

7. ORNITHOLOGY

7.1 Introduction

This chapter assesses the likely significant effects that the Slieveacurry Renewable Energy Development (the 'Proposed Development') may have on avian receptors. Particular attention has been paid to species of ornithological importance. These include species with national and international protection under the Wildlife Acts 1979-2012 and the EU Birds Directive 2009/147/EC among other relevant legislation. Where potential effects are identified, mitigation is described and residual impacts on avian receptors are assessed.

This chapter is supported by Technical Appendices 7-1 to 7-4, which contain data from the surveys undertaken including full details of the survey times, weather conditions, and other relevant information together with the bird records themselves. Appendix 7-5 contains the Collision Risk Assessment document which illustrates how the Collision Risk Modelling was undertaken for this site. Appendix 7-6 contains the Bird Monitoring Programme. Appendix 7-7 contains the Hen Harrier Enhancement Plan. Additionally, a Confidential Appendix 7-8 includes confidential information and figures. The Proposed Development, core EIAR study boundary and areas surveyed are provided in Figures 7-1 to 7-8.

The chapter is structured as follows:

- The Introduction provides a description of the Proposed Development and the relevant legislation, guidance and policy context regarding ornithology.
- This is followed by a comprehensive description of the ornithological surveys and impact assessment methodologies that were followed to inform the robust assessment of likely significant effects on avian receptors.
- A description of the Baseline Ornithological Conditions and Receptor Evaluation is then provided. This is followed by an Assessment of Effects, which, as per SNH Guidance (2017), includes direct habitat loss, displacement and death from collision. Effects are described with regard to each phase of the Proposed Development: construction, operational and decommissioning. Potential cumulative effects in combination with other projects are fully assessed.
- Proposed mitigation and best practice measures to ameliorate 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 ornithology.

The following list defines the meaning of the technical terms used in this chapter:

- "Key Ornithological Receptor" (KOR) is defined as a species occurring within the zone of influence of the development upon which likely significant effects are anticipated and assessed.
- "Zones of Influence" (ZOI) for individual ornithological receptors refers to the zone within which potential effects are anticipated. ZOIs were assigned following best available guidance (SNH 2016 and McGuinness et al. 2015).
- The "Site" is defined as the EIAR site boundary with the exception of the underground cable route which runs to the south-east of the site.
- The "Cable Route" is defined as the underground cabling connection between the proposed turbines and the existing Slievecallan 110kV substation, measuring approximately 7.1km in total, located on existing & proposed roads/tracks, agricultural & forestry land and within the public road corridor.
- "Development footprint" is defined as the area occupied by the infrastructure.

- “Proposed Development area” is defined as the area within the EIAR site boundary.
- The “study area” is defined by the particular survey which is being discussed.

7.1.1 Description of the Proposed Development

A detailed description of the Proposed Development is included in Chapter 4 of this EIAR. The Proposed Development will include 8. No. turbines with a tip height in the range of 175 metres maximum and 173 metres minimum; a blade length in the range of 75 metres maximum to 66.5 metres minimum; hub height in the range of 108.5 metres maximum to 100 metres minimum and all associated foundations and hardstanding areas, access roads including upgrade of existing site roads and provision of new roads, excavation of 2 No. borrow pits, underground cabling linking the turbines and connecting the turbines to the existing Slieveacallan 110kV substation, extension to the existing substation, meteorological mast and two temporary construction compounds. As discussed, full details are available in Chapter 4 of this EIAR.

The Proposed Development will have an operational life of 30 years from the date of full commissioning.

7.1.2 Legislation, Guidance and Policy Context

This EIAR is prepared in accordance with the requirements of the 2011 EIA Directive as amended by EIA Directive 2014/52/EU.

The following are the key legislative provisions applicable to habitats and fauna in Ireland:

- Irish Wildlife Acts 1976 to 2017.
- The European Communities (Birds and Natural Habitats) Regulations 2011 (transposes EU Birds Directive 2009/147/EC and EU Habitats Directive 2009/147/EC, 92/43/EC).
- The International Convention on Wetlands of International Importance 1971.

In the absence of specific National Irish Ornithological Survey Guidance, the guidance documents published by Scottish Natural Heritage (SNH) have been followed to inform this assessment:

- SNH (2017). *Recommended bird survey methods to inform impact assessment of onshore wind farms*. Scottish Natural Heritage.
- SNH (2018) *Avoidance rate information & guidance note: Use of avoidance rates in the SNH wind farm collision risk model*. Scottish Natural Heritage, Edinburgh, UK. <http://www.snh.gov.uk/docs/B721137.pdf>.
- SNH (2016). *Assessing Connectivity with Special Protection Areas (SPAs)*. Scottish Natural Heritage.
- SNH (2012). *Assessing the Cumulative Impact of Onshore Wind Energy Developments*. Scottish Natural Heritage.
- SNH (2006). *Assessing Significance of Impacts from Onshore Windfarms on Birds Outwith Designated Sites*. Scottish Natural Heritage.
- SNH (2009). *Monitoring the impact of onshore wind farms on birds*. Scottish Natural Heritage.
- SNH (2000). *Wind farms and birds: calculating a theoretical collision risk assuming no avoidance action*. SNH Guidance Note.

The following Irish Guidance documents were also consulted:

- Percival, S.M. (2003). *Birds and wind farms in Ireland: A review of potential issues and impact assessment*. Ecological Consulting.

- McGuinness, D., Muldoon, C., Tierney, N., Cummins, S., Murray, A., Egan, S. & Crowe, O. (2015). *Bird Sensitivity Mapping for Wind Energy Developments and Associated Infrastructure in the Republic of Ireland*. Guidance Document. Birdwatch Ireland.
- Birds of Conservation Concern in Ireland 2014-2019 (Colhoun, K. and Cummins, S. 2013).

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

- Planning and Development Acts 2000 – 2018.
- Clare County Council (2017). Clare County Development Plan 2017-2023.
- EPA (2017). *Draft revised guidelines on the information to be contained in Environmental Impact Statements*. Environmental Protection Agency.
- EPA (2015) 'Revised Guidelines on the Information to be contained in Environmental Impact Statements – Draft September 2015'
- EPA (2015) 'Advice Notes for Preparing Environmental Impact Statements – Draft September 2015'.
- EPA (2003). *Advice notes on current practice (in the preparation of Environmental Impact Statements (where relevant))*.
- EPA (2002). *Guidelines on the information to be contained in Environmental Impact Statements*. DoEHLG (2013). *Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment*. Department of the Environment, Community and Local Government (where relevant).
- European Commission (2011). *Wind energy development and Natura 2000*. Guidance document.
- *Statements*. Environmental Protection Agency (where relevant).
- NRA (2009). *Guidelines for Assessment of Ecological Impacts of National Road Schemes (Revision 2)*. National Roads Authority.
- European Commission (2002). *Assessment of plans and projects significantly affecting Natura 2000 sites*.
- European Commission (2017). *Environmental Impacts Assessment of Projects*. Guidance on the preparation of the Environmental Impact Assessment Report.
- CIEEM (2017) *Guideline for Ecological Report Writing*

7.1.3 Statement of Authority and Competence

This ornithology chapter has been prepared by Ms. Margaux Pierrel (BSc. MSc., Eng.), Project Ornithologist, and reviewed by Mr. Pdraig Cregg (BSc., MSc.), Senior Ornithologist, of McCarthy Keville O'Sullivan Ltd. (MKO). Both are suitably qualified, competent, professional ecologists with extensive experience of completing avifaunal assessments and are competent experts for the purposes of the preparation of this EIAR. The scope of works and survey methodology was devised by Senior Ornithologist, Mr. Alex Ash (BSc.) and is fully compliant with recent SNH guidance.

Field surveys were undertaken by Susan Doyle (PhD), Tony Kennelly (BSc.), Joe Kelly (BSc.), Patrick Manley (BSc.), Sean O'Brien (BSc.), Paul Troake (BSc.) and John Curtin (BSc.) All of the above surveyors are competent experts in the field of ornithology.

7.2 Assessment Approach and Methodology

7.2.1 Desk Study

A comprehensive desk study was undertaken to search for any relevant information on species of conservation concern that may potentially make use of the Proposed Development area and its wider

surroundings. The assessment included a thorough review of the available ornithological data including:

- Review of online web-mappers: National Parks and Wildlife Service (NPWS), National Biodiversity Data Centre (NBDC), Irish Wetland Bird Survey I-WeBS.
- Review of Bird Atlases: (Sharrock, 1976; Lack, 1986; Gibbons et al., 1993; Balmer et al., 2013).
- Review of Birds of Conservation Concern (BoCCI) in Ireland 2020-2026 (Gilbert G. *et al.*, 2021).
- Review of specially requested records from the NPWS Rare and Protected Species Database.
- Review of impact assessments associated with nearby developments including wind farms.

7.2.2 Consultation

7.2.2.1 Scoping and Consultation

Consultation was undertaken with the relevant statutory and non-statutory organisations as part of the EIAR scoping to inform the current assessment. Full details can be found in Section 2.5 of Chapter 2.

Table 7-1 provides a list of the organisations consulted with regard to ornithology during the scoping process and notes where scoping responses were received.

Copies of all scoping responses are included in Appendix 2-1 of this EIAR. The recommendations of the consultees have informed the EIAR preparation process and the contents of this chapter. Table 2-5 in Chapter 2 of this EIAR describes where the comments raised in the scoping responses received have been addressed in this assessment.

Table 7-1 Consultation Responses

	Consultee	Response
01	An Taisce	No response received to date
02	BirdWatch Ireland	No response received to date
03	Clare County Council	Response received on 20 th of April 2020. On the 14 th of October 2021 a response was received in relation to requested Bird Monitoring Reports, please see Section 7.13.2 for further details.
04	Department of Agriculture, Food and the Marine	Response received on 24 th of April 2020
05	Department of Culture, Heritage, and the Gaeltacht	Response received on 26 th of August 2020
07	Irish Peatland Conservation Council	No response received to date
08	Irish Red Grouse Association	No response received to date
09	Irish Raptor Study Group	No response received to date
10	Irish Wildlife Trust	No response received to date

	Consultee	Response
11	National Parks and Wildlife Service	Response received on 30 th of November 2017

7.2.3 Identification of Target Species and Key Ornithological Receptors

This section of the report describes the criteria used for the selection of target species. The methodology for assessment followed a precautionary screening approach with regard to the identification of Key Ornithological Receptors. Following a comprehensive desk study, initial site visits and consultation, a list of “Target species” potentially susceptible to impacts from this type of development and likely to occur in the zone of influence of the Proposed Development was derived. The observation/survey work carried out on the Site was specifically designed to survey for these identified target species in accordance with SNH guidance (2017). The target species list (Appendix 7-1) was drawn from:

- Annex I of the EU Birds Directive.
- Special Conservation Interests (SCI) of Special Protection Areas (SPA) within the zone of likely significant effects.
- Red and Amber-listed birds of Conservation Concern.
- Species protected under the fourth schedule of the Wildlife Acts 1976-2017.

Following analysis of the collated bird survey data, it was possible to refine the list of target species to identify “Key Ornithological Receptors” and exclude species that were not recorded during the extensive surveys and those for which pathways for the significant effect could not be identified.

7.2.4 Field Surveys

Field surveys were undertaken during the survey period April 2016 - March 2018 and between October 2020 and September 2021. The data provided in this report is robust and allows clear, precise and definitive conclusions to be made on the avian receptors identified within the subject site. Field survey methodologies have been devised to survey for the bird species composition and assemblages that occur within the study area.

7.2.4.1 Initial Site Assessment

Based on the results of the desk study, consultation and reconnaissance site visits, the likely importance of the study area for bird species was ascertained. Based on the collated information available from the above preliminary assessment and adopting a precautionary approach, a site-specific scope for the ornithological survey was developed.

7.2.4.2 Survey Methodologies

The survey work undertaken between April 2016 and March 2018 and between October 2020 and September 2021 forms the core dataset for the assessment of effects on ornithology.

In the absence of specific national bird survey guidelines, the ornithological surveys were designed and undertaken in full accordance with ‘*Recommended bird survey methods to inform impact assessment of onshore wind farms*’ (SNH, 2017).

The various survey types undertaken are described below.

7.2.4.2.1 Vantage Point Surveys

Vantage point surveys were undertaken in accordance with SNH guidance from April 2016 to March 2018. Surveys were conducted monthly throughout this survey period from three fixed vantage points (VP1, VP2 and VP3) to allow comprehensive coverage of the 500m study area surrounding the proposed turbines. The vantage point locations were selected by undertaking a viewshed analysis, as described below, and confirmed by a recce visit and initial field surveys in April 2016. The proposed turbine layout is entirely covered from three fixed VPs (VP1, VP2 & VP3).

Additionally, vantage point surveys were undertaken in accordance with SNH guidance between October 2020 and September 2021. Surveys were conducted monthly throughout this survey period from three fixed vantage points during the winter season (VP1, VP2 and VP3) and from four vantage points between April and September 2021 (VP1, VP2, VP3 and VP4).

Figure 7-1 shows the locations of all vantage points relative to the development Site.

Viewshed Analysis

Viewshed analysis was carried out to inform coverage of the study area from fixed vantage point locations (i.e. VPs 1, 2, 3 and 4). Viewsheds were calculated using Resoft Wind Farm ZTV (Zone of Theoretical Visibility) software in combination with Mapinfo Professional (Version 10.0) using a notional layer suspended at 25m, which is representative of the minimum height considered for the Potential Collision Risk Area based on the largest swept path of the turbine model (150m Rotor diameter, 100m hub height, 175m overall tip height). While the relevance of being able to view as much of the Site to ground level is acknowledged, the SNH guidance emphasizes the importance of visibility of the 'collision risk volume' when the data is to be used to estimate the risk of collision with turbines by birds.

The viewshed analysis involved testing each VP location for its visibility coverage by creating a viewshed point 1.5 meters in height (to represent the height of observer) on a map using 10 metre contours terrain data. The relative height of forestry and its effects on visibility is also accounted for in the analysis. Using the ZTV software, a viewshed of 360 degrees was produced calculating an area 25 metres from ground level up to a 2km radius. The resulting viewshed image was then cropped to 180 degrees to give the viewshed from each VP location in line with SNH (2017). A 500m buffer was applied to the outer most turbines of the Proposed Development in line with SNH (2017). The aim of the viewshed analysis is to establish whether the selected vantage points offer adequate coverage of the turbine layout proposed at that time of surveying. The visible area within the view sheds at 25m are provided in Figures 7-2, 7-2-1, 7-2-2, 7-2-3 and 7-2-4. Adequate coverage of the proposed turbine layout was achieved.

Data Recording and Digitisation

Data on bird observations and flight activity was collected from a scanning arc of 180° and a 2km radius by an observer at each fixed location for six hours per month. Surveys were scheduled to provide a spread over the full daylight period including dawn and dusk watches to coincide with the highest peaks of bird activity. Target species were as listed in Appendix 7-1, Table 1.

Survey effort for vantage point watches is presented in Appendix 7-2, Table 1. This includes full details of dates, times, survey locations, survey duration and weather conditions for each survey. Table 7-2 below shows a summary of the VP survey work undertaken.

Table 7-2 Vantage Point Survey Effort

Survey Season	Months	Minimum Effort per VP
2016 Breeding Season (3VPs)	Apr - Sep	36 hours/VP
2016/2017 Non-Breeding Season (3VPs)	Oct - Mar	36 hours/VP
2017 Breeding Season (3VPs)	Apr - Sep	36 hours/VP
2017/2018 Non-Breeding Season (3VPs)	Oct - Mar	36 hours/VP
2020/2021 Non-breeding Season (3VPs)	Oct - Mar	36 hours/VP
2021 Breeding Season (4VPs)	Apr - Sept	36 hours/VP

Observed flight activity was recorded as per defined flight bands, which were chosen in relation to the dimensions of potential turbine models for the Site. Bands were split into 0-10m, 10-25m, 25m-175m and >175m. All flight activity within the height band 25-175m is considered to be within the Potential Collision Height (PCH). Therefore, the largest swept path of the range of turbine dimensions considered in this application, is considered in collision risk calculations which are used to assess the significance of effects on key ornithological receptors.

Each flight observation was assigned a unique identifier when mapped in the field and subsequently digitised using GIS software.

7.2.4.2.2 *Breeding Bird Surveys (Adapted Brown & Shepherd Survey)*

Breeding walkover surveys were undertaken to determine the presence of bird species of high conservation concern and identify areas of possible, probable or confirmed breeding territories for bird species observed within the study area. The survey methodology followed the adapted Brown and Shepherd method for upland sites as outlined in Gilbert et al. (1998) and SNH (2017) ('adapted Brown and Shepherd surveys'). Heavily forested areas, that could not be walked, were surveyed from adjacent areas where the habitat could be overlooked.

Transect routes were devised to ensure coverage of different habitat complexes within the study area. Transects were selected in order to survey every area of suitable breeding/ foraging habitat to within 100m, where access allowed. Target species were waders, raptors, waterbirds, gulls and other birds of conservation concern. Along with target species, all additional species observed were recorded to inform the evaluation of supporting habitat.

Walkover surveys were carried out between daylight hours during the core breeding season months of April, May, June and July (in 2016, 2017 and 2021), with the Site being visited two to three days per month on each occasion. The timing of visits followed the recommendations of Calladine et al. (2009). Following all survey visits, the field maps were analysed to determine the number and location of breeding territories. All non-breeding individuals and species encountered were also recorded.

The survey effort is presented in Appendix 7-2, Table 2. This includes full details of dates, times, survey locations, survey duration and weather conditions for each survey. Figure 7-3 shows the transect routes surveyed.

7.2.4.2.3 *Breeding Raptor Surveys*

Breeding raptor surveys (i.e. birds of prey and owls) were undertaken within the study area and its immediate surroundings. Survey methodology was as outlined in Hardey et al. (2013), as per SNH (2017) recommendations. These surveys aimed to identify occupied territories and monitor their

breeding success within the study area. Raptor surveys were undertaken onsite and to a 2km radius from the Site boundary, in the form of short VP watches and walked transects. These surveys were undertaken on a monthly basis during the core breeding season period (April to July, in 2016, 2017 & 2021). Each visit required a survey effort of approximately two days to survey the entirety of the study area. All areas of suitable habitat within 2km of the Site were surveyed for the presence of species including hen harrier, merlin, peregrine falcon, red kite, goshawk and other more abundant raptor species. Old buildings/ruins were visited to survey for raptor occupancy (e.g. barn owl).

Survey effort details are provided in Appendix 7-2, Table 3. Figure 7-4 shows the areas surveyed.

7.2.4.2.4 *Red Grouse Surveys*

Red Grouse surveys were undertaken in March 2017 and March 2018. The methodology used was derived from that described in Bibby et al. (2000) and the survey methods for the most recent national Red Grouse survey (2006/2007 to 2007/2008) coordinated by BirdWatch Ireland and submitted to the NPWS (Murray et al., 2013). The survey targeted areas of suitable habitat (i.e. open moorland and areas of heather). Areas of forestry were not surveyed as they do not have the potential to support red grouse populations. The survey consisted of tape luring transects. Survey details are provided in Appendix 7-2, Table 4. Figure 7-5 shows the areas surveyed.

The work was carried out under NPWS Licence Numbers 026/2017 and 020/2018.

7.2.4.2.5 *Hen Harrier Roost Surveys*

Suitable habitat for roosting hen harrier within 2km of the Site (as per SNH 2017) were surveyed for the presence of hen harrier during the winter season. Survey work was undertaken in accordance with the methodology devised by Gilbert et al. (1998) and the 'Irish Hen Harrier Winter Roost Survey' (unpublished document coordinated by members of NPWS). Surveys were carried out throughout the entirety of both non-breeding seasons (October 2016 - March 2017, Oct 2017 – Mar 2018¹ & Oct 2020 – Mar 2021). Full details of survey effort are provided in Appendix 7-2, Table 5. Figure 7-6 shows the locations of Hen Harrier Roost Survey VP locations.

