Expansion Area
- Soft Levelled Area

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Drawing Title: **Mammal Record**

Project Title: **Slievecurry Renewable Energy Development, Co. Clare**

Drawn By: Holly Witter	Checked By: Sarah Mullen
Project No.: 170224	Drawing No.: Figure 6-8
Scale: 1:25000	Date: 2021-11-16

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6.6.1.4.4 **Bats**

Bat surveys undertaken in 2019, in accordance with NatureScot (2021) (previously SNH, 2019), form the core dataset for the assessment of effects on bats. The scope of bat work was designed in 2019 for a potential layout of up to 11 Turbines. It is supplemented by additional data derived from surveys undertaken on the site in 2017 which were designed in accordance with the Bat Conservation Trust's guidelines for wind turbine developments (Hundt, 2012). Bat surveys included roost surveys, manual transect surveys and ground-level static surveys.

Roost surveys

Following the search for roosts in 2017 and 2019, no structures containing potential suitable bat roost features were identified within the site boundary. However, during the autumn 2019 transect survey, a single bat was observed resting and flying within a single storey stone shed (Grid ref: E112927 N181098). It is possible that the structure is used as a transitional/night roost.

The shed had multiple bat access points in gaps in the stonework and roof tiles. The front door of the building was also left open continuously. Connectivity to the area is provided by hedgerows and linear forestry edges although the site is exposed on the side of a hill. No evidence of bat use was recorded during the preliminary roost assessment. The shed where the bat was observed, the house and adjacent sheds are being retained as part of the Proposed Development.

The site was checked for potential tree roosts but no trees with significant roosting features were identified within the site. Trees may have increased or decreased probability of hosting roosting bats in certain circumstances i.e. Having large broadleaf trees with cavities or other damage such as rot or loose bark increased probability whereas, Conifer plantations and young trees with little – no damage have a decreased probability of hosting bats (Kelleher and Marnell, 2006). The surrounding habitats were assessed as largely unsuitable for roosting bats.

Manual transects 2019

Manual transects were undertaken in Spring, Summer and Autumn 2019. Bat activity was recorded on all surveys. A total of 111 bat passes were recorded. In general, Soprano pipistrelle (n=85) was recorded most frequently, followed by *Myotis* sp. (n=11), Common pipistrelle (n=9), Leisler's bat (n=5) and Brown long-eared bat (n=1). Species composition and activity levels varied significantly between surveys. Figures 4-1 – 4-3, Section 4.7 'Manual Transects' of the standalone 'Bat Report', provided in Appendix 6.2 of the EIAR, presents results for individual species per survey period.

Ground-level Static Surveys 2019

Where developments have more than 10 turbines, NatureScot requires 1 detector per turbine up to 10 plus a third of additional turbines. The scope of bat work was designed in 2019 prior to the finalising of the proposed development layout (i.e. 8 turbines). The surveys were designed for a potential layout of up to 11 turbines. Given that 11 turbines were initially proposed, 11 detectors were deployed to ensure compliance with NatureScot guidance. The results of those surveys are provided below. The location of all static detectors is provided in Table 3-2 of the Bat report Appendix 6.2 of this EIAR.

In total, 31,899 bat passes were recorded across all deployments. In general, Leisler's bat (n=17,611) and Common pipistrelle (n=9,453) occurred most frequently, followed by Soprano pipistrelle (n=3,784) and *Myotis* sp. (n=921). Instances of Brown long-eared bat (n=130) were significantly less.

Bat activity was dominated by Leisler's bat in Spring (see Plate 4-3 and Table 4-4, Appendix 6.2 of the EIAR). Common pipistrelle was most prevalent in Summer and Autumn. In addition, Leisler's bat, common and soprano pipistrelle occurred frequently in Summer. Instances of *Myotis* sp. were less frequent and Brown long-eared bat were relatively rare.

Activity was variable between survey nights. Therefore, the median Nightly Pass Rate was used as the most appropriate measure of bat activity (Lintott & Mathews, 2018). Plate 4-4, Appendix 6.2 of the EIAR, illustrates the median Nightly Pass Rate per species per deployment. Results for each species per detector can be found in Section 4.8 of the detailed bat report, provided in Appendix 6.2 of the EIAR.

6.6.1.4.5 **Reptiles and Amphibians**

Common frog (*Rana temporaria*) was recorded in the area of peatland habitat within the site and within drainage ditches. The species is likely to breed in drainage ditches and areas of permanent standing water 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 and amphibians. It is considered that suitable habitat is extremely widespread in the study area and beyond.

6.6.1.4.6 **Fisheries and Aquatic Fauna**

The small streams that flow off the site of the Proposed Development, and downstream watercourses, were subject to biological evaluation and assessment through kick sampling. Full details of the results of these surveys are provided in Appendix 6.3. A map of the kick sample locations is provided in Figure 6-2.

The survey included a general habitat assessment and biological water quality assessment at watercourse within or downstream of the EIAR study area boundary, including the underground cabling route. The water quality, as per Q-value (Quality Rating System)¹⁴, is fully described in Appendix 6-3. Four of the six sample locations assessed were Q3 'Poor', one as Q-3-4 'Moderate' and one was not suitable for assessment due to its small nature and dense vegetation.

The upland eroding watercourses within the EIAR study area boundary featured higher gradients and higher flows not conducive to supporting resident salmonids, European eel, lamprey or white-clawed crayfish. However, the larger downstream watercourses within the lower catchment are likely to support fish species identified in the desk study, see Section 6.5.1.2.

6.6.1.4.7 **Marsh Fritillary**

The desk study identified that marsh fritillary is known to occur in the wider area surrounding the Proposed Development. Based on the findings of the desk study and identification of suitable habitat for the species during other ecological surveys, dedicated surveys for the species were undertaken within the study area to identify areas of suitable marsh fritillary habitat i.e. areas containing an abundance of devil's bit scabious (*Succisa pratensis*). Surveys focussed on the infrastructure footprint and surrounding areas.

Suitable habitat was recorded in small areas within the study as shown in Figure 6-10. The suitable habitat was mainly associated with areas of Wet grassland (GS4) and Cutover bog (PB4)/Wet heath (HH3) mosaic, see Plate 6-28.

The majority of the suitable marsh fritillary habitat recorded within the EIAR study area boundary occurs away from the proposed infrastructure footprint. This has been facilitated through an iterative design process.

¹⁴ Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C., & MacGarthaigh, M. (2005). Water quality in Ireland. Environmental Protection Agency, Co. Wexford, Ireland.

During the larval web searches of areas of suitable marsh fritillary habitat, habitat condition assessments were undertaken during larval web searches within areas of suitable habitat for the species. As described in Section 6.4.3.3.3, habitat suitability assessments involved an assessment of the vegetation characteristics at a requisite number of stops within the area of suitable habitat. Records of vegetation height, abundance of devil's bit scabious, presence of structured vegetation, low invading scrub and stock grazing were noted within the relevant recording sheets. This followed methods set out in National Biodiversity Data Centre (NBDC¹⁵) best practice guidance. Only areas identified as providing suitable marsh fritillary supporting habitat i.e. containing sufficient abundance of devils-bit scabious, were subject to the condition assessment. An example of marsh fritillary larval webs recorded at the site is provided in Plate 6-29.

