

6. BIODIVERSITY

6.1 Introduction

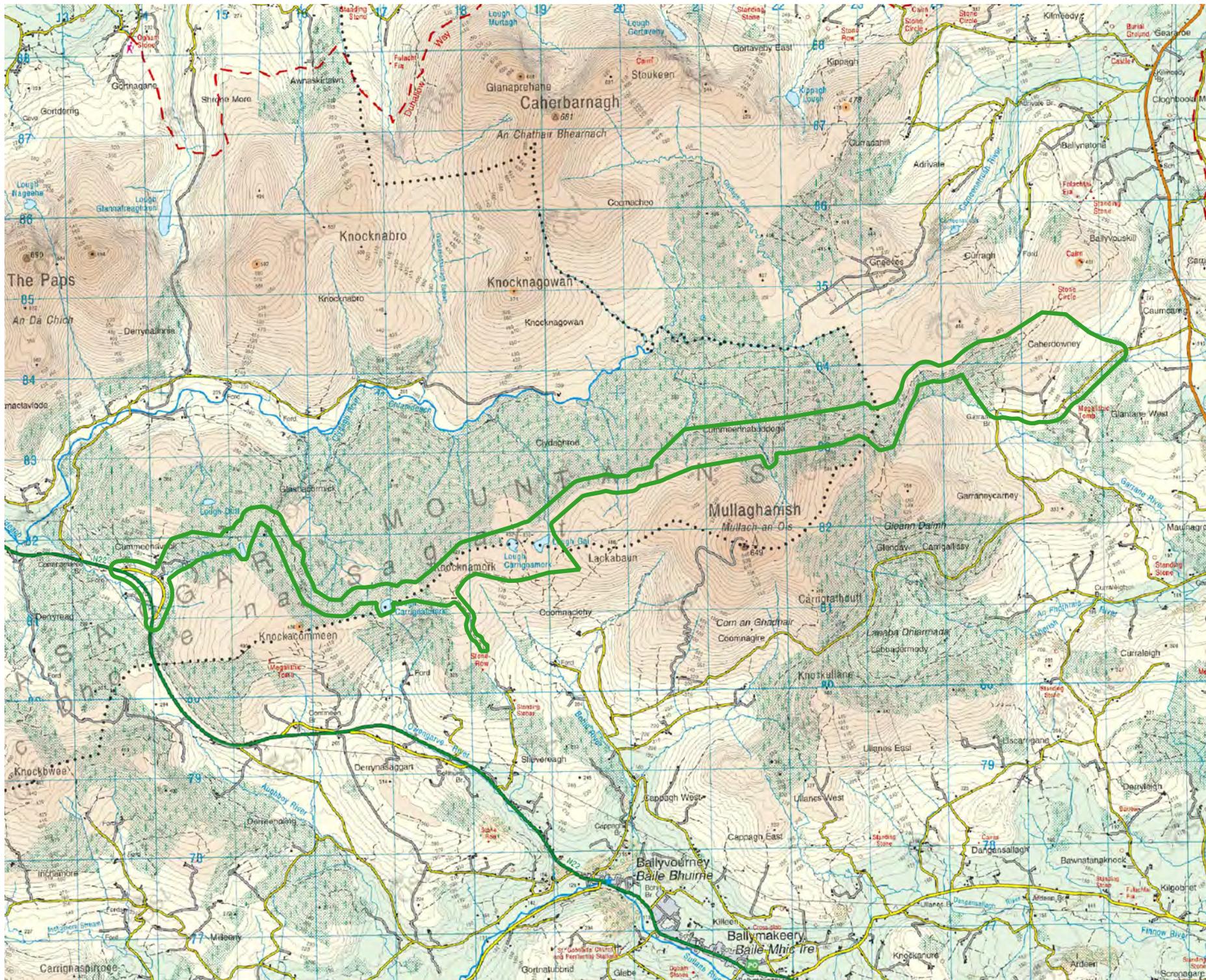
This chapter assesses the likely significant effects (both alone and cumulatively with other projects) that the Proposed Development may have on Biodiversity, Flora and Fauna and sets out the mitigation measures proposed to reduce or offset any potential significant effects that are identified. The residual impacts on biodiversity are then assessed. The full description of the Proposed Development is provided in Chapter 4 of this EIAR, Description.

The chapter is structured as follows:

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

The following defines terms utilised in this chapter:

- For the purposes of this EIAR, the entire proposed works are referred to as ‘the Proposed Development’.
- For the purpose of this EIAR, the term ‘EIAR Study Area’ refers to the site green line boundary as shown in Figure 6-1.
- The area actually covered by the Proposed Development is referred to as the ‘Development Footprint’
- “Key Ecological Receptor” (KER) is defined as a species or habitat occurring within the zone of influence of the Proposed 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



Drawing Title	
Site Location	
Project Title	
Proposed Substation Underground Cabling & Access Roads to Knocknagowan Renewable Energy Development	
Drawn By	Checked By
KME	PR
Project No.	Drawing No.
210732	Fig. 6-1
Scale	Date
1:100000	14.07.2022
 MKO Planning and Environmental Consultants Tuam Road, Galway Ireland, H91 WY84 +353 (0) 91 735611 email: info@mkofireland.ie Website: www.mkofireland.ie	

Microsoft product screen shots reprinted with permission from Microsoft Corporation
 Ordnance Survey Ireland Licence No. AR 0021820© Ordnance Survey Ireland/Government of Ireland

Requirements for Ecological Impact Assessment

National Legislation

The Wildlife Act, 1976–2021, 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.

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;
- Continue to produce guidance on the protection of biodiversity in designated areas, marine and the wider countryside for Local Authorities and relevant sectors;

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

- 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 EIAR 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 (as amended).

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

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

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

- Cork County Development Plan 2022 – 2028, accessed on 04/07/2022
- Kerry County Development Plan 2015-2021, accessed on 04/07/2022
- Draft Kerry County Development Plan 2022 – 2028, accessed on 04/07/2022
- National Biodiversity Action Plan 2017-2021, accessed on 04/07/2022

6.3.1 Statement of Authority

Baseline ecological surveys were undertaken by Kevin Mc Elduff (B.Sc. (Env.)) and Pdraig Desmond (B.Sc. (Eco.)) of MKO. Bat surveys were conducted by Keith Costello (B.Sc.), Cathal Bergin (B.Sc.) and Neil Campbell (B.Sc., M.Sc.) of MKO. All surveyors have the relevant academic qualifications and are competent experts in undertaking the ecological surveys in which they were involved.

This EIAR chapter has been prepared by Kevin Mc Elduff and Pdraig Desmond, and reviewed by Inga Reich (Honours degree Biology, Ph.D. Applied Ecology) and Pat Roberts (B.Sc., MCIEEM). Inga has over 5 years' postdoctoral experience in ecology and professional ecological consultancy and Pat has over 15 years' experience in ecological management and assessment.

6.4 Methodology

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

6.4.1 Desk Study

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

- Review of online web-mappers: National Parks and Wildlife Service (NPWS), EPA (Envision), Water Framework Directive (WFD), Inland Fisheries Ireland (IFI), National Bat Database of Ireland, National Lesser Horseshoe Bat Database, Geological Survey Ireland (GSI), National Monuments database, University of Bristol Spelaeological Society (UBSS) Cave Database for the Republic of Ireland.
- Review of Article 17 Reports for information on bat species' range and distribution.
- Data on potential occurrence of protected bryophytes – as per NPWS online map viewer; Flora Protection Order Map Viewer – Bryophytes².
- Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper
- Inland Fisheries Ireland (IFI) Reports, where available.
- Records from the NPWS web-mapper and review of specially requested records from the NPWS Rare and Protected Species Database for the hectads in which the Proposed Development is located.
- Review of existing reports and assessments in relation to the Permitted Development.

² NPWS, 2019, Online map viewer; Flora Protection Order Map Viewer – Bryophytes. Online, Available at: <http://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e>, Accessed: 26/06/2019.

6.4.2 Scoping and Consultation

MKO undertook a scoping exercise during preparation of this EIAR, as described in Chapter 2, Section 2.3 of this EIAR.

Copies of all scoping responses are included in Appendix 2–1 of this EIAR. The recommendations of the consultees have informed assessments undertaken and the contents of this chapter. Table 2-544 in Chapter 2 of this EIAR describes where the comments raised in the scoping responses received have been addressed in this assessment.

6.4.3 Field Surveys

Comprehensive surveys of the biodiversity of the entire site were undertaken on the 28th of September 2021, the 29th of September 2021, the 13th of January 2022, the 9th of February 2022, the 9th of May 2022 and the 10th of May 2022. Surveys were conducted throughout a range of seasons including optimum periods for vegetation surveys and habitat mapping, i.e. April to September (Smith et al., 2011). Bat surveys were carried out in August 2021.

The walkover surveys were also designed to detect the presence, or likely presence, of a range of protected species. The surveys included a search for signs of otter and areas of suitable habitat, potential features likely to be of significance to bats and additional habitat features for other protected species that are likely to occur in the vicinity of the Proposed Development.

The multi-disciplinary walkover surveys comprehensively covered the entire EIAR Study Area for features and locations of ecological significance. The 2021 and 2022 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.

6.4.3.1 Dedicated Habitat and Vegetation Composition Surveys

Habitats within the site were classified according to the guidelines set out in *'A Guide to Habitats in Ireland'* (Fossitt, 2000), which classifies habitats based on the vegetation present and management history. The extent of each habitat on site was mapped on site using aerial photography, handheld GPS and smartphone technology. A representative photograph was also taken for each of the habitats recorded on site.

The habitat assessment surveys described in this report, including EU Habitats Directive Annex I classification and condition assessment, have been undertaken with reference to the following guidelines and interpretation documents:

- Perrin, P.M, Martin, J.R., Barron, J.R., Roche & O'Hanrahan, B. (2014) Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland. Version 2.0. Irish Wildlife Manuals, No. 79. National Parks and Wildlife Service.
- O'Neill, F.H., 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.
- 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.

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

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 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 and otter were undertaken at the times set out below with the methodologies followed also provided below.

6.4.3.2.1 Bat Surveys

Bat Habitat Suitability Appraisal

Bat walkover surveys were carried out throughout 2021. During these surveys, habitats within the EIAR Study Area were assessed for their suitability to support roosting, foraging and commuting bats. Connectivity with the wider landscape was also considered. Suitability was assessed according to Collins (2016) which provides a grading protocol for roosting habitats and for commuting and foraging areas. Suitability categories are divided into *High*, *Moderate*, *Low* and *Negligible*, and are described fully in Collins (2016).

Roost Surveys

A search for roosts was undertaken within the Proposed Development site. The aim was to determine the presence of roosting bats and the need for further survey work or mitigation. The site was visited on multiple occasions in August 2021. A walkover was carried out and all structures and trees were assessed for their potential to support roosting bats (see Collins (2016) for criteria in assessing roosting habitats).

Any potential roost sites were subject to a roost assessment. This comprised a detailed inspection of the exterior and interior (if accessible) to look for evidence of bat use, including live and dead specimens, droppings, feeding remains, urine splashes, fur oil staining and noises.

Any potential tree roosts were examined for the presence of rot holes, hazard beams, cracks and splits, partially detached bark, knot holes, gaps between overlapping branches and any other potential roost features (i.e. PRFs) identified by Andrews (2018).

No structures were identified within the boundary of the Proposed Development and no trees with high quality PRFs were identified within the Proposed Development site.

Manual Transect Surveys

Manual activity surveys comprised walked transects at dusk. A series of representative transect routes were selected throughout the Proposed Development site. The aim of the surveys was to identify if

there were bats present at the site, what bat species were present and to gather any information on bat foraging and commuting behaviour. Two dusk surveys were carried out in August 2021 (Table 6-1).

Two surveyors were equipped with active full spectrum bat detector, a Batlogger M (Elekon, Lucerne, Switzerland). Where possible, species identification was made in the field and any other relevant information was also noted, e.g. numbers, behaviour, features used, etc. All bat echolocation was recorded for subsequent analysis to confirm species identifications.

The dusk surveys commenced 30 minutes before sunset and were completed for 2 hours after sunset. Conditions were suitable for all bat surveys completed at the site (Table 6-1).

Table 6-1 Bat Activity Survey Effort 2021

Date	Surveyor	Type	Sunrise/Sunset	Weather
4 th August 2021	Keith Costello and Cathal Bergin	Dusk	21:21	15° C, Dry-Drizzle, Light-gentle breeze
23 rd August 2021	Keith Costello and Cathal Bergin	Dusk	20:43	15° C, Dry, Light-gentle breeze

Ground-level Static Detector Surveys

Full spectrum bat detectors, Song Meter SM4 and SM4 Mini (Wildlife Acoustics, Maynard, MA, USA), were deployed during static surveys to record bat activity at four fixed locations over a two-week period in August 2021. The locations of static detectors were selected to represent the range of habitats present within the site, including favourable bat habitats. Settings used were those recommended by the manufacturer for bats, with minor adjustments in gain settings and band pass filters to reduce background noise when recording. Detectors were set to record from 30 minutes before sunset until 30 minutes after sunrise. The Song Meter automatically adjusts sunset and sunrise times using the Solar Calculation Method when provided with GPS coordinates.

The survey was designed to utilise four static detectors to monitor bat activity. The detectors were deployed on site on the 4th August until 23rd August 2021.

Analysis of Static Detector Results

Echolocation signal characteristics (including signal shape, peak frequency of maximum energy, signal slope, pulse duration, start frequency, end frequency, pulse bandwidth, inter-pulse interval and power spectra) were compared to published signal characteristics for local bat species (Russ, 1999). Myotis species (potentially Daubenton's bat (*M. daubentonii*), Whiskered bat (*M. mystacinus*), Natterer's bat (*M. nattereri*)) were considered as a single group, due to the difficulty in distinguishing them based on echolocation parameters alone (Russ, 1999). The echolocation of Soprano pipistrelle (*P. pygmaeus*) and Common pipistrelle (*P. pipistrellus*) are distinguished by having distinct (peak frequency of maximum energy in search flight) of ~55 kHz and ~46 kHz respectively (Jones & van Parijs, 1993).

Individual bats of the same species cannot be distinguished by their echolocation alone. Thus, 'bat passes' was used as a measure of activity (Collins, 2016). For the purposes of this survey, a bat pass was defined as a recording of an individual species/species group's echolocation containing at least two echolocation pulses and of maximum 15 seconds length.

6.4.3.3 Aquatic surveys

6.4.3.3.1 Otter and Aquatic Habitat Suitability Surveys

There are seven EPA mapped watercourse crossings associated with the proposed works, with six crossings associated with the proposed underground electrical cabling route and the remaining crossing associated with the proposed Turbine Delivery Route (TDR). Table 4-2 in Chapter 4 of this EIAR,

Description has numbered the six watercourse crossings associated with the proposed underground electrical cabling route (33kV and 110kV) from 1 to 6, with watercourse crossing no. 1 being the most westerly crossing and watercourse crossing no. 6 being the most easterly crossing.

Otter surveys were conducted as per NRA (2009) guidelines ‘*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*’. This involved a search for all otter signs e.g. spraints, scat, prints, slides, trails, couches and holts. In addition to the width of the rivers/watercourses, a 10m riparian buffer (both banks) was considered to comprise part of the otter habitat (NPWS 2009). The dedicated otter surveys 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, 2013).

All seven EPA mapped watercourse crossings were surveyed for signs of otter. Otter surveys at these water crossings involved visual inspection of the watercourse and associated verge habitat for a length of 150m upstream and downstream of the footprint of the Proposed Development as per guidance set out in NRA Guidelines for the Treatment of otters prior to the Construction of National Road Schemes. All other watercourses and waterbodies within 150m of the footprint of the Proposed Development were also surveyed for signs of otter for a length of approximately 150m upstream and downstream of the closest point of the watercourse to the footprint of the Proposed Development. No Signs of otter were recorded during the dedicated otter surveys of the watercourses that drain the EIAR Study Area boundary.

Habitat suitability for protected aquatic species of conservation interest which are known or suspected to occur within the EIAR Study Area (e.g. fish species, otter etc.) were conducted at each of the seven small EPA mapped watercourses that are crossed by the Proposed Development footprint. Stream characterisation was carried out at the seven watercourse crossings associated with the footprint of the proposed works. Characteristics such as flow rate, substrate, depth, width and associated vegetation were assessed during these surveys.

6.4.3.4 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).

6.4.4 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 KERs. Following a comprehensive desk study, initial site visits (main ecological surveys) of the site were undertaken on the 28th and 29th September 2021 by Kevin McElduff; “Target receptors” likely to occur in the zone of influence of the Proposed Development were identified. The target receptors included habitats and species that were protected under the following legislation:

- Annexes of the EU Habitats Directive.
- Qualifying Interests (QI) of Special Areas of Conservation (SAC) within the likely zone of impact.
- Species protected under the Wildlife Acts 1976-2021.
- 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 EIAR 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 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 KERs.

6.4.4.3 Characterisation of Impacts and Effects

The Proposed Development will result in a number of potential 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 (Guidelines on the information to be contained in Environmental Impact Assessment Reports, EPA 2022). 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 KERs 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 *Guidelines on information to be included in Environmental Impact Assessment Reports* (EPA, 2022) 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 EPA Guidelines (2022) as shown in Table 6-2.

Table 6-2 Criteria for determining significance of effect, based on (EPA, 2022) 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).

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.

6.4.4.6 Limitations

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

6.5 Establishing the Ecological Baseline

6.5.1 Desk Study

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

6.5.1.1 Designated Sites

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

The potential for the Proposed Development to impact on sites that are designated for nature conservation was considered in this 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 2022:

"A biodiversity section of an EIAR, for example, should not repeat the detailed assessment of potential effects on European sites contained in documentation prepared as part of the Appropriate Assessment process, but it should refer to the findings of that separate assessment in the context of likely significant effects on the environment, as required by the EIA Directive."

Section 6.7.2 of this EIAR provides a summary of the key assessment findings with regard to European Designated Sites.

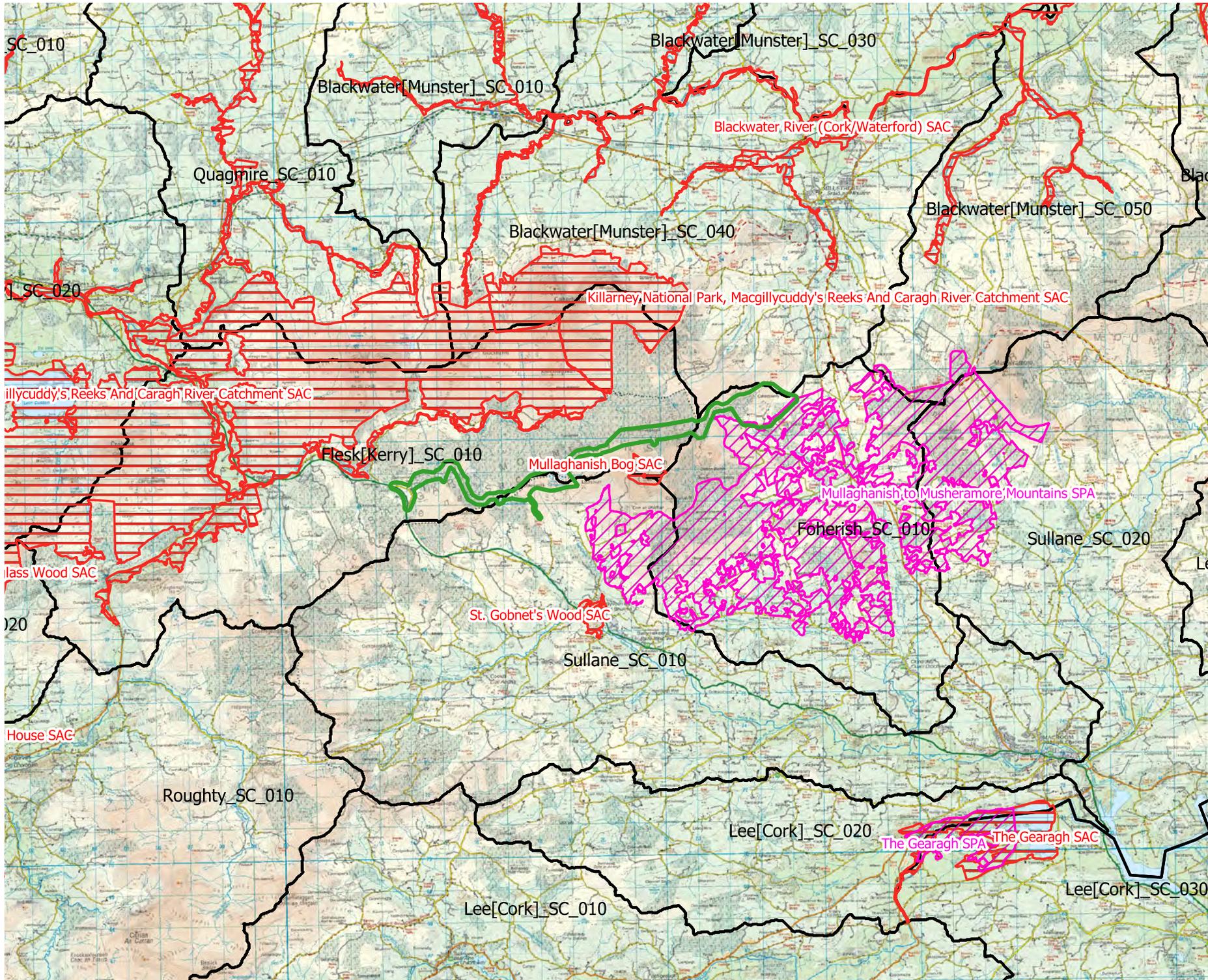
Natural Heritage Areas (NHAs) are designated under Section 18 the Wildlife (Amendment) Act 2000 and their management and protection is provided for by this legislation and planning policy. The

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 07/04/2022. The datasets were utilised to identify Designated Sites which could feasibly be affected by the Proposed Development.
- All Designated Sites that could potentially be affected were identified using a source-pathway - receptor model. To provide context for the assessment, European and National Sites within a distance of 15km surrounding the Proposed Development site are shown on Figures 6-2 and 6-3 respectively.
- Information on European Sites is provided in the AA Screening Report that accompanies this application and the 'Screened In' European Sites are listed below. Table 6-3 provides information on Nationally Designated Sites in the vicinity of the Proposed Development.
- Sites that were further away from the Proposed Development were also considered and in this case connectivity with sites that were further than 15km downstream in the catchment were identified but given the nature, scale and location of the Proposed Development and the attenuating properties of the intervening waterbodies, no potential pathway for significant effects was identified.
- **Error! Reference source not found.** provides details of all relevant designated sites as identified in the preceding steps and assesses which are within the likely Zone of Impact. All relevant 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 05/05/2022.