7.2.4.2.6 *Winter Transect Surveys*

Winter transect surveys were undertaken to record the presence of bird species of high conservation concern within areas of potential suitable habitat in the study area.

Transect routes, devised to ensure coverage of different habitat complexes, were visited between vantage point locations within the study area during winter months (in 2016/17, 2017/18 and 2020/21). Methodology was broadly based on adapted Brown and Shepherd methods. Target species were raptors, waterbirds, gulls and ground birds of conservation interest. Along with target species, all additional species observed were recorded to inform the evaluation of supporting habitat.

Survey effort, including details of survey duration and weather condition, is presented in Appendix 7-2, Table 6. Figure 7-7 shows the surveyed area.

7.2.4.2.7 *Wildfowl Distribution Surveys*

Significant wetland sites and waterbodies within five kilometres of the study area were surveyed for waterbird populations during the 2016/17 winter season. The count methodology was in line with survey methodology guidelines issued by SNH (2017) and BirdWatch Ireland (2015). Counts were

¹ In March 2018, HHVP3 and HHVP4 were not surveyed, in error, HHVP1 and HHVP2 were surveyed twice instead. This is unlikely to have resulted in any missed roosting behaviour given in the two years of surveying prior to this no hen harrier roosts were identified.

undertaken during daylight hours from suitable vantage points at the wetland sites. The areas surveyed included Lough Keagh (approx. 1km north-west of the Proposed Development area), Lough Abullaunduff (1.5km to the north-west), Mooghna Lough (3km to the north), Lough Caum (4.7km to east).

Due to the paucity of wildfowl observations on Site or within several kilometres of same, including surveys at these waterbodies, wildfowl distribution surveys were discontinued for the 2017/18 winter season.

Survey effort, including details of survey duration and weather condition, is presented in Appendix 7-2, Table 6. Figure 7-7 shows the surveyed area.

7.2.4.2.8 *Cable Route*

The Proposed Development will connect to the existing Slievecallan 110kV substation. Connection via Slievecallan will comprise underground cabling, measuring approximately 7.1km in total. The electricity generated on site will be combined at the Ring Main Unit (RMU) located adjacent to turbine no. T6. The underground cabling will connect from this location to the substation located in the townland of Knockalassa, predominately following proposed and existing wind farm/ forestry roads measuring approximately 4.28km, with a short 0.94 km section over agricultural and forestry land, 0.28km along a local road and a 1.6 km section within the public road corridor (R460). The cable route was surveyed during the 3-year extensive surveys undertaken at the Site.



Map Legend

- EIA Site Boundary
- Turbine Layout
- 500m turbine buffer
- ▲ VP Locations



Drawing Title

Vantage Point Survey Locations

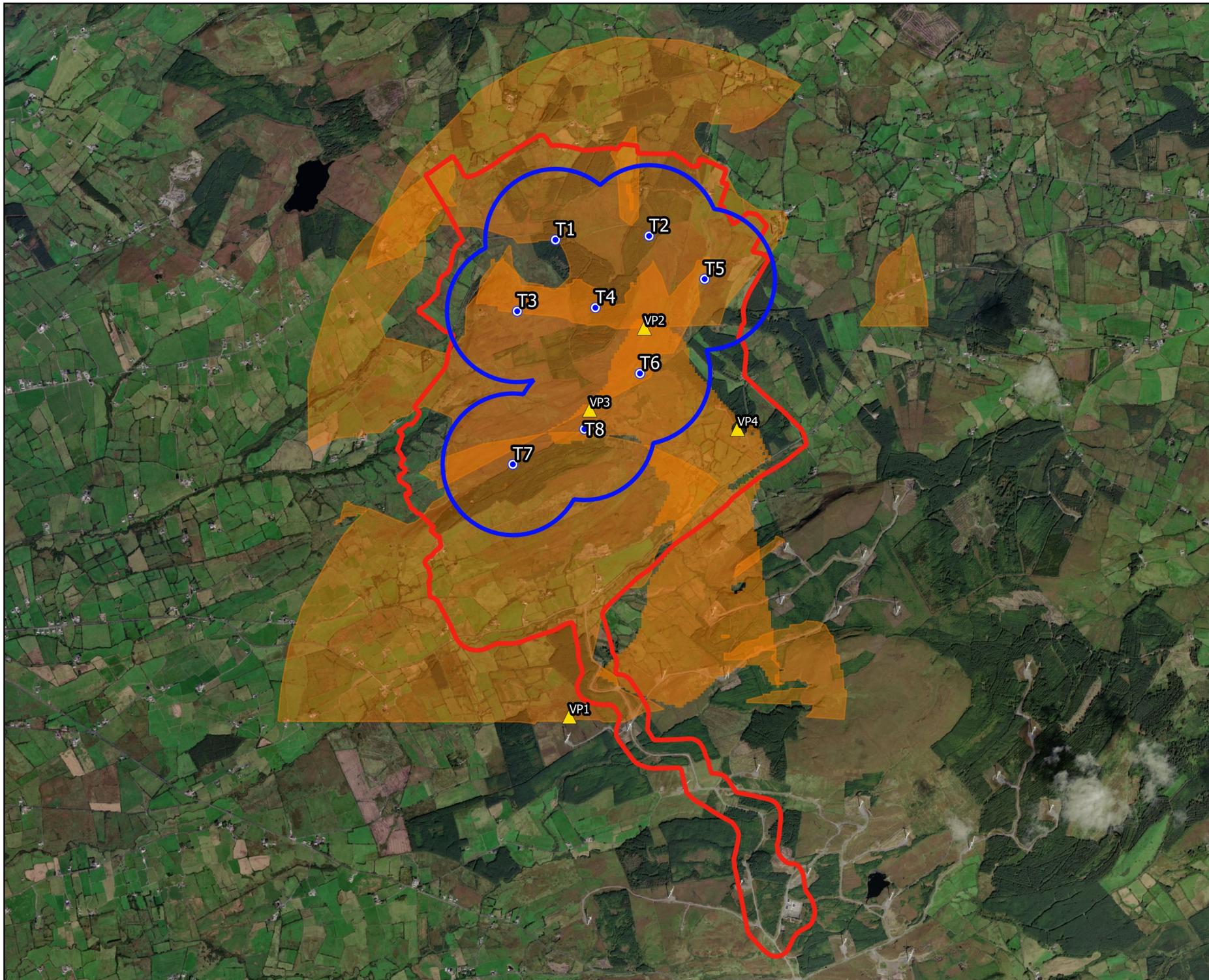
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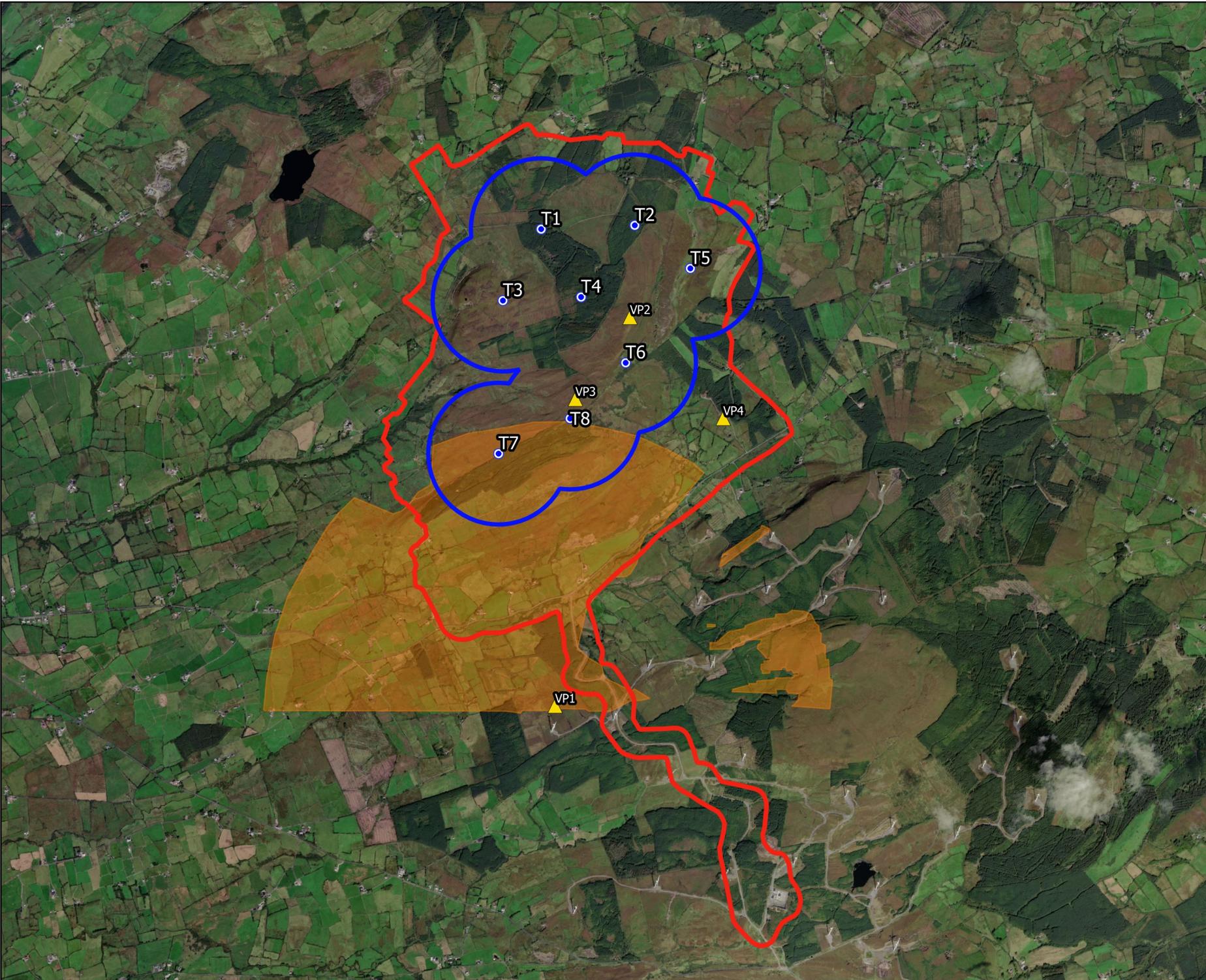
Map Legend

- EIA Site Boundary
- Turbine Layout
- 500m turbine buffer
- ▲ VP Locations
- Viewshed Coverage

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Drawing Title	
Viewshed Analysis Coverage	
Project Title	
Slieveacurry Renewable Energy Development, Co. Clare	
Drawn By	Checked By
Margaux Pierrel	Padraig Cregg
Project No.	Drawing No.
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Map Legend

- EIA Site Boundary
- Turbine Layout
- 500m turbine buffer
- ▲ VP Locations
- Viewshed Coverage



Drawing Title

VP1 Viewshed Analysis Coverage

Project Title
Slieveacurry Renewable Energy Development, Co. Clare

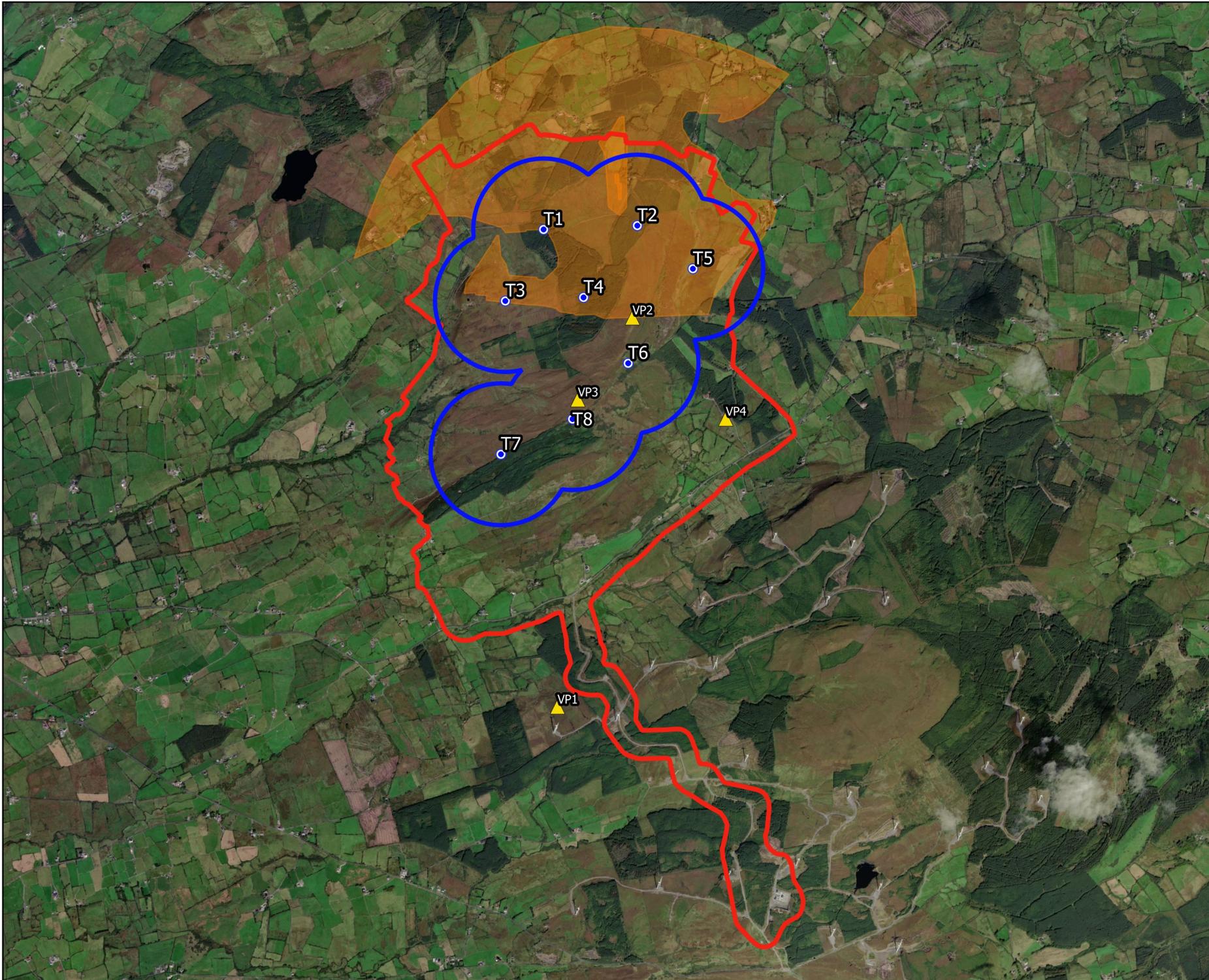
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Map Legend

-  EIA Site Boundary
-  Turbine Layout
-  500m turbine buffer
-  VP Locations
-  Viewshed Coverage



Drawing Title

VP2 Viewshed Analysis Coverage

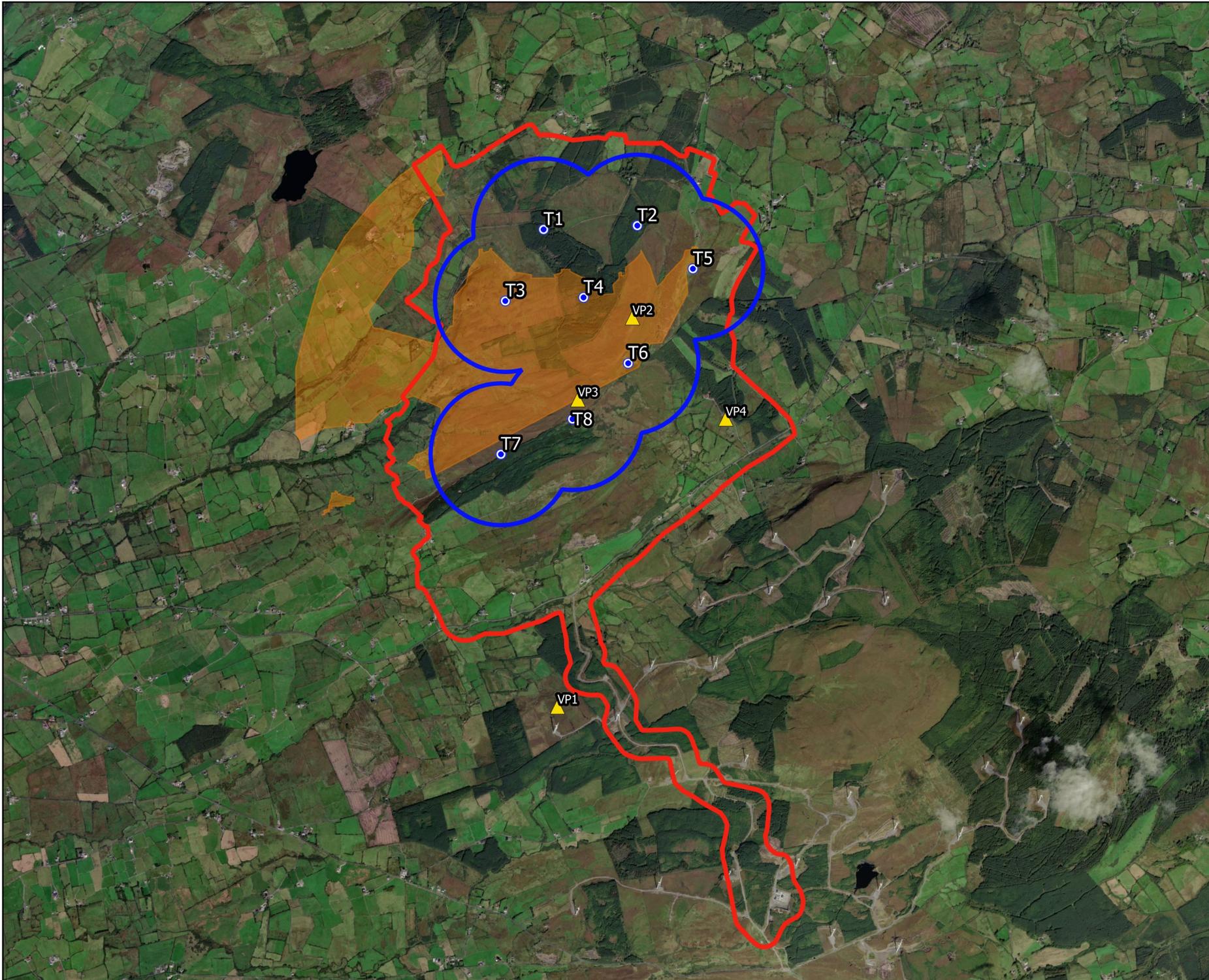
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Map Legend

- EIA Site Boundary
- Turbine Layout
- 500m turbine buffer
- ▲ VP Locations
- Viewshed Coverage