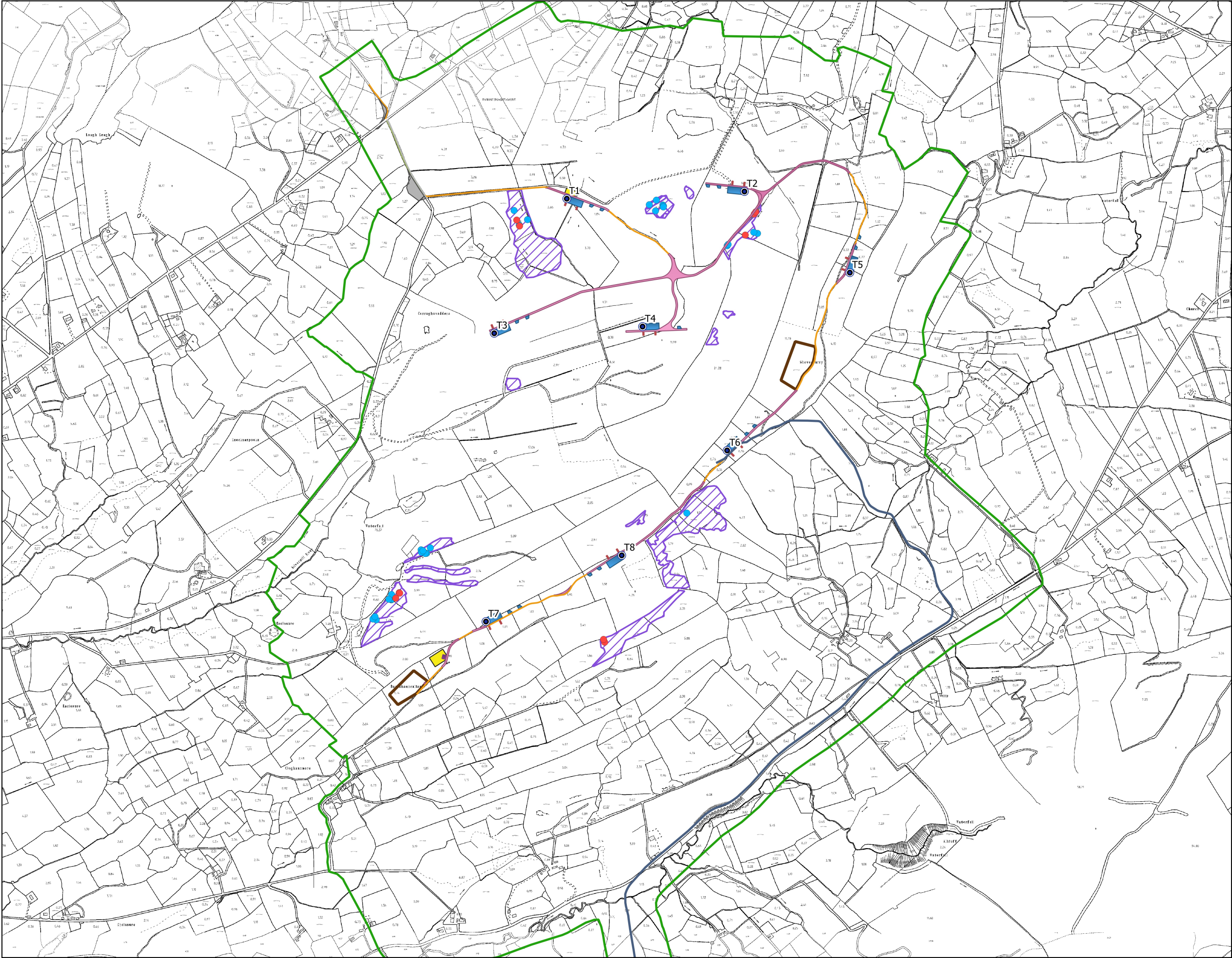


Plate 6-28 - 'Suitable (Under-grazed) habitat' within the east of the site boundary

¹⁵ NBDC, 2019, *Habitat Condition Assessment for Marsh Fritillary*, Online, Available at: <http://www.biodiversityireland.ie/wordpress/wp-content/uploads/Marsh-Fritillary-Habitat-Condition-Form.pdf>, Accessed, 20 March 2020



Plate 6-29 – Typical marsh fritillary larval web (containing larvae) recorded at the site



- Map Legend**
- Marsh Fritillary Larval Webs 2018
 - Marsh Fritillary Larval Webs 2017
 - Suitable Marsh Fritillary Habitat
 - EIAR Study Boundary
 - Proposed Turbine Locations
 - Existing Roads - Upgrade Proposed
 - Proposed New Site Roads
 - Proposed Turbine Foundations
 - Proposed Turbine Hardstands
 - Proposed Borrow Pits
 - Proposed Temporary Construction Compound
 - Met Mast Location
 - Proposed Underground Cable Route
 - Proposed Extension to Existing Slieveacallan Substation
 - Temporary Runover Area
 - County Road to be Maintained
 - Public Road Expansion Area
 - Soft Levelled Area



Drawing Title	
Marsh Fritillary Records	
Project Title	
Slieveacurry Renewable Energy Development, Co. Clare	
Drawn By	Checked By
Holly Witter	Sarah Mullen
Project No.	Drawing No.
170224	Figure 6-10
Scale	Date
1:12500	2021-11-16

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6.6.1.4.8 Other species

Irish hare (*Lepus timidus ssp. hibernicus*) was observed on occasion within the site boundary. The scats of fox (*Vulpes vulpes*) were also recorded in a number of areas within the site. No evidence of other taxa including invertebrates or amphibians, species listed in Annex II or IV of the EU Habitats Directive, or other species of conservation concern was identified within the boundaries of the Proposed Development site.

Incidental records of invertebrates were recorded during the walkover surveys of the site. In addition to the aquatic invertebrates identified during kick samples of the watercourses on site, the following include the species commonly recorded within the study area:

- › Fox moth (*Macrothylacia rubi*)
- › Neuroptera lacewing,
- › Drinker moth (*Euthrix potatoria*)
- › Common hawker dragonfly (*Aeshna juncea*)
- › Common darter damselfly (*Sympetrum striolatum*)
- › Peacock butterfly (*Inachis io*)
- › Red admiral (*Vanessa atalanta*)
- › Meadow brown (*Maniola jurtina*)
- › Speckled wood butterfly (*Pararge aegeria*)
- › Green veined white (*Pieris napi*)
- › Common blue damselfly (*Polyommatus icarus*)
- › Small tortoiseshell butterfly (*Aglaia urticae*)
- › Buff-tailed bumblebee (*Bombus terrestris*)
- › Garden spider (*Araneus diadematus*)
- › Crane fly (*Tipulidae sp*)
- › Field grasshopper (*Chorthippus brunneus*)

6.6.2 Importance of Ecological Receptors

Table 6-14 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. These ecological receptors are considered in Section 6.7 of this report and mitigation/ measures will be incorporated into the Proposed Development where required, to avoid potential significant impacts on the features.

Table 6-14 Key Ecological Receptors identified during the assessment

Ecological feature or species	Reason for inclusion as a KER	KER
Designated sites	Nationally Designated Sites	Yes
	The following Nationally designated site is located downstream of the Proposed Development and has been identified as being within the likely Zone of Impact: › Inagh River Estuary pNHA and Carrowmore Point To Spanish Point And Islands pNHA.	
	These designated sites have been assessed as of National importance.	
	European Designated Sites	Yes

Ecological feature or species	Reason for inclusion as a KER	KER
	<p>The following Special Areas of Conservation 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"> › Inagh River Estuary SAC (000036) › Carrowmore Point to Spanish Point and Islands SAC (001021) <p>These sites are assigned International importance and included as a KER as there is potential for indirect effects on them via water pollution.</p> <p>Note: SPAs within the Likely Zone of Impact are considered in Chapter 7, Ornithology and in the NIS.</p>	
Aquatic Habitats and Related Species	<p>Eroding/upland rivers (FW1)</p> <p>A number of natural watercourses and larger rivers were located within the site boundary or occur downstream of the EIAR study area boundary. These watercourses include:</p> <ul style="list-style-type: none"> › Glendine River (Glendine(Clare)_010), Kildeema River (Kildeema_010), Inagh River (Inagh(Ennistymon_SC_040) as well as several unnamed channels. <p>These Rivers and Streams have been assigned Local importance (Higher Value) as they are of high biodiversity value and connect to downstream waterbodies in the local area. They also provide a conduit to downstream SACs of international importance.</p>	Yes
	<p>Aquatic and Fisheries Species</p> <p>The aquatic species that are associated with the rivers 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. The downstream watercourses and fauna within them have been assigned as of Local Importance (Higher Value) due to the known populations of salmon, trout and lamprey species along with otter.</p> <p>No in river works are proposed as part of the Proposed Development therefore no potential for direct impact on EPA mapped watercourses exists. Where small drainage features occur within the site and do require culverting, see Section 4.6.4.11 and Section 4.7.5.3, Chapter 4 of this EIAR. In the absence of mitigation, the construction, operational and decommissioning phases of the Proposed Development have the potential to result in indirect effects on aquatic dependant receptors and it is therefore included as a KER for further assessment.</p>	Yes
Conifer plantation (WD4)	<p>Much of the Proposed Development infrastructure is located within Conifer Plantation (WD4). This is a highly modified habitat with a low biodiversity value. This is classified as Local Importance (Lower Value). For these reasons, this habitat has not been identified as a KER.</p>	No
Peatlands and associated habitats	<p>Upland Blanket Bog (PB2)</p> <p>This habitat, including the areas of Eroding blanket bog (PB5), has been assigned County Importance as, although the habitat occurring within the site has been degraded as a result of forestry, grazing and turbary activities, the areas of upland blanket bog conform to EU Habitats Directive Annex I habitat Blanket Bog [7130] and is of high biodiversity in a local context.</p>	Yes