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



Map Legend

- EIAR Study Boundary
- SAC
- SPA
- Groundwater subcatchments

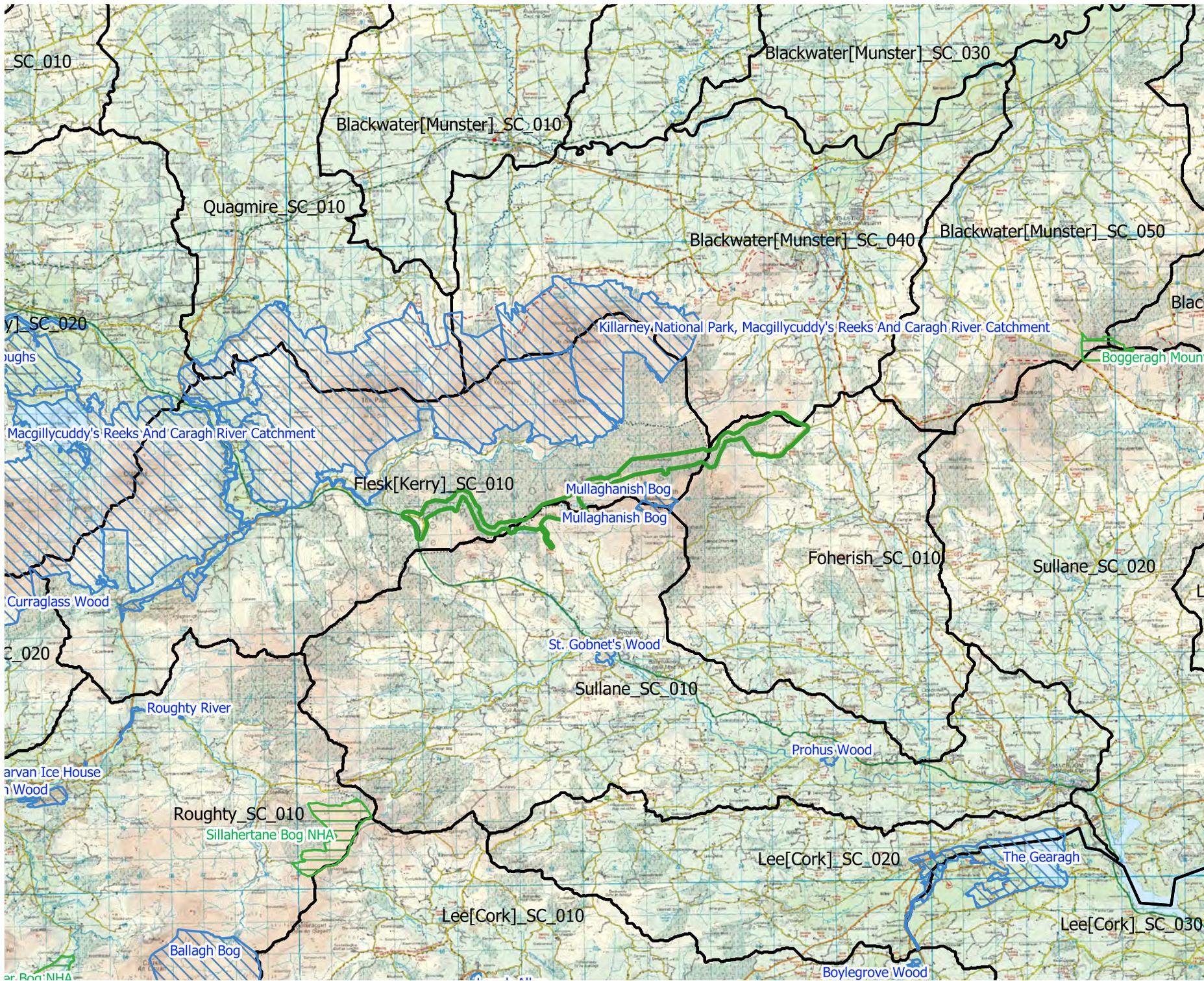
Microsoft product screen shots reprinted with permission from Microsoft Corporation
 Ordnance Survey Ireland Licence No. AR 0021820 © Ordnance Survey Ireland/Government of Ireland

Drawing Title
 European Designated Sites within the vicinity of the Proposed Development

Project Title
 Proposed Substation Underground Cabling & Access Roads to Knocknamark Renewable Energy Development

Drawn By KME	Checked By PR
Project No. 210732	Drawing No. Fig. 6-2
Scale 1:250000	Date 14.07.2022

MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW84
 +353 (0) 91 735611
 email: info@mkofireland.ie
 Website: www.mkofireland.ie



Map Legend

- EIAR Study Boundary
- NHA
- pNHA
- Groundwater subcatchments

Microsoft product is screen shots reprinted with permission from Microsoft Corporation
Ordnance Survey Ireland Licence No. AR 0021820© Ordnance Survey Ireland/Government of Ireland

Drawing Title
Nationally Designated Sites within the vicinity of the Proposed Development
 Project Title
 Proposed Substation Underground Cabling & Access Roads to
 Knocknarek Renewable Energy Development

Drawn By	Checked By
KME	PR
Project No.	Drawing No.
210732	Fig. 6-3
Scale	Date
1:250000	14.07.2022

MKO
 Planning and
 Environmental
 Consultants
 Tuam Road, Galway
 Ireland, H91 VW84
 +353 (0) 91 735611
 email: info@mkofireland.ie
 Website: www.mkofireland.ie

Table 6-3 Identification of Nationally designated sites within the Likely Zone of Impact

Designated Site	Distance from Proposed Development (km)	Likely Zone of Impact Determination
Natural Heritage Areas (NHA)		
Sillahertane Bog NHA [001882]	8.3km	The Proposed Development is located outside of this Designated Site and there is no potential for direct effect. Due to the terrestrial nature of the site and the intervening distance between the site and the Proposed Development, no pathway for indirect effects exists. No pathway for effect was identified and the site is not within the Likely Zone of Impact.
Boggeragh Mountains NHA [002447]	8.9km	The Proposed Development is located outside of this Designated Site and there is no potential for direct effect. Due to the lack of surface water connectivity and the intervening distance between the site and the Proposed Development, no pathway for indirect effects exists. No pathway for effect was identified and the site is not within the Likely Zone of Impact.
proposed Natural Heritage Areas (pNHA)		
Mullaghanish Bog pNHA [001890]	0.3km	The Proposed Development is located outside of this Designated Site and there is no potential for direct effect. This pNHA is terrestrial in nature and is located upstream of the Proposed Development and due to the nature and scale of the works in proximity to the pNHA, there is no potential for habitat deterioration through drainage or any other mechanism. No pathway for indirect effects exists. No pathway for effect was identified and the site is not within the Likely Zone of Impact.
Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment pNHA [000365]	1km	The Proposed Development is located outside of this Designated Site and there is no potential for direct effect. Downstream surface connectivity with the pNHA has been identified via tributaries of the Caragh River and there is potential for deterioration of water quality during the construction phase of the Proposed Development. A pathway for effect was identified and the site is within the Likely Zone of Impact.
St. Gobnet's Wood pNHA [000106]	3.2km	The Proposed Development is located outside of this Designated Site and there is no potential for direct effect.

Designated Site	Distance from Proposed Development (km)	Likely Zone of Impact Determination
		There is surface water connectivity between the Proposed Development and this pNHA via watercourses that flow from the EIAR Study Area to the Sullane River, upon the banks of which, the pNHA is situated. However, due to the terrestrial nature of the site, no pathway for indirect effects exists. No pathway for effect was identified and the site is not within the Likely Zone of Impact.
Roughy River pNHA [001376]	9.3km	The Proposed Development is located outside of this Designated Site and there is no potential for direct effect. Due to the lack of surface water connectivity and the intervening distance between the site and the Proposed Development, no pathway for indirect effects exists. No pathway for effect was identified and the site is not within the Likely Zone of Impact.
Prohus Wood pNHA [001248]	9.4km	The Proposed Development is located outside of this Designated Site and there is no potential for direct effect. Due to the terrestrial nature of the site, no pathway for indirect effects exists. No pathway for effect was identified and the site is not within the Likely Zone of Impact.
Old Domestic Building, Curraglass Wood pNHA [002041]	9.7km	The Proposed Development is located outside of this Designated Site and there is no potential for direct effect. Due to the terrestrial nature of the site and the intervening distance between the site and the Proposed Development, no pathway for indirect effects exists. No pathway for effect was identified and the site is not within the Likely Zone of Impact.
Doo Loughs pNHA [000350]	11km	The Proposed Development is located outside of this Designated Site and there is no potential for direct effect. Due to the lack of surface water connectivity and the intervening distance between the site and the Proposed Development, no pathway for indirect effects exists. No pathway for effect was identified and the site is not within the Likely Zone of Impact.
Kilgarvan Ice House pNHA [000364]	12.7km	The Proposed Development is located outside of this Designated Site and there is no potential for direct effect. Due to the terrestrial nature of the site and the intervening distance between the site and the Proposed Development, no pathway for indirect effects exists. No pathway for effect was identified and the site is not within the Likely Zone of Impact.

Designated Site	Distance from Proposed Development (km)	Likely Zone of Impact Determination
The Gearagh pNHA [000108]	13.2km	<p>The Proposed Development is located outside of this Designated Site and there is no potential for direct effect.</p> <p>The Proposed Development is located in a separate hydrological catchment. Due to the lack of hydrological connectivity and the intervening distance between the site and the Proposed Development, no pathway for indirect effects exists. No pathway for effect was identified and the site is not within the Likely Zone of Impact.</p>
Lough Allua pNHA [001065]	13.5km	<p>The Proposed Development is located outside of this Designated Site and there is no potential for direct effect.</p> <p>The Proposed Development is located in a separate hydrological catchment. Due to the lack of hydrological connectivity and the intervening distance between the site and the Proposed Development, no pathway for indirect effects exists. No pathway for effect was identified and the site is not within the Likely Zone of Impact.</p>
Kilgarvan Wood pNHA [001787]	13.6km	<p>The Proposed Development is located outside of this Designated Site and there is no potential for direct effect.</p> <p>Due to the terrestrial nature of the site, no pathway for indirect effects exists. No pathway for effect was identified and the site is not within the Likely Zone of Impact.</p>
Ballagh Bog pNHA [001886]	13.7km	<p>The Proposed Development is located outside of this Designated Site and there is no potential for direct effect.</p> <p>Due to the lack of surface water connectivity and the intervening distance between the site and the Proposed Development, no pathway for indirect effects exists. No pathway for effect was identified and the site is not within the Likely Zone of Impact.</p>

Potential for significant indirect effects as a result of pollution of surface water during the construction phase of the Proposed Development were identified in respect of The Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment pNHA [000365] which is located approximately 1km downstream of the Proposed Development and connected via tributaries of the Caragh River. This pNHA overlaps with three European sites (Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment SAC, Killarney National Park SPA and Erik bog SPA). Impacts on the pNHA within the ZOI are further described in Section 6.7.2 of this Chapter. There is no pathway for significant effects between the Proposed Development and any other pNHAs

Potential for effects on European sites is summarised in this report and is fully addressed in the Natura Impact Statement submitted as part of the application. The AA Screening that accompanies this application also identify the following European Sites as being within the Likely Zone of Impact:

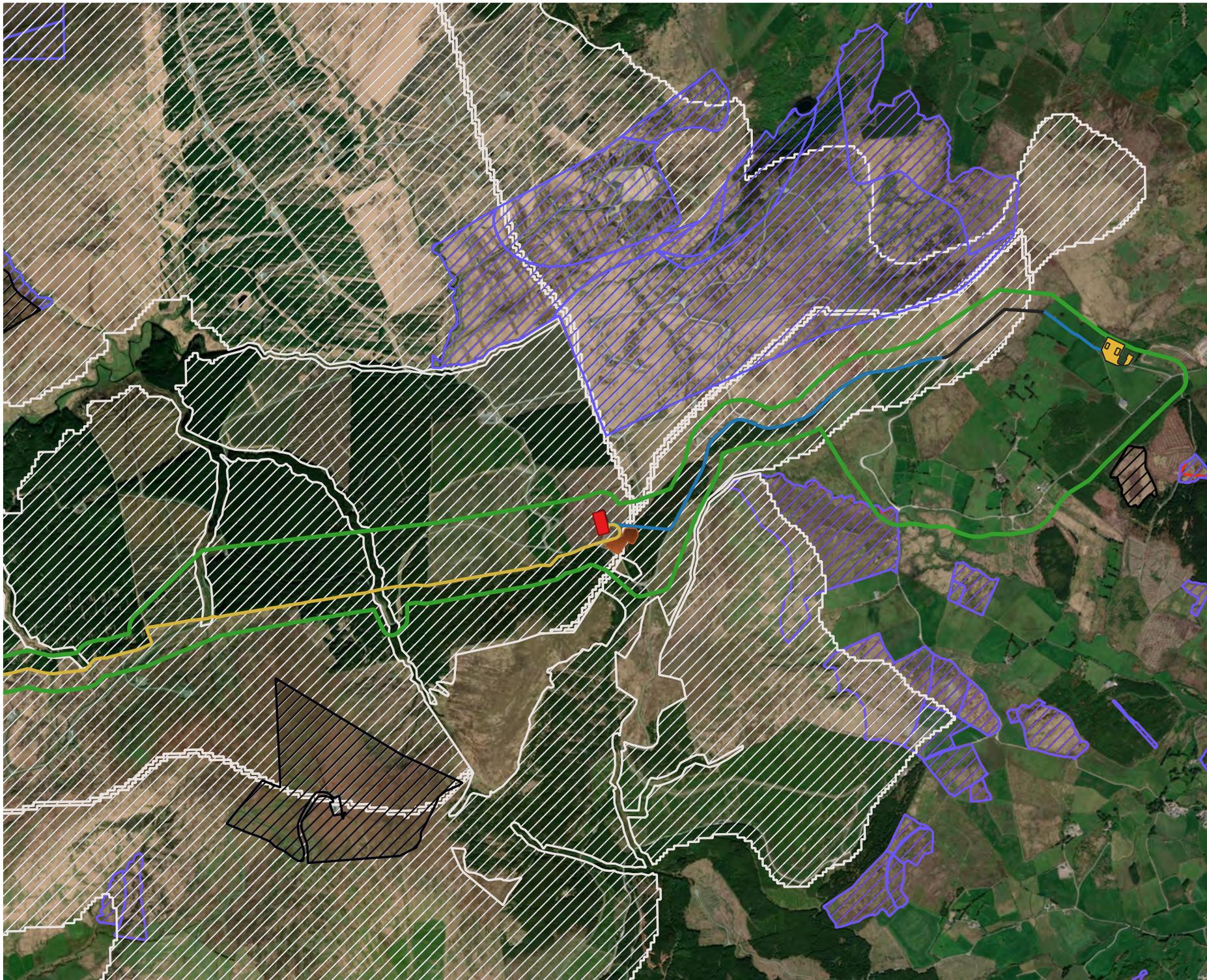
- Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment SAC [000365]
- Mullaghanish to Musheramore Mountains SPA [004162]

Impacts on these sites are fully considered under the European designation within the NIS.

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 were conducted prior to undertaking the multi-disciplinary walkover survey.

Available NPWS datasets were downloaded and overlain on the Proposed Development area. Whilst the mapping shows much of the EIAR Study Area to comprise Alpine/ Subalpine heath, Dry heath and Wet heath, ground truthing revealed that much of this mapping was inaccurate and also covered areas of Conifer plantation (WD4), Recolonising bare ground (ED3) and Buildings and artificial surfaces (BL3). Figures 6-4A and 6-4B, below, show Article 17 habitats within the EIAR Study Area. Figures 6-5A - 6-5H below show an accurate view of the habitats within the EIAR Study Area.



- ### Map Legend
- EIAR Study Boundary
 - 33kV Underground Cabling and Access Roads
 - 110kV Underground Cabling
 - 110kV Underground Cabling and Access Road
 - Ballyvouskill 220kV Substation
 - Proposed 110kV Substation Location
 - Proposed Borrow Pit
 - Active Blanket Bog
 - Alpine and Subalpine Heath
 - Dry Heath
 - Wet Heath

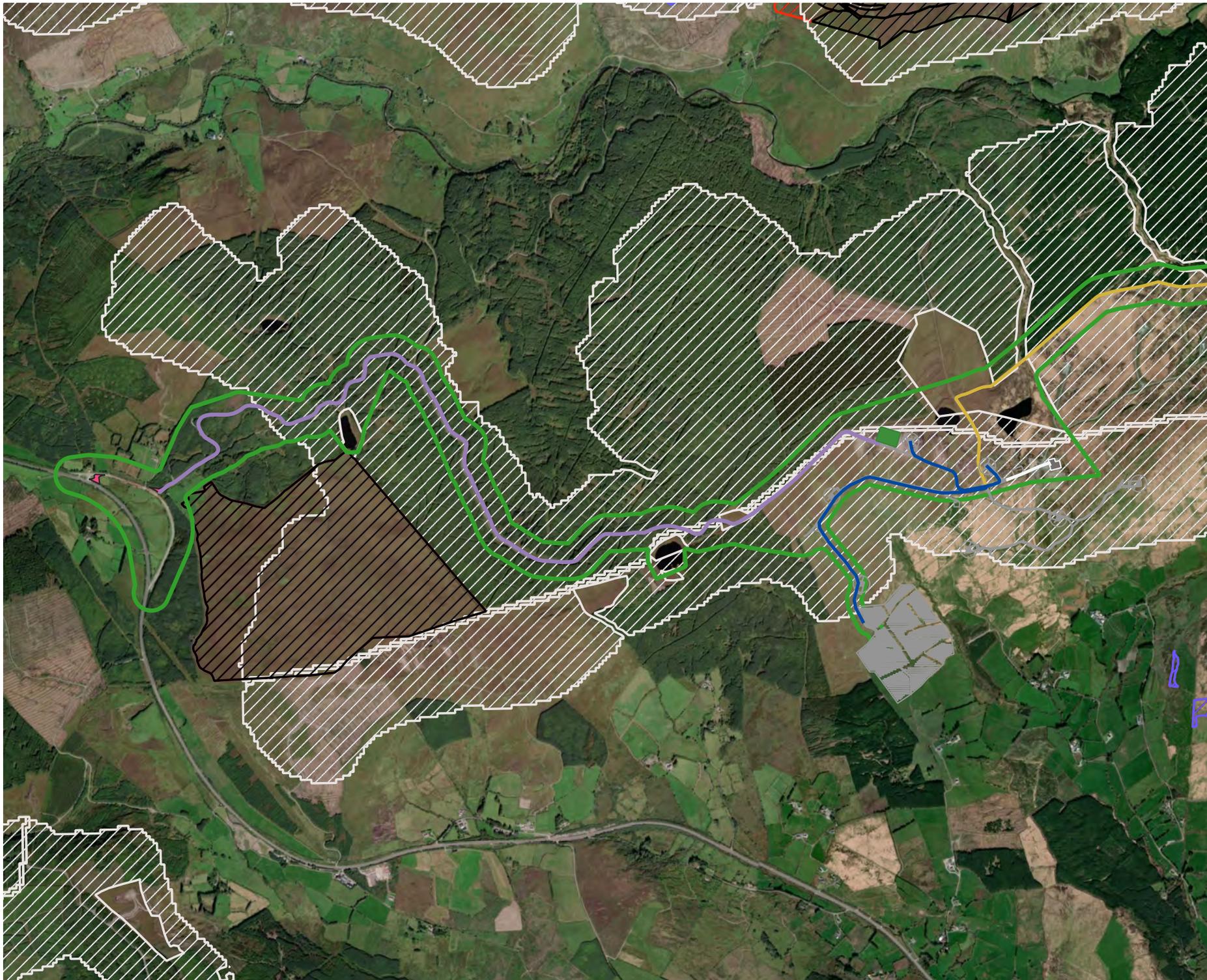
Microsoft product screen shots reprinted with permission from Microsoft Corporation

Drawing Title
Article 17 Habitats within the Proposed Development

Project Title
 Proposed Substation, Underground Cabling & Access Roads to
 Knocknarek Renewable Energy Development

Drawn By KME	Checked By PR
Project No. 210732	Drawing No. Fig. 6-4A
Scale 1:45000	Date 14.07.2022

MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW84
 +353 (0) 91 735611
 email: info@mkofireland.ie
 Website: www.mkofireland.ie



- ### Map Legend
- EIAR Study Boundary
 - Access Road (Upgrade & New)
 - Temp. Road
 - 33kV Underground Cabling and Access Roads
 - 33kV Underground Cabling within the Permitted Development
 - Permitted Borrow Pit Extension
 - Omitted 38kV Electrical Substation and Battery Storage Compound
 - Knocknamork Permitted Development
 - Active Blanket Bog
 - Alpine and Subalpine Heath
 - Dry Heath
 - Wet Heath

Microsoft product screen shots reprinted with permission from Microsoft Corporation



Drawing Title
Article 17 Habitats within the Proposed Development

Project Title
 Proposed Substation Underground Cabling & Access Roads to Knocknamork Renewable Energy Development

Drawn By KME	Checked By PR
Project No. 210732	Drawing No. Fig. 6-4B
Scale 1:45000	Date 14.07.2022

MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW84
 +353 (0) 91 735611
 email: info@mkofireland.ie
 Website: www.mkofireland.ie

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 I of the EU Habitats Directive, The Irish Red Data Book, 1, Vascular Plants (Wyse Jackson et al., 2016) or the Flora (Protection) Order ((FPO) 1999, as amended 2015) had been recorded in the relevant 10km squares in which the EIAR Study Area is situated (W18 and W28). Each hectad contains 100 whole 1km squares containing terrestrial habitats. Species of conservation concern are given in Table 6-4. No species listed in Annex II of the Habitats Directive are shown in the atlas for squares W18 and W28.

Table 6-4 Species listed designated under the Flora Protection Order or the Irish Red Data Book within Hectad W18 and W28

Common Name	Scientific Name	Hectad	Status
Chamomile	<i>Chamaemelum nobile</i>	W18	NT
Long Beech Fern	<i>Phegopteris connectilis</i>	W18, W28	NT
Corn Marigold	<i>Chrysanthemum segetum</i>	W28	NT
Ivy-leaved Bellflower	<i>Wahlenbergia hederacea</i>	W18	NT
Heath Cudweed	<i>Gnaphalium sylvaticum</i>	W28	EN, FPO
Green Field-speedwell	<i>Veronica agrestis</i>	W18, W28	NT
Stag's Horn Clubmoss	<i>Lycopodium clavatum</i>	W28	NT

Red List of Irish Flowering Plants (Wyse Jackson et al., 2016), EN – Endangered, NT – Near Threatened, FPO – Floral Protection Order

6.5.1.4 Bryophytes

A search of the NPWS online data map for bryophytes (NPWS, 2018) was also undertaken with no protected bryophytes recorded within or adjacent to the Proposed Development site.

6.5.1.5 National Biodiversity Data Centre (NBDC) Records

A search of the National Biodiversity Data Centre (NBDC) website was conducted on the 8th December 2021. This helped to inform survey effort and provide a baseline of likely species composition in the area. Records of protected fauna recorded from hectads W18 and W28 are provided in Table 6-5.

Table 6-5 NBDC records for species of conservation interest in hectads W18 and W28

Common name	Scientific name	Designation	Hectad
Common Frog	<i>Rana temporaria</i>	HD Annex V, WA	W28, W18
Hen Harrier	<i>Circus cyaneus</i>	BD Annex I	W28, W18
Eurasian Teal	<i>Anas crecca</i>	BD Annex II, BOCCI Amber List	W18, W28
Mallard	<i>Anas platyrhynchos</i>	BD Annex II, III	W18, W28
Fir Clubmoss	<i>Huperzia selago</i>	HD Annex V	W28, W18
Brown long-eared bat	<i>Plecotus auritus</i>	HD Annex IV, WA	W28, W18

Common name	Scientific name	Designation	Hectad
Pipistrelle	<i>Pipistrellus pipistrellus</i> sensu lato	HD Annex IV, WA	W18
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	HD Annex IV, WA	W28, W18
Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>	HD Annex II, IV, WA	W18
Lesser Noctule	<i>Nyctalus leisleri</i>	HD Annex IV, WA	W18
European Otter	<i>Lutra Lutra</i>	HD Annex II, IV, WA	W28, W18
Kerry Slug	<i>Geomalacus geomalacus</i>	HD Annex II, IV, WA	W18
Pine Martin	<i>Martes martes</i>	HD Annex V, WA	W18

HD = EU Habitats Directive; WA = Wildlife Acts (Ireland); BOCCI = Birds of Conservation Concern Ireland; WA = Wildlife Act

6.5.1.6 NPWS

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 W18 and W28. An information request was also sent to the NPWS scientific data unit requesting records from the Rare and Protected Species Database on the 9th December 2021. A response was received on the 31st of December 2021. Table 6-6 lists rare and protected species records obtained from NPWS.

Table 6-6 NPWS records for rare and protected species

Common name	Scientific name	Designation	Hectad
Ivy-leaved Bellflower	<i>Wahlenbergia hederacea</i>	Red List (NT)	W18
Bog Orchid	<i>Hammarbya paludosa</i>	Red List (NT), FPO	W18
Hen Harrier	<i>Circus cyaneus</i>	BD Annex I	W18, W28
Peregrine Falcon	<i>Falco peregrinus</i>	BD Annex I	W18, W28
Kerry Slug	<i>Geomalacus maculosus</i>	HD Annex II, IV, WA	W18
Sika Deer	<i>Cervus nippon</i>	WA	W18, W28
Common frog	<i>Rana temporaria</i>	HD Annex V, WA	W18, W28
European Otter	<i>Lutra lutra</i>	HD Annex II, IV, WA	W18
Eurasian Badger	<i>Meles meles</i>	WA	W18
Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>	HD Annex II, IV, WA	W18

NT = Near Threatened; FPO = Flora Protection Order; WA = Wildlife Act; BD = Birds Directive; HD = Habitats Directive.

6.5.1.7 Bats

Bat Records

The National Bat Database of Ireland holds records of bat observations received and maintained by BCI. These records include results of national monitoring schemes, roost records as well as ad-hoc observations. The most recent search examined bat presence and roost records within a 10 km radius

of the Proposed Development (BCI 2012, Hundt 2012, NatureScot, 2021). Results from the National Biodiversity Data Centre were also reviewed for bat species present within the relevant 10km grid squares of the Proposed Development.