Drawing Title

VP3 Viewshed Analysis Coverage

Project Title
Slieveacurry Renewable Energy Development, Co. Clare

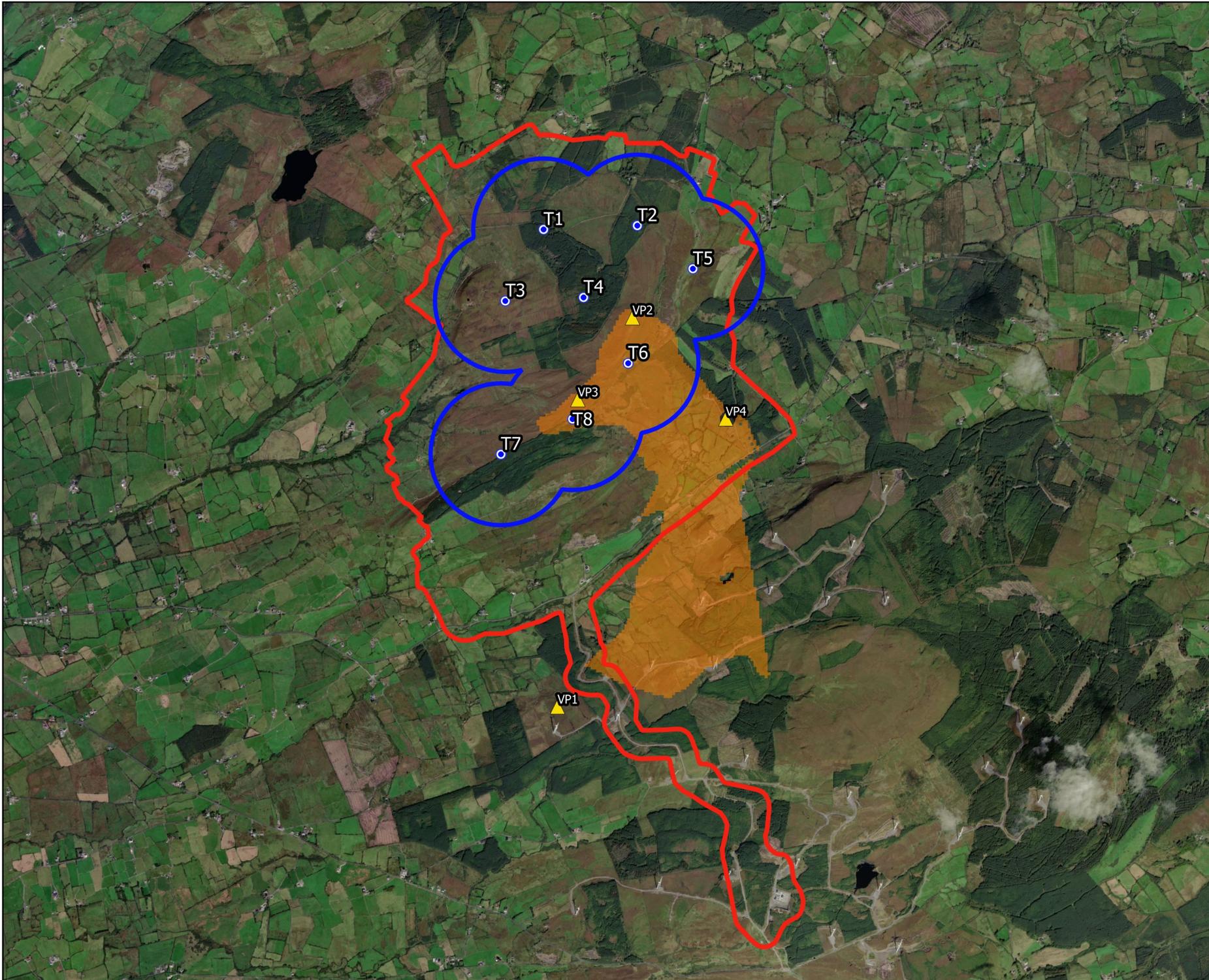
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Map Legend

- EIA Site Boundary
- Turbine Layout
- 500m turbine buffer
- ▲ VP Locations
- Viewshed Coverage



Drawing Title

VP4 Viewshed Analysis Coverage

Project Title
Slieveacurry Renewable Energy Development, Co. Clare

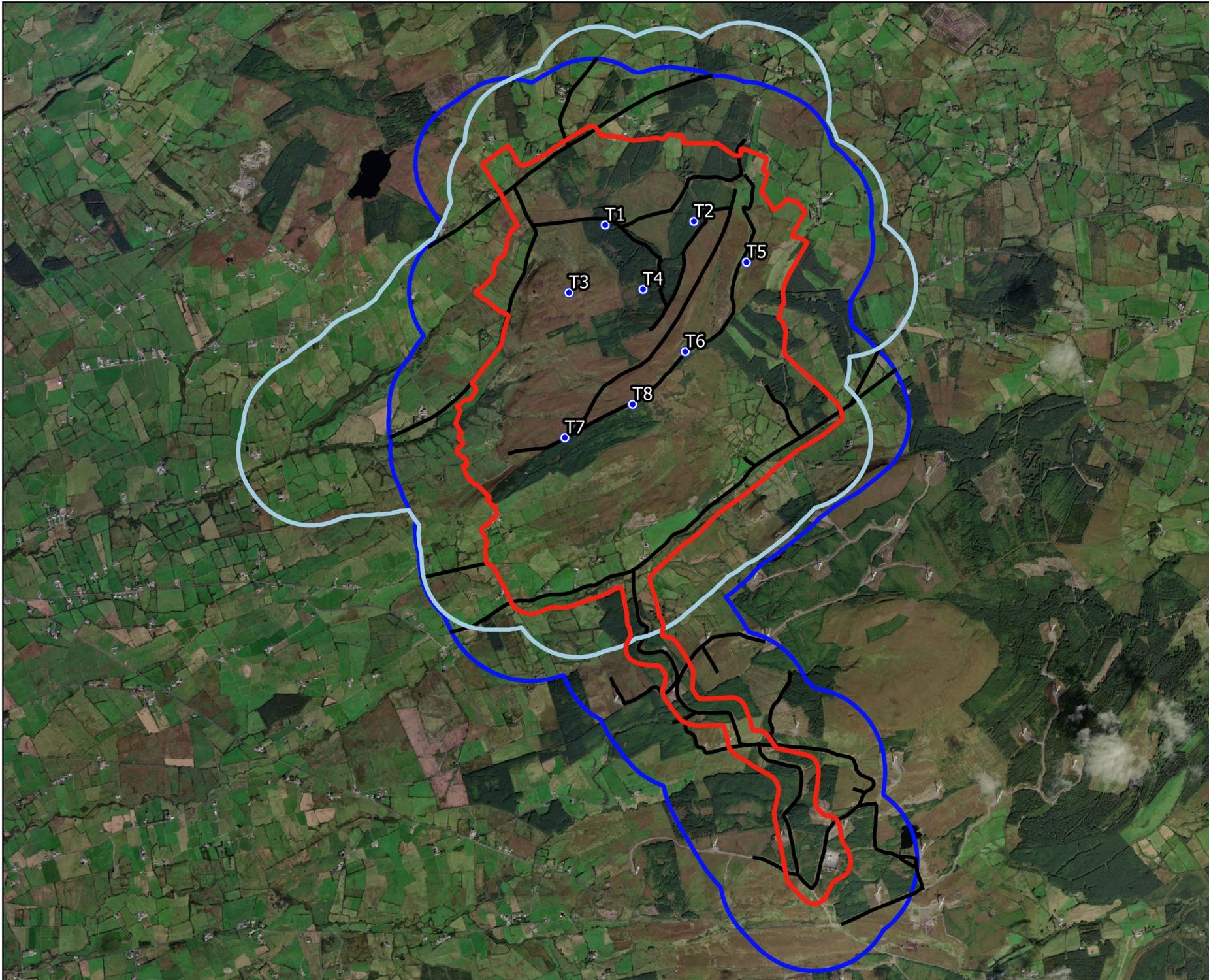
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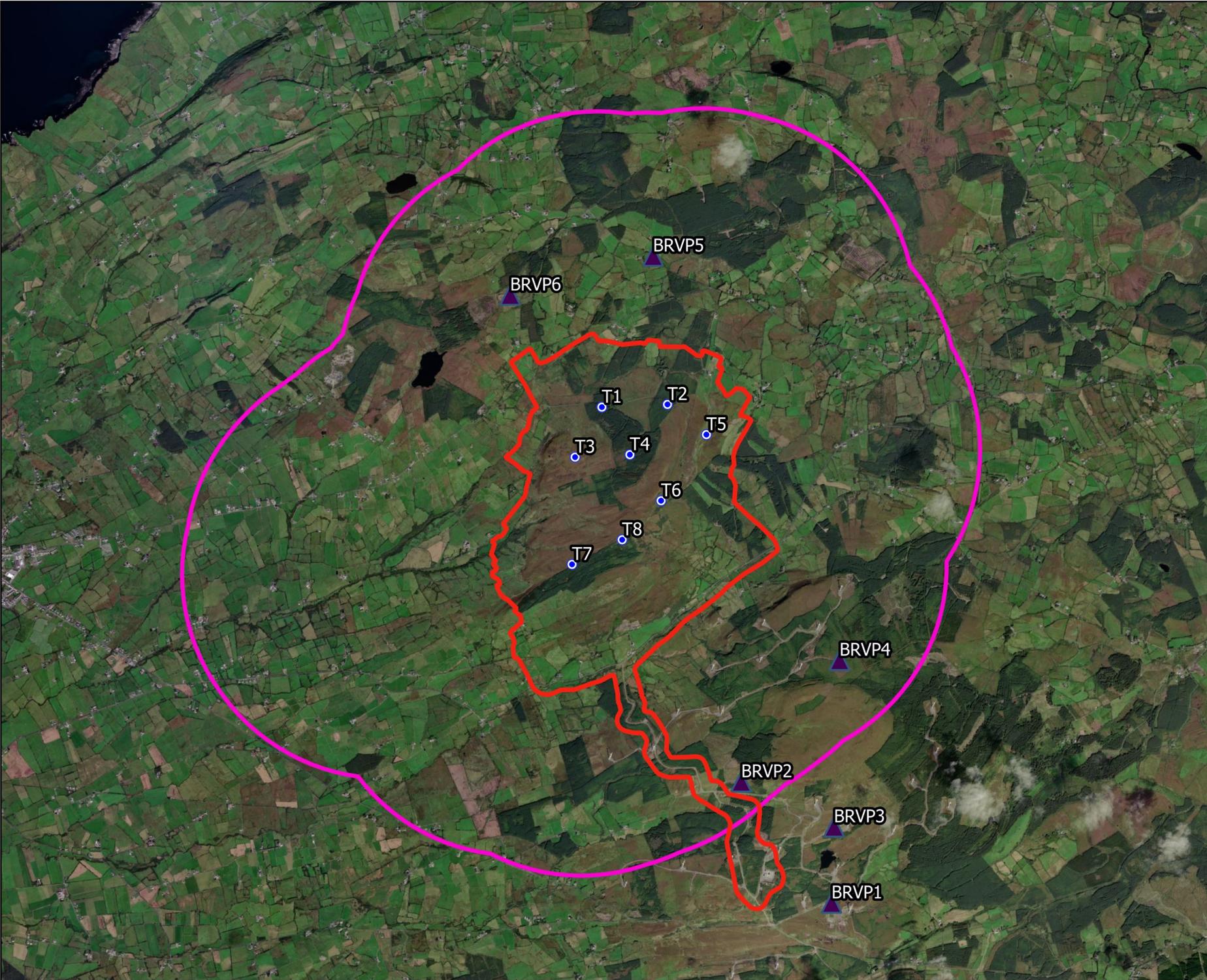
Map Legend

- EIA Site Boundary
- 500m Survey Radius (2016-2017)
- 500m Survey Radius (2021)
- Turbine Layout
- Transect

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Drawing Title Breeding Bird Survey Area (500m radius)	
Project Title Slieveacurry Renewable Energy Development, Co. Clare	
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Map Legend

-  EIA Site Boundary
-  2km Survey Radius (2016-2017)
-  Raptor VP (2021)
-  Turbine Layout



Drawing Title
**Breeding Raptor Survey Area
 (2km radius)**

Project Title
**Slieveacurry Renewable Energy
 Development, Co. Clare**

Drawn By Margaux Pierrel	Checked By Padraig Cregg
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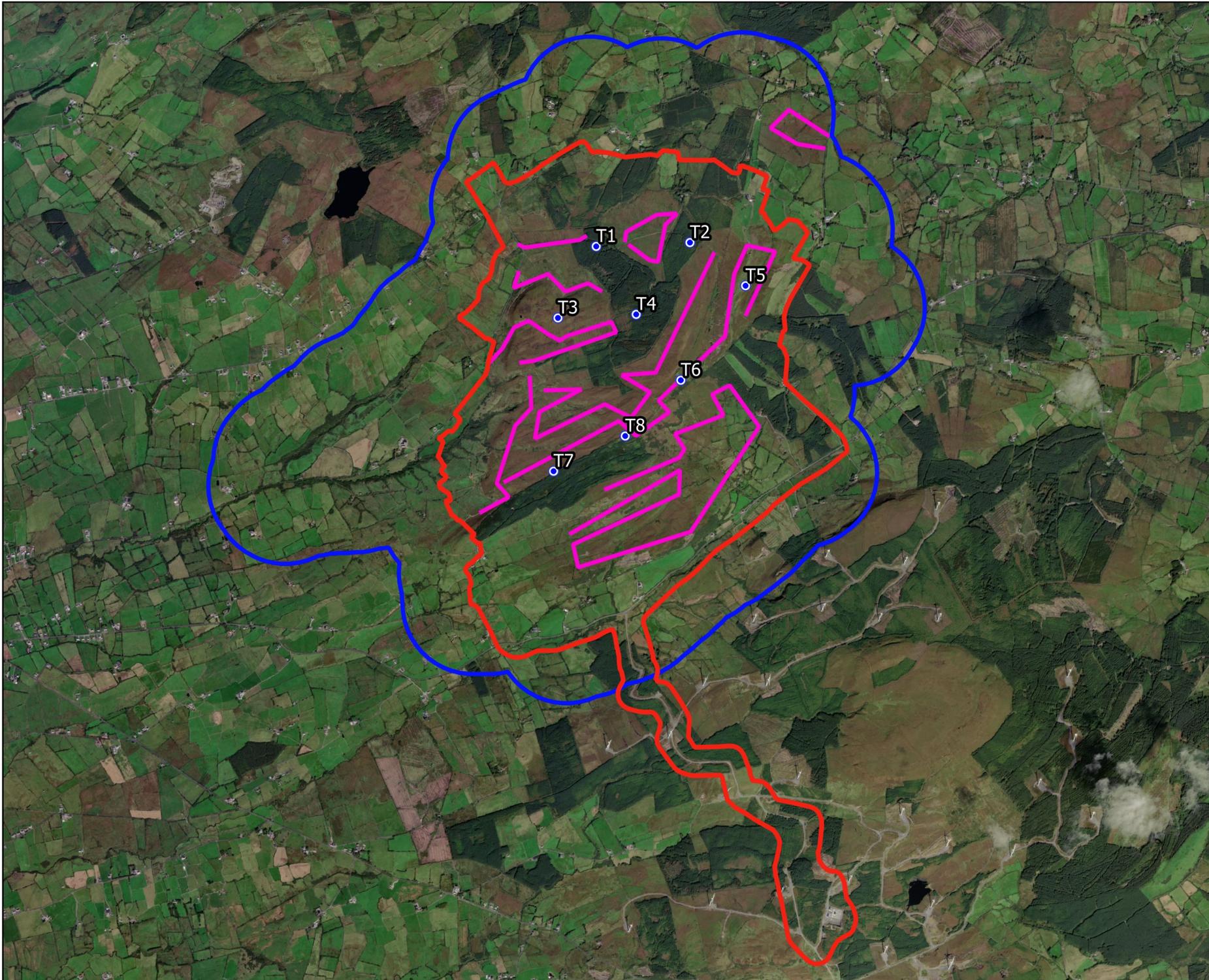
Project No. 170224	Drawing No. Fig 7-4
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Scale 1:50000	Date 16.11.2021
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Map Legend

- EIA Site Boundary
- 500m Survey Radius
- Red Grouse Survey Transect
- Turbine Layout



Drawing Title

Red Grouse Survey Area

Project Title

Slieveacurry Renewable Energy Development, Co. Clare

Drawn By

Margaux Pierrel

Checked By

Padraig Cregg

Project No.

170224c

Drawing No.

Fig 7-5

Scale

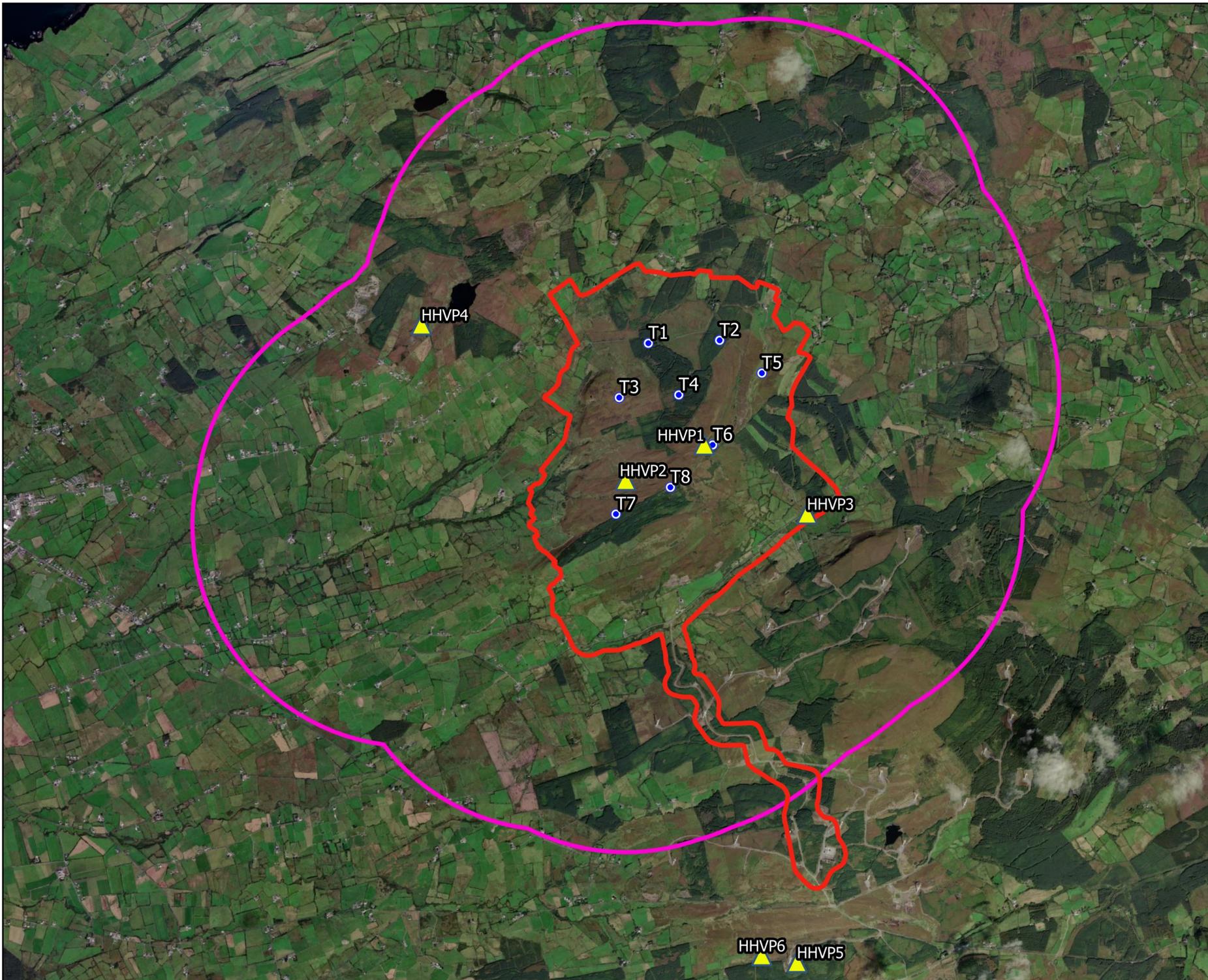
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Date