Ecological feature or species	Reason for inclusion as a KER	KER
	The footprint of the Proposed Development has the potential to result in direct and indirect effects on the receptor and it is included as a KER for further assessment.	
	<p>Cutover bog (PB4)</p> <p>This habitat is assigned County Importance as, although the habitat occurring within the site has been degraded as a result of historic turbary activities, the areas of upland blanket bog conform to EU Habitats Directive Annex I habitat Blanket Bog [7130] and is of high biodiversity in a local context. The footprint of the Proposed Development has the potential to result in direct and indirect effects on the receptor and it is included as a KER for further assessment.</p>	Yes
	<p>Wet heath (HH3)</p> <p>This habitat, including the small areas of Exposed siliceous rock (ER1), have been assigned as of County Importance as, although the habitat occurring within the site has been degraded as a result of forestry, grazing and turbary activities, these areas of bog conform to the EU Habitats Directive Annex I listed habitat Wet heath [4010] and is of high biodiversity in a local context. The footprint of the Proposed Development has the potential to result in direct and indirect effects on the receptor and it is included as a KER for further assessment.</p>	Yes
	<p>Transition mire and quaking bog (PF3)</p> <p>The Transition mire and quaking bog (PF3) habitat form part of the wider Upland blanket bog (PB2) habitat that conforms to EU Habitats Directive Annex I Blanket bogs [7130]. Therefore, this habitat has been assessed as of local importance (higher value). The Proposed Development infrastructure footprint avoids this habitat and as such, there is no potential for impact on this habitat. It has therefore not been included as a KER.</p>	No
Spoil and bare ground (ED2)	The habitat is common and widespread in the wider area. The habitat has been assessed as of Local Importance (lower value) as it is largely associated with artificial site access tracks and is of low biodiversity value. For this reason, it has not been identified for further assessment and is not a KER.	No
Hedgerow (WL1)	Hedgerows have been assessed as of local importance (higher value) as they provide connectivity to the wider landscape and provide supporting habitat for a wide variety of faunal species. However, there will be no permanent loss of hedgerow as a result of the proposed development. The only temporary impact on Hedgerow will be associated with the installation of the proposed underground cable route. This will be associated with facilitating access during construction and will then be reinstated. Therefore, no significant impacts on this habitat have been identified and there will be no significant effect at any geographic scale.	No
Wet grassland (GS4)	Wet grassland (GS4) has been assessed as of local importance (lower value) as where this habitat occurs within the Proposed Development footprint, it is generally of low biodiversity value primarily due to fragmentation, abandonment and scrub encroachment associated with the surrounding afforestation of the landscape. However, the habitat is of some local importance to local wildlife (NRA, 2009). As such, the habitat has been assessed as of Local Importance (lower value).	No

Ecological feature or species	Reason for inclusion as a KER	KER
	Note, areas conforming to the EU Habitats Directive Annex I listed habitat <i>Molinia</i> meadow [6410] have been fully avoided.	
Scrub (WS1)	This habitat within the site is largely dominated by patches of gorse scrub, and in wetter locations, willows (<i>Salix</i> spp.). However, this habitat is of some local importance to local wildlife (NRA, 2009). The habitat is common and widespread in the wider area and as such, has been assessed as of Local Importance (lower value).	No
Badger	Badger as an ecological receptor has been assigned Local Importance (Higher value) on the basis that the habitats within and adjacent to the study area are likely to be utilised by a locally occurring badger population of Local Importance. Direct impacts on badger are not anticipated as no badger sett has been identified within or adjacent to the proposed infrastructure. There will be no loss of resting or breeding places associated with the Proposed Development. Given the small scale nature of the proposed infrastructure footprint in relation to the availability of suitable habitat for the species, no potential for significant habitat loss or disturbance/displacement has been identified. Therefore, the species has not been included as a KER for further assessment.	No
Otter	A single record of otter was recorded within the site boundary, beneath a culvert on the access road to the existing Slievecallan windfarm. This was recorded during targeted otter surveys of the site. Based on the low number of otter records within the study area and the low suitability of the smaller watercourses/drains occurring within the upper reaches of the catchment (in which the turbine infrastructure is located i.e. turbine hardstands and access roads), otter has been assessed as of Local Importance (higher value). This is also because the species is listed in Annex I and IV of the EU Habitats Directive. No evidence of a more ecologically important population was recorded during any of the site surveys undertaken. The Proposed Development has the potential to result in indirect effects on the receptor (as a result of deterioration in water quality (supporting habitat) or disturbance/displacement during construction/ decommissioning) and it is therefore included as a KER and requires further assessment.	Yes
Marsh fritillary	The species has been assessed as of County importance as they are listed in Annex II of the EU Habitats Directive and it is likely that the population on site may represent 1% of the County population of the species. The Proposed Development footprint has avoided all areas of supporting habitat and all recorded populations. However, as some of the infrastructure (notably the site access road south of T2) occurs adjacent to suitable habitat and mapped colonies, further assessment is required in the absence of mitigation.	Yes
Bats	The habitats within and surrounding the Proposed Development site are likely to be utilised 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 2019) and European legislation – (Habitats Directive (92/43/EEC). Bats are likely to forage and commute within the vicinity of the Proposed Development. No potential bat roosting features were identified within or adjacent to the development footprint. The Proposed Development has the potential to result in direct and indirect effects on the receptor. Therefore, bats are included as a KER for further assessment.	Yes

Ecological feature or species	Reason for inclusion as a KER	KER
Reptiles and Amphibians	It is considered that the Proposed Development will not result in a significant loss of suitable habitat for reptiles and amphibians. No evidence of populations of amphibians being significant at more than a local level was recorded. No likely significant effects on these species are anticipated and therefore further survey/ assessment was not deemed necessary. Based on the low number of amphibian records for the site and the highly afforested nature of parts of the study area, amphibians and reptiles have been assessed as of Local Importance (lower value). However, should any frogspawn be encountered and require translocation during the project development, a licence under Section 23 (Wildlife Act) will be acquired by the project ecologist prior to any such works.	No
Invasive species	Although Rhododendron was recorded within the EIAR study area boundary, the Proposed Development footprint avoids these areas and there is therefore no potential for any further spread of the species as a result of the Proposed Development.	No
Additional protected fauna (e.g. Irish hare, fox etc).	The recorded evidence suggests that the study area is not utilised by populations of higher than local significance and no potential for significantly effects have been identified at the population level. Due to the small footprint and nature of the Proposed Development, they are unlikely to be significantly affected by the Proposed Development. For this reason, other faunal species are not considered further in this EIAR. Significant effects are not anticipated.	No

6.7 Ecological Impact Assessment

6.7.1 Do-Nothing Effect

If the Proposed Development were not to proceed, the majority of the lands within the site would continue to be managed as commercial forestry and the grazing of livestock (mainly cattle) on degraded peatlands. This would continue to involve the harvesting of timber as it matures, followed by the coniferous forestry replanting as well as ongoing agricultural activities. The other habitats identified within the EIAR study area, including peatlands and associated habitats, would likely remain in a similar condition. In some drier areas of the peatland habitat, scrub is likely to develop and in time, this may undergo succession to small areas of woodland. The general biodiversity on the site, as described in this chapter, would likely remain similar to its current state as activity levels and land use would not change significantly.

6.7.2 Effects on Designated Sites

None of the elements of the Proposed Development are located within the boundaries of any Nationally or European designated sites. There will be no direct effects on any designated site as a result of the construction, operation and decommissioning the Proposed Development.

Two nationally designated sites were identified as being within the zone of influence and as KERs. These are:

- Inagh River Estuary pNHA and
- Carrowmore Point To Spanish Point And Islands pNHA.