A review of the National Bat Database of Ireland was made on the 8th June 2022 yielded results of bats within a 10km radius of the EIAR Study Area. The search yielded five bat species within 10km. Table 6-7 lists the bat species recorded within the hectad which pertains to the current study area (W18 and W28).

Table 6-7 NBDC Bat Records

Hectad	Species	Database	Status
W18 & W28	Brown long-eared bat <i>Plecotus auritus</i>	National Bat Database of Ireland	HD Annex II & IV, WA
W18	Lesser horseshoe bat <i>Rhinolophus hipposideros</i>	National Bat Database of Ireland	HD Annex II & IV, WA
W18	Leisler's bat <i>Nyctalus leisleri</i>	National Bat Database of Ireland	HD Annex IV, WA
W18	Common pipistrelle <i>Pipistrellus pipistrellus</i>	National Bat Database of Ireland	HD Annex IV, WA
W18 & W28	Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	National Bat Database of Ireland	HD Annex IV, WA

Bat Species' Range

EU member states are obliged to monitor the conservation status of natural habitats and species listed in the Annexes of the Habitats Directive. Under Article 17, they are required to report to the European Commission every six years. In April 2019, Ireland submitted the third assessment of conservation status for Annex-listed habitats and species, including all species of bats (NPWS, 2019).

The 2019 Article 17 Reports were reviewed for information on bat species' range and distribution in relation to the location of the Proposed Development. The aim was to identify any high-risk species at the edge of their range (NatureScot, 2021).

The potential for negative impacts is likely to increase where there are high risk species at the edge of their range (NatureScot, 2021). Therefore, range maps presented in the 2019 Article 17 Reports (NPWS, 2019) were reviewed in relation to the location of the Proposed Development.

The Proposed Development site is located outside the current known range for Lesser horseshoe bat and Natterer's bat, and partially outside (W28) the known range for Nathusius' pipistrelle. The Proposed Development site is within the range of all other species.

Designated Sites

The National Parks and Wildlife Service (NPWS) map viewer and website provides information on rare and protected species, sites designated for nature conservation and their conservation objectives. A search was undertaken of sites designated for the conservation of bats within a 10 km radius of the EIAR Study Area (BCI 2012, Hundt, 2012, NatureScot, 2021). This included European designated sites, i.e. SACs, and nationally designated sites, i.e. NHAs and pNHAs.

Within Ireland, the Lesser horseshoe bat is the only bat species requiring the designation of Special Areas of Conservation (SACs) and the site is situated within the known range of this species.

A brief description of these designated sites is provided in Table 6-8. The Lesser horseshoe bat roosts for which the SACs have been designated, are significantly outside the core foraging range (2.5km) of

Lesser Horseshoe bat (NPWS, 2013). There is therefore no potential for significant effect on the Lesser horseshoe bat population for which the SACs have been designated.

Table 6-8 Sites Designated for Conservation of Bats within 10km

Designated Site	Bat Species of Interest	Description	Distance
Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC [000365]	Lesser horseshoe bat	Nursery and Hibernation roosts	16.2km
Old Domestic Building, Curraglass Wood SAC [002041]	Lesser horseshoe bat	Nursery roost	9.7km

Landscape Features

Geological Survey Ireland, National Monuments Database and UBSS Cave Database

The Geological Survey Ireland (GSI) online mapping tool and University of Bristol Speleological Society (UBSS) Cave Database for the Republic of Ireland were consulted for any indication of natural subterranean bat sites, such as caves, within 10 km of the Proposed Development site (BCI, 2012) (last searched on the 8th June 2022). Furthermore, the archaeological database of national monuments was reviewed for any evidence of manmade underground structures, e.g. souterrains, that may be used by bats (last searched on the 8th June 2022).

A review of the GSI online mapper did not indicate the possible presence of any subterranean sites within the Proposed Development site and a search of the National Monuments Database did not reveal the presence of any manmade subterranean sites within the site.

A search of the UBSS Cave Database for the Republic of Ireland found no caves within the Proposed Development site or within 10km of the site.

National Biodiversity Data Centre Bat Landscape Mapping

The National Biodiversity Data Centre (NBDC) map viewer presents “Bat Landscape” maps for individual species and for all species combined. Lundy *et al.* (2011) used Maximum Entropy Models to examine the relative importance of bat landscape and habitat associations in Ireland. The resulting map provides a 5-point scale, ranging from highest habitat suitability index (presented in red) to lowest suitability index (presented in green). However, squares highlighted as less favourable may still have local areas of abundance.

The location of the Proposed Development was reviewed in relation to bat habitat suitability indices. The aim of this was to assess habitat suitability for all bat species within the Proposed Development site. It is worth noting that these results are based on a modelling exercise and not confirmed bat species records. Regardless, they may provide a useful indication of potential favourable bat associations within the Proposed Development site.

A review of the NBDC bat landscape map provided a habitat suitability index of 10.44 (green). This indicates that the Proposed Development area has low habitat suitability for bat species.

6.5.1.8 Freshwater Pearl Mussel (*Margaritifera margaritifera*)

The NPWS *Margaritifera* Sensitive Area map (Version 8, 2017) was consulted during the desk study. There is surface water connectivity between the proposed works and two *Margaritifera* sensitive catchments: the Laune and the Lee-Sullane, which is located upstream of the Lee Lower catchment.

The Laune and the Lee-Sullane *Margaritifera* sensitive areas are classified as *catchments of other extant populations* and the Lower Lee is classified as *catchment with previous records of Margaritifera*.

In total there are seven EPA mapped watercourse crossings associated with the Proposed Development. There are six EPA mapped watercourse crossings associated with the proposed underground electrical cabling route, of which one watercourse crossing is located within the Lee-Sullane catchment and five watercourse crossings are located within the Laune catchment. The remaining EPA mapped watercourse crossing is associated with the footprint of the proposed TDR and is located within the Laune catchment.

A data request was submitted to the NPWS to ascertain the location of the nearest populations of the species downstream of the Proposed Development. The results received from NPWS indicate that populations of freshwater pearl mussels do occur within the Sullane River to the south of the site and within the Clydagh River to the northwest of the site.

A freshwater pearl mussel survey of both the Clydagh River (Laune Catchment) and the Bohill and Owengarve Rivers (Lee/Sullane Catchment) was conducted in April and June 2018 by Pat Roberts (B.Sc. (Env.)) in accordance with the *Margaritifera margaritifera* Stage 1 and Stage 2 Survey Guidelines produced by the NPWS (Irish Wildlife Manual No. 12). The survey was conducted under licence number C99/2018 from the NPWS. Surveys were conducted during optimal conditions using bathyscopes. No further records of freshwater pearl mussel were recorded during these surveys.

The Site Specific Conservation Objectives (SSCO) document for the Killarney National Park, MacGilllicuddy's Reeks and Caragh River SAC show the populations of freshwater pearl mussel for which the SAC is designated. None of these are located downstream of the Proposed Development as they are within separate sub-catchments. No instream works are required at any of the EPA mapped watercourse crossing locations along the proposed underground electrical cabling route. Furthermore, no instream works are to take place in any other watercourse not been included in EPA mapping, as described in Chapter 4 of this EIAR, Description.

6.5.1.9 Inland Fisheries Ireland Data

The Proposed Development site drains into the Flesk watercourse (IE_SW_22F020040), the Sullane watercourse (IE_SW_19S020170), the Foherish watercourse (IE_SW_19F020300) and the Kilmeeley East watercourse (IE_SW_18F030060). The Flesk flows in a westerly direction through the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC [000365] and into the Castlemaine Harbour SAC [000343]. The Sullane flows in a south easterly direction through St. Gobnet's Wood SAC [000106] before joining with the River Lee [IE_SW_19L030800]. The Foherish flows in a south easterly direction through Mullaghanish to Musheramore Mountains SPA [004162] before joining the Sullane. A search of the Inland Fisheries Ireland (IFI) online database was carried out to determine the species richness of the Flesk, the Sullane and the Foherish watercourses. No species richness information was found on the IFI online database for any of the above watercourses.

6.5.1.10 Invasive Species

The NBDC database also contains records of invasive species identified within the relevant hectad. Records of 'high impact' invasive species for hectads W18 and W28 are provided in Table 6-9.

Table 6-9 NBDC records for invasive species (hectads W18 and W28)

Common Name	Scientific Name	Hectad
Rhododendron	<i>Rhododendron ponticum</i>	W28
Japanese Knotweed	<i>Fallopia japonica</i>	W28, W18
American Mink	<i>Mustela vison</i>	W28, W18

Sika deer	<i>Cervus nippon</i>	W28, W18
-----------	----------------------	----------

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).

6.5.1.11 Baseline Hydrology

Regionally, the Proposed Development site is located within the Laune-Maine-Dingle Bay and the Lee (catchment ID_22) and Cork Harbour and Youghal Bay (catchment ID_19) surface water catchments within the Hydrometric Areas 22 and 19 of the South Western River Basin District. A regional hydrology map is shown in Figure 8-2, Chapter 8 of this EIAR.

On a more local scale, the site is located in the Laune-Maine-Dingle Bay and Lee, Cork harbour and Youghal Bay catchments (catchments 22 and 19 respectively).

Within these catchments, the EIAR Study Area is located within the Foherish (Foherish_SC_010), the Sullane (Sullane_SC_010) and the Flesk (Flesk (Kerry)_SC_010) hydrological sub-catchments. The EIAR Study Area is located within the following river sub basins: Garrane (Lee)(Garrane (Lee)_010), Flesk (Kerry)(Flesk (Kerry)_010), Flesk (Kerry)(Flesk (Kerry)_020), Sullane (Sullane_020) and Flesk (Kerry)(Flesk (Kerry)_030).

The Flesk watercourse (EPA code: 22F02) flows in a westerly direction, approximately 1km north of the Proposed Development site, at its closest point. The section of the Flesk to the north of the Proposed Development site is classified as an upland/eroding river (FW1). The Owengarve watercourse (EPA code: 19O02) flows south south-easterly from the site, joining the Sullane watercourse (EPA code: 19S02), approximately 4.95km downstream. The Garrane (Lee) watercourse (EPA code: 19G03) flows south easterly from the site, joining the Foherish watercourse (EPA code: 19F02), approximately 3.7km downstream. The Kilmeehy East watercourse (EPA code: 18K64) flows south-easterly from the EIAR Study Area, joining the Foherish watercourse (EPA code: 19F02), approximately 5km downstream.

Several additional upland/eroding rivers (FW1) were identified on site, which fed into the Flesk to the north, the Sullane to the south and the Foherish to the southeast. Water Quality

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

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 14th December 2021 regarding the water quality status of the rivers which run within and directly adjacent to the EIAR 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
Flesk [EPA code: 22F02]	Located approx. 1km north of proposed site, fed by unnamed tributaries, flowing west	Good	At Risk
Sullane [EPA code: 19S02]	Located approx. 4.95km south, fed by the Owengarve, flows southeast	Good	At Risk
Garrane – tributary of the Foherish River [EPA code: 19G03]	Located within the eastern section of proposed site, flowing southeast	Good	Not at Risk
Foherish [EPA code: 19F02]	Located approx. 700m south of proposed site, no apparent hydrological connection	Good	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
Flesk [EPA code: 22F02]	Flesk (Kerry)	E119205 N 83598.2	2019	4 (Good)
	Br (Ford) near Clydagh Lodge	E113763.53 N 83596.17	2019	5 (High)
Sullane [EPA code: 19S02]	Ballyvourney Bridge	E119570.25 N77593.45	1990	4-5 (High)
	First Bridge downstream of Ballyvourney Bridge	E120211.71 N76947.05	2020	4 (Good)
Garrane [EPA code: 19G03]	Bridge upstream Foherish River	E127035.82 N81257.04	2020	5 (High)
Foherish [EPA code: 19F02]	Keel Bridge	E128219 N81428.5	2020	4 (Good)

6.5.1.12 Conclusions of the Desktop Study

The desktop study has provided information about the existing environment in Hectads W18 and W28, within which the Proposed Development site is located. The site is located in the Laune-Maine-Dingle Bay and Lee, Cork harbour and Youghal Bay catchments, within Hydrometric Areas 22 and 19 of the South Western River Basin District.

On a more local scale, the site is located in sub-catchments Foherish (Foherish_SC_010), the Sullane (Sullane_SC_010) and the Flesk (Flesk (Kerry)_SC_010). The Proposed Development is located within the following river sub basins; Flesk (Kerry)_030, Flesk (Kerry)_020, (Kerry)_010, Garrane (Lee)_010, Foherish_010, and Sullane_020.

There are several watercourses which drain the ELAR Study Area to the following downstream EU Designated Sites, which are further considered in the Natura Impact Statement prepared for the Proposed Development:

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

The desktop study has provided information about the existing environments in Hectads W18 and W28, within which the Proposed Development site is located.

The desk study identified that a variety of protected faunal species are known to occur within the EIAR Study Area, including bats, Kerry slug, otter and badger. Species recorded during the desk study informed the survey methodologies undertaken during the site visits.

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 Description of the Existing Environment

6.6.1 Description of Habitats

The habitat classifications and codes correspond to those described in ‘*A Guide to Habitats in Ireland*’ (Fossitt 2000). A total of 16 habitats were recorded within the EIAR Study Area (Table 6-12). Peatland and grassland habitats have also been categorised to plant communities from the National Survey of Upland Habitats (Perrin et al. 2014) and the Irish Vegetation Classification.

Habitat maps are also provided with the Proposed Development footprint overlain in Figure 6-5A, 6-5B, 6-5C, 6-5D, 6-5E, 6-5F, 6-5G and 6-5H.

Table 6-12 Habitats recorded in the EIAR Site Boundary

Habitat Name	Fossitt Code
Buildings and artificial surfaces	BL3
Upland/ eroding rivers	FW1
Wet grassland	GS4
Drainage ditches	FW4
Treelines	WL2
Improved agricultural grassland	GA1
Wet heath/ Upland Blanket Bog mosaic	HH3/ PB2
Recolonising bare ground	ED3
Conifer plantation/ Dry meadows and grassy verges	WD4/ GS2
Recently-felled conifer woodland	WS5
Conifer Woodland	WD4
Cutover bog	PB4
Upland blanket bog / Wet heath	PB2/ HH3
Dystrophic Lakes	FL1
Immature woodland	WS2
Treelines/ Hedgerows mosaic	WL2/ WL1

Habitats within each section of the Proposed Development are described below.

6.6.1.1 Habitats within and adjacent to Proposed 110kV Underground Electrical Cabling Route

Habitats within and adjacent to the footprint of the proposed 110kV underground electrical cabling route are Buildings and artificial surfaces (BL3), Upland/ eroding rivers (FW1), Wet grassland (GS4), Drainage ditches (FW4), Treelines (WL2), Improved agricultural grassland (GA1), Wet heath (HH3)/ Upland Blanket Bog (PB2), Recolonising bare ground (ED3) and Conifer plantation (WD4)/ Dry meadows and grassy verges (GS2).

Description of proposed 110kV cabling route footprint

Starting at the existing 220kV Ballyvouskill substation, the proposed 110kV underground electrical cabling route proceeds to the northwest through fields of Improved Agricultural Grassland (GA1) and Wet Grassland (GS4) with access tracks (Recolonising Bare Ground (ED3)) small Drainage Ditches (FW4). These habitats are shown in Plates 6-1 and 6-2.



Plate 6-1 View of Wet grassland (GS4) located to the west of existing Ballyvouskill 220kV substation.



Plate 6-2 View of improved agricultural habitats through which the proposed 110kV cabling passes as it proceeds northwest from the existing Ballyvouskill 220kV substation.

The 110kV cabling route then proceeds out of the agricultural grasslands and into an unfenced area that is dominated by a mosaic of Upland Blanket Bog (PB2) and Wet Heath (HH3). This area was degraded through drainage and turbary and evidence of sheep and deer grazing was recorded. Species present in Wet heath (HH3)/ Upland blanket bog (PB2) mosaic habitat included Ling heather (*Calluna vulgaris*), Purple Moor-grass (*Molinia caerulea*), Hare's-tail cotton grass (*Eriophorum vaginatum*), Common cotton grass (*Eriophorum angustifolium*), Round-leaved sundew (*Drosera rotundifolia*), Cross-leaved heather (*Erica tetralix*), Tormentil (*Potentilla erecta*), Cuckoo flower (*Cardamine pratensis*), Common sorrel (*Rumex acetosa*), Soft rush (*Juncus effusus*), Lousewort (*Pedicularis sylvatica*), Bird's-foot trefoil (*Lotus corniculatus*), Milkwort (*Polygala vulgaris*), *Sphagnum palustre*, *Sphagnum rubellum*, *Sphagnum auriculatum*, *Polytrichum* spp., Red-stemmed feather moss (*Pleurozium schreberi*) and Reindeer lichen (*Cladonia rangiferina*).

The area where the 110kV cabling is proposed is located immediately adjacent to an area where an existing 110kV underground cable is located. This area is heavily degraded and is dominated by Soft rush (*J. effusus*). This is shown in Plate 6-3 below.



Plate 6-3 View of degraded Wet heath (HH3)/Upland Blanket Bog (PB2) habitat mosaic within which an existing underground 110kV cable was previously laid. Proposed 110kV cabling is to be located in degraded peatland habitat directly to the left of the rush-dominated strip shown in the plate above.

The proposed 110kV underground electrical cabling route heads northwest adjacent to the existing 110kV cable for a distance of 160m and then veers southwest and follows immediately adjacent to an existing track for a distance of 440m. The existing 110kV cable is located underneath the track and the proposed 110kV underground electrical cabling route will be located immediately adjacent to it within peatland habitat that is highly degraded and disturbed as shown in Plates 6-4 and 6-5. The 110kV underground electrical cabling route crosses the existing track prior to joining the forestry road approximately 80m to the east of the hairpin bend.



Plate 6- 4 View of degraded Wet heath (HH3)/Upland Blanket Bog (PB2) mosaic habitat within which the proposed 110kV cabling is to be installed. Proposed 110kV cabling is to be installed to the right of the roadway shown in the plate above.



Plate 6- 5 View of degraded Wet heath (HH3)/Upland Blanket Bog (PB2) mosaic habitat to the south of existing trackway, classified as (ED3). Proposed 110kV cabling is to be installed in the degraded peatland habitat shown to the left of the fence in the plate above before crossing the existing track and joining the existing forestry road.

The route then proceeds in a south westerly direction in the margin of an existing forestry road (BL3) that is bounded by commercial Conifer Plantation (WD4) for a distance of approximately 1.9km. The proposed 110kV underground electrical cabling route and associated access road will be located in Dry Meadows and Grassy Verge (GS2) habitat at the edge of the road as shown in Plate 6-6 below.



Plate 6- 6 View of forestry roadway classified as Buildings and artificial surfaces (BL3) and surrounding Dry Meadows and Grassy Verge (GS2) habitat into which the 110kV cabling will be laid.

The proposed 110kV underground electrical cabling route then veers to the west through an existing conifer plantation, some of which has been recently clear-felled, before terminating at the site of the proposed 110kV electrical substation. This area is shown in Plate 6-7 below.



Plate 6-7 View of immature Conifer woodland (WD4) located within the footprint of the proposed 110kV cabling route. Proposed 110kV cabling runs west through the habitat shown in the plate above and continues through the mature Conifer plantation seen in the background before concluding at the footprint of the proposed 110kV substation.

6.6.1.1.1 **EPA mapped watercourse crossing associated with 110kV Electrical Underground Cabling Route**

There is one EPA mapped watercourse crossing associated with the footprint of the proposed 110kV underground cabling route. This watercourse is referred to as watercourse crossing no. 6 in Table 4-2 in Chapter 4 of this EIAR, Description. Crossing methodology for this watercourse is also described in Chapter 4 of this EIAR, Description. Although dry at the time of surveying and supporting grassy vegetation, this watercourse has been classified as Upland/ eroding rivers (FW1) as evidence suggests it is a small mountain stream that dries out periodically with a persisting and obvious channel evident. This watercourse was culverted under a forestry roadway through a 600mm pipe. There is evidence of intermittent waterflow through this channel in a southerly direction during periods of wet weather. This was evidenced by the presence of flattened vegetation at the southerly end of the existing culvert. The location of this watercourse in relation to the footprint of the Proposed Development can be seen in Figure 6-5B, below.



Plate 6-8 View of dry temporary watercourse at watercourse crossing no. 6, classified as Upland/eroding rivers (FW1).

6.6.1.1 Habitats within and adjacent to Proposed 110kV Electrical Substation and Borrow Pit

Habitats recorded within and adjacent to the footprint of the proposed 110kV substation and borrow pit comprise solely of Conifer Plantation (WD4) of varying ages. These habitats are shown in Plates 6-9 and 6-10.

Conifer plantation (WD4) varied between mature stands and young recruiting saplings. Conifer plantation (WD4) was species poor, with Sitka spruce (*P. sitchensis*) dominating. Mature conifer

plantation understory was species poor with accumulated pine needles a characteristic feature. Vegetation assemblages were dominated by bryophytes. Species present in immature Conifer plantation (WD4) included Sitka spruce (*P. sitchensis*), Soft rush (*J. effusus*), Purple-moor grass (*M. caerulea*), Foxglove (*D. purpurea*), Gorse (*U. europeaus*) and Bracken (*P. aquilinum*).



Plate 6-9 View of immature Conifer plantation (WD4) within the footprint of the proposed 110kV substation.



Plate 6-10 View of Conifer plantation (WD4) within which the proposed borrow pit will be located.

6.6.1.2 Habitats within and Adjacent to Proposed 33kV Underground Electrical Cabling Route

Habitats recorded within and adjacent to the footprint of the proposed 33kV underground electrical cabling route include Conifer plantation (WD4), Drainage ditches (FW4), Upland/ eroding rivers (FW1), Wet heath (HH3)/ Upland blanket bog (PB2), Recolonising bare ground (ED3), Cutover bog (PB4), Wet grassland (GS4) and Dystrophic Lakes (FL1).

The proposed 33kV underground electrical cabling route originates from the proposed 110kV substation discussed above. This is located within immature Conifer woodland (WD4). From here the proposed 33kV underground electrical cabling heads in a westerly direction, crossing and running alongside a forestry roadway that is classified as Buildings and artificial surfaces (BL3). It then enters a mature Conifer plantation (WD4) and continues west through a mosaic of Conifer plantation (WD4) of varying ages. It crosses a stream that is classified as Upland/ eroding rivers (FW1). Once passed this stream, the footprint of the proposed 33kV underground electrical cabling re-enters into mature Conifer plantation (WD4). Examples of the conifer plantation habitats through which the cabling passes are shown in Plates 6-11 – 6-13.



Plate 6- 11 View of immature Conifer plantation (WD4) within the footprint of the proposed 33kV cabling route. Proposed 33kV cabling runs south through immature Conifer plantation (WD4) shown above, crosses a forestry roadway and enters into mature Conifer plantation (WD4) in background.



Plate 6- 12 View of mature Conifer plantation within which the proposed 33kV cabling will be located.



Plate 6-13 View of species poor mature Conifer plantation (WD4) understory.

The proposed 33kV underground electrical cabling route footprint then proceeds along the edge of a forestry plantation that is bounded to the south by a mosaic of Upland Blanket Bog (PB2) and Wet Heath (HH3). The habitat in this area was relatively dry, well drained and highly disturbed. Sitka spruce (*P. sitchensis*) and deadwood were characteristic features of this habitat. Species present in this habitat included Sitka spruce (*P. sitchensis*), Purple-moor grass (*M. caerulea*), Soft rush (*J. Effusus*), Bracken (*P. aquilinum*), Bilberry (*Vaccinium myrtillus*), Gorse (*U. Europeaus*), Ling heather (*C. vulgaris*) and Briar (*Rubus fruticosus* agg.).



Plate 6-14 View of the edge of the conifer plantation along which the 33kV cabling route is proposed. The proposed 33kV cabling route is located to the right of the fence shown in the plate above.