16.11.2021



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Map Legend

- EIA Site Boundary
- 2km Survey Radius
- ▲ HHVP locations
- Turbine Layout



Drawing Title

Hen Harrier Roost Survey VP Locations

Project Title
Slieveacurry Renewable Energy Development, Co. Clare

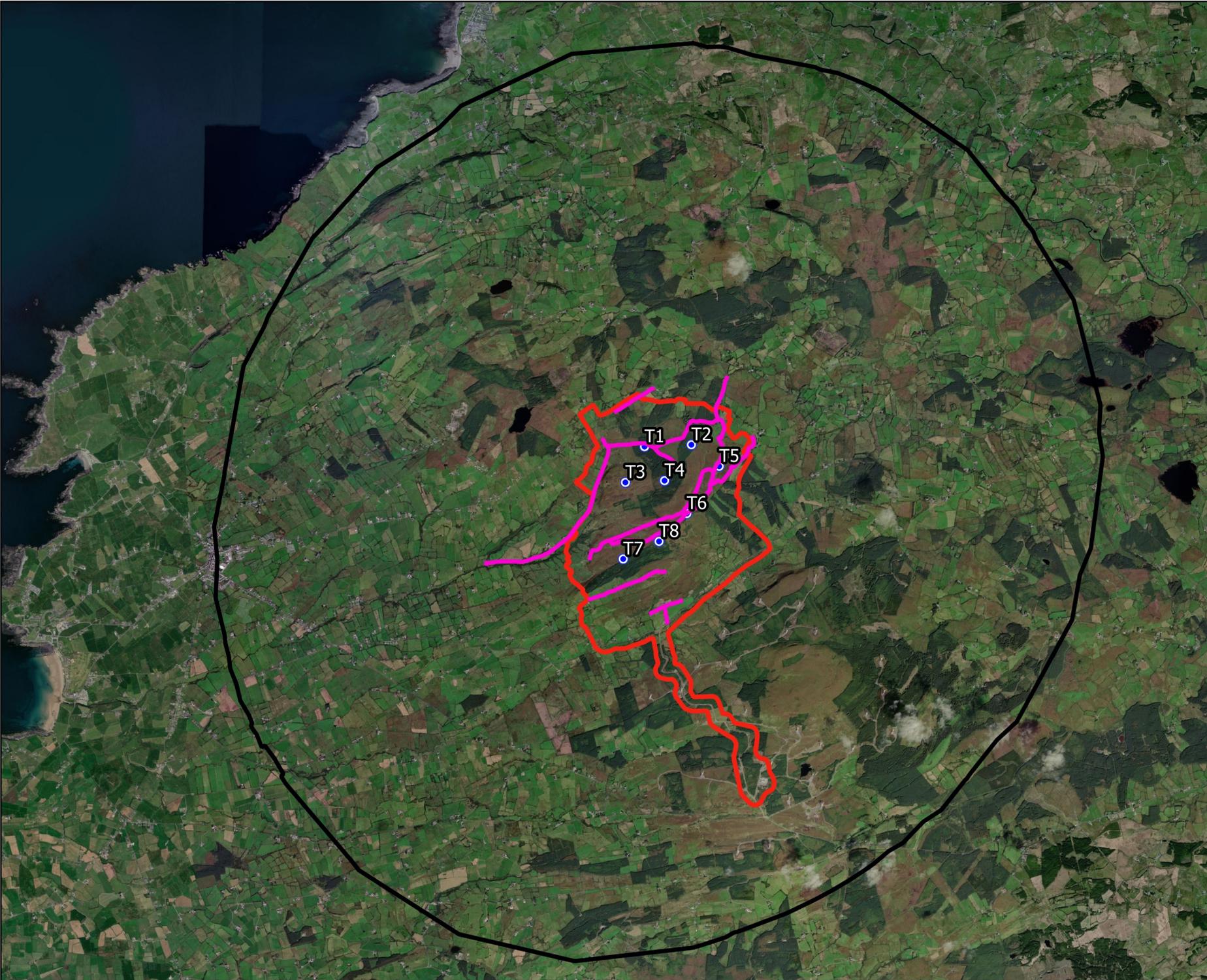
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Project No. 170224c	Drawing No. Fig 7-6
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Map Legend

- EIA Site Boundary
- Waterfowl Survey Area (5km)
- Winter Walkover Transects
- Turbine Layout



Drawing Title	
Winter Transect/Waterfowl Surveys	
Project Title	
Slieveacurry Renewable Energy Development, Co. Clare	
Drawn By	Checked By
Margaux Pierrel	Padraig Cregg
Project No.	Drawing No.
170224c	Fig 7-7
Scale	Date
1:70000	16.11.2021
<div style="display: inline-block; vertical-align: middle; margin-left: 10px;"> <p>MKO Planning and Environmental Consultants Tuam Road, Galway Ireland, H91 VV84 +353 (0) 91 735611 email: info@mkofireland.ie Website: www.mkofireland.ie</p> </div>	

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7.2.5 Ornithological Evaluation Criteria and Impact Assessment Methodology

7.2.5.1 Potential Effects Associated with Proposed Development

As per SNH Guidance, wind farms present three potential risks to birds (Drewitt & Langston 2006, 2008; Band et al. 2007):

- **Direct habitat loss** through the construction of wind farm infrastructure;
- **Displacement** (sometimes called indirect habitat loss) if birds avoid the wind farm and its surrounding area due to turbine construction and operation. Displacement may also include barrier effects in which birds are deterred from using normal routes to feeding or roosting grounds;
- Death through **Collision** or interaction with turbine blades and other infrastructure.

For each of these three risks, the detailed knowledge of bird distribution and flight activity within and surrounding the Site has been utilised to predict the potential effects of the Proposed Development on birds. Effects are assessed with regard to the construction phase, the operational phase and the decommissioning phase. They are also assessed cumulatively with other projects.

7.2.5.2 Geographical Framework

Guidance on Ecological Impact Assessment (CIEEM 2018) recommends categories of ornithological or nature conservation value that relate to a geographical framework (e.g. international, through to local). This assessment utilises the geographical framework described in Guidelines for Assessment of Ecological Impact of National Road Schemes (NRA 2009). The guidelines provide a basis for the determination of whether a site is of importance on the following scales:

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

Locally Important (lower value) receptors contain habitats and species that are widespread and of low ecological significance and of importance only in the local area. Internationally Important sites are 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.

7.2.5.3 Receptor Evaluation and Impact Assessment (Percival 2003)

Percival's (2003) methodology for assessing the effects of wind farms on birds has been applied to assess the sensitivity of a species to the development type, the magnitude of the effect and the significance of the potential impact. The following tables (Table 7-3 - Sensitivity, Table 7-4- Magnitude of effect, Table 7-5 - Determination of significance) outline the assessment criteria for each stage.

Table 7-3 Evaluation of Sensitivity for Birds (Percival 2003)

Sensitivity	Determining Factor
Very High	Species that form the cited interest of SPA's and other statutorily protected nature conservation areas. Cited means mentioned in the citation text for the site as a species for which the site is designated.

Sensitivity	Determining Factor
High	<p>Species that contribute to the integrity of an SPA but which are not cited as a species for which the site is designated.</p> <p>Ecologically sensitive species including the following: divers, common scoter, hen harrier, golden eagle, red necked phalarope, roseate tern and cough.</p> <p>Species present in nationally important numbers (>1% Irish population)</p>
Medium	<p>Species on Annex 1 of the EU Birds Directive.</p> <p>Species present in regionally important numbers (>1% regional (county) population).</p> <p>Other species on BirdWatch Ireland's red list of Birds of Conservation Concern</p>
Low	<p>Any other species of conservation interest, including species on BirdWatch Ireland's amber list of Birds of Conservation Concern not covered above.</p>

Table 7-4 Determination of Magnitude of Effects (Percival 2003)

Sensitivity	Description
Very High	<p>Total loss or very major alteration to key elements/ features of the baseline conditions such that the post development character/ composition/ attributes will be fundamentally changed and may be lost from the site altogether.</p> <p>Guide: < 20% of population / habitat remains</p>
High	<p>Major loss or major alteration to key elements/ features of the baseline (pre-development) conditions such that post development character/ composition/ attributes will be fundamentally changed.</p> <p>Guide: 20-80% of population/ habitat lost</p>
Medium	<p>Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of baseline will be partially changed.</p> <p>Guide: 5-20% of population/ habitat lost</p>
Low	<p>Minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible but underlying character/composition/attributes of baseline condition will be similar to pre-development circumstances/patterns.</p> <p>Guide: 1-5% of population/ habitat lost</p>
Negligible	<p>Very slight change from baseline condition. Change barely distinguishable, approximating to the "no change" situation.</p> <p>Guide: < 1% population/ habitat lost</p>

Table 7-5 Significance matrix: combining magnitude and sensitivity to assess significance (Percival 2003)

Significance		Sensitivity			
		Very High	High	Medium	Low
Magnitude	Very High	Very High	Very High	High	Medium
	High	Very High	Very High	Medium	Low
	Medium	Very High	High	Low	Very Low
	Low	Medium	Low	Low	Very Low
	Negligible	Low	Very Low	Very Low	Very Low

7.2.5.4 Impact Assessment – EPA Criteria (2017 Draft)

EPA impact assessment criteria are described below and outlined in Table 7-6 and Table 7-7.

The following terms were utilised when quantifying duration and frequency of effects:

- Momentary – effects lasting from seconds to minutes
- Brief – effects lasting less than a day
- Temporary – effects lasting less than a year
- Short-term – effects lasting 1 to 7 years
- Medium term – effects lasting 7 to 15 years
- Long term – effects lasting 15 to 60 years
- Permanent – effects lasting over 60 years
- Reversible – effects that can be undone, for example through remediation or restoration
- Frequency – How often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)

Table 7-6 Criteria for assessing impact significance based on (EPA, 2017)

Impact Magnitude	Definition
No change	No discernible change in the ecology of the affected feature
Imperceptible Effect	An effect capable of measurement 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 baseline trends
Significant Effect	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
Profound Effect	An effect which obliterates sensitive characteristics

Table 7-7 Criteria for assessing impact quality based on (EPA, 2017)

Impact Type	Criteria
Positive	A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities)
Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
Negative	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance)

EPA impact assessment criteria have been used in this assessment for consistency between the biodiversity and ornithology chapters. Percival (2003) has also been followed in the assessment of potential impacts given its specific focus on the interactions between wind farms and birds. The two assessment criteria have been used to independently characterise impacts to inform a robust assessment of potential impacts on local avian communities resulting from the Proposed Development.

7.2.5.5 Collision Risk Assessment

Collision risk is calculated using a mathematical model to predict the numbers of individual birds, of a particular species, that may be killed by collision with moving wind turbine rotor blades. The modelling method used in this collision risk calculation follows Scottish Natural Heritage (SNH) guidance which is sometimes referred to as the Band Model (Band et al. (2007).

Two stages are involved in the model:

- Stage 1: Determination of the number of birds or flights passing through the air space swept by the rotor blades of the wind turbines.
- Stage 2: Calculation of the probability of a bird strike occurring.

Please see Appendix 7-5 for full details on the collision risk modelling method.

7.2.6 Survey Justification

A comprehensive suite of bird surveys has been undertaken at the Site between April 2016 and March 2018 and between October 2020 and September 2021.

Results are derived from a continuous two years and a further twelve months of surveying undertaken in line with SNH Guidance. These are the results that are analysed to inform this assessment.

The surveys undertaken provide the information necessary to allow a complete, comprehensive and robust assessment of the potential impacts of the Proposed Development on avian receptors.

7.2.6.1 Mitigation

The development has been designed to specifically avoid, reduce and minimise effects on all Ornithological Receptors. Where potential effects on KORs are predicted, mitigation has been prescribed to avoid, reduce and remove such effects.

Proposed best practice design and mitigation measures are specifically set out and are realistic in terms of cost and practicality. These measures have been subject to detailed design and will effectively address the effects on the identified KORs.

The potential effects of the Proposed Development were considered and assessed to ensure that all effects on KORs are adequately addressed and no significant residual effects are likely to remain following the implementation of mitigation measures/best practice (please refer to section 7.8 for further details).

7.2.6.2 Limitations

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

No difficulties (for example technical deficiencies or lack of knowledge) were encountered while compiling the required information. No significant limitations in the scope, scale or context of the assessment have been identified.

7.3 Baseline Conditions and Receptor Evaluation

7.3.1 Identification of Designated Sites within the Likely Zone of Influence of the Development

An Appropriate Assessment Screening Report (AASR) and Natura Impact Statement (NIS) were prepared to provide the competent authority 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 EPA draft Guidance 2017, “a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement” but should “incorporate their key findings as available and appropriate”. This section provides a summary of the key findings of the NIS with regard to Special Protection Areas. A summary of key assessment findings with regard to Special Areas of Conservation is provided in Chapter 6 of this EIAR. Potential impacts for Special Protection Areas are assessed in detail in the Appropriate Assessment Screening Report and Natura Impact Statement which accompanies this application.

Using GIS software, sites designated for nature conservation within the potential ZOI of the Proposed Development were identified. The ZOI was derived utilising a precautionary approach. Initially, sites within a 15-kilometer radius of the proposed works were identified. Then designated sites located outside the 15km buffer zone were taken into account and assessed. In this case, no potential for direct or indirect impacts for species listed as Special Conservation Interest of SPAs more than 15km from the Site was identified.

In addition, and in the absence of any specific European or Irish guidance, the Scottish Natural Heritage (SNH) Guidance, ‘Assessing Connectivity with Special Protection Areas (SPA)’ (2016) was consulted. This document provides guidance in relation to the identification of connectivity between Proposed Development and Special Protection Areas. The guidance takes into consideration the distances some species may travel beyond the boundary of their SPAs and outlines information on dispersal and foraging ranges of bird species which are frequently encountered when considering projects. Potential effects on wetlands and supporting habitats associated with Special Protection Areas and indirect potential pathways in the form of surface water pollution are considered in the AASR and NIS.



Three SPAs were located within the Likely Zone of Influence of the development, which are listed below in Table 7-8.

Table 7-8 Designated Sites in the Zone of Influence

European Site	Distance from proposed works (km)	Qualifying Interests/Special Conservation Interests for which the European Site has been designated (https://www.npws.ie , 23/03/2021)	Conservation Objectives	Zone of Influence Determination & Identification of Pathways for Effect
Special Protection Area				
Mid-Clare Coast SPA (004182)	7.2 km to the south-west of the Site.	<ul style="list-style-type: none"> ➤ Cormorant (<i>Phalacrocorax carbo</i>) [A017] ➤ Barnacle Goose (<i>Branta leucopsis</i>) [A045] ➤ Ringed Plover (<i>Charadrius hiaticula</i>) [A137] ➤ Sanderling (<i>Calidris alba</i>) [A144] ➤ Purple Sandpiper (<i>Calidris maritima</i>) [A148] ➤ Dunlin (<i>Calidris alpina</i>) [A149] ➤ Turnstone (<i>Arenaria interpres</i>) [A169] ➤ Wetland and Waterbirds [A999] 	<p>‘To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.’</p> <p>To maintain the favourable conservation condition of the wetland habitat in Mid-Clare Coast SPA as a resource for the regularly occurring migratory waterbirds that utilise it’ (NPWS, Version 1, 2014²)</p>	<p>This European Site is 7.2km to the south-west of the Site, at its closest point. The Proposed Development is located entirely outside of the SPA boundary.</p> <p>Hydrological connectivity has been identified between the Proposed Development and this SPA via watercourses that occur within the west of the Site and along the Cable Route to Slievecallan. The proposed Cable Route crosses both the Kildeema Stream and Annagh [Clare] River, both of which join at Spanish Point, before entering the Atlantic Ocean and the SPA.</p> <p>Therefore, following a review of the conservation objective supporting document and taking a precautionary approach, potential for indirect effects via surface water pollution has been identified on the SCI feature Wetlands and Waterbirds [A999]. This SCI includes the supporting habitat for the SCI species for which the SPA has been designated. It is therefore important for maintaining the favourable conservation condition of the wetland habitat in the Mid-Clare Coast SPA.</p>

² NPWS, Version 1, 2014, Online, Available at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004182.pdf; Accessed 23.03.2021

European Site	Distance from proposed works (km)	Qualifying Interests/Special Conservation Interests for which the European Site has been designated (https://www.npws.ie , 23/03/2021)	Conservation Objectives	Zone of Influence Determination & Identification of Pathways for Effect
Special Protection Area				
				<p>As described in Chapter 7 ‘Birds’ of the EIAR, none of the SCI species for which the SPA has been designated were recorded during the dedicated bird surveys of the Site between April 2016 – March 2018. In addition, the Site does not offer suitable supporting habitat for the SCI species for which the SPA is designated. The Site is located over 7.2 km inland from the coastal SPA. Therefore, disturbance/displacement related effects on SCI species have been excluded. In addition, no potential for collision risk associated with the operation of the turbines was identified.</p> <p><i>The SPA is considered to be within the Likely Zone of Impact and further assessment is required with regard to the Wetlands and Waterbirds [A999] SCI of the SPA.</i></p>
Cliffs of Moher SPA (004005)	11.8 km to the north-west of the Site.	<ul style="list-style-type: none"> ➤ Fulmar (<i>Fulmarus glacialis</i>) [A009] ➤ Kittiwake (<i>Rissa tridactyla</i>) [A188] ➤ Guillemot (<i>Uria aalge</i>) [A199] 	‘To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA’ (NPWS, version 7, 2020 ³)	<p>This European Site is located 11.8km north-west of the proposed Site. The Proposed Development is located entirely outside of the SPA boundary.</p> <p>This Site is in a separate hydrological catchment. No hydrological connection between the Site and the SPA</p>

³ NPWS (2020) Conservation objectives for Cliffs of Moher SPA [004005]. Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht. Online, Available at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004005.pdf, Accessed 23.03.2021

European Site	Distance from proposed works (km)	Qualifying Interests/Special Conservation Interests for which the European Site has been designated (https://www.npws.ie , 23/03/2021)	Conservation Objectives	Zone of Influence Determination & Identification of Pathways for Effect
Special Protection Area				
		<ul style="list-style-type: none"> ➤ Razorbill (<i>Alca torda</i>) [A200] ➤ Puffin (<i>Fratercula arctica</i>) [A204] ➤ Chough (<i>Pyrrhocorax pyrrhocorax</i>) [A346] 		<p>was identified. No pathway for significant effect as a result of water quality deterioration on this European Site was identified.</p> <p>As described in Chapter 7 'Birds' of the EIAR, none of the SCI species for which the SPA has been designated were recorded during the dedicated bird surveys of the Site between April 2016 – March 2018. In addition, the Site does not offer suitable supporting habitat for the SCI species for which the SPA is designated. The Site is located over 11.8km inland from the coastal SPA. Therefore, disturbance/displacement related effects on SCI species have been excluded.</p> <p><i>No pathways for significant effect on the European Site was identified. Thus it can 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 European site, that the Proposed Development, individually or in combination with other plans and projects, would therefore not have a significant effect on this European Site.</i></p>
Corofin Wetlands SPA (004220)	14.6 km to the north-east of the Site.	<ul style="list-style-type: none"> ➤ Little Grebe (<i>Tachybaptus ruficollis</i>) [A004] ➤ Whooper Swan (<i>Cygnus cygnus</i>) [A038] 	‘To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.’	This European Site is 14.6km to the north-east of the Site, at its closest point. The Proposed Development is located entirely outside of the SPA boundary.

European Site	Distance from proposed works (km)	Qualifying Interests/Special Conservation Interests for which the European Site has been designated (https://www.npws.ie , 23/03/2021)	Conservation Objectives	Zone of Influence Determination & Identification of Pathways for Effect
Special Protection Area				
		<ul style="list-style-type: none"> ➤ Wigeon (<i>Anas penelope</i>) [A050] ➤ Teal (<i>Anas crecca</i>) [A052] ➤ Black-tailed Godwit (<i>Limosa limosa</i>) [A156] ➤ Wetland and Waterbirds [A999] 	<p>‘To maintain or restore the favourable conservation condition of the wetland habitat at Corofin Wetlands SPA as a resource for the regularly-occurring migratory waterbirds that utilise it’ (NPWS, version 7, 2020⁴)</p>	<p>This Site is in a separate hydrological catchment. No hydrological connection between the proposed Site and the SPA was identified. No pathway for significant effect as a result of water quality deterioration on this European Site was identified.</p> <p>No connectivity between the proposed Site and the SPA was recorded. Widgeon was recorded offsite; however, the individuals are most likely to be associated with a local population, sperate from the SPA due to the separation in distance. In any event no potential for impact on wigeon or any other SCI species was identified in relation to habitat loss, displacement or collision mortality. As described in Chapter 7 ‘Birds’ of the EIAR, Chapter 7 of the accompanying EIAR concludes that ‘No pathways for significant effects were identified’.</p> <p>The Site does not offer suitable supporting habitat for the SCI species for which the SPA is designated. The Site is located over 11.8km inland from the coastal SPA. Therefore, disturbance/displacement related effects on SCI species have been excluded.</p>

⁴ NPWS (2020) Conservation objectives for Corofin Wetlands SPA [004220]. Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht. Available at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004220.pdf, Accessed 23.03.2021

European Site	Distance from proposed works (km)	Qualifying Interests/Special Conservation Interests for which the European Site has been designated (https://www.npws.ie , 23/03/2021)	Conservation Objectives	Zone of Influence Determination & Identification of Pathways for Effect
Special Protection Area				
				<i>No pathways for significant effect on the European Site was identified. Thus it can 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 European Site, that the Proposed Development, individually or in combination with other plans and projects, would therefore not have a significant effect on this European Site.</i>
Nationally Designated Sites				
Slievecallan Mountain Bog NHA	0.21km from the Site.	This NHA is designated for upland blanket bog and occurs upgradient of the Proposed Development. Hen harrier are stated to occur within the Site.		Impact on hen harrier within this NHA have been assessed in Section 7.8.2.1 below.
Other than sites which are encompassed by the above listed SPAs, no nationally designated sites of ornithological significance occur within the potential ZOI.				