Nationally designated sites that are also designated as European Sites have been assessed as those designations within the Appropriate Assessment Screening Report and NIS, with the relevant conclusions are recorded and referenced in this chapter.

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 excluded 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 be likely to have a significant effect on the following sites:

- › Inagh River Estuary SAC (000036)
- › Carrowmore Point to Spanish Point and Islands SAC (001021)

As a result, an Appropriate Assessment is required, and a Natura Impact Statement has been prepared in respect of the Proposed Development in order to assess whether the Proposed Development will adversely impact the integrity of these European Sites’.

‘This NIS has provided an assessment of all potential direct or indirect adverse effects on European Sites.

The findings presented in the NIS are that:

Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction and operation of the proposed development does not adversely affect the integrity of European sites.

Therefore, 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’.

6.7.2.1.1 **Potential Introduction or Spread of Invasive Alien Plant Species**

Pre-Mitigation Impacts

The Third Schedule invasive species Rhododendron was recorded within the EIAR study area boundary. No infestation will be impacted and no treatment or site specific management is required. However, from a precautionary perspective, a pre-construction invasive species survey will be undertaken a part of the Proposed Development. This will provide updated data in advance of any construction given the intervention time period between the original survey work and any future grant of permission/construction. Measures will be in place to prevent the spread of these species during the proposed works. In addition, all necessary precautions will be taken to prevent the introduction of invasive species to the site from elsewhere.

Proposed Best Practice Biosecurity Measures

Best practice measures in relation to invasive species are described below:

- › All earthworks machinery will be thoroughly pressure-washed prior to arrival on site and prior to their further use elsewhere.
- › Care will be taken not to disturb or cause the movement of invasive species fragments, either intentionally or accidentally.
- › Stands of Rhododendron will be clearly demarcated by temporary fencing and tracking within them will be strictly avoided.
- › Good construction site hygiene will be employed to prevent the spread of these species with vehicles thoroughly cleaned down prior to leaving any site with the potential to have supported invasive species. All plant and equipment employed on the construction site (e.g. excavator, footwear, etc.) will be thoroughly cleaned down on site to prevent the spread of invasive plant. All clean down must be undertaken in areas with no potential to result in the spread of invasive species.
- › Any material that is imported onto any site will be verified by a suitably qualified ecologist to be free from any invasive species listed on the 'Third Schedule' of Regulations 49 & 50 of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011). This will be carried out by searching for rhizomes and plant material.

The control of invasive alien species will follow guidelines issued by the National Roads Authority - *The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads* (NRA 2010).

6.7.3 Likely Significant Effects During Construction Phase

6.7.3.1 Effects on Habitats During Construction

Table 6-15 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. Note that only small sections of hedgerow habitat will be lost to facilitate the proposed underground cable route. These will be reinstated post construction and are assessed further below.

Table 6-15 Extent of habitat lost to the Proposed Development

Habitat	Area to be lost to development footprint (hectares)
Conifer plantation (WD4)	4.39 ha
Wet grassland (GS4)	0.74 ha
Improved agricultural grassland (GA1)	0.041 ha
Wet Grassland (GS4)/ Cutover bog (PB4)	0.058 ha
Cutover bog (PB4)/ Upland blanket bog (PB2)/Wet heath (HH3) mosaic including small areas of Exposed siliceous rock (ER1)	2.92 ha
Buildings and artificial surfaces (BL3)	0.97 ha
Total	9.10 ha

The Proposed Development will result in the loss of areas of habitat that are of Local Importance (Lower Value) and are not identified as KERs. This mainly involves the loss of coniferous plantation

forestry (WD4) and has been assessed as of low ecological value. Any direct or indirect impacts on habitats assessed as of local importance (lower value) not significant, including; Conifer plantation (WD4), Wet grassland (GS4), Scrub (WS1), Recolonising bare ground (ED3) and Spoil and bare ground (ED2). The effects on habitats that are identified as KERs are described in the below tables.

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

Table 6-16 Potential for impact on rivers, streams and Sensitive Aquatic 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 and other aquatic species identified during the desk study and likely to occur downstream of the Proposed Development.</p> <p>The footprint of the Proposed Development has been specifically designed to avoid the large watercourses within the study area (i.e. all significant infrastructure has been located over 50 metres from EPA mapped watercourses), see Sections 4.2 & 4.7 of the EIAR. Only minor culvert upgrade works are proposed as described in Section 4.6.4.1.1 and 4.7.5 of the EIAR. Therefore, there is no potential for the Proposed Development to result in any barrier to the movement of aquatic species. A general description of the various construction methods employed at watercourse crossings are described in, see Section 4.7.5.3. The measures minimise potential for impact on the receiving environment.</p> <p>There is potential for the construction activity to result in the runoff of silt, nutrients and other pollutants such as hydrocarbons and cementitious material into these watercourses. This could result from the removal of scrub and forestry, culverting of drainage ditches, minor movement of peat or the use of concrete and other construction materials. The Proposed Development will cross a number of small drainage ditches, which are not themselves ecologically sensitive but do provide connectivity to the larger watercourses that surround the site.</p> <p>In the absence of appropriate mitigation measures and standard best practice, the construction phase of the Proposed Development has the potential to result in indirect effect on aquatic receptors in the form of water pollution.</p> <p>These effects on water quality are fully described in Chapter 9 ‘Water’ of this EIAR and are described here in relation specifically to ecology.</p>
<p>Characterisation of unmitigated effect</p>	<p>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 all major infrastructure such as turbine bases, site compound etc. are located over 50 metres from any significant watercourse.</p>
<p>Assessment of Significance prior to mitigation</p>	<p>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.</p>
<p>Mitigation</p>	<p>A detailed drainage maintenance plan for the Proposed Development is provided in Section 4.6.8 of this EIAR with additional drainage details described in Section 4.6 generally. 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: ‘Water’ of this EIAR, see Section 9.5.2. and the Construction Environmental Management Plan (CEMP) that is provided as Appendix 4-4 of this EIAR, provides the details of exactly how the measures will be implemented during construction.</p>

Residual Effect following Mitigation	Following the implementation of mitigation, there will be no significant residual effect on aquatic habitats or species as a result of the Proposed Development. The residual impact will be the same for any selected turbine that is within the range of dimensions for which planning permission is sought.
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6.7.3.1.2 Assessment of Potential Effects on Peatlands and Associated Habitats

Table 6-17 Loss of peatlands and associated habitats

Description of Effect	<p>The loss of peatland habitat to the Proposed Development footprint is 2.97 hectares. This is associated with Turbines T3, T5 & T6, part of T7 and a proposed borrow pit to the south of T5 (borrow pit 2). All other turbines and associated infrastructure are located within plantation forestry (WD4). As described in Section 6.6.1.1.2, there will be no loss of transition mire habitat as this has been completely avoided as part of the project design.</p> <p>The remaining areas of peatland habitats have been entirely avoided in the design of the Proposed Development with no potential for any effect thereon.</p> <p>In the absence of appropriate drainage design there is the potential to result in indirect effects on the habitat immediately adjoining the footprint through drainage.</p>
Characterisation of unmitigated effect	This is a permanent and irreversible impact on habitats of County Importance. The magnitude of this impact is Slight as it only affects a small percentage of the overall habitat type, which is widespread in the surrounding landscape.
Assessment of Significance prior to mitigation	The loss or degradation of Upland blanket bog (PB2), Cutover bog (PB4) and Wet heath (HH3) has been assessed as a permanent significant negative effect on a small area of a receptor of County importance, in the absence of mitigation. The impact is restricted to a small percentage of the overall habitat within the site.
Mitigation	<p>The Proposed Development has been deliberately designed to minimise loss of peatland habitats by siting turbines, access roads and associated infrastructure within Coniferous forestry (WD4). The areas of deep peat within the study area have been avoided in the design of the development and all areas that are within the construction footprint have been degraded through extensive grazing of sheep or cattle, drainage, peat cutting, forestry or scrub encroachment. In addition, as shown in Figure 1-1 'Plan Drawing Of Wind Farm With Road Construction Type' of the accompanying Peat & Spoil Management Plan (Fehily Timoney, 2021¹⁶) Appendix 4-2, Chapter 4 of this EIAR, existing site access tracks have been utilised where possible to minimise the impact of the Proposed Development footprint on the receiving environment. Secondly, the road construction methodology has also been designed to minimise the amount of material movement (Fehily Timoney, 2021).</p> <p>Where the development footprint does occur on this habitat, the Proposed Development provides for the replacement of peatland habitat through the restoration of forestry (WD4) back to peatland. This is fully described in the site-specific Biodiversity Management and Enhancement Plan (BMEP), provided in Appendix 6.5 of the EIAR. The BMEP aims to ensure that there will be no net loss of peatland habitat associated with the Proposed Development. It is proposed to undertake enhancement of this area of peatland through the felling of stunted plantation forestry (WD4) and drain blocking within these areas. This will be undertaken around Turbines T2 (1.51ha), T4 (1.8 ha) & T8 (1.2 ha) equating to 4.5 ha. In addition, the proposed borrow pit no. 2, located to the south of T5, will also be fully reinstated post-construction (as set out in the accompanying Peat & Spoil Management Plan). The reinstated borrow pit will equate to approximately 1.28 ha. Following the implementation of the measures outlined in this report, to offset the loss of degraded</p>