Upland blanket bog (PB2)/ Wet heath (HH3) mosaic habitat was identified to the south of the proposed 33kV underground electrical cabling. The footprint of the proposed 33kV underground electrical cabling route is located outside of this habitat. Ground in this habitat was waterlogged. Species present in this mosaic habitat include Ling heather (*Calluna vulgaris*), Purple Moor-grass (*Molinia caerulea*), Hare's-tail cotton grass (*Eriophorum vaginatum*), Common cotton grass (*Eriophorum angustifolium*), White-beak sedge (*Rhynchospora alba*), Round-leaved sundew (*Drosera rotundifolia*), Cross-leaved heather (*Erica tetralix*), Tormentil (*Potentilla erecta*), Bog asphodel (*Narthecium ossifragum*), Soft rush (*Juncus effusus*), *Sphagnum palustre*, *Sphagnum rubellum*, *Sphagnum auriculatum*, *Polytrichum* spp., Red-stemmed feather moss (*Pleurozium schreberi*) and Reindeer lichen (*Cladonia rangiferina*). This habitat is shown in Plate 6-15.



Plate 6- 15 View of Upland blanket bog (PB2)/ Wet heath (HH3) mosaic habitat located directly to the south of the footprint of the proposed 33kV cabling route.

As it proceeds in a westerly direction, the proposed 33kV underground electrical cabling enters into a forestry firebreak, classified as Recolonising bare ground (ED3). The proposed 33kV underground electrical cabling route follows the path of this firebreak in a westerly direction. This is shown in Plate 6-16



Plate 6- 16 View of firebreak classified as Recolonising bare ground (ED3) within which the proposed 33kV cabling will be located.

After following the path of this firebreak for approximately 2.2km the footprint of the proposed 33kV underground electrical cabling turns in a southerly direction and runs along an existing roadway, classified as Recolonising bare ground (ED3), for approximately 530m where it meets the Permitted Development infrastructure. This roadway is located between two dystrophic lakes but there is no complete surface water connection between the roadway and the lakes. Lough Carrignamork (19_71) and Lough Gal (22_147), classified as Dystrophic lakes (FL1), are located approximately 25m and 128m respectively from the footprint of the proposed 33kV underground electrical cabling route. These dystrophic lakes are located within peatland habitat and have steep peat-based banks. Dystrophic lakes

correspond to the EU Habitats Directive Annex I habitat, Natural dystrophic lakes and ponds (Natura 2000 Code 3160). Lough Carrignamork is shown below in Plate 6-17.



Plate 6-17 View of Lough Carrignamork, classified as Dystrophic Lake (FL1), located approximately 25m to the west of the proposed 33kV cabling route footprint.

At this point 33kV underground cabling will connect to the locations of wind farm elements within the permitted development site. This stretch of 33kV underground electrical cabling runs through a mosaic of highly degraded Cutover bog (PB4), Wet grassland (GS4) and Recolonising bare ground (ED3). These habitats are shown in Plates 6-18 – 6-20.



Plate 6- 18 View of Recolonising bare ground (ED3) located in an area where historical peat removal has stripped soil down to the underlying bedrock where the 33kV cabling will be located.



Plate 6- 19 View of Cutover bog (PB4) and Wet Grassland (GS4) located adjacent to existing roadway, classified as Recolonising bare ground (ED3) within which the additional proposed 33kV cabling will be located.



Plate 6- 20 View of Wet grassland (GS4) located within the footprint of the proposed 33kV cabling route.

6.6.1.2.1 EPA mapped watercourse crossings associated with 33kV Electrical Underground Cabling Route

There are five EPA mapped watercourse crossings associated with the footprint of the proposed 33kV underground electrical cabling route. These watercourses have been classified as Upland/ eroding rivers (FW1). These watercourse crossings are numbered 1 to 5 in accordance with Table 4-2 of Chapter 4 of this EIAR, Description. Watercourse crossings 1, 2, 3, 4 and 5 are within the footprint of the proposed 33kV underground electrical cabling routes and are addressed individually below.

The EPA mapped watercourse at watercourse crossing no. 5 flows north out of the EIAR Study Area and into the Flesk River catchment. Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC has downstream surface water connectivity to the EIAR Study Area via the Clydagh River. Water flow within this watercourse was slow at the time of the site visit. The substrate of this watercourse comprised pebble and fine sediment. The depth of this watercourse varied from ~10cm to ~30cm. The width of this watercourse varied from ~0.5m to ~1m. No in-stream vegetation was recorded within this watercourse with the exception of aquatic bryophytes. Mosses, such as *Tortula muralis*, were recorded growing on rocks in the watercourse. Species recorded within associated bankside habitat included Sitka spruce (*P. sitchensis*), Purple-moor grass (*M. caerulea*), Soft rush (*J. Effusus*), Bracken (*P. aquilinum*), Foxglove (*D. purpurea*), Great woodrush (*L. sylvatica*) and Ling heather (*C. vulgaris*).

Whilst the watercourse was small, typical of an upland stream and did not provide high quality fishery habitat, it provides connection to known sensitive watercourses downstream.



Plate 6- 21 View of watercourse at watercourse crossing no. 5, classified as Upland/eroding rivers (FW1).

The EPA mapped watercourse at watercourse crossing no. 4 flows north out of the EIAR Study Area and into the Flesk River catchment. Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC has downstream surface water connectivity to the EIAR Study Area via the Clydagh River. Water flow within this watercourse was moderate at the time of the site visit. The substrate of this watercourse comprised pebble and boulder. The depth of this watercourse varied from ~10cm to ~40cm. The width of this watercourse varied from ~1m to ~2m. No in-stream vegetation was recorded within this watercourse with the exception of aquatic bryophytes. Mosses, such as *Tortula muralis*, were recorded growing on rocks in the watercourse. Species recorded within associated bankside habitat included Sitka spruce (*P. sitchensis*), Purple-moor grass (*M. caerulea*), Soft rush (*J. Effusus*), Bracken (*P. aquilinum*), Bilberry (*V. myrtillus*), Foxglove (*D. purpurea*), Great woodrush (*L. sylvatica*), Gorse (*U. Europeaus*), Ling heather (*C. vulgaris*) and Briar (*Rubus fruticosus agg.*).

Whilst the watercourse was small, typical of an upland stream and did not provide high quality fishery habitat, it provides connection to known sensitive watercourses downstream.



Plate 6- 22 View of watercourse at watercourse crossing no. 4, classified as Upland/eroding rivers (FW1).

The EPA mapped watercourse at crossing no. 3 flows north out of the EIAR Study Area and into the Clydagh River. Killarney National Park, Macgillicuddy's Reeks And Caragh River Catchment SAC has downstream surface water connectivity to the EIAR Study Area via the Clydagh River (Flesk catchment). Water flow within this watercourse was moderate at the time of the visit. The substrate of this watercourse comprised pebble and boulder. The depth of this watercourse varied from ~20cm to ~40cm. The width of this watercourse was ~1m. No in-stream vegetation was recorded within this watercourse with the exception of aquatic mosses. Mosses, such as *Tortula muralis*, were recorded growing on rocks within the watercourse. Species recorded within associated bankside habitat included Sitka spruce (*P. sitchensis*), Soft rush (*J. Effusus*), Purple-moor grass (*M. caerulea*), Bracken (*P. aquilinum*), Foxglove (*D. purpurea*), Great woodrush (*L. sylvatica*), Gorse (*U. Europeaus*), Nettle (*U. dioica*) and Briar (*Rubus fruticosus* agg.). Whilst the watercourse was small, typical of an upland stream and did not provide high quality fishery habitat, it provides connection to known sensitive watercourses downstream.



Plate 6- 23 View of watercourse at watercourse crossing no. 3, classified as Upland/eroding rivers (FW1).

The EPA mapped watercourse at crossing no. 2 flows north out of the EIAR Study Area and into the Clydagh River. Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC has downstream surface water connectivity to the EIAR Study Area via the Clydagh River (Flesk catchment). Water flow within this watercourse was slow. The substrate of this watercourse comprised gravel, sand and silt. The depth of this watercourse varied was ~20cm at the time of the site visit. The width of this watercourse varied from ~0.3m to ~1m. No in-stream vegetation was recorded within this watercourse with the exception of aquatic mosses. Species richness of the bankside habitat associated with this watercourse varied as this watercourse was located partially in Conifer plantation (WD4) and partially in Wet heath (HH3)/ Upland blanket bog (PB2) mosaic habitat. Species recorded along the boundary of this watercourse through Conifer plantation (WD4) included Sitka spruce (*P. sitchensis*), Purple-moor grass (*M. caerulea*), Bracken (*P. aquilinum*) and Foxglove (*D. purpurea*). Species recorded on the banks of this watercourse in Wet heath (HH3)/ Upland blanket bog (PB2) mosaic habitat included Purple-moor grass (*M. caerulea*), Ling heather (*C. vulgaris*), Hare's-tail cotton grass (*Eriophorum vaginatum*), Common cotton grass (*Eriophorum angustifolium*), Soft rush (*Juncus effusus*) and Cross-leaved heather (*Erica tetralix*). Whilst the watercourse was small, typical of an upland stream and did not provide high quality fishery habitat, it provides connection to known sensitive watercourses downstream.



Plate 6- 24 View of watercourse at watercourse crossing no. 2, classified as Upland/eroding rivers (FW1).

The EPA mapped watercourse at watercourse crossing no. 1 flows north out of the EIAR Study Area and into the Clydagh River. Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC has downstream surface water connectivity to the EIAR Study Area via the Clydagh River (Flesk catchment). Water flow within this watercourse was slow during the site visit. The substrate of this watercourse comprised silt with scattered pebbles and is typical of a peatland stream. The depth of this watercourse varied was ~20cm. The width of this watercourse varied from ~0.3m to ~0.5m. No in-stream vegetation was recorded within this watercourse. Species richness of the bankside habitat associated with this watercourse varied as this watercourse was located partially in Conifer plantation (WD4) and partially in Wet heath (HH3)/ Upland blanket bog (PB2) mosaic habitat. Species recorded along the banks of this watercourse through Conifer plantation (WD4) included Sitka spruce (*P. sitchensis*), Purple-moor grass (*M. caerulea*), Soft rush (*J. effusus*) and Tormentil (*P. erecta*). Species recorded along the boundary of this watercourse in Wet heath (HH3)/ Upland blanket bog (PB2) mosaic habitat included Purple-moor grass (*M. caerulea*), Ling heather (*C. vulgaris*), Hare's-tail cotton grass (*E. vaginatum*), Soft rush (*J. effusus*), Tormentil (*P. erecta*) and Cross-leaved heather (*E. tetralix*). Whilst the watercourse was small, typical of an upland stream and did not provide high quality fishery habitat, it provides connection to known sensitive watercourses downstream.



Plate 6- 25 View of watercourse at watercourse crossing no. 1, classified as Upland/eroding rivers (FW1).

6.6.1.3 Habitats within and Adjacent to Proposed Extension of Permitted Borrow Pit

Habitats within and adjacent to proposed extension works at the borrow pit as permitted under Planning Permission Ref. No. 19/4972 include Recolonising bare ground (ED3) and Cutover bog (PB4) (Plate 6-25).

Recolonising bare ground (ED3) located within the footprint of the proposed extension to the permitted borrow pit is characterised by bare ground with sparse vegetation cover. A narrow strip of Cutover bog (PB4) exists on the northern edge of the footprint of the proposed extension works.



Plate 6- 26 View of recolonising bare ground and cutover bog within the footprint of the proposed extension works at permitted borrow pit.

6.6.1.4 Habitats within and Adjacent to Proposed TDR

Habitats within and adjacent to proposed TDR works include Buildings and artificial surfaces (BL3), Conifer plantation (WD4), Upland/ eroding rivers (FW1), Dystrophic lakes (FL1), Upland blanket bog (PB2)/ Wet heath (HH3), Recolonising bare ground (ED3), Improved agricultural grassland (GA1), Wet grassland (GS4), Immature woodland (WS2), Treelines (WL2), Hedgerows (WL1) and Drainage ditches (FW4).

Throughout the western section of the proposed TDR works associated with the turbine delivery route, the proposed works follow existing forestry roads that are located within the existing forestry plantation, with occasional deviations requiring felling of Conifer Plantation (WD4) to exclude sharp bends from the TDR. Existing roadways to be widened are located within Conifer Plantation (WD4). Sitka spruce (*P. sitchensis*) was the dominant species. Also present were stands of Lodgepole pine (*P. contorta*). Conifer plantation understory was generally dominated by needles and bryophytes with some fungi.



Plate 6- 27 Typical view of forest roadway classified as Buildings and artificial surfaces (BL3) located within the footprint of the proposed TDR works.



Plate 6- 28 Typical view of Conifer plantation (WD4) adjacent to and within the footprint of the proposed TDR works.

The eastern end of the footprint of the proposed TDR works is located within a forestry firebreak at the interface between a conifer plantation and degraded and drained upland blanket bog habitats. This

section of new access road follows the firebreak which is classified as Recolonising bare ground (ED3). Bare peat is characteristic of this habitat. Species present included Sitka spruce (*P. sitchensis*), Purple Moor-grass (*Molinia caerulea*), Bilberry (*V. myrtillus*), Common cotton grass (*E. angustifolium*), Round-leaved sundew (*D. rotundifolia*), Ling heather (*C. vulgaris*), Bog asphodel (*N. ossifragum*), *Sphagnum palustre* and *Sphagnum capillifolium*. This firebreak is shown in Plate 6-28 below. The TDR works terminate within an area of Recolonising Bare Ground (ED3) on an existing track within degraded peatland habitats.



Plate 6- 29 View of firebreak, classified as Recolonising bare ground (ED3), located within the footprint of the proposed road upgrade works.

6.6.1.4.1 Watercourse crossings associated with TDR

One unnamed EPA mapped watercourse (IE_SW_22F020040), classified as Upland/ eroding rivers (FW1) is culverted beneath the forestry roadway proposed for TDR works. This watercourse flows in a northerly direction through conifer plantation into the Clydagh River. Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC has a surface water connection to the site via the Clydagh River (Flesk catchment). There was little to no in-stream vegetation, with species poor vegetative communities along the banks of this watercourse due to the location of this watercourse in an area of conifer plantation. This stream was ~20cm deep and ~1m wide. No instream works will take place within this watercourse.



Plate 6- 30 View of stream, classified as Upland/eroding rivers (FW1) located within Conifer plantation (WD4). The watercourse shown in the plate above is culverted beneath the forest roadway proposed for TDR works.

Two Dystrophic lakes (FL1), Lough Carrignafurark (19_67) and an unnamed lake (22_71), are located approximately 70m and 75m to the south of the proposed TDR works footprint. These dystrophic lakes are located within a mosaic of Wet heath (HH3)/ Upland blanket bog (PB2) habitat and have steep peat-based banks. There is no surface water connection between the proposed works and these lakes. Associated peatland habitats are located outside of the footprint of the proposed TDR works. Dystrophic lakes correspond to the EU Habitats Directive Annex I habitat, Natural dystrophic lakes and ponds (Natura 2000 Code 3160).



Plate 6- 31 View of unnamed Dystrophic Lake (FL1) located approximately 75m to the south of the footprint of the proposed TDR works. Fringe habitats associated with this waterbody comprise Wet heath (HHL)/ Upland blanket bog (PB2) mosaic habitat and Conifer plantation (WD4).



Plate 6- 32 View of Lough Carrignafurark, classified as Dystrophic Lake (FL1), located approximately 70m to the south of the footprint of the proposed TDR works.

Several areas of Upland blanket bog (PB2)/ Wet heath (HH3) mosaic habitat were recorded less than five metres from the edge of the footprint of the proposed TDR works. Waterlogging was prevalent in these areas with substantial *Sphagnum* coverage. Species present include Ling heather (*Calluna vulgaris*), Purple Moor-grass (*Molinia caerulea*), Hare's-tail cotton grass (*Eriophorum vaginatum*), Common cotton grass (*Eriophorum angustifolium*), Cross-leaved heather (*Erica tetralix*), Tormentil (*Potentilla erecta*), Soft rush (*Juncus effusus*), Bird's-foot trefoil (*Lotus corniculatus*), *Sphagnum palustre*, *Sphagnum rubellum*, *Polytrichum* spp., Red-stemmed feather moss (*Pleurozium schreberi*) and Reindeer lichen (*Cladonia rangiferina*). These areas will be entirely avoided by the proposed works, which will be confined to existing forestry roads, conifer plantation and fire breaks. The proposed works will not involve significant excavations or road drainage.



Plate 6- 33 View of Upland blanket bog (PB2)/ Wet heath (HH3) mosaic habitat located directly to the north of the footprint of the proposed TDR works.

Immature planted woodland (WS2) was present in the west of the EIAR Study Area, within the footprint of proposed junction widening works associated with the TDR. This habitat was dominated by Ash (*Fraxinus excelsior*). Species present in the woodland understory include Soft rush (*J. effusus*), Perennial rye grass (*Lolium perenne*), Creeping bent (*Agrostis stolonifera*), Sweet vernal grass (*Anthoxanthum odoratum*), Yorkshire fog (*Holcus lanatus*), Foxglove (*Digitalis purpurea*), Thistle (*Cirsium* spp.), Briar (*Rubus fruticosus* agg.), Dandelion (*Taraxacum* spp.) and Nettle (*Urtica dioica*).



Plate 6-34 View of Immature woodland (WS2) located within the footprint of the proposed junction widening associated with the TDR.

Improved agricultural grassland (GA1) was recorded in the west of the EIAR Study Area within the footprint of the proposed temporary access road off the N22 associated with the TDR (Plate 6-34 & 6-35). This habitat was grazed by sheep at the time of surveying and was dominated by Perennial ryegrass (*L. perenne*).



Plate 6- 35 View of Improved agricultural grassland (GAI) within the footprint of the proposed temporary access road associated with the TDR in the west of the ELAR Study Area.



Plate 6- 36 View of Improved agricultural grassland (GAI) within the footprint of the proposed temporary access road associated with the TDR in the west of the ELAR Study Area. Treelines (WL2) in the background of the above plate are located outside of the footprint of the Proposed Development.

Treeline (WL2)/ Hedgerow (WL1) mosaic habitat was recorded in the west of the EIAR Study Area. Approximately 15m of Treeline (WL2)/ Hedgerow (WL1) mosaic habitat is located within the footprint of the proposed temporary access road associated with the TDR. Ash (*F. excelsior*) and Willow (*Salix* spp.) dominated these habitats.



Plate 6- 37 View of Hedgerow (WL1) located in the west of the EIAR Study Area.



Plate 6- 38 View of Treeline (WLI) located in the west of the EIAR Study Area.

Drainage ditches (FW4) are located in the southwest of the EIAR Study Area. Water levels varied between habitat areas, with variation between waterlogged and dry habitats. Water levels within waterlogged ditches was shallow, approximately 15cm deep. These waterlogged Drainage ditches (FW4) were located in agricultural land outside the footprint of the Proposed Development. Width varied among drainage ditches, ranging from 0.3m to 1m in places. Flow rates also varied among drainage ditches (FW4), with variation between stagnant and flowing areas. Drainage ditch substrate varied from light sediment to gravel and pebbles. Drainage ditches present within the footprint of elements associated with the proposed TDR were dry at the time of surveying and did not support wetland vegetation. Plant species present within dry Drainage ditches (FW4) include Perennial rye grass (*Lolium perenne*), Gorse (*Ulex europaeus*), Soft Rush (*Juncus effusus*), Foxglove (*Digitalis purpurea*), Ribwort plantain (*Plantago lanceolata*), Daisy (*Bellis perennis*), Colt's-foot (*Tussilago farfara*), Thistle (*Cirsium* spp.), Meadow buttercup (*Ranunculus acris*), Ribwort plantain (*P. lanceolatum*), Dandelion (*Taraxacum* spp.), Briar (*Rubus fruticosus* agg). As no water was present in dry Drainage ditches within the footprint of elements associated with the proposed TDR, no instream works will take place within these drainage ditches as per Chapter 4 of this EIAR, Description.



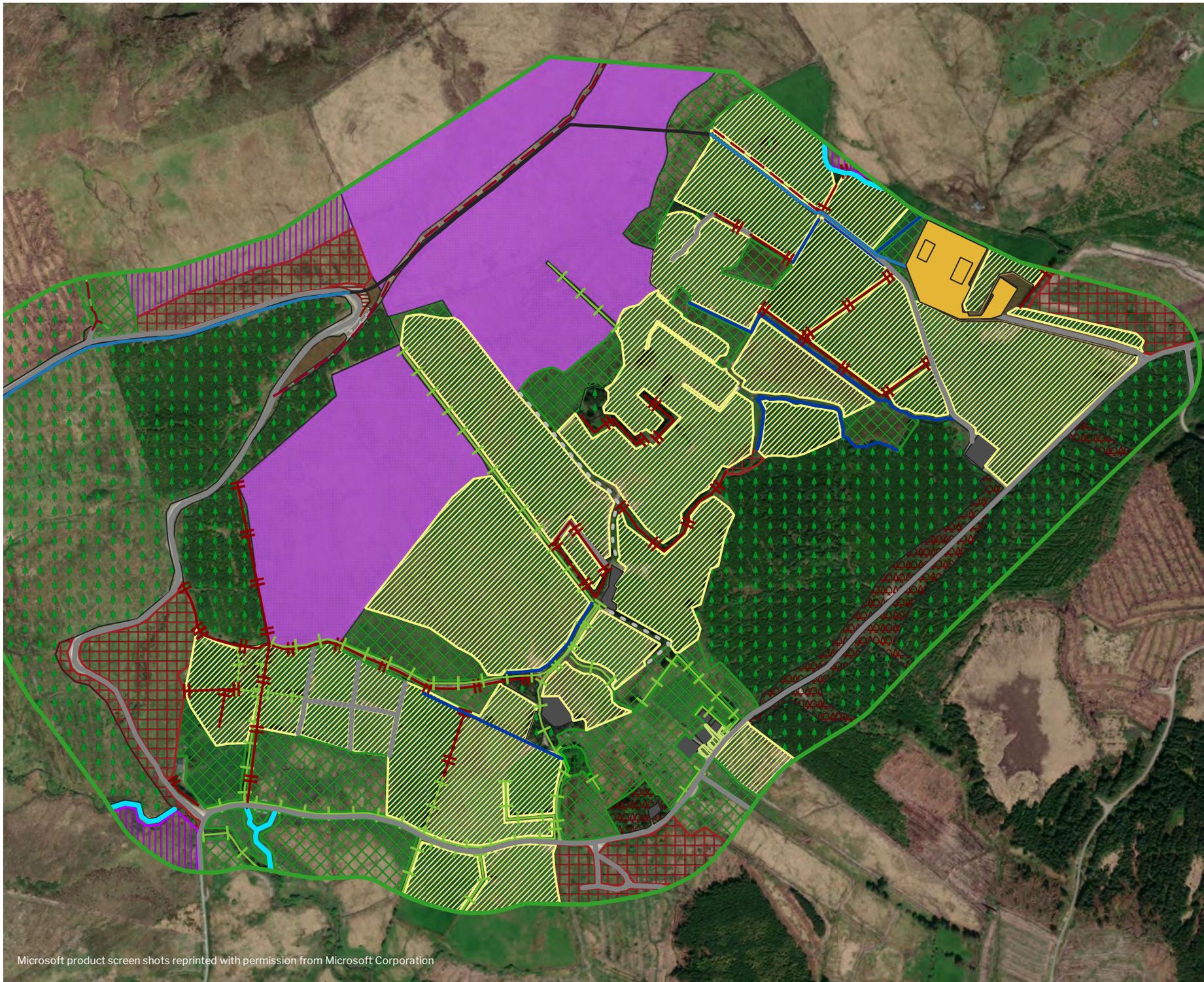
Plate 6-39 View of dry Drainage ditch (FW4) located within the footprint of the proposed temporary access road off the N22 associated with the TDR.

6.6.1.5 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 Proposed Development 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 (see Table 6-6), were recorded within the EIAR Study Area.

6.6.1.6 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. *Rhododendron ponticum* was recorded within the EIAR Study Area boundary. Invasive species encountered within the EIAR Study Area are shown below in Figures 6-5G and 6-5H. No works are proposed in the vicinity of these invasive species.



Map Legend

- EIAR Study Boundary
- 110kV Underground Cabling
- 110kV Underground Cabling and Access Road
- Ballyvouskill 220kV Substation
- Buildings and Artificial Surfaces
- Spoil and Bare Ground
- Recolonising Bare Ground
- Eroding/Upland Rivers
- Drainage Ditches
- + Hedgerows
- + Treelines
- Buildings and artificial surfaces
- Spoil and bare ground
- Recolonising bare ground
- Improved agricultural grassland
- Dry meadows and grassy verges
- Wet grassland
- Wet heath/ Upland blanket bog
- Upland blanket bog
- Mixed broadleaved/conifer woodland
- + Conifer plantation
- Scrub



Drawing Title

Habitat Map

Project Title

Proposed Substation, Underground Cabling & Access Roads to
Kincolumark Renewable Energy Development

Drawn By

KME

Checked By

PR

Project No.