7.3.2 Breeding and Wintering Bird Atlas Records

Bird Atlas 2007-11: The breeding and wintering birds of Britain and Ireland' (Balmer et al., 2013) is the most recent comprehensive work on wintering and breeding birds in Ireland.

Previous Bird Atlases have been the primary source of information on the distribution and abundance of British and Irish birds prior to Bird Atlas 2007–11. The three previously published atlases were:

- Sharrock, J.T.R. (1976) The atlas of breeding birds in Britain and Ireland.
- Lack, P.C. (1986) The atlas of wintering birds in Britain and Ireland.
- Gibbons, D.W., Reid, J.B. & Chapman, R.A. (1993) The new atlas of breeding birds in Britain and Ireland: 1988-1991.

The Proposed Development area lies within hectads R17 and R18. Table 7-9 presents a list of species of conservation interest species recorded from the relevant hectads:

Table 7-9 Breeding Bird Atlas Data (Hectads R17 and R18)

Species Name	Breeding Atlas 68-72		Breeding Atlas 88-91		Breeding Atlas 07-11		Conservation Status
	R17	R18	R17	R18	R17	R18	
Hen Harrier (<i>Circus cyaneus</i>)	Conf	-	Seen	-	Conf	Poss	BD
Merlin (<i>Falco columbarius</i>)	-	Poss	-	-	-	-	BD
Corncrake (<i>Crex crex</i>)	Conf	Conf	-	-	-	-	BD
Kingfisher (<i>Alcedo atthis</i>)	Prob	Poss	-	Seen	-	-	BD
Barn Owl (<i>Tyto alba</i>)	-	Prob	-	-	-	-	RL
Red Grouse (<i>Lagopus lagopus</i>)	Conf	Conf	-	Breed	Poss	-	RL
Lapwing (<i>Vanellus vanellus</i>)	Prob	Conf	-	Breed	-	-	RL
Curlew (<i>Numenius arquata</i>)	Conf	Conf	Breed	-	Prob	-	RL
Woodcock (<i>Scolopax rusticola</i>)	-	Prob	-	-	-	-	RL
Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	-	Conf	-	Seen	-	-	RL
Twite (<i>Carduelis flavirostris</i>)	Conf	-	-	-	-	-	RL
Meadow Pipit (<i>Anthus pratensis</i>)	Conf	Conf	Breed	Breed	Conf	Conf	RL
Grey Wagtail (<i>Motacilla cinerea</i>)	Prob	Conf	Breed	-	Conf	Poss	RL
Yellowhammer (<i>Emberiza cintrinella</i>)	-	Conf	-	-	-	-	RL

Seen = recorded; Possible = possible breeding; Probable = probable breeding; Confirmed = confirmed breeding; - = not-recorded

Table 7-10 shows those species recorded in the relevant hectads (R17 and R18) in the wintering birds' atlases that are also protected under the EU Birds Directive or mentioned on the Birds of Conservation Concern in Ireland (BoCCI) Red List.

Table 7-10 Wintering Bird Atlas Data (Hectads R17 and R18)

Species Name	Wintering Atlas 81-84		Wintering Atlas 07-11		Conservation Status
	R17	R18	R17	R18	
Whooper Swan (<i>Cygnus cygnus</i>)	Pres	Pres	Pres	Pres	BD
Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>)	-	Pres	-	-	BD
Hen Harrier (<i>Circus cyaneus</i>)	-	Pres	Pres	Pres	BD
Merlin (<i>Falco columbarius</i>)	-	-	Pres	-	BD
Short-eared Owl (<i>Asio flammeus</i>)	-	-	Pres	-	BD
Great Northern Diver (<i>Gavia immer</i>)	-	-	-	Pres	BD
Little Egret (<i>Egretta garzetta</i>)	-	-	-	Pres	BD
Barn Owl (<i>Tyto alba</i>)	-	-	Pres	-	RL
Wigeon (<i>Anas penelope</i>)	-	Pres	-	Pres	RL
Tufted Duck (<i>Aythya fuligula</i>)	Pres	Pres	-	Pres	RL
Common Scoter (<i>Melanitta nigra</i>)	-	-	-	Pres	RL
Velvet Scoter (<i>Melanitta fusca</i>)	-	-	-	Pres	RL
Lapwing (<i>Vanellus vanellus</i>)	-	Pres	-	Pres	RL
Woodcock (<i>Scolopax rusticola</i>)	Pres	Pres	Pres	Pres	RL
Herring Gull (<i>Larus argentatus</i>)	-	Pres	-	-	RL
Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	Pres	Pres	-	Pres	RL
Red Grouse (<i>Lagopus lagopus</i>)	Pres	-	Pres	-	RL
Curlew (<i>Numenius arquata</i>)	Pres	Pres	-	Pres	RL

Present = recorded; - = not-recorded

7.3.3 Bird Sensitivity Mapping Tool

A Bird Sensitivity Mapping Tool for wind energy development was developed by BirdWatch Ireland and provides a measured spatial indication of where protected birds are likely to be sensitive to wind energy developments. The tool can be accessed via the National Biodiversity Data Centre Website (www.biodiversityireland.ie) and is accompanied by a guidance document (McGuinness et al. (2015).

The criteria for estimating a zone of sensitivity (i.e. 'low', 'medium', 'high' and 'highest') is based on a review of the behavioural, ecological and distributional data available for each species.

The Site is located within a zone of *Low* sensitivity to windfarm development. In addition, there is a zone of *Medium* sensitivity approximately 600m to the south-east of the Site and is crossed by the Cable Route.

7.3.4 Irish Wetland Bird Survey (I-WeBS) Records

The study area does not contain an I-WeBS site and the nearest site is located approximately 6.5km from the Site boundary. Data from I-WeBS sites in County Clare has been used to estimate County populations of wintering waterbirds identified as KORs. Datasets for the following sites were downloaded from www.birdwatchireland.ie and reviewed:

Clare I-WeBS Sites

- > Ballyallia Lake
- > Ballycar Lough
- > Carran Ploje
- > Castlough
- > Corofin Wetlands
- > Dromore Lakes (Clare)
- > Farihy Lough
- > Inagh River
- > Knockaunroe/Rinnamona
- > Liscannor Bay (Liscannor – Rinanoughter)
- > Lough Atorick
- > Lough Girroge
- > Lough Graney
- > Lough O'Grady
- > Mid-Clare Coast (Mal Bay – Doonbeg Bay)
- > Poulataggle
- > Pouleenacoona
- > River Shannon (Lower)
- > River Shannon (Lower) Aerial
- > Scariff area
- > Shannon & Fergus Estuary
- > Shannon & Fergus Estuary Aerial
- > South East Clare Lakes
- > Tullaher Lough
- > Turloughmore (Clare)

7.3.5 NPWS Rare and Protected Species Dataset

An information request was sent to the NPWS requesting records from the Rare and Protected Species Database. The sections below provide the records obtained from the NPWS (30th November 2017) regarding rare and protected bird species. The NPWS were contacted via email on the 9th of July and on the 2nd of October 2020, prior to finalising this EIAR chapter, and it was confirmed that no new records were available.

Hen Harrier

Table 7-11 below provides the NPWS records for Hen Harrier to defined radii (km) of the Site. As previously discussed, the Proposed Development lies within hectads R17 and R18.

Table 7-11 NPWS Hen Harrier Records (November 2017)

Year	Within Site boundary	0-1km from Site boundary	1-3km from Site boundary	3-5km from Site boundary
2015	3 Confirmed Territories in Hectad R17			
2010	1 Sighting	1 Confirmed Breeding Site 1 Additional Sighting	1 Confirmed Breeding Site 1 Additional Sighting	1 Possible Breeding Site
2005	3 Confirmed Breeding Sites in Hectad R17			
1998-2004	No data	No Records	1 Confirmed Breeding Site in 2003	No Records

Curlew

The NPWS holds one record for breeding curlew within 1-3 kilometres of the development area and one record within 3-5 kilometres (both are pre-2015 records).

Greenland White-fronted Goose

The NPWS identified that several Greenland white-fronted goose observations were recorded within five kilometres of the Proposed Development area. However, the most recent observation within this five-kilometre radius dates from the 1995/1996 winter season. The remaining four observations range from 1983/1984 to 1984/1985.

Department of Culture, Heritage and the Gaeltacht

The Department's Development Application Unit (DAU) consultation response was received on the 26th of August 2020. It stated that Birds Directive Annex I species hen harrier had been recorded in the area. It was recommended that survey work should be undertaken during both the breeding and non-breeding seasons.

7.3.6 Hen Harrier

On the 21st of July 2020, a consultation response email was received from the NPWS. In this response, the Proposed Development was identified to be located in close proximity of a non-designated regionally important breeding area for hen harrier.

In 2016, the NPWS prepared an unpublished post hoc analysis report of the 2015 Hen Harrier Survey which identified a range of relatively important yet non-SPA designated areas for breeding hen harriers. The Site is located in close proximity to the non-SPA designated area in north and west Clare. The Cable Route is located within this north and west Clare regional stronghold. Summary data for this non-designated area is provided in Table 7-12. A population of sixteen pairs was recorded from the north and west Clare area in 2010. Eight pairs were identified in 2015 which correlates to a 50% decrease in occupancy between 2010 and 2015.

Table 7-12 Summary of 2015 Hen Harrier National Survey data for north and west Clare

Confirmed pairs	Possible pairs	Total number of territories	% of national population	Total number of young	Productivity/successful pairs
3	5	8	5.1%	2	2.0

7.3.7 Additional Breeding Hen Harrier Data

The nearest known nest was recorded in 2020. It is located to the south-east and adjacent to the Slievecallan Mountain Bog NHA, as per Figure 7-10 in Confidential Appendix 7-8. This nest was located during operational phase monitoring of Slievecallan Wind Farm and is located approximately 2.6km from the Site and c.1km from the Cable Route. This record is given further consideration in the assessment section (7.8) below.

7.4 Field Survey Results

A comprehensive list of all bird species recorded during surveys is provided in Table 7-1 of Appendix 7-1. The target species listed below were recorded within the zone of influence of the Proposed Development during the ornithological surveys. The list is ordered in accordance with conservation significance: Annex I species, SCIs of designated sites, Red-listed species and raptors.

- > Golden Plover (Annex I species)
- > Hen Harrier (Annex I species)
- > Merlin (Annex I species)
- > Peregrine Falcon (Annex I species)
- > Osprey (Annex I species)
- > Common Snipe (Red-listed with regard to Breeding & Wintering populations)
- > Kestrel (Red-listed with regard to Breeding populations)
- > Red Grouse (Red-listed with regard to Breeding populations)
- > Woodcock (Red-listed with regard to Breeding populations)
- > Buzzard (Raptor, Schedule IV of the Wildlife Act; 1976)
- > Sparrowhawk (Raptor, Schedule IV of the Wildlife Act; 1976)

The following sections describe the observations of each target species under the individual survey headings. Survey data and mapping for each target species is provided in the technical appendices. Appendix 7-3 presents results summary tables including:

- > Summary of seasonal Vantage Point Survey Effort.
- > Summary of the monthly distribution of flight activity recorded for the target species during the vantage point watches.
- > Summary of observations at Potential Collision Height for target species during vantage point watches.
- > Summary of the monthly distribution of flight activity recorded for the non-target species during the vantage point watches.
- > Summary of monthly distribution of target species during Breeding Bird Surveys.
- > Summary of monthly distribution of non-target species during Breeding Bird Surveys.
- > Summary of monthly distribution of Breeding Raptor Survey results.
- > Summary of Red Grouse observations during Red Grouse Surveys.
- > Summary of monthly observations of Hen Harrier during Hen Harrier Roost Surveys.
- > Summary of monthly distribution of target species during Winter Transect Surveys.
- > Summary of monthly distribution of target species during Waterfowl Surveys.

7.4.1 Golden Plover

Raw survey data for golden plover is provided in Appendix 7-4. Results summary tables are present in Appendix 7-3.

Vantage Point Surveys

Golden plover were recorded on 14 occasions during Vantage Point Surveys (see Appendix 7-4, Figure 7-1-1). All of these fourteen flight observations except one occurred within, or partially within, the Potential Collision Height. There were eleven observations of birds in flight within, or partially within, 500m of the proposed turbine layout.

Most observations of this species occurred during winter months. Six flights were recorded during the 2016/2017 winter season (October – March) with flocks between 11 and 44 birds recorded in flight and landing on areas of upland blanket bog and conifer plantation. Three flights were recorded during the 2017/2018 winter season with flocks between 10 and 12 birds. One observation was of a flock of 15 commuting birds flying and landing on ground in April 2016. The remaining four observations occurred during the 2020/21 winter months. All observations ranged from individuals to a flock of 44 birds.

Breeding Bird Surveys

Golden plover was recorded only once during Breeding Bird Surveys (see Appendix 7-4, Figure 7-3-1). On the 24th of April 2016, a flock of 20 birds was observed flying over blanket bog and conifer plantation, approximately 140m to the north-east of the Site.

Winter Transect Surveys

Golden plover was recorded on a single occasion during Winter Transect Surveys (see Appendix 7-4, Figure 7-7-1). On the 28th of January 2021, a flock of six birds was observed loafing/roosting on the bog within the Site.

Incidental Observations

There was one incidental observation of golden plover between April 2016 and March 2018 and between October 2020 and September 2021 (see Appendix 7-4, Figure 7-8-1). On the 31st of March 2018, a flock of approximately 35 birds were observed circling repeatedly over bog within the Site during a Hen Harrier Roost Survey.

There were no additional observations of this species during any of the other comprehensive surveys.

7.4.2 Hen Harrier

Raw survey data for hen harrier is provided in Appendix 7-4. Results summary tables are present in Appendix 7-3.

Vantage Point Surveys

Hen harrier were recorded on 23 occasions during Vantage Point Surveys between April 2016 and March 2018 and between October 2020 and September 2021 (see Appendix 7-4, Figure 7-1-2). Eight observations were of individual birds in hunting flights over areas of heath and upland blanket bog. Other observations were of individual birds recorded in non-hunting flights over upland blanket bog, wet grassland and conifer plantation. Eight observations were recorded during the winter seasons: three

observations during the 2016/2017 winter season, two during the 2017/2018 winter season and three during the 2020/21 winter season. There were 16 observations of birds in flight within 500m of the proposed turbine layout. Eight flights were recorded at Potential Collision Height, all other flights were recorded below PCH.

Breeding Bird Surveys

Hen harrier was observed on five occasions during Breeding Bird Surveys (see Appendix 7-4, Figure 7-3-2). On the 18th of April 2017, an individual bird was seen hunting over an area of bog and conifer plantation, within the Site. On the 8th of April 2021, a male hen harrier was observed potentially displaying (i.e. if displaying a much weaker display flight than is typical) on site over an area of blanket bog before flying out of view. No further observations were recorded in this location despite repeat visits to the area the following month. On the 9th of June 2021, a male was observed displaying on site over blanket bog for a few seconds. No further breeding behaviour was recorded in this location despite repeat visits to this location on three consecutive days. It was concluded that there was no breeding attempt. Please refer to Section 7.5.2 for further discussion.

On the 18th of June 2021, a male hen harrier was recorded hunting off site over areas of blanket bog. On the 21st of July 2021, a male hen harrier was observed flying low over the hill.

Breeding Raptor Surveys

As presented in Figure 7-9-1, all hen harrier activity was recorded off site, within the nearby Slievecallan Wind Farm associated with a nest site. This nest is approximately 2.6km from the proposed Site. Hen harrier was observed on 19 occasions during breeding raptor surveys (see Confidential Appendix 7-8, Figure 7-9-1). All observations occurred between April and June 2021. All April observations occurred on the same day with five observations recorded off site at Slievecallan wind farm with displaying and food passing at a known nest site. Three observations occurred on the same day in May 2021. Similarly, all these observations are associated with the known breeding pair at Slievecallan. In June, there were eleven additional observations, all recorded on the same day. Again similarly, all flight lines are associated with the Slievecallan known breeding pair. Two male hen harrier were observed simultaneously approximately 3km south of the proposed wind farm site with one male displaying, followed by a second male in a southward direction. One of these males is presumably associated with the Slievecallan breeding pair.

Hen Harrier Roost Surveys

Hen harrier was only recorded once during Hen Harrier Roost Surveys (see Appendix 7-4, Figure 7-6-1). On the 29th of October 2016, a ringtail was observed hunting over heather moorland and blanket bog approximately 950m north-west of the Site. There was no observation during the 2017/2018 winter season. No evidence of roosting hen harrier was recorded during any of the surveys, which extended to 2km from the Site.

Winter Transect Surveys

Hen harrier were observed on five occasions during Winter Transect Surveys (see Appendix 7-4, Figure 7-7-2). Four observations were recorded during the 2016/2017 winter season; one observation was recorded during the 2017/2018 winter season. All observations were of birds hunting or flying over upland blanket bog, conifer plantation and improved agricultural grassland. All observations were recorded within, or partially within, the Site.

Incidental Observations

There was one incidental observation of hen harrier between April 2016 and March 2018 and between October 2020 and September 2021 (see Appendix 7-4, Figure 7-8-2). On the 15th of May 2016, a ringtail (probable juvenile) was observed hunting while the surveyor was driving to a Vantage Point Survey. The observation was recorded within the Site.

There were no additional observations of this species during any of the other comprehensive surveys.

7.4.3 Merlin

Raw survey data for merlin is provided in Appendix 7-4. Results summary tables are present in Appendix 7-3.

Vantage Point Surveys

Merlin was only recorded once during Vantage Point Surveys between April 2016 and March 2018 and between October 2020 and September 2021 (see Appendix 7-4, Figure 7-1-3). The observation occurred on the 30th of October 2016, on this occasion a male merlin was observed hunting over upland blanket bog, within 500m of the proposed turbine layout. This observation was recorded partially at Potential Collision Height.

There were no additional observations of this species during any of the other comprehensive surveys.

7.4.4 Peregrine Falcon

Raw survey data for peregrine falcon is provided in Appendix 7-4. Results summary tables are present in Appendix 7-3.

Vantage Point Surveys

Peregrine falcon was only recorded once during Vantage Point Surveys (see Appendix 7-4, Figure 7-1-4). On the 25th of October 2016, an individual bird was observed hunting over upland blanket bog and improved agricultural grassland, within, or partially within, 500m of the proposed turbine layout. This observation was recorded at Potential Collision Height.

There were no additional observations of this species during any of the other comprehensive surveys.

7.4.5 Osprey

Raw survey data for osprey is provided in Appendix 7-4. Results summary tables are present in Appendix 7-3.

Vantage Point Surveys

Osprey was observed on a single occasion during Vantage Point Surveys (see Appendix 7-4, Figure 7-1-5). On the 25th of October 2016, an individual bird was observed travelling through the Site over upland blanket bog and conifer plantation. This observation was recorded at Potential Collision Height.

There were no additional observations of this species during any of the other comprehensive surveys.

7.4.6 Common Snipe

Raw survey data for common snipe is provided in Appendix 7-4. Results summary tables are present in Appendix 7-3.