¹⁶ Fehily Timoney, 2021, Peat & Spoil Management Plan, Slieveacurry Renewable Energy Development

	peatland habitat, there will be no residual net loss of peatland habitats on the site. In addition, the proposed forestry reinstatement to peatland has the potential to result in a long-term positive effect with a gain of (2.12 ha) in peatland habitat overall. The extent of lands subject to peatland restoration are shown in Figure 1.1, Appendix 6-5 of the EIAR.
Residual Effect following Mitigation	Following the implementation of mitigation and the arising effect of the mitigation measures, there will be no significant residual effect on peatland habitats. The restoration and enhancement of peatland habitats will have a local positive impact. The residual impact will be the same for any selected turbine that is within the range of dimensions for which planning permission is sought.

6.7.3.2 Effects on Fauna During Construction


The Proposed Development has the potential to result in habitat loss and disturbance impacts on faunal species that were recorded on the site but were not included as KERs, see Table 6-14. Given the extensive area of habitat that will remain undisturbed throughout the site and the avoidance of the most significant areas of faunal habitat (natural woodlands and watercourses), no significant effects on non-KER faunal biodiversity are anticipated as a result of the Proposed Development. Therefore, these species were excluded from further assessment.

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 6.7.3.1.1 above and is not repeated below.

6.7.3.2.1 Assessment of Potential Effects on Marsh Fritillary

Table 6-18 Assessment of Potential Impacts on Marsh fritillary

Description of Effect	Habitat Loss/ Fragmentation Suitable habitat for marsh fritillary occurs within the study area boundary. These areas are shown in Figure 6-9 of this Chapter. The Proposed Development has been deliberately designed to avoid all recorded marsh fritillary colonies. There are however, some works proposed close to identified marsh fritillary habitat and associated populations (notably south of Turbine no. 2, see Plate 6-30). If the works area is not clearly defined and the areas of marsh fritillary habitat not fenced off and avoided in advance of the construction works, taking a precautionary approach, there could be some potential for direct impact.
Characterisation of unmitigated effect	In the absence of mitigation/best practice, potential for Long-term Slight Negative Effect through the loss of potentially suitable supporting habitat for this receptor of County importance was identified where it occurs in close proximity to the Proposed Development. In the absence of appropriate site setup, the effects would be slight at worst, as the entire development has been designed to avoid these.
Assessment of Significance prior to mitigation	Given the design of the scheme, there is no potential for the construction of the Proposed Development to result in significant effects on marsh fritillary as the footprint of the development avoids all marsh fritillary colonies. However, mitigation will be employed to ensure that there is no temporary habitat loss or degradation effects on this species at all.
Mitigation	Whilst it is highly unlikely that the onsite population of marsh fritillary will be impacted during construction, due to the avoidance of all recorded colonies on site, measures that have been put in place to protect the species. This includes the placement of site access roads, south of T2, on the north western side of the existing firebreak embankment, away from the suitable habitat. This thereby avoids any remote potential for effects on the population.

	<p>Best practice measures for the protection and enhancement of the supporting habitat within the Proposed Development site include:</p> <ul style="list-style-type: none"> › Avoidance Measures: The entire Proposed Development has been designed to avoid marsh fritillary and supporting habitat on site, see Figure 6.10. › Pre-construction Measures: Areas of suitable marsh fritillary habitat will be fenced off or clearly marked prior to the commencement of any site works under the guidance and supervision of a suitably qualified Ecological Clerk of Works (ECoW). This is particularly important where the site access track, south of T2, occurs in close proximity to a known colony (see Plate 6-30 below). Although the access track is located within forestry and the adjoining fire break, the adjacent peatland habitat provides suitable supporting habitat for the species and requires protection through fencing. › Pre-commencement surveys will be undertaken for marsh fritillary to determine long term trends of the population within the site. › Vegetation structure and suitability will be monitored following the NBDC survey methodology (NBDC, 2020). › Pollinator enhancement measures through habitat creation, as described in the Biodiversity Management and Enhancement Plan, Appendix 6-5. › Habitat condition monitoring will be undertaken during construction and in year 1 post construction to ensure that there are no negative effects on marsh fritillary habitat.
	 <p><i>Plate 6-30 Example of forestry (WD4) and adjoining fire break in which the site access track, south of T2 will be located. The marsh fritillary supporting habitat is located within the adjoining peatland (right). This area will be fenced off in advance of site works.</i></p>
Residual Effect following Mitigation	<p>Following the incorporation of the above avoidance and mitigation measures, no potential for significant effect on marsh fritillary has been identified. There is the potential for the Proposed Development to increase the extent of available habitat on the site for marsh fritillary and also to increase the quality of the habitat on the site. The residual impact will be the same for any selected turbine that is within the range of dimensions for which planning permission is sought.</p>

6.7.3.2.2 Assessment of Potential Effects on Bats

Table 6-2 Assessment of Potential Impacts on Bats

Description of Effect	The current proposal has been designed to minimise impacts on the receiving environment and maximises the use of existing infrastructure at the site including
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	<p>internal access tracks. Consequently, the Proposed Development footprint is dominated by modified habitats including conifer plantation and degraded peatlands.</p> <p>As per NIEA and NatureScot 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 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 commercial conifer plantation and open peatland habitats. 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. The Proposed Development, including the felling of conifers and creation of new road infrastructure will provide a positive change with the creation of additional available areas of linear landscape features that may be utilised by bats for commuting or foraging.</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> <p>No significant displacement of individuals or populations is anticipated.</p>
Mitigation & Best Practice	<p>A full suite of best practice measures in relation to noise restrictions, lighting restrictions and buffering are provided in the Bat Report (Appendix 6-2)</p>
Residual Effect following Mitigation	<p>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.</p> <p>The felling of conifer forestry will open up the plantation and provide additional forestry edge habitats and linear features for commuting and foraging bats. This will result in a slight positive impact on the local bat population.</p> <p>Taking into consideration the proposed best practice and adaptive mitigation measures; significant residual effects on bats with regard to 1) Collision mortality, barotrauma and other injuries (Operational Phase Impact), 2) Loss or damage to</p>

	commuting and foraging habitat, 3) Loss of, or damage to, roosts and 4) Displacement of individuals or populations are not anticipated for any selected turbine that is within the range of dimensions for which planning permission is sought is anticipated.
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6.7.3.2.3 Assessment of Potential Effects on Otter

Table 6-20 Assessment of Potential Impacts on otter

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>Potential for effects on otter has been considered with regard to NPWS 'Threat Response Plan'¹⁷ (TRP) which identifies four significant threats facing otter in an Irish context: habitat destruction, water pollution, disturbance (recreational sources) and accidental death/persecution.</p>
Characterisation of unmitigated effect	<p>Only a single otter spraint was recorded during the dedicated otter surveys. This was recorded along the Kildeema River (EPA code; 28K01) along the underground cable route, where it leaves the R460 towards, see Figure 6-8. Given the layout of the Proposed Development, no significant habitat destruction, no loss of breeding or resting places and no direct mortality related impacts on this species are anticipated. Turbine locations have been selected to avoid natural watercourses (located over 50 metres from EIA mapped watercourses). 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 EIAR study area on occasion, particularly the lower reaches of the main watercourses. 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). 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>
Assessment of Significance prior to mitigation	<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</p>

¹⁷ NPWS (2009) Threat Response Plan: Otter (2009-2011). National Parks & Wildlife Service, Department of the Environment, Heritage & Local Government, Dublin.