210732

Drawing No.

Fig. 6-5A

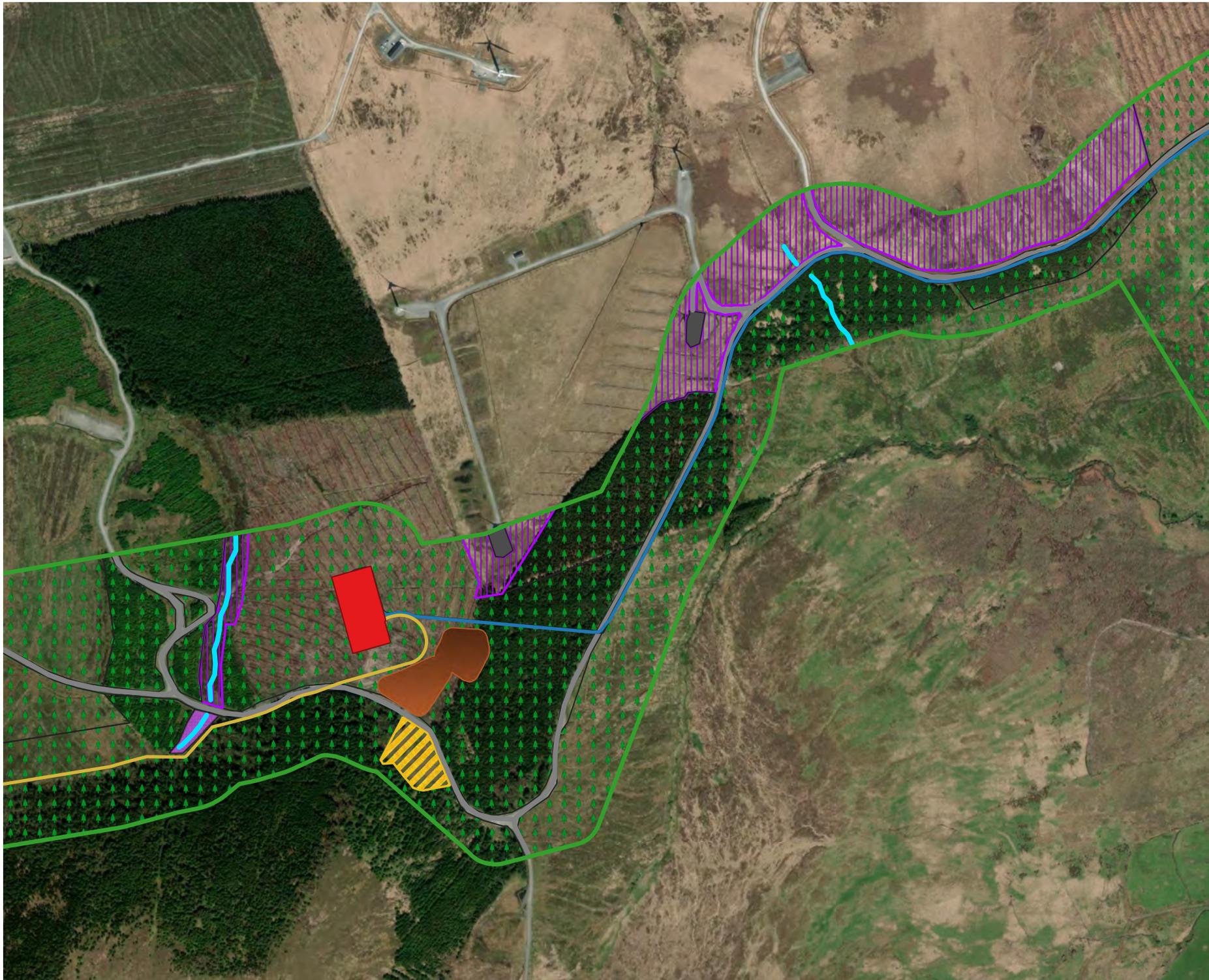
Scale

1:10000

Date

15.07.2022

MKO
 Planning and
 Environmental
 Consultants
 Tuam Road, Galway
 Ireland, H91 VW84
 +353 (0) 91 735611
 email: info@mkofireland.ie
 Website: www.mkofireland.ie



Map Legend

- EIAR Study Boundary
- 33kV Underground Cabling and Access Roads
- 110kV Underground Cabling
- 110kV Underground Cabling and Access Roads
- Proposed 110kV Substation Location
- Proposed Borrow Pit
- Buildings and Artificial Surfaces
- Eroding/Upland Rivers
- Buildings and artificial surfaces
- Dry meadows and grassy verges
- Wet grassland/Scrub
- Wet heath
- Upland blanket bog
- Conifer plantation



Microsoft product screen shots reprinted with permission from Microsoft Corporation

Drawing Title

Habitat Map

Project Title

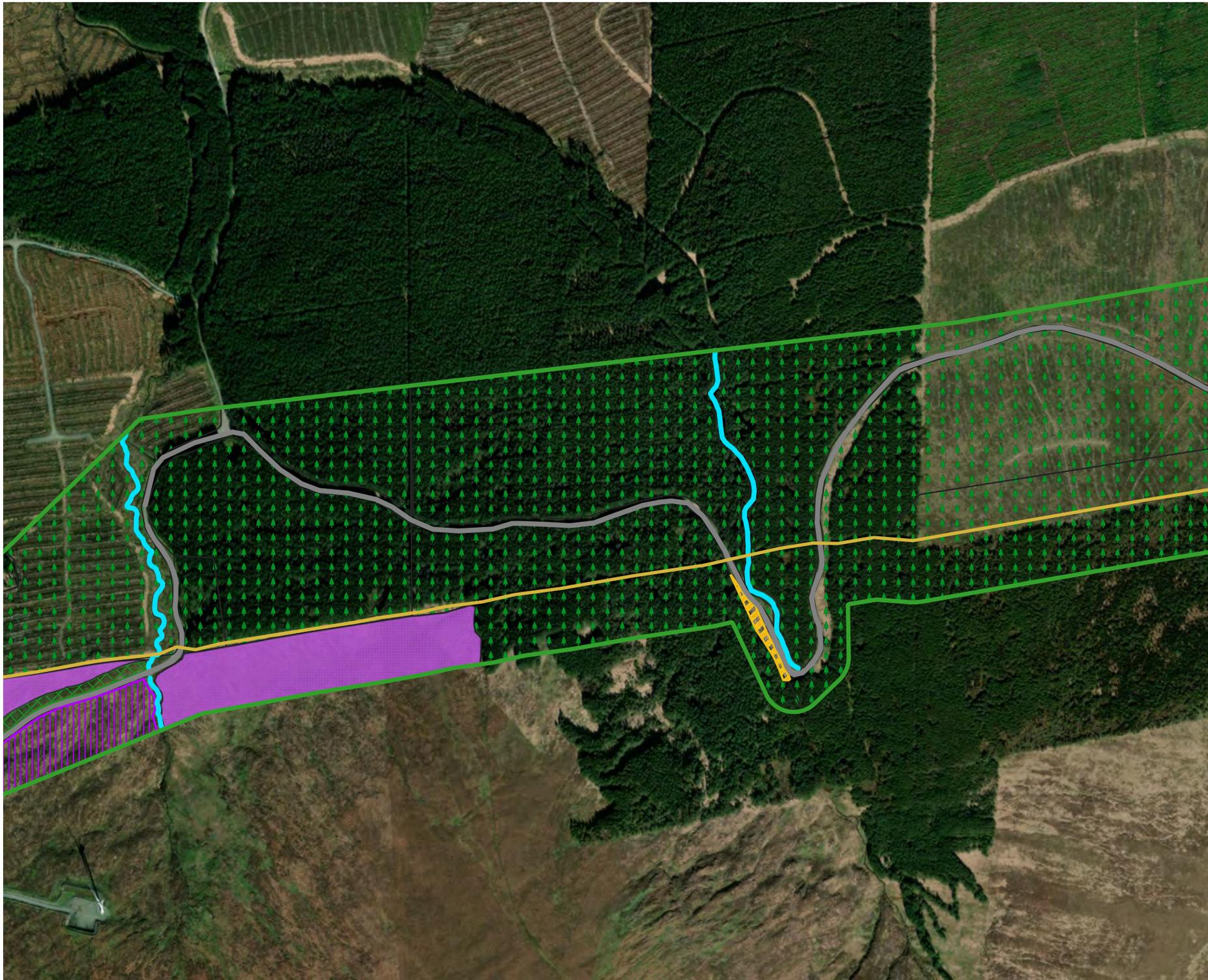
Proposed Substation, Underground Cabling & Access Roads to Knocknamark Renewable Energy Development

Drawn By KME	Checked By PR
-----------------	------------------

Project No. 210732	Drawing No. Fig. 6-5B
-----------------------	--------------------------

Scale 1:10000	Date 15.07.2022
------------------	--------------------

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email: info@mkofireland.ie
Webste: ww.mkofireland.ie



Map Legend

- EIAR Study Boundary
- 33kV Underground Cabling and Access Roads
- Buildings and Artificial Surfaces
- Eroding/Upland Rivers
- Wet grassland
- Wet grassland/Scrub
- Wet heath/ Upland blanket bog
- Upland blanket bog
- Conifer plantation



Microsoft product screen shots reprinted with permission from Microsoft Corporation

Drawing Title

Habitat Map

Project Title

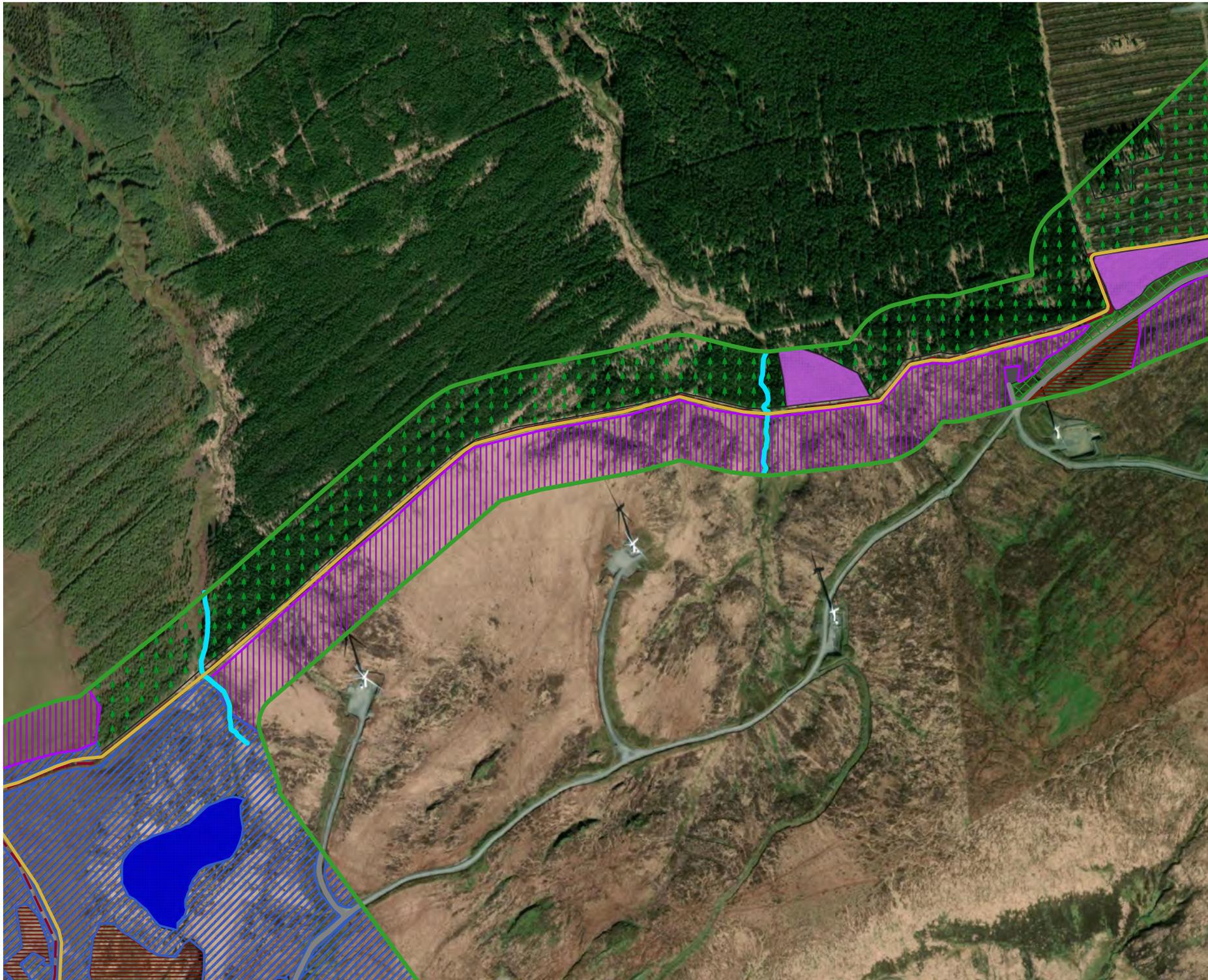
Proposed Substation Underground Cabling & Access Roads to Knocknamark Renewable Energy Development

Drawn By KME	Checked By PR
------------------------	-------------------------

Project No. 210732	Drawing No. Fig. 6-5C
------------------------------	---------------------------------

Scale 1:10000	Date 15.07.2022
-------------------------	---------------------------

MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW84
 +353 (0) 91 735611
 email: info@mkofireland.ie
 Website: www.mkofireland.ie



- ### Map Legend
- EIAR Study Boundary
 - 33kV Underground Cabling and Access Roads
 - Buildings and Artificial Surfaces
 - Recolonising Bare Ground
 - Eroding/Upland Rivers
 - Buildings and artificial surfaces
 - Recolonising bare ground
 - Dystrophic lakes
 - Wet grassland
 - Wet heath/ Upland blanket bog
 - Upland blanket bog
 - Cutover bog
 - ▲ ▲ Conifer plantation

Microsoft product screen shots reprinted with permission from Microsoft Corporation



Drawing Title
Habitat Map

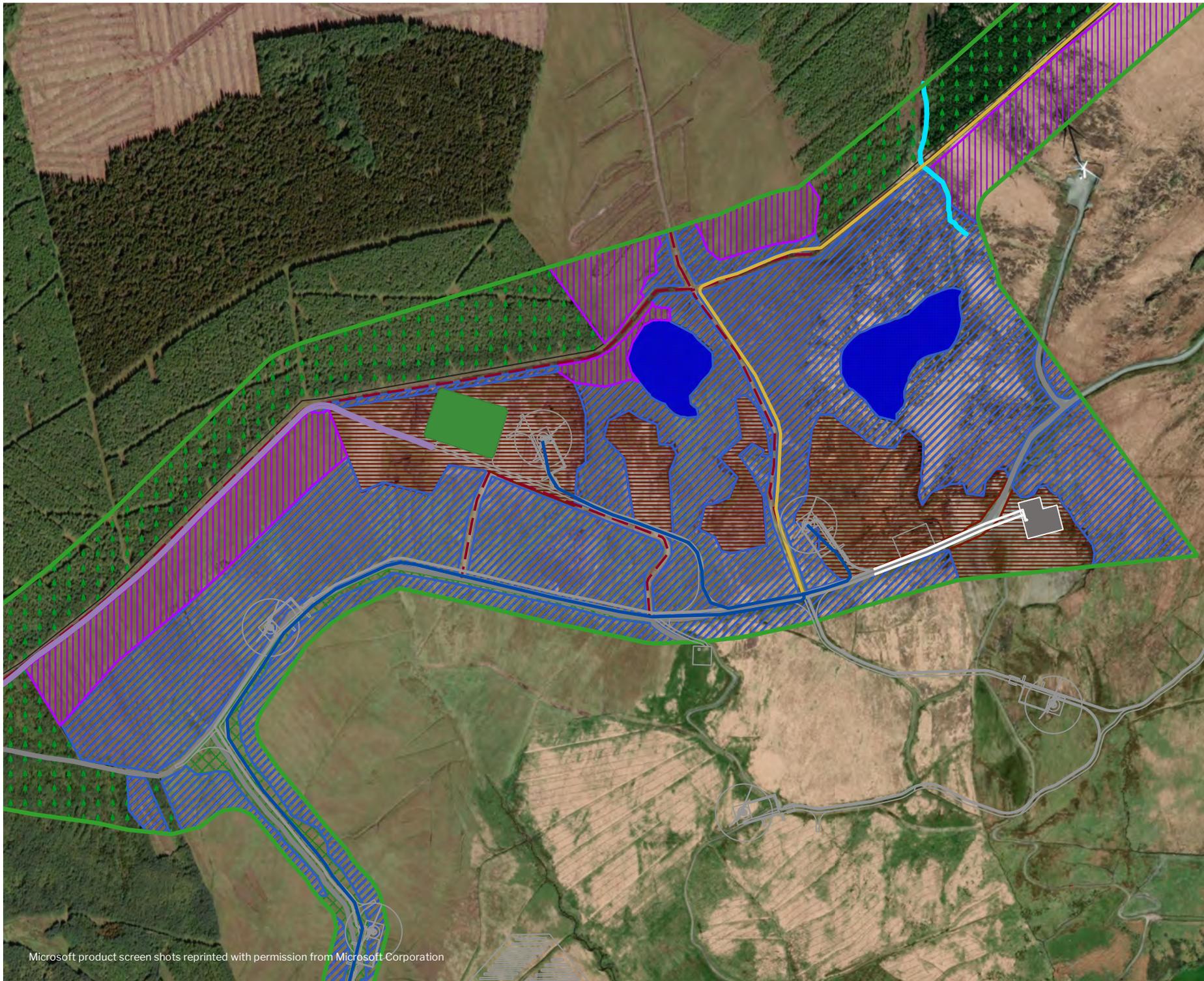
Project Title
Proposed Substation, Underground Cabling & Access Roads to Kincolumark Renewable Energy Development

Drawn By KME	Checked By PR
------------------------	-------------------------

Project No. 210732	Drawing No. Fig. 6-5D
------------------------------	---------------------------------

Scale 1:10000	Date 15.07.2022
-------------------------	---------------------------

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email: info@mkofireland.ie
Webste: ww.mkofireland.ie



Map Legend

-  EIAR Study Boundary
-  Access Road (Upgrade & New)
-  33kV Underground Cabling and Access Roads
-  33kV Underground Cabling within the Study Boundary
-  Permitted Borrow Pit Extension
-  Omitted 38kV Electrical Substation and Knocknamork Permitted Development
-  Buildings and Artificial Surfaces
-  Recolonising Bare Ground
-  Eroding/Upland Rivers
-  Recolonising bare ground
-  Dystrophic lakes
-  Wet grassland
-  Upland blanket bog
-  Cutover bog
-  Conifer plantation



Drawing Title
Habitat Map

Project Title
Proposed Substation, Underground Cabling & Access Roads to Knocknamork Renewable Energy Development

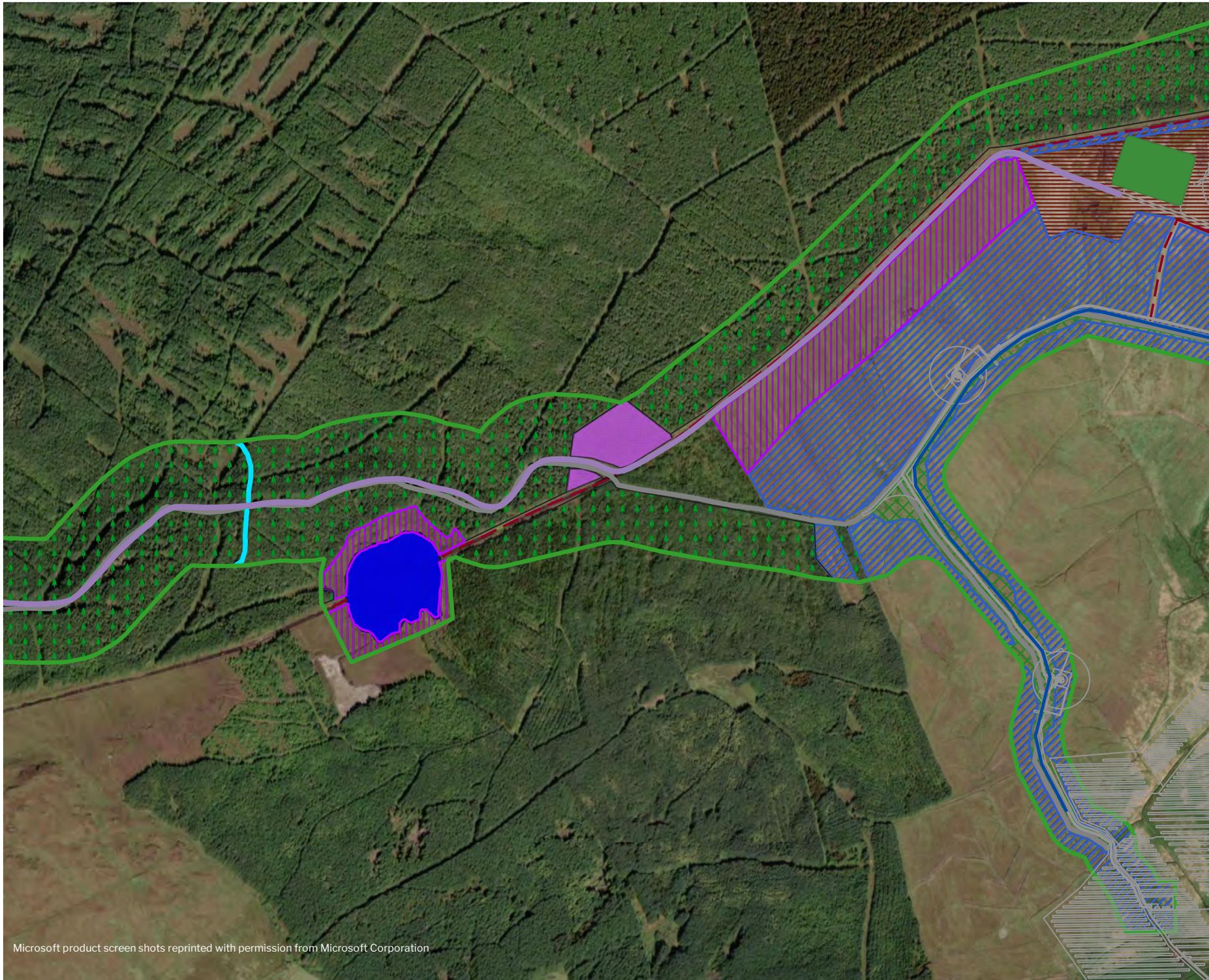
Drawn By KME	Checked By PR
------------------------	-------------------------

Project No. 210732	Drawing No. Fig. 6-5E
------------------------------	---------------------------------

Scale 1:10000	Date 15.07.2022
-------------------------	---------------------------

MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW84
 +353 (0) 91 735611
 email: info@mkofireland.ie
 Website: www.mkofireland.ie

Microsoft product screen shots reprinted with permission from Microsoft Corporation



Map Legend

- EIAR Study Boundary
- Access Road (Upgrade & New)
- 33kv Underground Cabling within the Permitted Development
- Permitted Borrow Pit Extension
- Knocknamork Permitted Development
- Buildings and Artificial Surfaces
- Recolonising Bare Ground
- Eroding/Upland Rivers
- Recolonising bare ground
- Dystrophic lakes
- Wet grassland
- Upland blanket bog/ Wet heath
- Upland blanket bog
- Cutover bog
- ▲ Conifer plantation



Drawing Title

Habitat Map

Project Title

Proposed Substation, Underground Cabling & Access Roads to Knocknamork Renewable Energy Development