Vantage Point Surveys

Common Snipe were observed in flight on four occasions during Vantage Point Surveys (see Appendix 7-4, Figure 7-1-6). Three of these flight observations occurred during the 2017/2018 winter season. They consisted of a pair of birds flying briefly over upland blanket bog. The remaining flight was recorded in April 2021 with four birds observed briefly flying and heard calling. All flight lines were recorded within the Proposed Development area, of which only one was at Potential Collision Height.

There were a further three observations of snipe heard calling during Vantage Point Surveys but not seen. All these observations occurred during the 2016/2017 winter. These observations occurred within the Proposed Development area.

Breeding Bird Surveys

Common Snipe were observed on 31 occasions during Breeding Bird Surveys (see Appendix 7-4, Figure 7-3-3). Seven observations occurred during the 2016 breeding season, twenty-two observations occurred during the 2017 breeding season, while the remaining two occurred during the 2021 breeding season. The maximum number of common snipe encountered in a single day was four in April 2017 and six in June 2017. Most observations were of birds flushed from the ground in areas of blanket bog on site, while some observations were of birds heard calling. All observations were of individual birds, except two with two birds recorded.

Winter Transect Surveys

Common Snipe were recorded on 76 occasions during Winter Transect Surveys (see Appendix 7-4, Figure 7-7-3). Sixteen observations occurred during the 2016/2017 winter season, twenty-five occurred during the 2017/2018 winter season while the remaining thirty-five occurred during the 2020/21 winter season. All observations were of birds flying or flushed from the ground. All observations occurred within the Proposed Development area⁵.

There were no additional observations of this species during any of the other comprehensive surveys.

7.4.7 Kestrel

Raw survey data for kestrel is provided in Appendix 7-4. Results summary tables are present in Appendix 7-3.

Vantage Point Surveys

Kestrel were observed on 107 occasions during Vantage Point Surveys (see Appendix 7-4, Figure 7-1-7). Ninth of these observations were of individual birds in hunting flights, while 14 observations were of birds in non-hunting/travelling flights and three were of birds observed perched. Seven observations occurred during the 2016 breeding season, while there were seven observations during the 2016/17 winter season, a single observation during the 2017 breeding season, four observations during the 2017/2018 winter season, eleven during the 2020/21 winter season and 77 during the 2021 breeding

⁵ No flight lines were mapped during either the 2016/17 and 2017/18 winter season. Common snipe observation locations were identified by using the transect route numbers recorded by the surveyors.

season. 51 of these observations occurred within 500m of the proposed turbine layout. Flight activity was primarily associated with areas of upland blanket bog and conifer plantation in the southern and central portions of the Site. The majority of flights was recorded at Potential Collision Height.

Breeding Bird Surveys

Kestrel were observed on five occasions during Breeding Bird Surveys (see Appendix 7-4, Figure 7-3-4). Observations were recorded in May, June and July 2021. All observations were of individual birds recorded hunting over areas of upland blanket bog, improved agricultural grassland and scrub. In July 2021, a female kestrel was recorded carrying prey, confirming breeding locally. The nest location was not identified. All flights were recorded within the Site.

Breeding Raptor Surveys

Kestrel were observed on 21 occasions during Breeding Raptor Surveys (see Appendix 7-4, Figure 7-4-1). Eight observations occurred during the 2016 breeding season, six observations occurred during the 2019 breeding season and seven observations were recorded during the 2021 breeding season. Most observations were of birds hunting over upland blanket bog and conifer plantation. A possible breeding site was recorded within the proposed Site by the surveyor in April 2016, however, it was inactive during subsequent survey visits to the same location. In July 2021, a bird was observed carrying prey approximately 500m west of the proposed grid connection route and 2km south of the closest proposed turbine, confirming breeding within the vicinity of the site. All observations were recorded within 2km of the Proposed Development area.

Winter Transect Surveys

Kestrel was recorded on three occasions during Winter Transect Surveys (see Appendix 7-4, Figure 7-7-4). All observations were of birds hunting/flying over areas of blanket bog, wet grassland and conifer plantation within, or partially within the Proposed Development area.

Incidental Observations

There were 13 incidental observations of the species during Hen Harrier Roost Surveys and Vantage Point Surveys (see Appendix 7-4, Figure 7-8-3). All observations were of individual birds recorded hunting over blanket bog and wet grassland. Three observations were recorded on site.

There were no additional observations of this species during any of the other comprehensive surveys.

7.4.8 Red Grouse

Raw survey data for red grouse is provided in Appendix 7-4. Results summary tables are present in Appendix 7-3.

Vantage Point Surveys

Red grouse was observed on a single occasion during Vantage Point Surveys (see Appendix 7-4, Figure 7-1-8). On the 15th of April 2021, several males were heard calling before an individual displayed in an area of blanket bog. This flight was recorded below PCH, within 500m of the turbine layout.

Breeding Bird Surveys

Red grouse was only observed once during Breeding Bird Surveys (see Appendix 7-4, Figure 7-3-5). On the 24th of April 2016, an adult male was flushed from an area of bog, within the Site.

Red Grouse Surveys

Red grouse were recorded on ten occasions during dedicated Red Grouse Surveys (see Appendix 7-4, Figure 7-5-1). Two observations occurred during the 2017 breeding surveys and eight during the 2018 breeding surveys. On the 30th of March 2017, two individual birds were recorded, one flushed from the north of the Proposed Development area, one heard calling from the south. On the 21st of March 2018, on eight occasions, birds were recorded either flying or calling from areas of blanket bog, wet heath and conifer plantation. Observations ranged from single individuals to a pair of birds. All observations occurred within the proposed Site.

These observations indicate that red grouse held breeding territories in this area, within the Proposed Development area, during the 2017 and 2018 breeding seasons.

There were no additional observations of this species during any of the other comprehensive surveys.

7.4.9 Woodcock

Raw survey data for woodcock is provided in Appendix 7-4. Results summary tables are present in Appendix 7-3.

Breeding Bird Surveys

Woodcock was only recorded once during Breeding Bird Surveys (see Appendix 7-4, Figure 7-3-6). On the 24th of April 2016, an individual bird was flushed by the approaching surveyor, near a patch of scrub and forestry within the Site.

There were no additional observations of this species during any of the other comprehensive surveys.

7.4.10 Buzzard

Raw survey data for buzzard is provided in Appendix 7-4. Results summary tables are present in Appendix 7-3.

Vantage Point Surveys

Buzzard were only observed on one occasion during Vantage Point Surveys between April 2016 and March 2018 and between October 2020 and September 2021 (see Appendix 7-4, Figure 7-1-9). On the 6th of May 2016, an individual bird was observed soaring/circling high above Potential Collision Height over an upland blanket bog, approximately 300m from the proposed Site.

There were no additional observations of this species during any of the other comprehensive surveys.

7.4.11 Sparrowhawk

Raw survey data for sparrowhawk is provided in Appendix 7-4. Results summary tables are present in Appendix 7-3.

Vantage Point Surveys

Sparrowhawk were recorded on 13 occasions during Vantage Point Surveys (see Appendix 7-4, Figure 7-1-10). One observation occurred during the 2016/2017 winter season, one during the 2017 breeding season, three during the 2017/2018 winter season, two during the 2020/21 winter season and six during the 2021 breeding season. Most observations were of individual birds either flying/soaring or hunting

over conifer plantation, upland blanket bog and dry meadows and grassy verges. All observations occurred within the proposed Site and/or grid connection route. Only two observations were recorded at Potential Collision Height.

Breeding Bird Surveys

Sparrowhawk were recorded on a single occasion during breeding bird surveys (see Appendix 7-4, Figure 7-3-7). On the 24th of June 2021, a sparrowhawk was observed perch on a branch before flying off, calling. The flight was recorded over the proposed grid connection.

Breeding Raptor Surveys

Sparrowhawk were recorded on five occasions during Breeding Raptor Surveys (see Appendix 7-4, Figure 7-4-2). Two observations occurred during the 2016 breeding season, while the remaining three occurred during the 2021 breeding season. In April 2021, a female sparrowhawk was observed carrying prey into forestry, approximately 700m north of the Site. This observation confirms breeding in the vicinity of the Site.

Winter Transect Surveys

Sparrowhawk was observed on a single occasion during Winter Transect Surveys (see Appendix 7-4, Figure 7-7-5). On the 8th February 2018, an individual bird was observed in flight over upland blanket bog, within the Site.

There were no additional observations of this species during any of the other comprehensive surveys.

7.4.12 Passerines (Red-listed)

The BoCCI Red-listed species meadow pipit was recorded regularly during the surveys undertaken. This species was recorded to be a common resident within the Proposed Development area. The BoCCI Red-listed species redwing was occasionally recorded during the winter months.

7.5 Evaluation

A determination of the population importance of birds within the likely zone of influence is provided in the sections below following criteria described in Section 0. Estimates of National population sizes were obtained from the NPWS Article 12 Reporting (2008-2012) which details the status and trends of Ireland's bird species. The Proposed Development is fully located within County Clare. Where relevant, estimates for mean county populations has been derived following a review of I-WeBS sites in County Clare.

7.5.1 Golden Plover

Wintering

The estimated national wintering population of golden plover in Ireland is 80,707 for the Republic of Ireland (ROI) (Burke et al. 2018). 1% of the ROI National wintering population of golden plover is 807 birds. As per NRA 2009, a regularly occurring population of 807 golden plover is required for classification as Nationally Important. The maximum number of birds recorded from the winter season was 44 birds. This maximum number does not correspond with the classification criteria for National or International Importance (Burke et al. 2018).

To estimate the county population, a review of Clare I-WeBS sites was conducted. It should be noted that Clare I-WeBS sites are mainly coastal in nature and the population estimate provided based on I-WeBS figures below is likely to be an underestimate of the county population. The following mean count values have been recorded for Clare I-WeBS sites over the most recent 5-season period, i.e. for the period 2011/12 – 2015/16:

Clare I-WeBS Sites

- > Ballyallia Lake (mean 0)
- > Ballycar Lough (mean 0)
- > Carran Ploje (mean 0)
- > Castlough (mean 22)
- > Corofin Wetlands (mean 53)
- > Dromore Lakes (Clare) (mean 0)
- > Farihy Lough (mean 0)
- > Inagh River (mean 0)
- > Knockaunroe/Rinnamona (mean 0)
- > Liscannor Bay (Liscannor – Rinanoughter) (mean 283)
- > Lough Atorick (mean 0)
- > Lough Girroge (mean 0)
- > Lough Graney (mean 0)
- > Lough O'Grady (mean 0)
- > Mid-Clare Coast (Mal Bay – Doonbeg Bay) (mean 240)
- > Poulataggle (mean 0)
- > Pouleenacoona (mean 0)
- > River Shannon (Lower) (mean 0)
- > River Shannon (Lower) Aerial (mean 0)
- > Scariff area (mean 0)
- > Shannon & Fergus Estuary (mean 207)
- > Shannon & Fergus Estuary Aerial (mean 2,356)
- > South East Clare Lakes (mean 0)
- > Tullaher Lough (mean 0)
- > Turloughmore (Clare) (mean 0)

Based on the above, the mean wintering population for golden plover from Clare I-WeBS sites is 3,161. Therefore, a regularly occurring population of 32 birds (1% of the county population) is considered of County Importance in the context of the Site.

During the surveys, a maximum number of approximately 44 birds were observed in flight. The species was observed on sixteen occasions, of which thirteen were recorded within/partially within the Site. Flocks of county importance were recorded on only two dates. Flocks of county importance are therefore not considered to have regularly occurred within the Site. Most observations were of birds in flight/travelling. However, occasionally, birds were recorded landing on the ground within the Site.

The population within the Site is assigned a **Local Importance (Higher Level)** on the basis of a resident/regularly occurring wintering population assessed to be important to the local level.

Breeding

The breeding distribution of this species is restricted to the western side of the country north of Galway Bay. This species was only observed once during the breeding season. In April 2016, a flock of 15 birds was observed in flight before landing on the ground within the proposed Site. This flock was recorded by the surveyor as migratory. No evidence of breeding was recorded. There were no further observations of this species during the breeding season 2016, nor during the 2017 breeding season.

The species is not dependent on the Site for breeding.

7.5.2 Hen Harrier

Wintering

The estimated national wintering population of Hen Harrier in Ireland is 269-349 therefore 1% of the ROI National wintering population is 2-3 birds. As per NRA 2009, a regularly occurring wintering population of 2-3 Hen Harrier is required for classification as Nationally/Internationally Importance.

Taking a precautionary approach, it is assumed that the individuals recorded during the winter season are associated with a **Nationally/Internationally** important wintering population.

Breeding

Based on the latest Breeding Hen Harrier Survey (NPWS 2015), the ROI National breeding population is in the range of 108-157 pairs. Therefore, a single breeding pair in Ireland conforms to National/International Importance as per NRA criteria.

The Site is located in the north-west corner of the 10km national grid square R17. During the 2015 national survey, three hen harrier breeding attempts were recorded within this 10km grid square (R17).

This species was infrequently recorded during the 2016 and 2017 breeding season surveys, i.e. hen harrier were recorded on three occasions in total between the 2016 and 2017 breeding seasons. These observations were recorded during the core breeding season of April to July. However, no breeding behaviour was observed either within the Site or within 2km of same.

The nearest known nest was recorded in 2020 and 2021. It is located to the south-east and adjacent to the Slievecallan Mountain Bog NHA, as per Figure 7-10 in Confidential Appendix 7-8. This nest is located approximately 2.6km from the proposed Site and c.1km from the proposed Cable Route. Based on the 2020 Slievecallan Wind Farm operational and 2021 breeding season survey results, there is no evidence to suggest that this pair are foraging within the proposed Site with any regularity, as per Figure 7-10 in Confidential Appendix 7-8.

The results of October 2020 to September 2021 surveys were not significantly different from the results of surveys undertaken between April 2016 and March 2018. As discussed in Section 7.4.2 of this EIAR, the proposed Slieveacurry Wind Farm was occasionally visited by hen harrier. The results of breeding season 2021 surveys confirms that the Slievecallan nest discussed in Section 7.4.2 of the EIAR was active. This nest continues to be the nearest known nest to the proposed Slieveacurry Wind Farm.

Where a brief display flight was recorded onsite, the follow-up surveys did not record any further breeding activity onsite. No further breeding behaviour was recorded in this location despite repeat visits to this location on three consecutive days. It was concluded that there was no breeding attempt.

The results of surveys indicate that in addition to the Slievecallan pair there is a lone male hen harrier recorded to utilise the habitats within the existing Slievecallan Wind Farm and occasionally⁶ the proposed Slieveacurry Wind Farm. The evidence for this is firstly, two males were observed together and secondly, it is unlikely that a male provisioning a nest would have been recorded displaying c.3km from his nest site. Taking a precautionary approach, it is assumed that the individuals recorded during

⁶ For comparison purposes: during 2021 vantage point surveys there were 10 breeding season observations within 500m of the proposed Slieveacurry turbines, whereas on Slievecallan wind farm there were 19 observations within this wind farm associated with the nest site. Approximately twice as many observations were recorded at Slievecallan despite significantly less time spent surveying this existing wind farm than the proposed development.

breeding season are associated with a **Nationally/Internationally** important population from the wider area.

7.5.3 Merlin

As per the latest NPWS Article 12 reporting document, the estimated population of Merlin is between 200 – 400 pairs based on Hardy et al (2009).

Merlin populations are widespread but have a patchy distribution in Ireland therefore the merlin recorded during surveys requires further consideration. The species was only recorded once within 500m of the turbine layout when a male merlin was observed in a hunting flight.

Taking a highly precautionary approach, the population recorded was assigned **Local Importance (Higher Value)**.

7.5.4 Peregrine Falcon

The estimated national breeding population of peregrine falcon in Ireland is 425 breeding pairs as per the National Breeding Peregrine Survey 2017 (IRSG 2018, Unpublished Report).

Peregrine falcon are recovering from a severe population decline in Ireland (BoCCI) therefore, the observation of this species requires further consideration. The species was only recorded once approximately 200m to the east of the closest turbine.

Taking a highly precautionary approach, the population recorded was assigned **Local Importance (Higher Value)**.

7.5.5 Osprey

This species is rarely encountered in Ireland, with only a small number of migrating osprey passing through the country (typically along the east coast) each year.

Osprey was reported on only one occasion throughout an extensive 36-month period survey between April 2016 and March 2018. The bird recorded commuting across the Site is likely a vagrant passing through the area and is unlikely to be encountered at the Site again. This species is an obligate piscivore, that is reliant on large water bodies for foraging. There are no large water bodies within the Proposed Development area.

The Site is not of significance to this species.

7.5.6 Curlew

Curlew is Red-listed (BoCCI) with regard to breeding and wintering populations.

NPWS holds two records for breeding curlew, one within 1-3 kilometres of the development area and the other record within 3-5 kilometres (both are pre-2015 records).

This species was not observed during a comprehensive suite of surveys over a 36-month period. In particular, no curlew were recorded during the adapted Brown and Shepherd surveys, which specifically target breeding waders. These surveys were undertaken on site and to a 500m radius of the Site.

The development Site is not of significance to this species.

7.5.7 Common Snipe

Common Snipe is Red-listed in Ireland during both the breeding and winter seasons (BoCCI, 2021). As per the NPWS Article 12 Reporting, the national breeding population of snipe is 4,275 pairs. With this, an approximate population of 164 pairs per county is estimated. Therefore, as per NRA (2009), a regularly occurring population of 43 pairs is required for classification as National Importance and of 2 pairs for classification as County Importance.

The population recorded within the Site was assigned **County Importance** on the basis of a resident/regularly occurring population assessed to be important at the local level.

7.5.8 Kestrel

Kestrel is Red-listed in Ireland (BoCCI, 2021) during the breeding season only. . As per Lewis *et al.* (2019), the national population of kestrel is estimated at 13,500 birds. From this, an approximate estimate of a minimum of 519 birds per county can be estimated. Therefore, as per NRA (2009), a regularly occurring population of 135 birds is required for classification as National Importance and of 5 birds is required for classification as County Importance.

The population recorded was assigned **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

7.5.9 Red Grouse

Red grouse is BoCCI Red-listed during the breeding season in Ireland. As per the latest NPWS Article 12 reporting document, the estimated population of red grouse in Ireland is 1,898 breeding pairs. From this, an approximate estimate of a minimum of 73 birds per county can be estimated. Therefore, as per NRA 2009, a regularly occurring breeding population of 19 red grouse pairs is required for classification as Nationally Important and of one pair is required for classification a County importance.

One to two breeding territories were identified within the proposed Site during surveys. This species has been assigned *possible* breeding status at the Site.

The population recorded was assigned **County Importance** on the basis of a resident/regularly occurring population assessed to be important at the local level.

7.5.10 Woodcock

Woodcock is Red-listed (BoCCI) during the breeding season in Ireland but is not Red-listed with regard to wintering populations.

This species was recorded on a single occasion during the 36-month extensive surveys. On the 24th of April 2016, one individual was flushed near a patch of scrub and forestry, within 500m of the turbine layout. There was no subsequent observation of the species either during the 2016 or 2017 breeding seasons. It is therefore likely that the bird recorded in April 2016 was a lingering wintering individual, rather than a breeding bird.

The Site is not of significance to this species.

7.5.11 Buzzard

Buzzard is not listed on Annex I of the Birds Directive. The species is Green-listed in Ireland (BoCCI).

The species was not found to be dependent on the habitats of the Proposed Development area, given this is a large raptor with a conspicuous soaring habit (i.e. unlikely to be overlooked) and yet was only recorded on a single occasion in 36 months of surveying.

The Site is not of significance to this species.

7.5.12 Sparrowhawk

Sparrowhawk is not listed on Annex I of the Birds Directive. The species is Amber-listed in Ireland (BoCCI) during the breeding season only. The population recorded was assigned **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level. A confirmed breeding status was given to the species in 2021, the breeding site was approximately 700m north of the Site.