	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.
Mitigation	<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 Plan (CEMP) that is provided as Appendix 4.3 provides the details of exactly how the measures will be implemented during construction.</p> <p>All culvert upgrades under the supervision of the project ecologist and ensuring that riparian/aquatic habitat is not damaged and safe otter passage is ensured.</p>
Residual Effect following Mitigation	Following the implementation of mitigation, any effects on otter will be negligible and will not result in any significant effect. The residual impact will be the same for any selected turbine that is within the range of dimensions for which planning permission is sought

6.7.4 Likely Significant Effects During Operational Phase

6.7.4.1 Effects on Habitats during Operation

The operation of the Proposed Development will not result in any additional land take or loss of peatland habitats 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. However, the Proposed Development has the potential to result in enhancement of the surrounding areas through habitat rehabilitation management (as described in the Biodiversity Management and Enhancement Plan) that will be implemented during the construction phase of the Proposed Development and maintained during the operational phase. Details of the management that will be undertaken are provided in the Biodiversity Management and Enhancement Plan in Appendix 6.5. These include:

- › Restoring areas of forestry back to peatland around turbines no. T2, T4 & T8,
- › Natural re-vegetation and drain blocking within these areas of degraded peatlands,

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

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

Table 6-21 Assessment of Potential Impacts on Rivers, Streams and Sensitive Aquatic Faunal Species

Description of Effect	<p>Note: Whilst this impact assessment is in the habitats section, it also assesses the impact of the Proposed Development on aquatic species including salmonids, lamprey, white-clawed crayfish, European eel, aquatic invertebrates and other aquatic species. The Proposed Development will have no direct impact on the aquatic habitat of these species and there is no potential for disturbance. The only pathway for effect to occur is as a result of water pollution and this is discussed in this section in relation to habitats and species.</p> <p>The increased amount of hard standing associated with the Proposed Development infrastructure has, in the absence of mitigation, the potential to result in faster run off of water 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</p>
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	<p>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: ‘Water’ of this EIAR and are described here in relation specifically to biodiversity.</p>
Characterisation of unmitigated effect	<p>Impact on water quality during the operational phase of the Proposed Development has been assessed as a permanent negative effect in the absence of mitigation. The magnitude of this impact is slight because all major infrastructure will be located over 50 metres from any significant watercourse (those mapped by the EPA¹⁸ and downloaded to GIS) and the footprint of the Proposed Development will be minimal when compared to the overall size of the site. The closest turbine to an EPA mapped watercourse is Turbine no. 3, located approx. 90 metres to the east of the watercourse.</p>
Assessment of Significance prior to mitigation	<p>Significant effects on water quality are not anticipated at any geographic scale during the operation of the Proposed Development. However, mitigation will be employed to ensure that there will be no negative effects on sensitive aquatic receptors at all.</p>
Mitigation	<p>Whilst no significant effects on water quality are anticipated during the operational phase of the Proposed Development, any 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 9.4.4 of Chapter 9: ‘Water’ and Section 3.2 of the CEMP.</p>
Residual Effect following Mitigation	<p>No potential for significant effect has been identified at any geographic scale as a result of the Proposed Development. The residual impact will be the same for any selected turbine that is within the range of dimensions for which planning permission is sought.</p>

6.7.4.2 Effects on Fauna during Operation

The operation of the Proposed Development will not result in any additional habitat loss or deterioration, nor will it result in a significant increase in anthropogenic activity due to its location and scale.

The implementation of the Biodiversity Management and Enhancement Plan will ensure that any peatland habitats (primarily consisting of Cutover bog (PB4), Upland blanket bog and Wet heath habitats in varying forms) that is lost to facilitate the proposed infrastructure will be replaced within the site. The Biodiversity Management and Enhancement Plan will also incorporate the reinstatement of forestry back to peatland through tree felling and drain blocking, including an additional 2.12ha of peatland. The proposed forestry reinstatement to peatland will result in the long-term restoration of an additional 4.5 ha of peatland habitat overall.

These measures are fully described in Appendix 6.5. This will result in the establishment of habitats of higher value for local faunal species. As such the operation of the Proposed Development will not result in a significant impact at any geographic scale. Such measures will have positive effects on the non-volant terrestrial fauna at the site of the Proposed Development. There is no potential for significant negative effects on non-volant terrestrial fauna including marsh fritillary and otter that were identified as KERs during the construction phase of the development.

The operation of the Proposed Development will not have any effect on marsh fritillary or habitat for the species. No elements of the infrastructure are located on suitable marsh fritillary habitat and no

¹⁸ EPA, 2020, Online Map viewer. Available at: <https://gis.epa.ie/EPAMaps/>

maintenance works associated with the operation of the Proposed Development are proposed in any such habitat.

It is not anticipated that the operation of the Proposed Development will have any effect on otter or its supporting habitat during the operation phase. As described previously in this EIAR, there will be no requirements for in stream works and no loss of riverine habitat. No maintenance works associated with the operation of the Proposed Development are proposed in close proximity to suitable watercourses. In addition, all turbines are located over 50 metres from EPA mapped watercourses.

As described above, a Biodiversity Management and Enhancement Plan has been prepared as part of the Proposed Development. The management plan is provided in Appendix 6.5 and describes the measures required during the construction phase that will create a suitable substrate for the natural colonisation of devil's-bit scabious along site access tracks on site during the operational phase. This will ultimately allow for an increase in suitable available habitat for the species locally and thus a long-term gain for the species. This will result in a positive impact for the species and no potential for significant negative effect has been identified at any geographic scale. Therefore, this species is not identified as a KER during the operation of the Proposed Development.

It should be noted that no significant habitat for salmonids, lamprey, white-clawed crayfish, European eel, aquatic invertebrates or other aquatic species was recorded within the footprint of the Proposed Development and all major infrastructure such as turbine bases are located over 50 metres from the watercourses within the site, see Figure 9-7, Chapter 9 'Water' of the EIAR. 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 6.7.3.1.1 and is not repeated below.

Potential for significant effects on bat species resulting from the operation of the Proposed Development were identified and therefore, these are identified as KERs during the operational phase.

6.7.4.2.1 **Assessment of Potential Effects on Bats during operation**

Table 6-22 Assessment of Potential Impacts on Bats

Description of Effect	<p>There is no potential for loss or fragmentation of foraging or roosting habitat for bat species during the operational phase of the Proposed Development as there will be no additional loss of any habitats following construction.</p> <p>The bat survey report that is provided in Appendix 6.2, found bat species composition and abundance to be typical of the geographic location and partly afforested and largely open nature of the site.</p> <p>There will be some illumination of the turbines in the form of aviation lighting and whilst this lighting is unlikely to result in any significant increase in collision risk</p>
Characterisation of unmitigated effect	<p>The operation of the Proposed Development has the potential to result in a long-term effect on Pipistrelle species and Leisler's bat species as a result of mortality due to collision. The magnitude of this effect in the absence of mitigation is moderate on the basis 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>The effect of aviation lighting is predicted to be imperceptible.</p> <p>It is noted in the NIEA (2021) and NatureScot (2021) 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 at least three years' post construction is recommended in the guidelines and will be undertaken at this site, to determine the actual, post construction effects on the local bat populations</p>