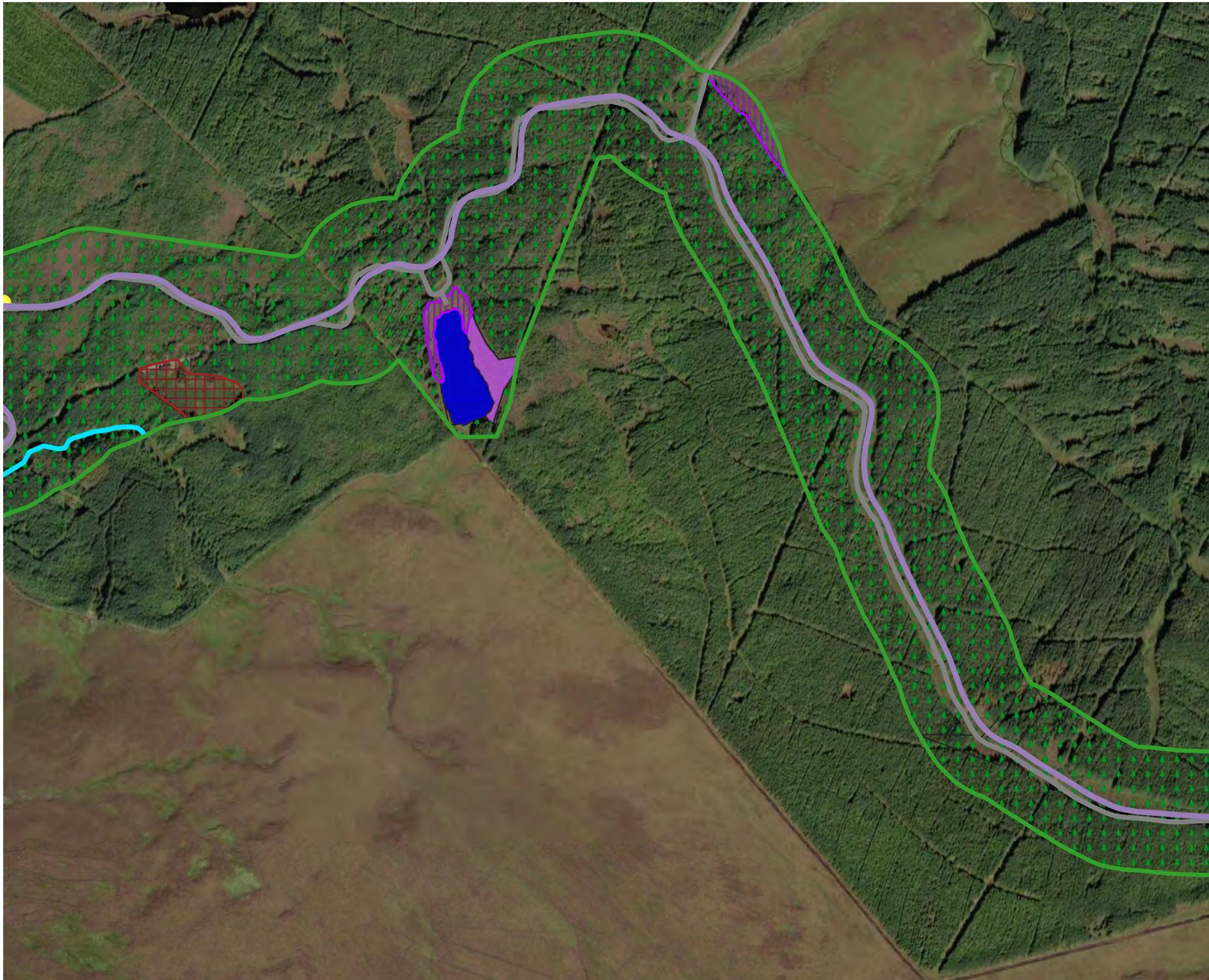
Drawn By: KME Checked By: PR

Project No. 210732 Drawing No. Fig. 6-5F

Scale 1:10000 Date 15.07.2022

MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW84
 +353 (0) 91 735611
 email: info@mkofireland.ie
 Website: www.mkofireland.ie

Microsoft product screen shots reprinted with permission from Microsoft Corporation



Map Legend

-  EIAR Study Boundary
-  Access Road (Upgrade & New)
-  Rhododendron
-  Buildings and Artificial Surfaces
-  Eroding/Upland Rivers
-  Dystrophic lakes
-  Wet heath
-  Upland blanket bog
-  Conifer plantation
-  Scrub



Drawing Title

Habitat Map

Project Title

Proposed Substation Underground Cabling & Access Roads to
Knocknamark Renewable Energy Development

Drawn By

KME

Checked By

PR

Project No.

210732

Drawing No.

Fig. 6-5G

Scale

1:10000

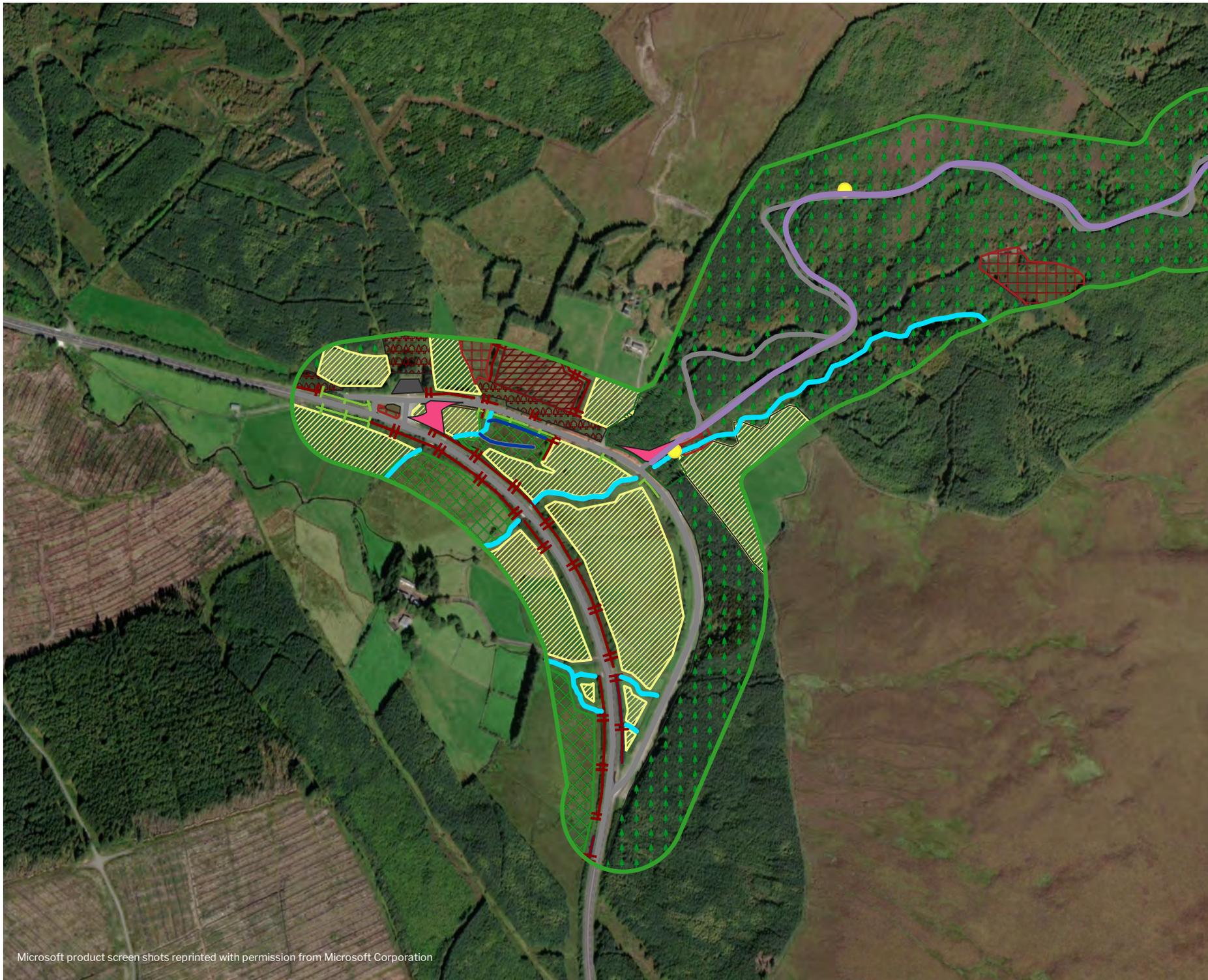
Date

15.07.2022



MKO
 Planning and
 Environmental
 Consultants
 Tuam Road, Galway
 Ireland, H91 VW84
 +353 (0) 91 735611
 email: info@mkofireland.ie
 Website: www.mkofireland.ie

Microsoft product screen shots reprinted with permission from Microsoft Corporation



Map Legend

- EIAR Study Boundary
- Access Road (Upgrade & New)
- Temp. Road
- Rhododendron
- Buildings and Artificial Surfaces
- Eroding/Upland Rivers
- Drainage Ditches
- |— Hedgerows
- |— Treelines
- Buildings and artificial surfaces
- ▨ Improved agricultural grassland
- ▨ Dry meadows and grassy verges
- ▨ Wet grassland
- ▨ Mixed broadleaved/conifer woodland
- ▲ Conifer plantation
- ▨ Scrub
- ▨ Immature woodland
- ▨ Recently-felled woodland



Drawing Title	
Habitat Map	
Project Title	
Proposed Substation, Underground Cabling & Access Roads to Kincolumark Renewable Energy Development	
Drawn By	Checked By
KME	PR
Project No.	Drawing No.
210732	Fig. 6-5H
Scale	Date
1:10000	15.07.2022
MKO Planning and Environmental Consultants Tuam Road, Galway Ireland, H91 VW84 +353 (0) 91 735611 email: info@mkofireland.ie Website: www.mkofireland.ie	

6.6.2 Fauna in the Existing Environment

The multi-disciplinary walkover surveys comprehensively covered the entire EIAR Study Area. 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). Faunal species were surveyed during the multidisciplinary surveys. Dedicated surveys for otters and bats were also undertaken. No requirement for dedicated surveys of other species was necessary based on the results of the comprehensive desk and field surveys described above.

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

- > 28/09/2021
- > 29/09/2021
- > 13/01/2022
- > 09/02/2022
- > 09/05/2022
- > 10/05/2022

In addition to the above targeted surveys, additional faunal signs/sightings were also recorded during other surveys including habitat assessments and bat surveys in 2021 and 2022. The site was also visited on numerous additional occasions during the undertaking of bat surveys in 2021.

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 EIAR Study Area during the site visit and assessment.

6.6.2.1 Otter

All seven watercourse crossings associated with the Proposed Development (as shown in Figure 6-5A – Figure 6-5H habitat maps) were surveyed for signs of otter. Otter surveys at these water crossings involved visual inspection of the watercourse and associated verge habitat for a length of 150m upstream and downstream of the footprint of the Proposed Development as per guidance set out in NRA Guidelines for the Treatment of otters prior to the Construction of National Road Schemes. All other watercourses and waterbodies within 150m of the footprint of the Proposed Development were also surveyed for signs of otter for a length of approximately 150m upstream and downstream of the closest point of the watercourse to the footprint of the Proposed Development. No Signs of otter were recorded during the dedicated otter surveys of the watercourses that drain the EIAR Study Area boundary.

No otter signs were recorded along the watercourses within the site or in close proximity to any of the main Proposed Development components. The main watercourses were assessed as providing suitable commuting and foraging habitat for the species and otter may occur within the EIAR Study Area boundary, at least on occasion.

6.6.2.2 Bats

Bat Habitat Appraisal

As outlined in section 6.6.1 above, the main habitat types identified within the boundary of the Proposed Development are Buildings and Artificial Surfaces (BL3), Upland/ Eroding River (FW1), Wet Grassland (GS4), Drainage Ditches (FW4), Treelines (WL2), Improved Agricultural Grassland (GA1), Wet Heath (HH3), Upland Blanket Bog (PB2), Recolonising Bare Ground (ED3), Conifer Plantation (WD4), Dry Meadows and Grassy Verges (GS2), Recently Felled Woodland (WS5), Cutover Bog

(PB4), Dystrophic Lakes (FL1), Immature woodland (WS2), and Treelines/ Hedgerows mosaic (WL2/WL1).

With regard to commuting and foraging bats, features along the Proposed Development area were assessed as having *Low-Moderate* suitability i.e. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water (Collins, 2016).

With regard to roosting bats, habitat features along the Proposed Development area, including roads and tracks, were assessed as having *Negligible* to *Low* roosting potential i.e. Negligible habitat features likely to be used by roosting bats/trees of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential (Collins, 2016).

The Proposed Development areas will be largely confined to existing roadways, tracks and conifer plantation. Any loss of bat habitat will be minimal and there is no potential for the Proposed Development works to result in significant effect on bat species.

Roost surveys

Following a search for roosts in August 2021, no structures containing potential suitable bat roost features were identified within the ELAR Study Area.

The Proposed Development 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.

No evidence of bats was identified during the daytime inspections. No trees or buildings that offer high quality bat roosting habitat were identified on site. Trees along the turbine delivery route and the cabling routes were classified as having *Negligible* to *Low* roosting potential. Trees present within the site were predominantly conifer species which lacked features that would support roosting bats, including cracks, hazard beams, cankers, rot holes, and fissures in the bark etc.

Manual Transect Surveys

Manual transects were undertaken in August 2021. Numerous foraging and commuting bats were recorded during the dusk bat activity surveys. A total of 289 bat passes were recorded. In general, common pipistrelle (*Pipistrellus pipistrellus*) n=196 occurred most frequently. This was followed by soprano pipistrelle (*Pipistrellus pygmaeus*) n=63. These species are common and widespread across Ireland. In addition, lower numbers of Leisler's bat (*Nyctalus leisleri*) n=25, *Myotis spp.*, n=4 and Brown long-eared bat (*Plecotus auratus*) were also recorded. Transect routes are presented in Figures 6-6A and 6-6B.

Activity levels were concentrated along the access roads and along hedgerows and treeline edge habitats in the vicinity of the proposed underground electrical cabling route in the eastern area of the site (Figure 6-6A – 6-6B). Plate 6-40 shows total bat species composition and Table 6-13 presents the results per survey. Plate 6-41 shows total bat passes per night.

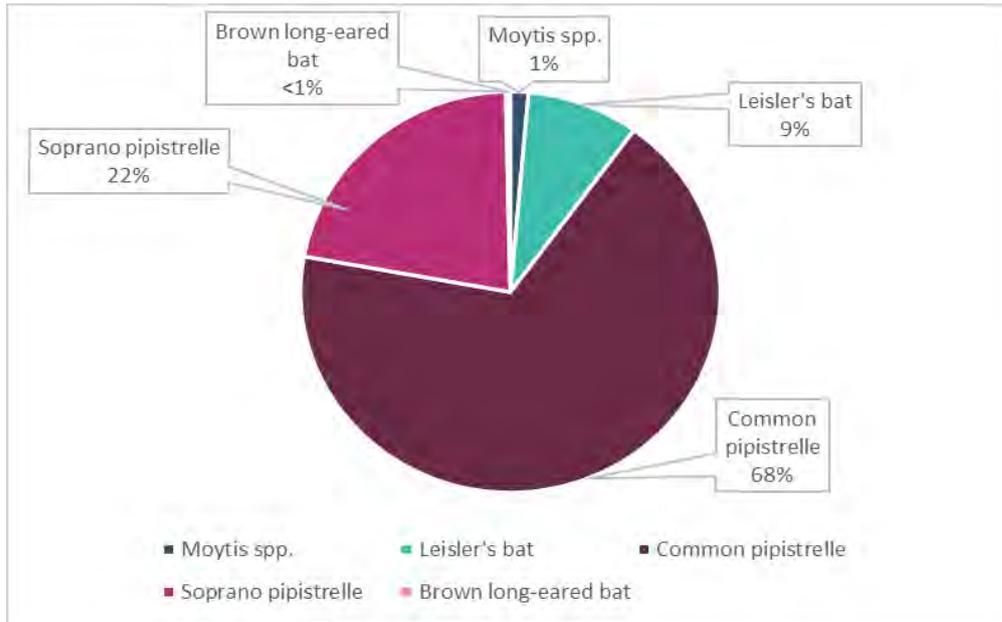


Plate 6- 40 Manual Activity Survey - Total Bat Species Composition

Table 6- 13 Manual Transect Bat Pass Results Per Survey

Species	Dusk 4 th August 2021	Dusk 23 rd August 2021	Total
<i>Myotis spp.</i>	-	4	4
Leisler's bat	16	9	25
Common pipistrelle	20	176	196
Soprano pipistrelle	15	48	63
Brown long-eared bat	-	1	1
Grand Total	51	238	289

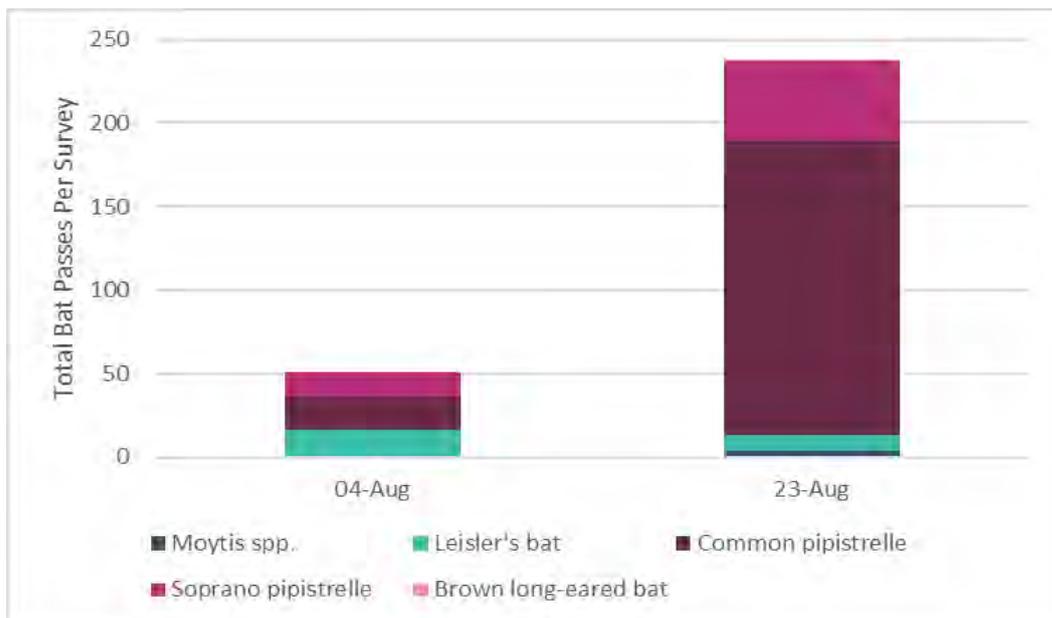
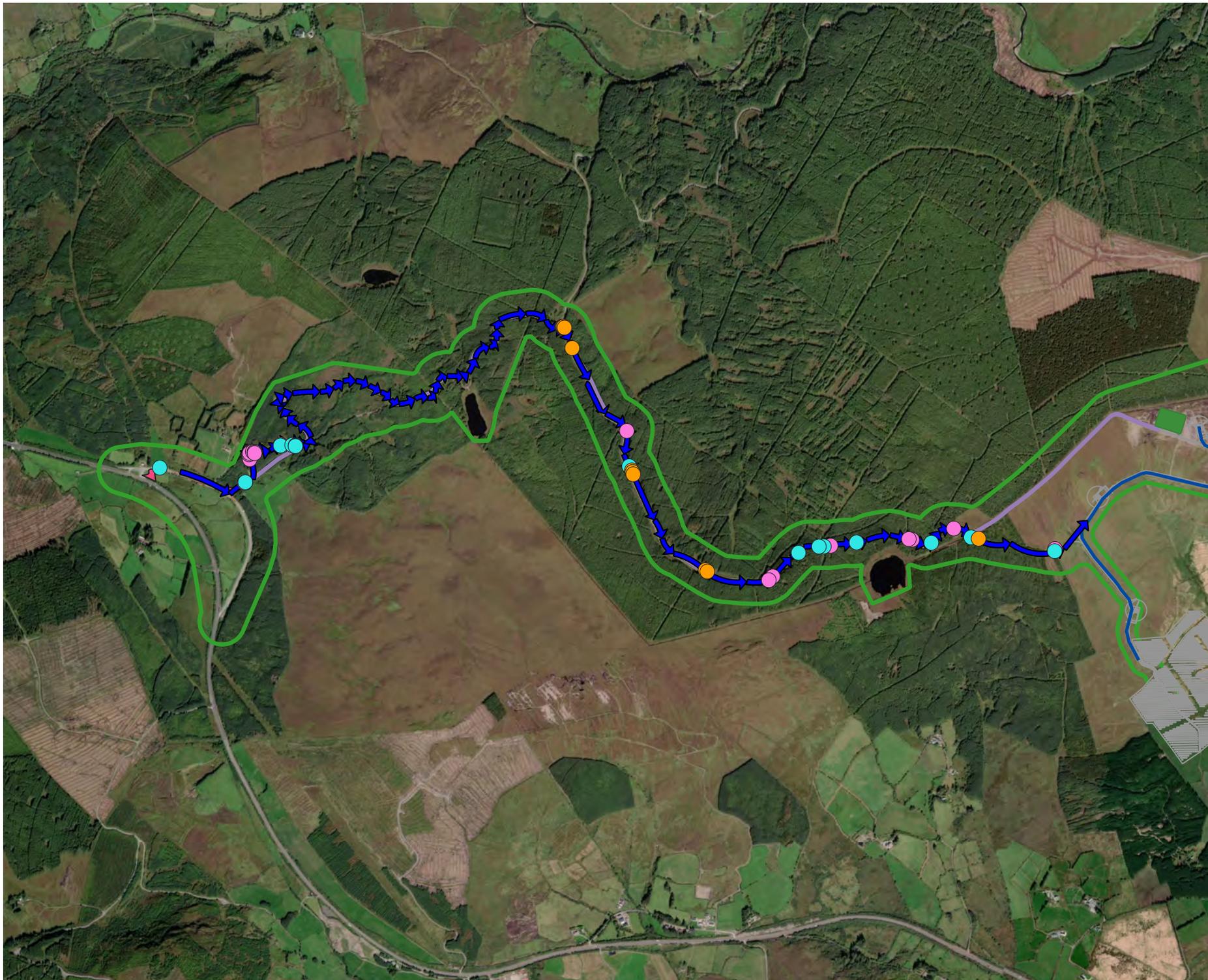


Plate 6- 41 Total Bat Passes Per Night



Map Legend

- EIAR Study Boundary
- Access Road (Upgrade & New)
- Temp. Road
- 33kv Underground Cabling within the Permitted Development
- Knocknamork Permitted Development
- ➔ Transect route

Dusk 04.08.21 transect results

- Leisler's bat
- Common pipistrelle
- Soprano pipistrelle



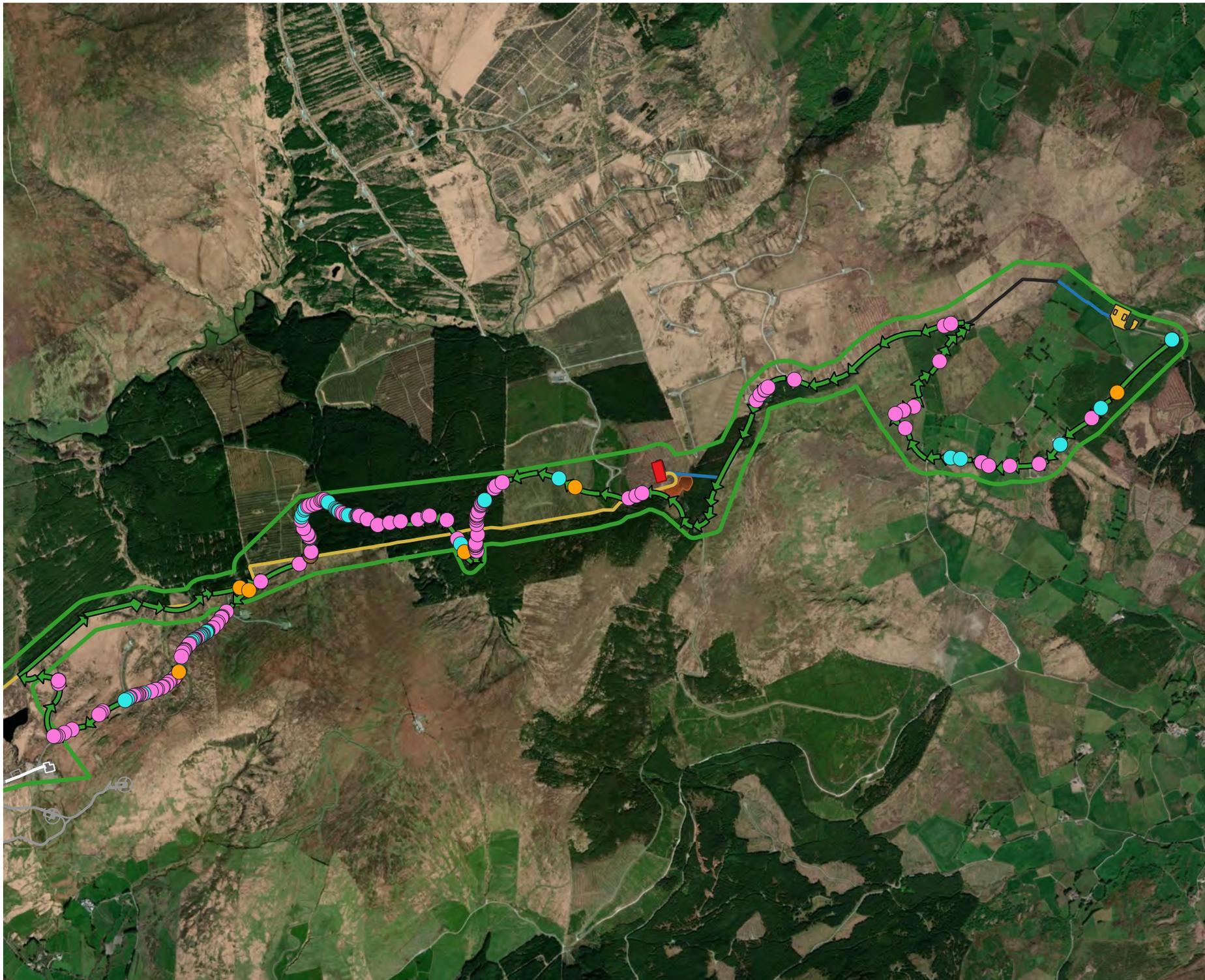
Microsoft product screen shots reprinted with permission from Microsoft Corporation