7.5.13 Passerines (Red-listed)

Meadow pipit are Red-listed in Ireland during the breeding season. The national breeding population of meadow pipit is 1,351,995 (Lewis *et al.*, 2019). The species was frequently encountered within the Proposed Development area. This species is commonly encountered in upland regions. Populations recorded were deemed to be of no greater than **Local Importance (Lower Value)**.

Redwing are Red-listed in Ireland during the winter season. The species was occasionally recorded within the Proposed Development area. Populations were deemed to be no greater than **Local Importance (Lower Value)**.

7.6 Identification of Key Ornithological Receptors

Table 7-13 Avifaunal Receptor Evaluation and Selection Criteria Rationale

Species	Conservation Status	NRA Evaluation (NRA, 2009)	Rational for inclusion/exclusion as KOR	KOR Yes/No
Golden Plover	Annex I, EU Birds Directive; BoCCI Red List & Irish Wildlife Act.	<p><u>Wintering</u></p> <p>Local Importance (Higher Value)</p>	<p>This species was occasionally recorded flying/feeding within the Site and within 500m of same during winter months. The potential for habitat loss cannot be excluded. An assessment of direct habitat loss is required.</p> <p>Birds were recorded within the Site. Taking a precautionary approach, the potential for displacement exists.</p> <p>This species was recorded flying over the Site within the potential collision risk zone. A collision risk assessment is required.</p>	Yes
		<p><u>Breeding</u></p> <p>No population of ecological significance recorded</p>	<p>This species was recorded on one occasion during the core breeding season. However, these birds are likely associated with a lingering wintering population rather than breeding individuals.</p> <p>No pathways for significant effects were identified. Please refer to Section 7.5.1 for further details.</p>	No
Hen Harrier	Annex I, EU Birds Directive; BoCCI Amber List & Irish Wildlife Act.	<p><u>All Seasons</u></p> <p>National/International Importance recorded</p>	<p>There was no confirmed breeding activity recorded during either the 2016, 2017, 2021 breeding seasons within the wind farm site. This species was occasionally recorded in flight within the Site. The potential for direct habitat loss cannot be excluded. An assessment of direct habitat loss is required.</p> <p>Birds were recorded within the Site. Taking a precautionary approach, the potential for displacement exists which requires assessment.</p>	Yes

Species	Conservation Status	NRA Evaluation (NRA, 2009)	Rational for inclusion/exclusion as KOR	KOR Yes/No
			This species was recorded flying over the Site within the potential collision risk zone. A collision risk assessment is required.	
Merlin	Annex I, EU Birds Directive; BoCCI Amber List & Irish Wildlife Act.	<u>Wintering</u> Local Importance (Higher Value)	<p>This species was only recorded once within the Site during surveys between April 2016 - March 2018 or October 2020 – September 2021. The individual was recorded during the winter. No evidence of breeding or roosting activity was recorded. Taking a highly precautionary approach, an assessment of habitat loss effects is required.</p> <p>This species was recorded within the Site boundary. Taking a highly precautionary approach, an assessment of displacement effects is required.</p> <p>This species was recorded flying over the development Site within the potential collision risk zone. A collision risk assessment is required.</p>	Yes
Peregrine Falcon	Annex I, EU Birds Directive; BoCCI Green List & Irish Wildlife Act.	<u>Wintering</u> Local Importance (Higher Value)	<p>This species was only recorded once within the Site during surveys between April 2016 - March 2018 or October 2020 – September 2021. The individual was recorded during the winter. No evidence of breeding or roosting activity was recorded. However, the potential for direct habitat loss while minimal, cannot be excluded. An assessment of direct habitat loss is required.</p> <p>This species was recorded within the Site boundary. Taking a highly precautionary approach, an assessment of displacement effects is required.</p> <p>This species was recorded flying over the development Site within the potential collision risk zone. A collision risk assessment is required.</p>	Yes

Species	Conservation Status	NRA Evaluation (NRA, 2009)	Rational for inclusion/exclusion as KOR	KOR Yes/No
Osprey	Annex I, EU Birds Directive & Irish Wildlife Act.	<u>N/A</u>	<p>The Proposed Development is located within peatland habitat and a commercial forestry which does not provide optimal habitat for this species. The large waterbodies that osprey are reliant on for foraging are not present within the Proposed Development area.</p> <p>This species was only recorded on one occasion crossing the Site during the extensive suite of surveys undertaken within the 36-month survey period. This individual is assumed to have been a vagrant bird only travelling though the Site.</p> <p>However, this species was recorded flying over the development Site within the potential collision risk zone. On a highly precautionary basis, a collision risk assessment is required.</p>	Yes
Common Snipe	BoCCI Red List (Breeding and Wintering Populations) & Irish Wildlife Act.	<u>All Seasons</u> County Importance	<p>The potential for habitat loss, while minimal, cannot be excluded. An assessment of direct habitat loss is required.</p> <p>The species was recorded within the Site boundary. An assessment of displacement effect is required.</p> <p>This species was recorded flying over the Site within the potential collision risk zone. A collision risk assessment is required.</p>	Yes
Kestrel	BoCCI Red List (Breeding Populations) & Irish Wildlife Act.	<u>All Seasons</u> Local Importance (Higher Value)	<p>The potential for habitat loss, while minimal, cannot be excluded. An assessment of direct habitat loss is required.</p> <p>The species was recorded within the Site boundary. An assessment of displacement effect is required.</p>	Yes

Species	Conservation Status	NRA Evaluation (NRA, 2009)	Rational for inclusion/exclusion as KOR	KOR Yes/No
			This species was recorded flying over the Site within the potential collision risk zone. A collision risk assessment is required.	
Red Grouse	BoCCI Red-Listed (Breeding Populations) & Irish Wildlife Act.	<u>All Seasons</u> County Importance	The potential for habitat loss cannot be excluded. An assessment of direct habitat loss is required. Birds were recorded within the proposed Site. The potential for displacement exists. No flights were recorded at PCH during VP surveys. Collision risk is unlikely to significantly impact this species.	Yes
Woodcock	BoCCI Red-Listed (Breeding Populations) & Irish Wildlife Act.	<u>Breeding</u> No population of ecological significance recorded	This species was only recorded on one occasion during the extensive suite of surveys undertaken within the 36-month survey period. Numbers of ecological significance as per NRA criteria were not recorded. No breeding evidence was recorded during the extensive surveys undertaken. There is no evidence to suggest that the development Site is of significance to this species. No pathways for significant effects were identified. Please refer to Section 7.5.8 for further details.	No
Buzzard	BoCCI Green List & Irish Wildlife Act.	<u>All Seasons</u> Local Importance (Higher Value)	This species was only recorded on one occasion during the extensive suite of surveys undertaken within the 36-month survey period. Numbers of ecological significance as per NRA criteria were not recorded. No breeding or roosting evidence was recorded during the extensive surveys undertaken. There is no evidence to suggest that the development Site is of significance to this species. No pathways for significant effects were identified. Please refer to Section 7.5.10 for further details.	No

Species	Conservation Status	NRA Evaluation (NRA, 2009)	Rational for inclusion/exclusion as KOR	KOR Yes/No
Sparrowhawk	BoCCI Amber List & Irish Wildlife Act.	<u>All Seasons</u> Local Importance (Higher Value)	<p>The potential for habitat loss, while minimal, cannot be excluded. An assessment of direct habitat loss is required.</p> <p>The species was recorded within the Site boundary. An assessment of displacement effect is required.</p> <p>This species was recorded flying over the Site within the potential collision risk zone. A collision risk assessment is required.</p>	Yes
Passerines (Red-Listed)	Irish Wildlife Act	<u>All Seasons</u> Local Importance (Lower Value)	As per SNH guidance, it is generally considered that passerine species are not significantly impacted by wind farms.	No

7.7 KOR Sensitivity Determination

Criteria developed by Percival (2003) is presented in Table 7-3 (Section 7.2.5.3) for assessing bird sensitivity within the study area. There were no **Very High** sensitivity KORs as there were no bird populations recorded which were likely to be associated with SPA populations.

High Sensitivity KORs include:

- Hen harrier (Ecologically sensitive species)

Medium Sensitivity KORs include:

- Golden plover (Annex I; EU Birds Directive)
- Merlin (Annex I; EU Birds Directive)
- Peregrine falcon (Annex I; EU Birds Directive)
- Osprey (Annex I; EU Birds Directive)
- Common snipe (BoCCI; Red-Listed)
- Kestrel (BoCCI; Red-Listed)
- Red grouse (BoCCI; Red-Listed)

The remaining KORs identified in the study area were classified as **Low Sensitivity**:

- Sparrowhawk

7.8 Likely and Significant Effects

This section of the assessment of effects is structured as follows:

- Assessment of 'Do nothing' Effect.
- Assessment of effects in relation to sites designated for nature conservation.
- Assessment of effects in relation to Key Ornithological Receptors
- Summary of potential effects associated with proposed infrastructure

All elements of the Proposed Development have been considered in assessing effects on ecological receptors, including:

- Site preparation works, upgrades to existing roads and tracks, construction of new site roads.
- Drainage works.
- Machinery access to the turbine locations.
- Excavation of turbine base foundations and borrow pits.
- Erection of turbines.
- Laying of underground cabling.
- Construction of other site infrastructure including substation extension and control buildings, met mast and temporary construction compound.

7.8.1 Do-Nothing Effect

The land that forms the study area is dominated by upland blanket bog and conifer plantation, with small areas in the surrounding landscape of improved agricultural grassland, wet grassland and heath.

If the Proposed Development for which this EIAR has been prepared does not go ahead, the Site would continue to be managed for the existing commercial forestry and would continue to support

areas of upland blanket bog. The avian communities on the Site would likely remain similar to its current state as activity levels and land use would not change significantly. In the specific case of forestry within the Proposed Development area, its value and suitability for local avian receptors will vary with the management of the forestry. Forestry plantation in their initial years prior to canopy closure, have the potential to support certain species (e.g. hen harrier), and as the forestry matures it is utilised by other species that favour woodland conditions. Therefore, as forestry matures/is felled there is potential for ongoing loss/creation of supporting habitat.

7.8.2 Effects on Key Ornithological Receptors during Construction and Operation

7.8.2.1 Hen Harrier (*All Seasons*)

Table 7-14 Impact Characterisation for Hen Harrier based on Percival (2003) & EPA (2017).

Analysis of potential effects during construction and operational phases of the Proposed Development		Magnitude and Significance of potential effect (Percival 2003)	Significance of potential effect (EPA 2017)
Construction Phase			
Direct Habitat Loss	<p>The Site is dominated by upland blanket bog and mature conifer plantation. No breeding or roosting sites were recorded within the study area between April 2016 and March 2018 nor between October 2020 and September 2021. The nearest known nest was recorded in 2020 and 2021. It is located to the south and adjacent to the Slievecallan Mountain Bog NHA, as per Figure 7-10 in Confidential Appendix 7-8. This nest is approximately 2.6km from the proposed Site and c.1km east of the Cable Route. No development infrastructure is proposed in this location.</p> <p>Where a brief display flight was recorded onsite, the follow-up surveys did not record any further breeding activity within the proposed development. Hen harrier were occasionally recorded foraging within the proposed Site. The majority of foraging flights were recorded in open habitats, such as blanket bog, cutover bog and rough grassland.</p> <p>The amount of open habitat (e.g. peatland/bog) that will be lost to the development footprint will be insignificant i.e. c. 9.39ha, relative to the availability of this habitat in the wider surroundings.</p> <p>No significant effects are predicted.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of a <i>High</i> sensitivity species and <i>Low</i> Impact corresponds to a Low effect significance.</p>	Long-term Slight Negative Effect

<p>Displacement</p>	<p>No roosting was recorded within the Site or 2km buffer of same between April 2016 and March 2018, nor between October 2020 and September 2021.</p> <p>No nesting were recorded at or within the 2km survey radius of the Site. As previously discussed, the nearest known nest was recorded in 2020 and 2021 approximately 2.6km from the Site and c.1km from the proposed Cable Route, as per Figure 7-10 in Confidential Appendix 7-8. Owing to the separation distance involved, no disturbance at the nest is predicted.</p> <p>Very few of the hen harrier observations associated with (the 2020 & 2021) Slievecallan nest involved birds flying in the direction of the proposed Site, as per Figure 7-10 in Confidential Appendix 7-8.</p> <p>Hen harrier were only occasionally recorded foraging within the Site. In 36 months of vantage point surveys, there were 23 observations, which is less than one record a month.</p> <p>It is unlikely that any significant displacement impact resulting from construction will occur for hen harrier given this species was not recorded to visit the Site frequently.</p> <p>No significant effects are predicted.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of a <i>High</i> sensitivity species and <i>Low</i> Impact corresponds to a Low effect significance.</p>	<p>Short-term Slight Negative Effect</p>
<p>Operational Phase</p>			
<p>Direct Habitat Loss</p>	<p>Direct or indirect effects are not predicted.</p>	<p>No Effect</p>	<p>No Effect</p>
<p>Displacement</p>	<p>No evidence of breeding was recorded within the Site or to a 2km radius of the Site. As previously discussed, the nearest known nest was recorded in 2020 and 2021 approximately 2.6km from the proposed Site, as per Figure 7-10 in Confidential Appendix 7-8. Owing to the separation distance involved no disturbance at the nest is predicted.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of a <i>High</i> sensitivity species and <i>Low</i></p>	<p>Long-term Slight Negative Effect</p>

	<p>Hen harrier were occasionally recorded foraging within the Site. The majority of the flights were recorded during the winter season and were located in the open areas of the Site.</p> <p>Based on the core dataset there is no potential for significant displacement effects given that hen harrier were not dependant on the habitats of the Site for roosting or breeding. In addition, there is no evidence that the birds from the (2020-2021) Slievacallan nest are using the habitats within the proposed Site with any regularity, as per Figure 7-10 in Confidential Appendix 7-8.</p> <p>No significant effects are predicted.</p>	Impact corresponds to a Low effect significance.	
Collision	<p>The species was recorded on two occasions flying within the potential collision risk zone during Vantage Point surveys. A “Random” collision risk analysis has been undertaken and full details are provided in Appendix 7-5.</p> <p>The collision risk has been calculated at a ratio of 0.0096 collisions per year, or one bird every 104 years. The predicted collision risk is insignificant.</p>	<p>The magnitude of the effect is assessed as <i>negligible</i>.</p> <p>The cross tabulation of a <i>High</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	Long-term Imperceptible Negative Effect

7.8.2.2 Golden Plover (*Wintering*)

Table 7-15 Impact Characterisation for Golden Plover based on Percival (2003) & EPA (2017).

Analysis of potential effects during construction and operational phases of the Proposed Development		Magnitude and Significance of potential effect (Percival 2003)	Significance of potential effect (EPA 2017)
Construction Phase			
Direct Habitat Loss	<p>This species was occasionally recorded utilizing habitats within the Site boundary/within 500m of the same during the winter season. Most observations were of small flocks recorded travelling over the Site. The two</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p>	Long-term Slight Negative Effect

	<p>largest flocks (numbered 44 and 35) were recorded flying over and landing on areas of upland blanket bog. These observations occurred on-site and within 500m of the proposed turbines.</p> <p>Land taken during the construction phase of the development will be discernible, however substantial areas of undisturbed suitable foraging habitat will remain beyond the development footprint.</p> <p>Significant effects with regard to direct habitat loss are not predicted.</p>	<p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Low</i> Impact corresponds to a Low effect significance.</p>	
Displacement	<p>As per McGuinness et al. (2015) the zone of sensitivity for the species is 800m during the breeding season only. The species is not identified as being particularly sensitive to wind farm developments during the wintering period. This species was occasionally recorded utilizing habitats within the Site boundary/within 500m of the same during the winter season. The frequency of observations and numbers per observation were both low.</p> <p>Given low numbers recorded and the abundance of similar suitable habitat in the wider surroundings of the Site, significant impacts are not predicted.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Low</i> Impact corresponds to a Low effect significance.</p>	Short-term Slight Negative Effect
Operational Phase			
Direct Habitat Loss	<p>Direct or indirect effects are not predicted.</p>	No Effect	No Effect
Displacement	<p>A study by Pearce-Higgins et al. (2009) found reduced use of habitat surrounding operating turbines, to within 200m of the turbine base. A review of 29 other studies suggests golden plover will approach wind turbines to an average distance of 175 metres in non-breeding season (Hötker et al., 2006). Furthermore, post-construction monitoring at 15 upland wind farms showed no significant decline in populations post-construction (Pearce-Higgins et al., 2012).</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Low</i> Impact corresponds to a Low effect significance.</p>	Long-term Slight Negative Effect

	<p>There were eleven observations of golden plover within 200m of the proposed turbine layout during surveys between April 2016 and March 2018, and October 2020 – September 2021.</p> <p>In the event of displacement, there are extensive areas of suitable habitat in the wider area. This would likely render such an effect inconsequential.</p> <p>There is no evidence to suggest that the Site lies on a migratory/ regular commuting route for the species therefore barrier effect is not predicted.</p> <p>Significant displacement effects are not predicted.</p>		
Collision	<p>The species was recorded flying within the potential collision risk zone during Vantage Point surveys. A “Random” collision risk analysis has been undertaken and full details are provided in Appendix 7-5.</p> <p>The collision risk has been calculated at a rate of 2.82 collisions per year. Annual mortality of adult golden plover has been calculated at 27% per annum (Sandercock, 2003). If 2.82 collisions were to occur per year, it would mean that the losses at the proposed wind farm would increase the annual mortality of the county population (i.e. 3,161 birds) by 0.33%. The predicted collision risk is therefore insignificant.</p>	<p>The magnitude of the effect is assessed as <i>negligible</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	Long-term Imperceptible Negative Effect

7.8.2.3 Merlin (*Wintering*)

Table 7-16 Impact Characterisation for Merlin based on Percival (2003) & EPA (2017).

Analysis of potential effects during construction and operational phases of the Proposed Development	Magnitude and Significance of potential effect (Percival 2003)	Significance of potential effect (EPA 2017)
Construction Phase		

Direct Habitat Loss	<p>This species was not recorded utilising habitat within the Site boundary for roosting or breeding. Significant effects are not predicted particularly given the low levels of activity recorded. The species was recorded hunting onsite on a single occasion over the 36-month surveys undertaken. Extensive areas of suitable foraging habitat will remain post-construction and there is an abundance of suitable habitat in the surrounding area.</p> <p>Significant effects are not predicted.</p>	<p>The magnitude of the effect is assessed as <i>negligible</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	Long-term Imperceptible Negative Effect
Displacement	<p>No breeding sites were recorded within the study area. Observations were confined to the non-breeding period.</p> <p>Significant displacement effects are not predicted, given how infrequently the Site was visited. In addition, the habitat that are present onsite are not considered to be unique to the Site.</p> <p>Significant displacement effects are not predicted.</p>	<p>The magnitude of the effect is assessed as <i>negligible</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	Short-term Imperceptible Negative Effect
Operational Phase			
Direct Habitat Loss	Direct or indirect effects are not predicted.	No Effect	No Effect
Displacement	<p>Significant effects are not predicted particularly given the low levels of activity recorded. Extensive areas of suitable foraging habitat will remain post-construction and there is an abundance of suitable habitat in the surrounding area.</p> <p>Significant displacement effects are not predicted.</p>	<p>The magnitude of the effect is assessed as <i>negligible</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	Long-term Imperceptible Negative Effect
Collision	The species was recorded flying within the potential collision risk zone on one occasion during Vantage Point surveys. A “Random” collision risk analysis has	The magnitude of the effect is assessed as <i>negligible</i> .	Long-term Imperceptible Negative Effect

	<p>been undertaken on a precautionary basis and full details are provided in Appendix 7-5.</p> <p>The collision risk has been calculated at a ratio of 0.0013 collisions per year, or approximately one bird every 750 years. The predicted collision risk is insignificant at any geographical scale.</p>	<p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	
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7.8.2.4 Peregrine Falcon (*Wintering*)

Table 7-17 Impact Characterisation for Peregrine Falcon based on Percival (2003) & EPA (2017).