Assessment of Significance prior to mitigation	Following the precautionary principle, there is potential for the operation of the Proposed Development to result in Significant effects on the local bat population.
Mitigation	<p><u>Bat Buffers</u></p> <p>In accordance with NIEA Guidance, a minimum 50m buffer to all habitat features used by bats (e.g., hedgerows, tree lines etc.) should be applied to the siting of all wind turbines. For wind farms proposed to be key-holed into commercial forestry plantation, NIEA Guidance recommends a minimum buffer of 100m between the turbines and the edge of the forestry.</p> <p>Three turbines are located in open peatland habitats and do not require a buffer. The remaining five turbines are located within or at the edge of conifer forestry therefore, a 100m buffer will be applied.</p> <p>Details of this mitigation and how it is calculated is provided in Appendix 6.2.</p> <p><u>Blade Feathering</u></p> <p>In accordance with NIEA Guidelines, blade feathering will be implemented as a standard across all proposed turbines when wind speeds are below the cut-in speed of the turbine</p> <p><u>Lighting</u></p> <p>Whilst no significant effect on bats as a result of artificial lighting was identified during the assessment, the applicant commits to the use of lights during construction, operation and decommissioning (such that they are necessary) in line with guidance that is provided in the Institute of Lighting Professionals Guidance Note 08/18 Bats and artificial lighting in the UK and Dark Sky Ireland Lighting Recommendations.</p> <p>The Dark Sky Ireland Lighting includes the following;</p> <ul style="list-style-type: none"> • Every light needs to be justifiable • Limit the use of light to when it is needed • Direct the light to where it is needed • Reduce the light intensity to the minimum needed • Use light spectra adapted to the environment • When using white light, use sources with a “warm” colour temperature (less than 3000K). <p>Details of this mitigation and how it is calculated is provided in Appendix 6.2.</p> <p><u>Bat Monitoring Plan</u></p> <p>In addition to this, ongoing monitoring of bat activity will be undertaken for at least 3 years’ post construction of the wind farm. The monitoring will also include corpse searching in the areas surrounding the turbines to gather data on any actual collisions.</p> <p>The results of post construction monitoring shall be utilised to assess changes in bat activity patterns. If significant effects are recorded, this data will be utilised to inform the design of any advanced site specified mitigation requirements. A range of measures shall be proposed to ensure that any such effects are fully mitigated. These measures shall include blade feathering, curtailment of turbines during certain conditions and increase of buffers surrounding the turbines. Any or all of the above measures may be employed following actual monitoring of the impact of the operating turbines on bats to ensure that no potential for significant effects on bat species remains.</p>

	Full details of the proposed monitoring programme are provided in Appendix 6.2.
Residual Effect following Mitigation	Following the implementation of the monitoring and mitigation described above, there is no potential for significant residual effects on bat species for any selected turbine that is within the range of dimensions for which planning permission is sought

6.7.5 Likely Significant Effects During Decommissioning phase

Decommissioning is fully described in Chapter 4. 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.

The wind turbines proposed as part of the Proposed Development are expected to have a lifespan of approximately 30 years. Following the end of their useful life, the equipment may be replaced with a new technology, subject to planning permission being obtained, or the Proposed Development may be decommissioned fully.

Upon decommissioning of the Proposed Development, the wind turbines will be disassembled in reverse order to how they were erected. The turbines will be disassembled with the same model of cranes that were used for their erection. The turbine will be removed from site using the same transport methodology adopted for delivery to site initially. The turbine materials will be transferred to a suitable recycling or recovery facility.

All above ground turbine components would be separated and removed off-site for recycling. Turbine foundations would remain in place underground and would be covered with earth and reseeded as appropriate. Leaving the turbine foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in environment emissions such as noise, dust and/or vibration.

Site roadways could be in use for purposes other than the operation of the development by the time the decommissioning of the Proposed Development is to be considered, and therefore it may be more appropriate to leave the site roads in situ for future use. It is envisaged that the roads will provide a useful means of extracting the commercial forestry crop which exists on the site. If it were to be confirmed that the roads were not required in the future for any other useful purpose, they could be removed where required.

The electrical cabling connecting the Slieveacurry Renewable Energy Development to the existing 110kV substation in the townland of Knockalassa will be removed from the underground cable ducting at the end of the useful life of the renewable energy development. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance for an underground element that is not visible.

A Decommissioning Plan has been prepared (Appendix 4-8) the detail of which will be agreed with the local authority prior to any decommissioning. The Decommissioning Plan will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will agreed with the competent authority at that time. The potential for effects during the decommissioning phase of the proposed renewable energy development has been fully assessed in the EIAR.

The impacts on biodiversity will also be similar in nature to those experienced during construction but on a far lesser scale and magnitude. There would be no additional or ancillary impacts associated with the decommissioning phase. The existing site roads would be used during decommissioning. The redundant underground cables will be pulled from their trenches without the requirement for significant excavation.

The same mitigation to prevent significant impacts on water quality and associated aquatic fauna and other terrestrial fauna during construction will be applicable to the decommissioning phase. A decommissioning plan is contained in the CEMP, Appendix 4-4 of this EIAR. The CEMP for the Proposed Development provides the details of the mitigation and best practice that will be employed to avoid any potential for significant residual effects on biodiversity during decommissioning of the Proposed Development. In addition, the measures incorporated into the construction phase, in Section 6.7.3 of this EIAR, including specific mitigation provided in relation to water quality in Chapter 9: 'Water', will be implemented during decommissioning. It can be concluded that following the implementation of preventative mitigation, there is no potential for the decommissioning of the Proposed Development to result in significant effects on biodiversity.

6.7.6 Monitoring Proposals

All the proposed monitoring that is set out in this EIAR Chapter and its appendices will be undertaken and the resulting reports will be sent to the local authority for review.

6.8 Cumulative impacts

The Proposed Development was considered in combination with other plans and projects in the area that could result in cumulative impacts on the Key Ecological Receptors (KERs) identified in Section 6.6.5 of this report, including European Sites, Nationally designated sites. This included a review of online Planning Registers and served to identify past, present 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.

6.8.1 Assessment of Plans

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

- › Clare County Development Plan 2017 -2023
- › National Biodiversity Action Plan 2017-2021
- › The Regional Planning Guidelines for the West 2010-2022

The review focused on policies and objectives that relate to designated sites for nature conservation, biodiversity and protected species. Policies and objectives relating to the conservation of peatlands and sustainable land use were also reviewed, particularly where the policies relate to the preservation of surface water quality. An overview of the search results with regard to plans is provided in Table 6-23.

European sites are considered in the Natura Impact Statement that accompanies this application.

Table 6-23 Assessment of Plans

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
Clare County Development Plan 2017 -2023	<p>CDP14.2 Development Plan Objective: European Sites</p> <p>It is an objective of the Development Plan:</p> <ul style="list-style-type: none"> A. To afford the highest level of protection to all designated European sites in accordance with the relevant Directives and legislation on such matters; B. To require all planning applications for development that may have (or cannot rule out) likely significant effects on European sites in view of the site’s Conservation Objectives, either in isolation or in combination with other plans or projects, to submit a Natura Impact Statement in accordance with the requirements of the EU Habitats Directive and the Planning and Development Act, 2000 (as amended); <p>To recognise and afford appropriate protection to any new or modified SPAs or SACs that are identified during the lifetime of this Plan, having regard to the fact that proposals for development outside of a European site may also have an indirect effect.</p>	<p>The Development plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the biodiversity, protected species and designated sites. A comprehensive Screening for Appropriate Assessment and Natura Impact Statement has been submitted along with this application.</p> <p>The Proposed Development has been designed in order to avoid peatland habitats where possible and where some loss has been identified; appropriate mitigation and enhancement measures have been incorporated into the Proposed Development through a Biodiversity Management and Enhancement Plan.</p>
	<p>CDP14.3 Development Plan Objective: Requirement for Appropriate Assessment under the Habitats Directive</p> <p>It is an objective of the Development Plan:</p> <ul style="list-style-type: none"> A. To implement Article 6(3) and where necessary Article 6(4) of the Habitats Directive and to ensure that Appropriate Assessment is carried out in relation to works, plans and projects likely to impact on European sites (SACs and SPAs), whether directly or indirectly or in combination with any other plan(s) or project(s). All assessments must be in compliance with the European Communities (Birds and Natural Habitats) Regulations 2011. <p>To have regard to ‘Appropriate Assessment of Plans and Projects in Ireland – Guidelines for Planning Authorities 2009’ or any updated version.</p>	<p>The Proposed Development is located outside of any Nationally designated sites, as described in Section 6.5.1.1.</p> <p>No potential for negative cumulative impacts when considered in conjunction with the current proposal were identified. No developments or projects identified within the Development Plan were found to occur in the wider area surrounding the Proposed Development.</p>
	<p>CDP14.11 Development Plan Objective: Habitat Protection</p> <p>It is an objective of the Development Plan:</p> <ul style="list-style-type: none"> A. To protect and promote the sustainable management of the natural heritage, flora and fauna of the County through the promotion of biodiversity, the conservation of natural habitats and the enhancement of new and existing habitats. 	<p>The Proposed Development has been designed in order to avoid peatland habitats where possible and where some loss has been identified; appropriate mitigation and enhancement measures have been</p>