Drawing Title
**Transect Route and associated results
 - 4th August 2021**

Project Title
 Proposed Substation Underground Cabling & Access Roads to
 Knocknamork Renewable Energy Development

Drawn By KME	Checked By PR
Project No. 210732	Drawing No. Fig. 6-6A
Scale 1:35000	Date 14.07.2022

MKO
 Planning and
 Environmental
 Consultants
 Tuam Road, Galway
 Ireland, H91 VW84
 +353 (0) 91 735611
 email: info@mkofireland.ie
 Website: www.mkofireland.ie



Map Legend

- EIAR Study Boundary
- 33kV Underground Cabling and Access Roads
- 110kV Underground Cabling
- 110kV Underground Cabling and Access Road
- Ballyvouskill 220kV Substation
- Proposed 110kV Substation Location
- Proposed Borrow Pit
- Omitted 38kV Electrical Substation and Battery Storage Compound
- Knocknamork Permitted Development
- Transect route

Dusk 23.08.21 transect results

- Myotis spp.
- Leisler's bat
- Common pipistrelle
- Soprano pipistrelle
- Brown long-eared bat



Microsoft product screen shots
reprinted with permission from
Microsoft Corporation

Drawing Title
**Transect Route and associated results
- 23rd August 2021**

Project Title
Proposed Substation Underground Cabling & Access Roads to
Knocknamork Renewable Energy Development

Drawn By KME	Checked By PR
Project No. 210732	Drawing No. Fig. 6-6B
Scale 1:50000	Date 14.07.2022

MKO
Planning and
Environmental
Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email: info@mkofireland.ie
Webste: www.mkofireland.ie



Map Legend

- EIAR Study Boundary
- Access Road (Upgrade & New)
- Temp. Road
- 33kV Underground Cabling and Access Roads
- 33kV Underground Cabling within the Permitted Development
- 110kV Underground Cabling
- 110kV Underground Cabling and Access Road
- Ballyvouskill 220kV Substation
- Proposed 110kV Substation Location
- Proposed Borrow Pit
- Permitted Borrow Pit Extension
- Omitted 38kV Electrical Substation and Battery Storage Compound
- Knocknamork Permitted Development
- ▲ Static Detector locations



Drawing Title
Static Detector locations

Project Title
Proposed Substation Underground Cabling & Access Roads to Knocknamork Renewable Energy Development

Drawn By KME	Checked By PR
Project No. 210732	Drawing No. Fig. 6-7
Scale 1:90000	Date 14.07.2022

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email: info@mkofireland.ie
Webste: ww.mkofireland.ie

Ground-level Static Surveys

Over the course of the August 2021 surveys, four static detectors were deployed on the site at four different locations (Figure 6-7), for a total of 14 nights. Static detectors were placed in different locations to provide a representative cover of the EIAR Study Area. These detectors allowed a specified look into species composition, commuting and foraging activities within the site.

All recordings were later analysed using bat call analysis software Kaleidoscope Pro v.5.4.2 (Wildlife Acoustics, MA, USA). Bat species were identified using established call parameters, to create site-specific custom classifiers. All identified calls were also manually verified.

In total, 805 bat passes were recorded across all detectors. Bat species recorded included Common pipistrelle (*Pipistrellus pipistrellus*) n=282, Soprano pipistrelle (*Pipistrellus pygmaeus*) n=180, *Myotis spp.* n=131, Brown long-eared bat (*Plecotus auritus*) n=109 and Leisler's bat (*Nyctalus leisleri*) n=93. Lesser horseshoe bat (*Rhinolophus hipposideros*) n=10 were rarely encountered, with 1% or less of total bats recorded.

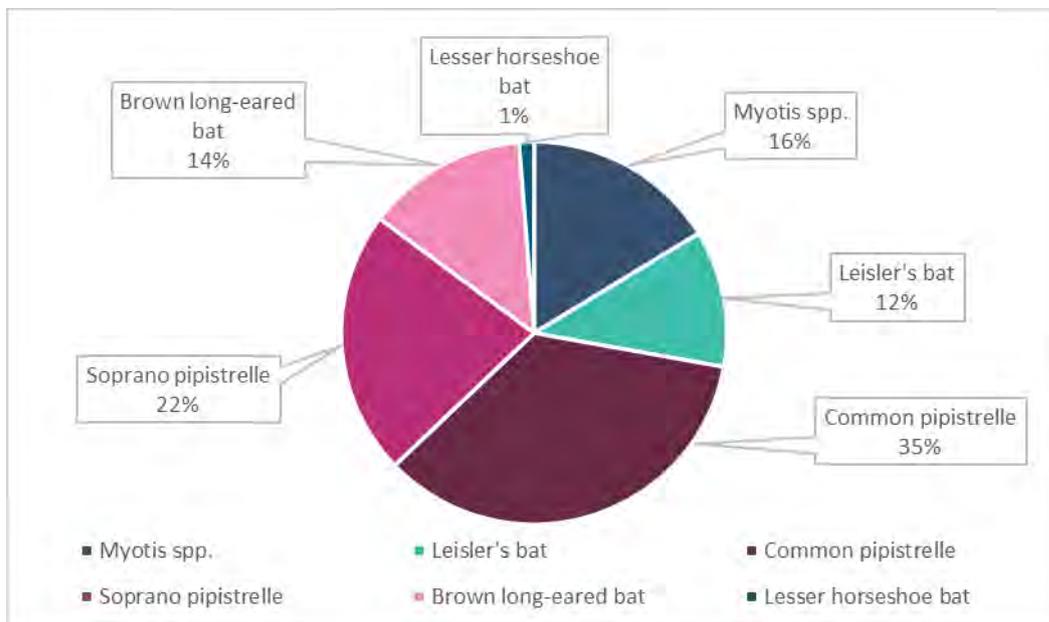


Plate 6- 42 Static Detector Surveys: Species Composition Across All Deployments (Total Bat Passes)

Plate 6-42 shows total bat passes per detector. Detector 1 (D01) was located along the conifer plantation in the north of the site along the turbine delivery route. Detector 2 (D02) was located in west of the site along a conifer forest ride along the turbine delivery route. Detector 3 (D03) was located along a conifer plantation and upland blanket bog in the north of the site along the proposed underground cabling route. Detector 4 (D04) was located along a conifer plantation edge in the east of the site along the proposed underground cabling route.

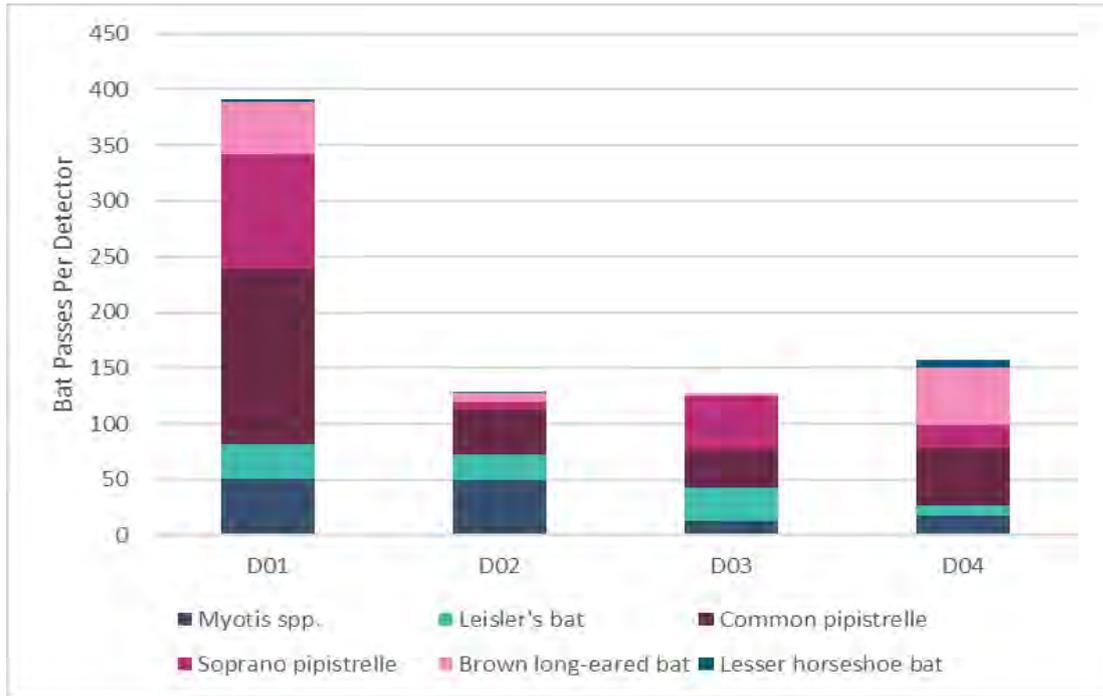


Plate 6-43 Static Detector Surveys: Species Composition Across All Deployments (Total Bat Passes, All Nights)

Analysis of the detector recordings also highlighted the total bat passes per night. Species composition per night across all detectors is shown in Plate 6-44. The detectors were deployed from nights 4th August to 17th August 2021. Activity varied across each night. The graphs demonstrate that Common and Soprano pipistrelle species were most commonly recorded during the survey periods. These species are common and widespread across Ireland.

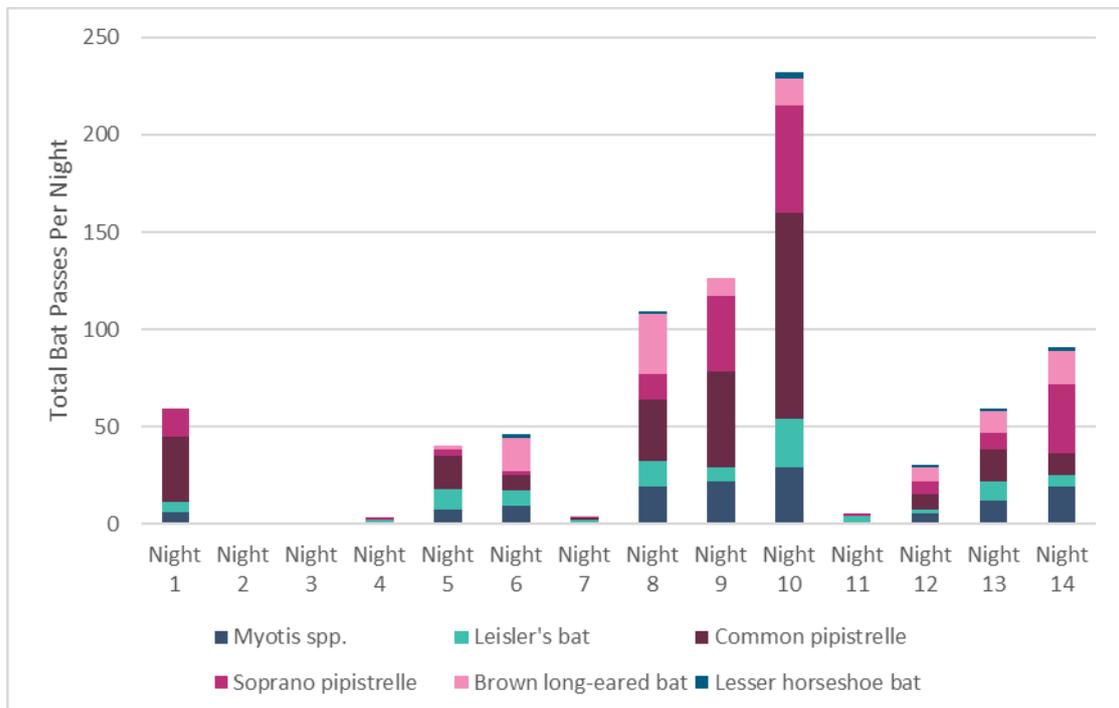


Plate 6-44 Static Detector Surveys: Total Bat Passes Per Night

Importance of Bat Population Recorded at the Site

Ecological evaluation within this section follows a methodology that is set out in Chapter three of the 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2009).

All bat species in Ireland are protected under the Bonn Convention (1992), Bern Convention (1982) and the EU Habitats Directive (92/43/EEC). Additionally, in Ireland bat species are afforded further protection under the Birds and Natural Habitats Regulations (2011) and the Wildlife Acts 1976-2021.

Bats as an Ecological Receptor have been assigned *Local Importance (Higher value)* on the basis that the habitats within the Proposed Development site are utilized by a regularly occurring bat population of *Local Importance*.

The results of the bat surveys, carried out in 2021 indicate that the Proposed Development site does not provide significant suitable habitat for a roosting bat population of ecological significance. No roosting site of *National Importance* (i.e. site greater than 100 individuals) was recorded within the site.

6.6.2.3 Birds

A total of eleven bird species were recorded within the EIAR Study Area. Species recorded included Rook (*Corvus frugilegus*), Jackdaw (*Corvus monedula*), Grey crow (*Corvus cornix*), Woodpigeon (*Columba palumbus*), Blackbird (*Turdus merula*), Robin (*Erithacus rubecula*), Stonechat (*Saxicola rubicola*), Tree sparrow (*Passer montanus*), Wren (*Troglodytes troglodytes*), Magpie (*Pica pica*) and Pheasant (*Phasianus colchicus*). These bird species are typical of the conifer plantations and upland habitats that are present on the site. Given the nature and scale of the works, consisting of short term works associated with construction of access roads, 110kV electrical substation, cable laying and forestry road widening along with construction works in a conifer plantation, there was no requirement for further, dedicated bird surveys.

Hen harrier, which is a Special Conservation Interest of the nearby Mullaghanish to Musheramore Mountains SPA, were not recorded during the surveys undertaken to inform this EIAR and no additional surveys for this species were required.

6.6.2.4 Other Fauna

The suitability of the EIAR Study Area to support other protected faunal species was assessed during the ecological multi-disciplinary walkover surveys. No signs of other protected fauna were recorded during the surveys with the exception of Pine Marten (*Martes martes*) scat, which was frequent throughout the conifer plantations and occasional sightings of Fallow Deer (*Dama dama*) along with regular records of their droppings and signs of their browsing activity. Given the faunal signs recorded and the nature and scale of the works, no further or additional faunal surveys were required, with an assessment having been made based on the ecological multi-disciplinary surveys. It is likely that populations of the above species utilise the EIAR Study Area along with other species such as stoat (*Mustela ermina*), fox (*Vulpes vulpes*) and badger (*Meles meles*). However, the site is unlikely to support any populations of international, national or county importance.

6.6.3 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 KERs. 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	<p>Nationally Designated Sites</p> <p>The following Nationally designated site has been identified as being within the likely Zone of Impact:</p> <ul style="list-style-type: none"> ➤ Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment pNHA [000365] <p>This site is assigned <i>National Importance</i> and included as a KER as there is potential for indirect effects on them via habitat degradation and water pollution.</p>	Yes
	<p>European Designated Sites</p> <p>The following European Designated Sites are identified in the AA Screening as being within the Likely Zone of Impact and are assessed fully in the NIS that accompanies this application:</p> <ul style="list-style-type: none"> ➤ Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment SAC [000365] ➤ Mullaghanish to Musheramore Mountains SPA [004162] <p>These sites are assigned <i>International Importance</i> and are included as a KER as there is potential for indirect effects water pollution.</p>	Yes
Improved agricultural grassland (GA1)	Improved agricultural grassland (GA1) has been classified as being of <i>Local importance (lower value)</i> as this habitat is common and widespread, highly modified and managed and of low biodiversity value. This habitat is therefore not included as a KER .	No
Wet grassland (GS4)	Wet grassland (GS4) has been classified as being of <i>Local importance (lower value)</i> as this habitat is common and widespread, highly modified and managed and of low biodiversity value. This habitat is therefore not included as a KER .	No
Wet heath (HH3)	Wet heath (HH3) has been classified as being of <i>County importance</i> as this habitat is listed under Annex I of the EU Habitats Directive but is highly degraded within the Proposed Development footprint and does not fulfil criteria for valuation as of <i>International</i> or <i>National</i> importance. This	Yes

Ecological feature or species	Reason for inclusion as a KER	KER
	habitat is of high biodiversity value. This habitat is within the Proposed Development footprint and as a result there will be direct impacts thereon. Therefore, this habitat is included as a KER .	
Upland blanket bog (PB2)	Upland blanket bog (PB2) has been classified as being of County importance as this habitat is listed under Annex I of the EU Habitats Directive but is highly degraded within the Proposed Development footprint and does not fulfil criteria for valuation as of International or National importance. This habitat is of high biodiversity value. This habitat is within the Proposed Development footprint and as a result there will be direct impacts thereon. Therefore, this habitat is included as a KER .	Yes
Cutover Bog (PB4)	This habitat is highly degraded within the Proposed Development footprint and does not conform to any Annex I habitat. It has been classified as being of <i>Local importance (lower value)</i> as this habitat is highly modified and of low biodiversity value. This habitat is therefore not included as a KER .	No
Recolonising bare ground (ED3)	Recolonising bare ground (ED3) has been classified as being of <i>Local importance (lower value)</i> as this habitat is common and widespread, highly modified and of low biodiversity value. This habitat is therefore not included as a KER .	No
Conifer plantation (WD4)	Conifer plantation (WD4) has been classified as being of <i>Local importance (lower value)</i> as this habitat is common and widespread, highly modified and managed and is of low biodiversity value. This habitat is therefore not included as a KER .	No
Dystrophic Lakes (FW1)	Dystrophic lakes (FW1) have been classified as being of <i>County importance</i> as this habitat is listed under Annex I of the EU Habitats Directive but does not fulfil criteria for valuation as of <i>International</i> or <i>National</i> importance. This habitat is of high biodiversity value. Proposed works are to take place in roadways close to these habitats but there is no surface water connection and, given the nature and scale of the proposed works, there is no potential for effects on this habitat. This habitat is not included as a KER .	No

Ecological feature or species	Reason for inclusion as a KER	KER
Treelines (WL2)/ Hedgerow (WL1)	Treelines (WL2)/ Hedgerows (WL1) have been classified as being of <i>Local importance (higher value)</i> as these habitats provide roosting, commuting and foraging habitat for a range of local species and are of high biodiversity value in a local context. Approximately 15m of Treeline (WL2)/ Hedgerow (WL1) habitat will be lost as a result of the Proposed Development. However, due to the immature nature and short term nature of the works this habitat is not included as a KER .	No
Scrub (WS1)	Scrub (WS1) has been classified as being of <i>Local importance (lower value)</i> as this habitat is of low biodiversity value and is common and widespread. Therefore, this habitat is not included as a KER .	No
Eroding/upland rivers (FW1)	The small watercourses on the site have been classified as being of <i>Local importance (higher value)</i> as this habitat provides commuting and foraging habitat for a range of local species, connect to downstream water features of International and National importance, and are of high biodiversity value in a local context. This habitat is within the Proposed Development footprint. While there will be no in stream works associated with the Proposed Development, there is the potential for indirect effects on this habitat in the form of run off associated with the proposed works. Therefore, this habitat is included as a KER .	Yes
Immature woodland (WS2)	Immature woodland (WS2) has been classified as being of <i>Local importance (higher value)</i> as this habitat provides roosting, commuting and foraging habitat for a range of local species and is of high biodiversity value in a local context. However, due to the immature and planted nature of this habitat it is not included as a KER .	No
Dry meadows and grassy verges (GS2)	Dry meadows and grassy verges (GS2) has been classified as being of <i>Local importance (lower value)</i> as this habitat is of low biodiversity value and is common and widespread. This habitat is therefore not included as a KER .	No
Buildings and artificial surfaces (BL3)	Buildings and artificial surfaces (BL3) has been classified as being of <i>Local importance (lower value)</i> as this habitat is common and widespread, highly modified and managed and is of low biodiversity value. This habitat is therefore not included as a KER .	No

Ecological feature or species	Reason for inclusion as a KER	KER
Birds	Eleven bird species were recorded over the course of the multidisciplinary site surveys. Birds have been classified as being of <i>Local importance (lower value)</i> as bird species recorded were common and widespread in the wider landscape. Furthermore, the nature and scale of the Proposed Development is such that there will be no significant loss of bird nesting and foraging habitat and no potential for significant disturbance. Birds are therefore not included as a KER .	No
Bats	All bat species in Ireland are protected under both national legislation – (Wildlife Act, 1976, as amended in 2021) and European legislation – (Habitats Directive (92/43/EEC)). Bats are likely to forage and commute within the vicinity of the Proposed Development. However, no bat roosts were recorded within the ELAR Study Area with no trees or buildings identified as being of high suitability to roosting bats and trees adjacent to the footprint of the proposed works classified as being of <i>negligible to low</i> suitability for roosting bats. Furthermore, the nature and scale of the Proposed Development are such that there will be no significant loss of bat foraging or commuting habitat. Bats are therefore not included as a KER .	No
Aquatic species	The aquatic species that are associated with the watercourses that are located within and surrounding the site assigned <i>Local Importance (Higher Value)</i> in that they have a high biodiversity value in the local context. Some downstream watercourses and their associated fauna have also been assigned <i>International Importance</i> as they are located within SACs. There is potential for indirect effect on these features as a result of impacts on water quality. These species include salmonid, lamprey species, white clawed crayfish, freshwater pearl mussel and other aquatic species. Aquatic species are therefore included as a KER .	Yes
Additional protected fauna (e.g. Irish hare, pine marten, fox etc).	The recorded evidence suggests that the ELAR Study Area is not utilised by populations of higher than <i>local significance</i> . Due to the nature and scale of the Proposed Development, they are unlikely to be significantly affected by the Proposed Development. For this reason, other faunal species are not included as a KER .	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 for commercial forestry. This would continue to involve the harvesting of timber as it matures, followed by the replanting of coniferous forestry. The other habitats identified within the EIAR Study Area, including agricultural grasslands, peatlands and associated habitats, would likely remain in a similar condition to current baseline. 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 of 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

The east of the EIAR Study Area overlaps with Mullaghanish to Musheramore Mountains SPA [004162]. However, no works are proposed for the overlapping area between the SPA and the EIAR Study Area. No proposed works are to take place within the boundaries of any Nationally or European designated sites and therefore there will be no direct effects on any designated site as a result of the construction, operation and decommissioning of the Proposed Development.

One nationally designated site was identified as being within the Likely Zone of Impact and as a KER, listed below:

- The Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment pNHA [000365]

This pNHA is also designated as a European Site and has been assessed as that designation within the Appropriate Assessment Screening Report and NIS, with the relevant conclusions recorded and referenced in this chapter.

Downstream surface connectivity (approximately 1km surface water distance) with this pNHA has been identified via tributaries of the Clydagh River (Flesk catchment) and there is potential for deterioration of water quality during the construction phase of the Proposed Development. The effect is classified as negative and short-term with a medium probability of occurring. The pathways that would allow for the deterioration of water quality to occur will be robustly blocked by the mitigation measures outlined in Section 6.7.3 below. Following the implementation of mitigation, the residual effect on Designated Sites is assessed as neutral, imperceptible and short-term with a low probability of occurring.

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 Guidance (2022), “A biodiversity section of an EIAR, for example, should not repeat the detailed assessment of potential effects on European sites contained in documentation prepared as part of the Appropriate Assessment process, but it should refer to the findings of that separate assessment in the context of likely significant effects on the environment, as required by the EIA Directive”. 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 subject development, individually or in combination with other plans and projects, would be likely to have a significant effect on the following sites:

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

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

The findings presented in the NIS are that:

‘For the reasons set out in detail in this NIS, in the light of the best scientific knowledge in the field, all aspects of the subject development which, by itself, or in combination with other plans or projects, which may affect the relevant European Sites have been considered. The NIS contains information which the competent authority, may consider in making its own complete, precise and definitive findings and conclusions and upon which it is capable of determining that all reasonable scientific doubt has been removed as to the effects of the subject development on the integrity of the relevant Natura 2000 sites.

In conclusion, in the light of the conclusions of the assessment which it shall conduct on the implications for the European sites concerned, the competent authority is enabled to ascertain that the subject development will not adversely affect the integrity of any of the European sites concerned’.

6.7.3 Likely Significant Effects During Construction Phase

6.7.3.1 Effects on Habitats During Construction

6.7.3.1.1 Habitat Loss and Deterioration

The majority of the Proposed Development area is made up of highly modified and disturbed habitats, that are of low biodiversity value. They are not identified as KERs and their loss or disturbance to facilitate the construction of the Proposed Development was assessed but was not found to be result in significant ecological effects. There is no potential for significant effects on the dystrophic lakes that are located within the EIAR Study Area as they are all separated from the proposed small scale works and there was no identified pathway for effect. Similarly, the majority of the works avoid the sensitive peatlands within the site and in turn avoid the potential for significant effects.

However, the proposed works do encroach on degraded Wet heath (HH3)/ Upland blanket bog (PB2) habitats, classified as being of *County importance*, within the eastern sections of the site where the proposed 110kV underground electrical cabling will be laid adjacent to an existing 110kV cable partially alongside an existing track and through this peatland habitat.

Table 6- 15 Potential for impact on peatland habitat

Description of Effect	The proposed works will involve the laying of 110kV underground cabling adjacent to an existing cable through an area that is dominated by a mosaic of degraded and partially cut over Upland blanket bog (PB2)/ Wet heath (HH3). Although degraded, Wet heath (HH3) and Upland blanket bog (PB2) within the footprint of the proposed 110kV underground cabling correspond to habitats listed under Annex I of the EU Habitats Directive. The proposed 110kV cabling will be located immediately adjacent to an existing track and will follow disturbed ground along its edge and will closely follow degraded habitats that lie adjacent to the existing cable and the degraded
------------------------------	--

	peatland that surrounds it. The works will be located within these peatland habitats for a distance of approximately 600m and will involve the disturbance of a strip of approximately 5metres in width. Whilst the peatlands will be replaced following the works, this will result in the potential further degradation of approximately 2,950m ² of degraded Wet heath (HH3)/ Upland blanket bog (PB2) habitat.
Characterisation of unmitigated effect	In the absence of mitigation, the direct effect on degraded Wet heath (HH3)/ Upland blanket bog (PB2) during construction will be negative and long-term, with a high certainty of occurring. The magnitude of any such impact is likely to be slight, given that Wet heath (HH3)/ Upland blanket bog (PB2) within the development footprint is already degraded and highly disturbed and is located adjacent to an existing underground cable and roadway and that only a small percentage of the overall Wet heath (HH3)/ Upland blanket bog (PB2) habitat in the area will be degraded.
Assessment of Significance prior to mitigation	In the absence of mitigation and following the precautionary principle, there is potential for the Proposed Development to result in a slight effect on the identified habitats at a county geographic scale in the form of habitat loss during the construction phase. This is not a significant effect.
Mitigation	<p>Whilst no significant habitat loss or deterioration is predicted, the following mitigation will be employed to minimise the impact of the proposed works on peatland habitats.</p> <ul style="list-style-type: none"> ➤ Temporary fences will be erected surrounding the proposed works area to prevent encroachment outside this area. ➤ An existing track and the route of the existing cable that lies adjacent to the proposed cabling will be used as part of the working area in order to minimise impacts on the surrounding peatlands. ➤ Low ground pressure wide-track machinery will be used and will be operated adjacent to the proposed 110kV underground cabling trench and existing track, with no access to areas that are not immediately adjacent to the proposed cabling route. ➤ At the outset, the turves with their existing vegetation will be stripped and stored the right way up on the adjacent track and disturbed habitat. ➤ The cable will be laid as per the methodology set out in Chapter 4 of this EIAR, Description. ➤ The turves will be replaced on top of the newly installed cabling and the temporary fence removed. ➤ Temporary fences will be put in place in all areas where works are taking place in close proximity to peatland habitats to avoid temporary or permanent encroachment onto them. <p>The proposed works area is located in a highly disturbed area of peatland habitat and taking into account the above mitigation, no significant effects on degraded Annex I peatland habitat are predicted. However, following a precautionary principle, it is estimated that the proposed works have the potential to result in the further degradation of 2,950m² of already degraded Wet heath (HH3)/ Upland blanket bog (PB2) habitat (given the length and width of the works area within the peatland habitats). In acknowledgement of this risk, the enhancement of 5,900m² of peatland habitat is proposed by felling coniferous forestry that was planted on peatland habitats. This will ensure that there is no potential for net loss of degraded Annex I habitat and will result in an overall net gain in peatland habitat area resulting from the proposed works. Details of the biodiversity enhancement area are provided in Section 6.7.3.1.1 below.</p>
Residual Effect following Mitigation	Following the implementation of mitigation, there will be no significant residual effect on peatland habitats.

6.7.3.1.1 Peatland Enhancement Proposal

It is proposed to fell and remove approximately 0.59 hectares of non-Annex I Sitka spruce (*P. sitchensis*) dominated conifer plantation (WD4) that is located on a peat substrate. In this area much of the original peatland vegetation has persisted beneath the conifer plantation (Plate 6-45). A dry Drainage ditch (FW4) was also recorded in this area. The removal of conifer trees will enable the reversion of the area back to Annex I Wet Heath over time. In its current state, lands within the proposed compensation site are classified as Conifer Plantation (WD4) and are classified as being of *Local importance (lower value)*.

The area is located on sloping ground at the interface between an existing heath and conifer plantation. It is on sloping ground with peat depths of between 0.4m to over 1m. The area was relatively dry underfoot with dry drainage channels located within the forestry. This area was bounded to the west by a forestry track which would facilitate access and enable management of this area.

The proposed enhancement area is shown on Figure 6-8.

Proposed measures for the enhancement of this area include:

- Trees shall be removed from the enhancement area along with all brash.
- Dry forestry drains located within the area will be blocked to assist in restoring peatland hydrological conditions.



Plate 6- 45 View of Conifer plantation (WD4) with small area of Molinia-dominated peatland within the proposed Compensation Area

To confirm that habitat restoration and enhancement has been successful, all areas of restored vegetation will be monitored post-restoration. Monitoring results will be reported within an Annual Environmental Report with any criteria failures identified and corrective actions implemented.

Following the felling of the trees and blocking of the forestry drains, permanent vegetation monitoring plots will be established within the enhancement area. The monitoring plot locations will be selected using stratified random sampling. This will allow the monitoring plots to be representative of microtopography and vegetation cover.

Monitoring plots will be surveyed and classified using the relevé method as per the National Survey of Upland Habitats (Perrin et al., 2014) with plot sizes being 2m x 2m. Biotic and abiotic parameters that form baseline indicators of ecological and hydrological condition of the bog will be recorded.

Monitoring plots will be marked out permanently using fencing posts and their location recorded using GIS. The number of monitoring plots will be determined by the level of plant community heterogeneity identified during the baseline survey. However, it is envisaged that a minimum of three 2m x 2m monitoring plots will be established across the enhancement area.

Vegetation monitoring will be carried out in years 1, 3, 5 and 10 after restoration. Results will be analysed and a report of the findings will be produced. The enhancement plan will be regularly updated and amended where necessary to improve the efficacy of the enhancement work.



Map Legend

- EIAR Study Boundary
- Access Road (Upgrade & New)
- Temp. Road
- 33kV Underground Cabling and Access Roads
- 33kV Underground Cabling within the Permitted Development
- 110kV Underground Cabling
- 110kV Underground Cabling and Access Road
- Ballyvuskil 220kV Substation
- Proposed 110kV Substation Location
- Proposed Borrow Pit
- Permitted Borrow Pit Extension
- Omitted 38kV Electrical Substation and Battery Storage Compound
- Knocknamork Permitted Development
- Enhancement land



Drawing Title	
Proposed Enhancement Area	
Project Title	
Proposed Substation Underground Cabling & Access Roads to Knocknamork Renewable Energy Development	
Drawn By	Checked By
KME	PR
Project No.	Drawing No.
210732	Fig. 6-8
Scale	Date
1:90000	14.07.2022

MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW84
 +353 (0) 91 735611
 email: info@mkofireland.ie
 Website: www.mkofireland.ie

Microsoft product screen shots reprinted with permission from Microsoft Corporation
 Ordnance Survey Ireland Licence No. AR 0021820 © Ordnance Survey Ireland/Government of Ireland

6.7.3.1.2 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>There are seven EPA mapped watercourse crossings associated with the footprint of the Proposed Development. There is the potential for the construction phase of the Proposed Development to result in pollution related effects, such as silt run-off, on rivers, streams and sensitive aquatic faunal species within and adjacent to the Proposed Development in the absence of mitigation.</p> <p>Given the nature and scale of the works and a lack of proposed in stream works in the EPA watercourses as described in Chapter 4 of this EIAR, Description, there will be no direct effects on these habitats, or the species associated with them. The nature and scale of the works are such that watercourses adjacent to the Proposed Development are unlikely to be significantly affected, provided that construction best practice in implemented</p> <p>Note: Whilst this impact assessment is in the habitats section, it also assesses the impact on the Proposed Development on aquatic species including salmonids, lamprey, white-clawed crayfish, European eel, freshwater pearl mussel, 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>Characterisation of unmitigated effect</p>	<p>In the absence of mitigation, the direct effect on rivers, streams and sensitive aquatic faunal species during the construction phase of the Proposed Development was considered to be as most slight, given the nature and scale of the works and the fact that no in-stream works are proposed for the development.</p> <p>However, indirect effects associated with the construction phase of the Proposed Development have the potential to result in, short term and likely effect on rivers, streams and sensitive aquatic faunal species but this effect would be very localised and last only a very short period of time. The magnitude of such an effect could potentially be significant.</p>
<p>Assessment of Significance prior to mitigation</p>	<p>In the absence of mitigation and following the precautionary principle, there is potential that the Proposed Development would result in a significant effect on the identified habitats and species at a local geographic scale in the form of pollution during the construction phase.</p>
<p>Mitigation</p>	<p>Mitigation measures are fully considered in Section 8.5 of Chapter 8 of this EIAR, Hydrology and Hydrogeology and include a series of surface water protection measures to be employed during all proposed construction operations for the Proposed Development.</p>
<p>Residual Effect following Mitigation</p>	<p>Following the implementation of mitigation, there will be no significant residual effect on aquatic habitats and species.</p>

6.7.3.2 Effects on Protected Fauna During Construction

The Proposed Development has the potential to result in short term and small scale habitat loss and disturbance impacts on faunal species within the site. Given the nature and scale of the proposed works, the avoidance of hedgerows and treelines, and the extent of suitable faunal habitat within the wider area that will not be impacted by the works, no significant effects on terrestrial faunal biodiversity are anticipated as a result of the Proposed Development. Whilst no significant effects on bird species

are anticipated, in order to minimise any effect all felling and cutting of woody vegetation will take place in strict accordance with Section 40 of the Wildlife Acts, which refers to the protection of wild birds. Additionally, a pre-commencement ecological walkover of the site will be undertaken to determine if any protected faunal species have moved into the site in the intervening period between the submission of the EIAR and the commencement of construction. Should any such species be present at that stage, they will be treated in accordance with the relevant guidelines and legislation (e.g. the Wildlife Acts and the NRA Guidance)

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 6.7.3.1.2 above and is not repeated in this section.

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 habitats and as such there is no potential for any likely significant direct or indirect effects in this regard.

The potential for negative, slight, indirect effects on aquatic habitats and species is identified in the form of entrainment of suspended solids and potentially hydrocarbons as a result of maintenance activities on the site.

In addition, the slight increase in hard standing that will occur as a result of the Proposed Development has the potential to result in a slight, indirect negative effect on aquatic habitats and species.

However, Section 8.5.3 of this EIAR clearly describes the mitigation that will be employed to avoid and/or reduce these impacts and ensure that no significant effects remain in this regard.

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 and no effects on terrestrial fauna are anticipated during the operational phase.

Effects on aquatic fauna are considered in Section 6.7.4.1 above and that assessment is not repeated in this section.

6.7.5 Likely Significant Effects During Decommissioning phase

It is not intended that the on-site electricity electrical substation will be removed at the end of the useful life of the Permitted Development, as permanent planning permission is being sought for the substation development. By the time the decommissioning of the Permitted Development is to be considered, the proposed 110kV substation and the proposed underground electrical cabling (110kV) from the proposed 110kV electrical substation to the existing 220kV Ballyvouskill will likely form an integral part of the local electricity network, with a number of supply connections and possibly some additional generation connection. Therefore, it is intended that the proposed 110kV substation and underground electrical cabling (110kV) will be retained as a permanent structure and will not be decommissioned.

The underground electrical cabling (33kV) connecting the Permitted Development to the proposed 110kV electrical substation 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.

Site roadways could be in use for purposes other than the operation of the development by the time the decommissioning of the Permitted 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.

Due to the nature, scale and short term of proposed decommissioning works, no significant effects on biodiversity will occur during the decommissioning stage of the Proposed Development.

6.8 Cumulative Impact

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 6.6.3 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 Section 2.5 of this EIAR, Background..

6.8.1 Assessment of Plans

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

- Cork County Development Plan 2022 – 2028
- Kerry County Development Plan 2015-2021
- Draft Kerry County Development Plan 2022 – 2028
- National Biodiversity Action Plan 2017-2021

The review focused on policies and objectives that relate to designated sites for nature conservation, biodiversity and protected species. An overview of the search results with regard to plans is provided in Table 6-17.

Table 6-17 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
<p>Cork County Development Plan 2022 – 2028 Volume 1</p>	<p><u>CS 2-5: North Cork Strategic Planning Area</u></p> <p>f) Prioritise the adequate provision of water services and transport infrastructure to meet current needs and future population targets while protecting the areas environment; and Protect and enhance the natural heritage of the Blackwater catchment.</p> <p><u>BE 15-2 Protect sites, habitats and species</u></p> <p>a) Protect all natural heritage sites which are designated or proposed for designation under European legislation, National legislation and International Agreements. Maintain and where possible enhance appropriate ecological linkages between these. This includes Special Areas of Conservation, Special Protection Areas, Marine Protected Areas, Natural Heritage Areas, proposed Natural Heritage Areas, Statutory Nature Reserves, Refuges for Fauna and Ramsar Sites. These sites are listed in Volume 2, Appendix A of the Plan.</p> <p>a) Provide protection to species listed in the Flora Protection Order 2015, on Annexes of the Habitats and Birds Directives, and to animal species protected under the Wildlife Acts in accordance with relevant legal requirements. These species are listed in Volume 2, Appendix A of the Plan.</p> <p>Protect and where possible enhance areas of local biodiversity value, ecological corridors and habitats that are features of the County’s ecological network. This includes rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands as well as coastal and marine habitats. It particularly includes habitats of special conservation significance in Cork as listed in Volume 2 Appendix A of the Plan.</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.</p> <p>The Proposed Development has been designed in order to avoid likely significant effect on areas of ecological importance. Where the potential for adverse effect on areas of ecological importance has been identified mitigation will be implemented.</p> <p>Where pathways for effect on Designated Sites have been identified, mitigation shall be implemented.</p> <p>No potential for negative cumulative impacts when considered in conjunction with the current proposal were identified.</p> <p>No developments or projects identified within the Development Plan were found to occur in the wider area surrounding the Proposed Development.</p>
<p>Kerry County Development Plan 2015-2021</p>	<p><u>NE-2</u></p> <p>Ensure that the requirements of relevant national and EU legislation, including the Habitats Directive (92/43/EEC), the EU (Birds) Directive (79/409/EEC), the Environmental Impact Assessment Directive (85/337/EEC), the Water Framework Directive (2000/60/EC), and the Flood Directive (2007/60/EC), are met by the Council in undertaking its functions.</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.</p> <p>The Proposed Development has been designed in order to avoid likely significant effect on areas of</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
	<p><u>NE-11</u></p> <p>Ensure that all projects likely to have a significant effect on a Natura 2000 / European site will be subject to Habitats Directive Assessment prior to approval.</p> <p><u>NE-12</u></p> <p>Ensure that no projects which will be reasonably likely to give rise to significant adverse direct, indirect or secondary impacts on the integrity of any Natura 2000 sites having regard to their conservation objectives, shall be permitted on the basis of this Plan (either individually or in combination with other plans or projects) unless imperative reasons of overriding public interest can be established and there are no feasible alternative solutions.</p> <p><u>NE-13</u></p> <p>Maintain the nature conservation value and integrity of all Natural Heritage Areas (NHAs), proposed Natural Heritage Areas (pNHAs), Nature Reserves and Killarney National Park. This shall include any other sites that may be designated at national level during the lifetime of the plan in co-operation with relevant state agencies</p> <p><u>NE-14</u></p> <p>Protect species of plants listed in the Flora Protection Order (S.I. No. 94 of 1999) and their habitats, species and the habitats of species that require strict protection under the Habitats Regulations (S.I. No. 94 of 1997, 233 of 1998 and 378 of 2005) and animal and bird species and their habitats protected under the Wildlife Acts 1976-2000.</p> <p><u>NE-15</u></p> <p>Achieve water quality targets by implementing the River Basin Management Plans (and associated programmes of measures) and to ensure that development undertaken or permitted by local authorities; other public agencies or private operators, shall not contravene the objectives of the Water Framework</p>	<p>ecological importance. Where the potential for adverse effect on areas of ecological importance has been identified mitigation will be implemented.</p> <p>Where pathways for effect on Designated Sites have been identified, mitigation shall be implemented.</p> <p>No potential for negative cumulative impacts when considered in conjunction with the current proposal were identified.</p> <p>No developments or projects identified within the Development Plan were found to occur in the wider area surrounding the Proposed Development.</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
	<p>Directive, the European Communities Environmental Objectives (Surface Waters) Regulations 2009 SI 272 of 2009 and the European Communities Environmental Objectives) Groundwaters) Regulations 2010, SI 9 of 2010.</p> <p><u>NE-16</u></p> <p>(a) Promote the protection of Protected Areas as outlined in Annex (IV) of the Water Framework Directive and the application of relevant Government Guidance in this area. Implement Sub-basin (b) Management Plans in accordance with the Fresh Water Pearl Mussel Regulations (SI 296 of 2009).</p> <p><u>NE-19</u></p> <p>Ensure that planning applications are assessed with regard to the Groundwater Protection Scheme and the likely impacts the development may have on groundwater quality. Development considered inappropriate by the Council will be prohibited in the vicinity of important aquifers. Cumulative impacts shall also be taken into consideration.</p> <p><u>NE-22</u></p> <p>Protect rivers, streams and other watercourses including those outside Protected Areas and maintain them where possible in an open state capable of providing suitable habitat for fauna and flora and to work with other agencies, as appropriate, to prevent the spread of invasive species in or along the county's aquatic habitats by implementing biosecurity measures, where appropriate.</p>	
<p>Draft Kerry County Development Plan 2022 - 2028</p>	<p>It is an Objective of the council to:</p> <p>KCDP 11-1 - Ensure that the requirements of relevant EU and national legislation, are complied with by the Council in undertaking its functions, including the requirements of the EU Birds and Habitats Directives.</p> <p>KCDP 11-2 - Maintain the nature conservation value and integrity of Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs). This shall include any other sites that may be designated at national level during the lifetime of the plan in co-operation with relevant state agencies.</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.</p> <p>The Proposed Development has been designed in order to avoid likely significant effect on areas of ecological importance. Where the potential for</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
	<p>KCDP 11-3 - Work with all stakeholders in order to conserve, manage and where possible enhance the County's natural heritage including all habitats, species, landscapes and geological heritage of conservation interest and to promote increased understanding and awareness of the natural heritage of the County.</p> <p>KCDP 11-5 - Support and facilitate the actions in the National Biodiversity Action Plan and Kerry County Councils Biodiversity Action Plan 2022 – 2028.</p> <p>KCDP 11-14 - Ensure invasive species are managed in compliance with the provisions of the EC (Birds and Habitats) Regulations (SI 477 of 2011), as amended, particularly Sections 49, 50 and the Third Schedule. Best practices, as produced and updated by relevant authorities, are to be adhered to in the management of invasive species particularly on sites proposed for development.</p> <p>KCDP 11-19 - Encourage and facilitate the retention and creation of features of local biodiversity value, ecological corridors and networks that connect areas of high conservation value such as watercourses, woodlands, hedgerows, earth banks and wetlands.</p> <p>KCDP 11-21 - Promote the integration and improvement of natural watercourses in development proposals having regard to the IFT's guidance Planning for Watercourses in the Urban Environment.</p> <p>KCDP 11-26 - Work with stakeholders to protect and sustainably enhance the biodiversity and where appropriate the landscape and recreational interests of woodlands in the County.</p>	<p>adverse effect on areas of ecological importance has been identified mitigation will be implemented.</p> <p>Where pathways for effect on Designated Sites have been identified mitigation shall be implemented.</p> <p>No potential for negative cumulative impacts when considered in conjunction with the current proposal were identified.</p> <p>No developments or projects identified within the Development Plan were found to occur in the wider area surrounding the Proposed Development.</p>
<p>National Biodiversity Action Plan 2017-2021</p>	<p>Objective 1 - Mainstream biodiversity into decision-making across all sectors</p> <p>Developments in the area of Green Infrastructure are being initiated at the local and regional level. Green Infrastructure is a strategically planned network of natural and semi natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services such as water purification, air quality, space for recreation and climate mitigation and adaptation.</p> <p>Objective 4 - Conserve and restore biodiversity and ecosystem services in the wider countryside</p>	<p>The Plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the biodiversity, protected species and designated sites. The Proposed Development has been designed in order to avoid any potential fragmentation of habitats or commuting corridors.</p>

Plans	Key Policies and Objectives directly related to European Sites and Biodiversity in the Zone of Influence	Assessment of Potential Impact on European Sites
	<p>Target 6.2 - Sufficiency, coherence, connectivity, and resilience of the protected areas network substantially enhanced by 2020.</p>	<p>No potential for negative cumulative impacts when considered in conjunction with the current proposal were identified.</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 Permitted 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.

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 protected species, was considered in relation to the existing land uses in the area.

The proposed works are primarily located in artificial and highly disturbed habitats, which generally provide low value habitats for faunal species. Provided that construction best practice is implemented, and mitigation measures are implemented, the potential for likely significant effect on degraded peatland habitats within the site has been avoided. The proposed works will not contribute to any significant overall loss of high value habitat, and has been deliberately designed to be located primarily within habitats that are of low biodiversity value and to minimise potential for impacts on more sensitive habitats.

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. and 6.8.3. Particular focus has been placed on those plans and projects that are in closest proximity to the Proposed Development.

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 or any other significant effect 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 its siting within habitats of low ecological value.

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.

Conclusion

The Proposed Development consists of relatively small scale works in the form of improvements to an existing forestry road, construction of new access roads, the laying of underground cabling and the construction of a 110kV substation and borrow pits. The development has been designed to avoid or minimise impacts on biodiversity. The site is located primarily within a large plantation coniferous forestry (WD4) of varying ages which has been assessed as of low ecological value. The Proposed Development has been deliberately designed to avoid sensitive peatland habitats where possible and to minimise impacts on them where they are unavoidable. Mitigation has been prescribed to minimise impacts on peatlands, aquatic habitats and species and general biodiversity during construction and operation. No significant impacts are anticipated during the decommissioning phase of the Proposed Development. No potential for significant cumulative effects exists, when considered in combination with other plans, projects or land uses.

Taking the above information into consideration and having regard to the precautionary principle, the Proposed Development will not result in any significant impacts on biodiversity either on the site of the Proposed Development or the wider area.

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 impacts on biodiversity are not anticipated at any geographic scale.