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	<p>B. To promote the conservation of biodiversity through the protection of sites of biodiversity importance and wildlife corridors, both within and between the designated sites and the wider Plan area.</p> <p>To ensure that there is no net loss of potential Lesser Horseshoe Bat feeding habitats, treelines and hedgerows within 3km of known roosts.</p>	<p>incorporated into the Proposed Development through a Biodiversity Management and Enhancement Plan.</p>
	<p>CDP14.14 Development Plan Objective: Inland Waterways and River Corridor</p> <p>It is an objective of Clare County Council:</p> <ul style="list-style-type: none"> A. To work with all relevant stakeholders to protect and manage inland waters, river corridors and their floodplains, turloughs, lakes, fens and other water bodies from degradation and damage, and to recognise and promote them as natural assets and key elements in the green infrastructure network in the County; B. To protect riparian zones / areas, where appropriate, in the Plan area; C. To ensure that, where development occurs within a riparian zone, it does not have a negative impact on associated habitats and species; D. To work with all relevant stakeholders to protect and improve appropriate access to waterways and river corridors whilst ensuring their conservation and the protection of the resource and water quality; E. To have regard to the ‘Clare County Wetlands Survey 2008’ and other relevant documentation, including the ‘Convention on Wetlands of International Importance’ (Ramsar Convention), 1971 (ratified, 1984) and the ‘EU Communication – Wise Use and Conservation of Wetlands 1995’, in the assessment of developments; F. To encourage development proposals to Maintain an appropriate width for the riparian zone to be protected; • Improve appropriate access and compatible leisure activities; • Maintain and enhance the fishing potential for both local interests and tourism by protecting the natural spawning beds of trout and salmon; <p>To protect the County’s valuable inland fishery resource and support its sustainable development through the protection of water quality and facilitation of ancillary infrastructure at appropriate locations.</p>	<p>The Development plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the aquatic biodiversity, protected species and designated sites. The Proposed Development has been designed in order to avoid any potential impacts on aquatic species and their supporting habitats, both within and downstream of the EIAR study area boundary.</p> <p>No potential for negative cumulative impacts when considered in conjunction with the current proposal were identified.</p>

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	<p>CDP14.15 Development Plan Objective: Freshwater Pearl Mussels</p> <p>It is an objective of the Development Plan:</p> <ul style="list-style-type: none"> A. To have regard to the potential impacts of developments within or in close proximity to the Cloon River freshwater pearl mussel catchment including impacts arising from downstream within the Shannon Estuary and Clonderlaw Bay; B. To have regard to the Cloon Freshwater Pearl Mussel Sub-Basin Management Plan in the assessment of planning applications; C. To ensure careful consideration is given to all proposed developments within the Doonbeg, Shannon–Graney/Scarriff and the Shannon–Woodford Freshwater Pearl Mussel sensitive areas; <p>To ensure full compliance with Objective CDP2.1 in relation to any future developments with close proximity to a freshwater pearl mussel catchment or sensitive area.</p>	<p>The Proposed Development is located entirely outside of any <i>Margaritifera</i> Sensitive Area, as mapped by the NPWS.</p> <p>No potential for negative cumulative impacts when considered in conjunction with the current proposal were identified.</p>
National Biodiversity Action Plan 2017-2021	Target 6.2 - Sufficiency, coherence, connectivity and resilience of the protected areas network substantially enhanced by 2020.	<p>There will be no adverse effects designated sites or biodiversity as a result of the Proposed Development.</p> <p>The Proposed Development will not impact on connectivity within the wider area and will maintain watercourses within and adjacent to the development site in good condition.</p>
Regional Spatial & Economic Strategy for the Southern Region - 2040	<p>RPO 1 - Environmental Assessment</p> <p>a. Any reference to support for all plans, projects, activities and development in the RSES should be considered to refer to ‘environmentally sustainable development’ that has no adverse effects on the integrity of European sites and no net loss of biodiversity, that shall be subject to appropriate feasibility studies, best practice site/route selection (to consider environmental constraints such as landscape, cultural heritage, the protection of water quality, flood risks and biodiversity as a minimum), environmental assessment including EcIA to support development management and where required, the completion of statutory SEA, EIA and AA processes as appropriate</p> <p>b. The RSES seeks to protect, manage, and through enhanced ecological connectivity, improve the coherence of the Natura 2000 Network in the Southern Region.</p>	<p>The guidance document was comprehensively reviewed, with particular reference to policies and objectives that relate to the biodiversity, protected species and designated sites. A comprehensive Screening for Appropriate Assessment and Natura Impact Statement has been submitted along with this application.</p> <p>The Proposed Development has been designed in order to avoid peatland habitats where possible and where some loss has been identified; appropriate mitigation and enhancement measures have been</p>

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	<p>c. RSES support for other plans/ programmes (and initiatives arising) is on the basis of appropriate SEA, SFRA, EIA and AA processes being undertaken in order to ensure the avoidance of adverse effects on European Sites and ensure implementation of mitigation measures where required.</p> <p>d. Development Plans shall include an objective for the protection of European sites and Natural Heritage Areas (designated and notified proposed NHAs).</p>	<p>incorporated into the Proposed Development through a Biodiversity Management and Enhancement Plan.</p> <p>No potential for negative cumulative impacts when considered in conjunction with the current proposal were identified. No developments or projects identified within the Development Plan were found to occur in the wider area surrounding the Proposed Development.</p>

6.8.2 Assessment of Projects

As described in Section 2.2 of the EIAR, relevant projects have been assessed in-combination with the Proposed Development and include planning applications in the vicinity of the site, within the zone of influence of all habitats and species considered in this report, and include 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 the assessment with further detail provided below. In addition, Section 6.8.4 concludes on their potential for impact on biodiversity.

Other smaller developments within the wider study area, as fully described in Section 2.4.1 of this EIAR, have been considered within this cumulative impact assessment. In order to avoid repetition within the EIAR, these have not been repeated below.

For the purposes of this cumulative assessment wind farms within a 10-kilometre radius of the Proposed Development area were considered in further detail below. Wind farms occurring at greater distances were considered, however, given the nature of the KERs identified within the EIAR study area and that no significant residual effects were identified, further detailed analysis is not provided below:

- › Slievecallan Wind Farm, Co. Clare - Operational
- › Booltiagh Wind Farm, Co. Clare - Operational
- › Booltiagh Wind Farm Ext., Co. Clare - Operational
- › Glenmore, Wind Farm, Co. Clare – Constructed
- › Cahermurphy Wind Farm, Co. Clare – Proposed
- › Coor West Wind Farm, Co. Clare - Proposed

6.8.3 Existing Habitats and Land Uses

The potential for the Proposed Development to result in a cumulative loss or deterioration of habitats, or impact on the KER species identified, was considered in relation to the existing land uses in the area.

The Proposed Development is located in forestry habitats, which generally provide low value habitats for faunal species and some peatland habitats of County importance. The loss of peatland habitat that will be affected, will be fully mitigated through habitat enhancement and restoration proposed as part of this development. The Proposed Development will not contribute to any overall loss of high value habitat, it has been deliberately designed to be located on habitats of low value for faunal species.

6.8.4 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 in Sections 6.8.1 & 6.8.2. Particular focus has been placed on those plans and projects that are in closest proximity to the Proposed Development and those that could be potentially affected via downstream surface water.

Following the detailed surveys undertaken and impact assessment provided in Section 6.7, it is concluded that there will be no significant residual habitat loss, disturbance, deterioration of water quality etc., associated with the Proposed Development and therefore it cannot contribute to any cumulative effect when considered in combination with other plans and projects. The other wind farms in the area were considered (among other projects) but the Proposed Development has been deliberately designed to minimise the effects on biodiversity through the siting of the Proposed Development on habitats of low ecological value (four of the turbines located within conifer plantation forestry and the remainder on degraded cutover bog). The Proposed Development also includes a Biodiversity Management and Enhancement Plan, which further minimises / offsets any potential for individual or cumulative negative effects on biodiversity.

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 and plans 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.

6.9 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.