Analysis of potential effects during construction and operational phases of the Proposed Development		Magnitude and Significance of potential effect (Percival 2003)	Significance of potential effect (EPA 2017)
Construction Phase			
Direct Habitat Loss	<p>This species was recorded flying/soaring within the proposed Site on one occasion. Significant effects are not predicted particularly given the low levels of activity recorded. Extensive areas of suitable foraging habitat will remain post-construction and there is an abundance of suitable habitat in the surrounding area.</p> <p>Significant effects are not predicted.</p>	<p>The magnitude of the effect is assessed as <i>negligible</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	Long-term Imperceptible Negative Effect
Displacement	<p>No breeding or roosting territories were recorded within the study area.</p> <p>There was a single observation of this species on-site/within 500m of same throughout the entire survey period (April 2016 - March 2018 and October 2020 – September 2021).</p> <p>Significant displacement effects are not predicted, given how infrequently this species was encountered and owing to the abundance of similar suitable foraging habitats in the wider surroundings of the Site.</p>	<p>The magnitude of the effect is assessed as <i>negligible</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	Short-term Imperceptible Negative Effect

Operational Phase			
Direct Habitat Loss	Direct or indirect effects are not predicted.	No Effect	No Effect
Displacement	As previously discussed, the species was only recorded once onsite or within 500m of the proposed Site. The availability of alternative suitable habitat in the surroundings and the overall infrequency of occurrence of the species at the Site limit the potential for significant disturbance displacement effects. Significant displacement effects are not predicted.	The magnitude of the effect is assessed as <i>negligible</i> . The cross tabulation of <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.	Long-term Imperceptible Negative Effect
Collision	The species was recorded flying within the potential collision risk zone during VP surveys. A “Random” collision risk analysis has been undertaken and full details are provided in Appendix 7-5. The collision risk has been calculated at a ratio of 0.009 collisions per year or one bird every 108 years. The predicted collision risk is therefore negligible.	The magnitude of the effect is assessed as <i>negligible</i> . The cross tabulation of <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.	Long-term Imperceptible Negative Effect

7.8.2.5 Osprey(N/A)

Table 7-18 Impact Characterisation for Osprey based on Percival (2003) & EPA (2017).

Analysis of potential effects during construction and operational phases of the Proposed Development		Magnitude and Significance of potential effect (Percival 2003)	Significance of potential effect (EPA 2017)
Construction Phase			
Direct Habitat Loss	This species is reliant on large waterbodies for foraging. The Proposed Development is located within terrestrial habitats (e.g. commercial forestry and peatland habitats) which do not provide optimal habitat for this species. This	The magnitude of the effect is assessed as <i>negligible</i> .	Long-term Imperceptible Negative Effect

	<p>therefore limits the potential for ecologically significant effects to result. This species was recorded flying across the proposed Site on only one occasion.</p> <p>Significant effects are not predicted.</p>	<p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	
Displacement	<p>No breeding or roosting sites were recorded within the study area. As previously discussed, this species was only recorded on a single occasion in 36 months of surveying the Proposed Development area. Osprey are reliant on large water bodies for foraging. The Proposed Development area does not contain osprey foraging habitat.</p> <p>Significant displacement effects are not predicted.</p>	<p>The magnitude of the effect is assessed as <i>negligible</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	Short-term Imperceptible Negative Effect
Operational Phase			
Direct Habitat Loss	<p>Direct or indirect effects are not predicted.</p>	No Effect	No Effect
Displacement	<p>The Proposed Development is located within peatland habitat and a commercial forestry which does not provide optimal habitat for this species. The large waterbodies that osprey are reliant on for foraging are not present within the Proposed Development area.</p> <p>Significant displacement effects are not predicted.</p>	<p>The magnitude of the effect is assessed as <i>negligible</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	Long-term Imperceptible Negative Effect
Collision	<p>The species was recorded flying within the potential collision risk zone during VP surveys. A “Random” collision risk analysis has been undertaken and full details are provided in Appendix 7-5.</p> <p>The collision risk has been calculated at a ratio of 0.011 collisions per year or one bird every 89 years. The predicted collision risk is insignificant.</p>	<p>The magnitude of the effect is assessed as <i>negligible</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	Long-term Imperceptible Negative Effect

7.8.2.6 Common Snipe (*All Seasons*)

Table 7-19 Impact Characterisation for Common Snipe based on Percival (2003) & EPA (2017).

Analysis of potential effects during construction and operational phases of the Proposed Development		Magnitude and Significance of potential effect (Percival 2003)	Significance of potential effect (EPA 2017)
Construction Phase			
Direct Habitat Loss	<p>Common snipe were recorded regularly during surveys, during both the summer and winter months. In 2017 and 2021, during breeding walkover surveys, common snipe were recorded onsite in eight locations, as per Figure 7-3-5. The majority of these eight locations are located around the margins of the Proposed Development area away from development infrastructure.</p> <p>The loss of (potential) breeding and foraging habitat will be minimal as the infrastructure is confined to a narrow corridor, i.e. c. 9.39ha/1.18% of the total site area. Significant areas of suitable nesting and foraging habitat will remain post-construction and there is an abundance of suitable habitat in the surrounding area.</p> <p>Significant effects are not predicted.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Low</i> Impact corresponds to a Low effect significance.</p>	Long-term Slight Negative Effect
Displacement	<p>Common snipe were regularly recorded during surveys, with observations primarily relating to birds flushed by the surveyor. The majority of recorded snipe were flushed from the margins of the Proposed Development area and from agricultural grassland offsite, as per Figure 7-3-5. Disturbance from construction activities could result in the loss of common snipe breeding and wintering habitat locally. Pearce Higgins et al. (2009), found a 50% reduction in breeding density of common snipe within 500m of turbines. The majority of open habitat onsite is located within 500m of turbines. There is therefore potential for a measurable reduction in breeding density of common snipe to occur at the local scale. However, the Site does not contain habitats that are</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Low</i> Impact corresponds to a Low effect significance.</p>	Short-term Slight Negative Effect

	<p>unique to the local area nor are the open areas of the Site of particularly high-quality breeding habitat for common snipe.</p> <p>Significant effects are not predicted to occur at the county, national and international scale.</p>		
Operational Phase			
Direct Habitat Loss	Direct or indirect effects are not predicted.	No Effect	No Effect
Displacement	<p>As previously discussed, Pearce Higgins et al. (2009), found a 50% reduction in breeding density of snipe within 500m of turbines. A 500m buffer around the turbines would cover the majority of the open habitat onsite, therefore the Site is likely to result in a measurable reduction in breeding density of common snipe at the local scale. However, the Site does not contain habitats that are unique to the local area. Therefore, were displacement to occur it would not result in the loss of a scarce resource for the local common snipe population.</p> <p>Significant displacement effects are not predicted to occur at the county, national and international scale.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Low</i> Impact corresponds to a Low effect significance.</p>	Long-term Slight Negative Effect
Collision	<p>It is acknowledged that the predicted number of transits, and hence predicted rate of collision for common snipe may be underestimated, as flight activity for this species is predominantly crepuscular in nature while the Vantage Point surveys are largely diurnal (Table 1.4, SNH (2017)).</p> <p>The species was recorded flying with the potential collision risk zone during VP surveys. A “Random” collision risk analysis has been undertaken and full details are provided in Appendix 7-5.</p> <p>The collision risk has been calculated at a ratio of 0.0043 collisions per year, or one bird every 232 years. The predicted collision risk is insignificant.</p>	<p>The magnitude of the effect is assessed as <i>negligible</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	Long-term Imperceptible Effect

7.8.2.7 Kestrel (*All Seasons*)

Table 7-20 Impact Characterisation for Kestrel based on Percival (2003) & EPA (2017).

Analysis of potential effects during construction and operational phases of the Proposed Development		Magnitude and Significance of potential effect (Percival 2003)	Significance of potential effect (EPA 2017)
Construction Phase			
Direct Habitat Loss	<p>This species was frequently recorded foraging within the Site during the breeding and winter seasons. In April 2016, a possible nest site was recorded onsite, however this site was not found to be active on subsequent visits to the same location. This observation indicates that the Proposed Development area contains potential nesting habitat. During the 2021 breeding season breeding was confirmed locally (the nest site was not located).</p> <p>Direct loss of foraging habitat relative to its availability onsite, will be minimal.</p> <p>Substantial areas of undisturbed suitable breeding and foraging habitat will remain post construction.</p> <p>Significant effects are not predicted.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Low</i> Impact corresponds to a <i>Low</i> effect significance.</p>	Long-term Slight Negative Effect
Displacement	<p>This species was frequently recorded within Site during the breeding and winter seasons. The majority of observations involves foraging birds. The Proposed Development area does not contain habitats that are unique to the local area. Therefore, were displacement to occur it would not result in the loss of a scarce resource for the local kestrel population.</p> <p>Significant displacement effects are not predicted at the county, national or international scale.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Low</i> Impact corresponds to a <i>Low</i> effect significance.</p>	Short-term Slight Negative Effect
Operational Phase			

Direct Habitat Loss	Direct or indirect effects are not predicted.	No Effect	No Effect
Displacement	<p>Raptor studies have generally found only low levels of turbine avoidance (Hötker et al., 2006; Madders & Whitfield, 2006), with some species, such as kestrels, known to continue foraging activity close to turbines (Pearce Higgins et al., 2009). Significant effects are not predicted, given that extensive areas of suitable foraging habitat exist and will remain in the wider area. In addition, onsite habitats are not considered unique to the Site.</p> <p>Significant effects are not predicted.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Low</i> Impact corresponds to a <i>Low</i> effect significance.</p>	Long-term Slight Negative Effect
Collision	<p>The species was recorded flying within the potential collision risk zone during VP surveys. A “Random” collision risk analysis has been undertaken and full details are provided in Appendix 7-5.</p> <p>The collision risk has been calculated at a ratio of 0.63 collisions per year, equating to one bird every 1.6 year. Annual mortality of adult kestrel has been calculated at an average 35% per annum (range 30%-40%; Orta <i>et al.</i>, 2020). If 0.63 collisions were to occur per year, it would mean that the losses at the proposed wind farm would increase the annual mortality of the county population (c.519 birds) by 0.35%. The predicted collision risk is therefore negligible. Significant effects are not predicted at the county, national or international scale.</p>	<p>The magnitude of the effect is assessed as <i>negligible</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance..</p>	Long-term Imperceptible Negative Effect

7.8.2.8 Red Grouse (*Breeding*)

Table 7-21 Impact Characterisation for Red Grouse based on Percival (2003) & EPA (2017).

Analysis of potential effects during construction and operational phases of the Proposed Development	Magnitude and Significance of potential effect (Percival 2003)	Significance of potential effect (EPA 2017)
Construction Phase		

<p>Direct Habitat Loss</p>	<p>Red grouse were recorded on twelve separate occasions within the Site, of these ten were recorded during red grouse surveys in March 2017 and 2018. These observations indicate that the Proposed Development area hosts a small resident population (estimation of one to two breeding territories). The Site is dominated by upland blanket bog which provides suitable breeding habitat for red grouse. Extensive areas of suitable breeding and foraging habitat will remain post-construction and there is an abundance of suitable habitat in the surrounding area.</p> <p>Significant effects are not predicted.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Low</i> Impact corresponds to a Low effect significance.</p>	<p>Long-term Slight Negative Effect</p>
<p>Displacement</p>	<p>As per McGuinness et al. (2015), a zone of sensitivity of 500m applies for breeding red grouse territories. Red grouse were recorded within the Site boundary on twelve occasions. Most observations were in the southern portion of the Site, in areas of blanket bog. It is estimated that there are one to two breeding territories on site. There is potential for temporary displacement of red grouse during construction works. However, studies of red grouse have found that population densities recover within one year after the disturbance caused by the construction of wind farms (Pearce-Higgins et al., 2012).</p> <p>Significant effects are not predicted at the county, national or international scale.</p>	<p>The magnitude of the effect is assessed as <i>medium</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Medium</i> Impact corresponds to a Low effect significance.</p>	<p>Short-term Slight Negative Effect</p>
<p>Operational Phase</p>			
<p>Direct Habitat Loss</p>	<p>Direct or indirect effects are not predicted.</p>	<p>No Effect</p>	<p>No Effect</p>
<p>Displacement</p>	<p>Red grouse show a high degree of site fidelity in Ireland (Watson and Moss, 2008). As a result, red grouse can be vulnerable to habitat fragmentation. However, operating turbines are not considered to result in significant levels of displacement (Douglas et al., 2011).</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Low</i></p>	<p>Long-term Slight Negative Effect</p>

	<p>In the unlikely event displacement does occur, there are extensive areas of suitable habitat in the wider area, to render this potential impact inconsequential.</p> <p>Significant effects are not predicted.</p>	Impact corresponds to a Low effect significance.	
Collision	<p>No flights were recorded at Potential Collision Height during Vantage Point surveys. Red grouse do not typically fly at a height that would put them at risk of colliding with operating turbine blades. Collision related mortality is not likely to significantly impact this species.</p>	No Effect	No Effect

7.8.2.9 Sparrowhawk (*All Seasons*)

Table 7-22 Impact Characterisation for Sparrowhawk based on Percival (2003) & EPA (2017).

Analysis of potential effects during construction and operational phases of the Proposed Development		Magnitude and Significance of potential effect (Percival 2003)	Significance of potential effect (EPA 2017)
Construction Phase			
Direct Habitat Loss	<p>No evidence of breeding was recorded within the proposed Site in 2016 and 2017. In 2021, a bird was observed carrying prey 700m north of the Site, which confirmed breeding locally. The Proposed Development area contains extensive areas of mature forestry, that provide suitable breeding and foraging habitat for sparrowhawk. However, this species was only observed within the development Site on twelve occasions throughout the extensive 36-month survey period, of these four were recorded on site during the breeding season. This is not a high number of observations given the favourable conservation status of the species and the considerable survey effort involved. Whilst the felling of forestry will result in habitat loss onsite, significant areas of suitable nesting habitat will continue to exist within the Site.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of <i>Low</i> sensitivity species and <i>Low</i> Impact corresponds to a Very Low effect significance.</p>	Long-term Slight Negative Effect

	Significant effects are not predicted, particularly given the low levels of activity recorded.		
Displacement	<p>No evidence of breeding was recorded within the proposed Site in 2016 and 2017. In 2021, a bird was observed carrying prey 700m north of the Site, which confirmed breeding locally. This species was only recorded within the Proposed Development area on twelve occasions. Significant effects are not predicted particularly given the low levels of activity recorded within the Proposed Development area. Extensive areas of suitable foraging habitat will remain post construction. The Proposed Development area does not contain habitats that are unique to the local area. Therefore, were displacement to occur it would not result in the loss of a scarce resource for the local sparrowhawk population.</p> <p>Significant displacement effects are not predicted.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of <i>Low</i> sensitivity species and <i>Low</i> Impact corresponds to a Very Low effect significance.</p>	Short-term Slight Negative Effect
Operational Phase			
Direct Habitat Loss	Direct or indirect effects are not predicted.	No Effect	No Effect
Displacement	<p>This species was only occasionally recorded within the proposed Site. In addition, none of the habitats found onsite are considered to be a scarce resource locally. Therefore, displacement effects are likely to be inconsequential.</p> <p>Significant effects are not predicted particularly given the low levels of activity recorded. In addition, extensive areas of suitable foraging habitat will remain post-construction.</p> <p>Significant displacement effects are not predicted.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of <i>Low</i> sensitivity species and <i>Low</i> Impact corresponds to a Very Low effect significance.</p>	Long-term Slight Negative Effect

<p>Collision</p>	<p>The species was recorded flying within the potential collision risk zone during VP surveys. A “Random” collision risk analysis has been undertaken and full details are provided in Appendix 7-5.</p> <p>The collision risk has been calculated at a ratio of 0.0078 collisions per year, or one bird every 128 years. The predicted collision risk is insignificant.</p>	<p>The magnitude of the effect is assessed as <i>negligible</i>.</p> <p>The cross tabulation of <i>Low</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	<p>Long-term Imperceptible Negative Effect</p>
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7.8.3 Effects on Key Ornithological Receptors during Decommissioning

7.8.3.1 All Species

Table 7-23 Impact Characterisation for Ecological Receptors based on Percival (2003) & EPA (2017).

Analysis of potential effects during construction and operational phases of the Proposed Development		Magnitude and Significance of potential effect (Percival 2003)	Significance of potential effect (EPA 2017)
Decommissioning Phase			
Direct Habitat Loss	Direct or indirect effects are not predicted.	No Effect	No Effect
Displacement	As above for construction phase for each species listed as a KOR.	As above for construction phase for each KOR	As above for construction phase for each KOR

7.8.4 Effects Associated with the Cable Route

The Proposed Development will connect to the existing Slievecallan 110kV substation. Connection via Slievecallan will comprise underground cabling, measuring approximately 7.1km in total. The electricity generated on site will be combined at the Ring Main Unit (RMU) located adjacent to turbine no. T6. The underground cabling will connect from this location to the substation located in the townland of Knockalassa, predominately following proposed and existing wind farm/ forestry roads measuring approximately 4.28km, with a short 0.94 km section over agricultural and forestry land, 0.28km along a local road and a 1.6 km section within the public road corridor (R460). The substation will be extended to facilitate the connection, with the provision of a new control building, associated electrical plant & equipment and security fencing. The potential for the Cable Route to impact birds is discussed below.

The majority of onsite habitats are of low ecological value (i.e. existing roads/tracks, agricultural land and forestry) and do not have the potential to support species of conservation interest in the area. The Cable Route passes within c.1km of the nearest known hen harrier nest located (as previously discussed) within the operational Slievecallan Wind Farm. No disturbance is predicted at the nest site based on the separation distance involved.

On a precautionary basis, it is assumed that some minor habitat loss and temporary displacement may occur along the Cable Route during construction works. However, given the extent of suitable habitat in the wider area, significant displacement effects are not predicted. The Cable Route does not have the potential to result in any significant habitat loss or displacement of any KOR species.

As per Percival (2003) the magnitude of the effect on KOR is assessed as Negligible. The cross tabulation of a High sensitivity species (e.g. hen harrier) and Negligible Impact corresponds to a Very Low effect significance. Hen harrier was used as an example as it is the highest sensitivity species identified as a KOR at this Site. The significance of the potential impact is classed as a short-term slight negative effect following EPA criteria (2017).

7.8.5 Effects on Designated Areas

The Proposed Development is not located within the boundaries of any European or Nationally designated sites important for nature conservation. There will be no direct effects on any designated site as a result of the construction, operation and decommissioning of the Proposed Development.

None of the pNHAs or NHAs within the ZOI were considered as KORs in their own right for the following reasons:

- Distance/buffer from the Proposed Development.
- Nature of the conservation sites (e.g. terrestrial nature of habitats)

In relation to European Sites, an AA Screening Assessment and Natura Impact Statement 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 EPA draft Guidance 2017, “a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement” but should “incorporate their key findings as available and appropriate”. This section provides a summary of the key assessment findings with regard to Special Areas of Conservation. A summary of key assessment findings with regard to Special Protection Areas is provided in Chapter 6.

The Screening for Appropriate Assessment concluded as follows:

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

- Inagh River Estuary SAC
- Carrowmore Point to Spanish Point and Islands SAC

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

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

The findings presented in the NIS are that:

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

Therefore, it can be objectively concluded that the Proposed Development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site’.

7.9 Mitigation and Best Practice Measures

This section describes the measures that are in place to mitigate adverse negative effects associated with the Proposed Development on avian receptors. Effects on avian receptors have been addressed in two ways:

- Design of the Proposed Development.
- Management of the development phases.

7.9.1 Mitigation by Design

The project design has followed the basic principles outlined below to eliminate the potential for significant effects on avian receptors:

- Hard standing areas have been designed to the minimum size necessary to accommodate the turbine model that is selected.
- The Cable Route has been selected to utilise built infrastructure for the majority of its length (i.e. cables to be laid within or adjacent to existing roads/ tracks). Cables will be laid underground to avoid effects on roadside hedgerows and disturbance to nesting birds.
- It is proposed to extend the existing substation at Slievecallan Wind Farm rather than building a new substation.

7.9.2 Mitigation During Construction, Operation and Decommissioning

The following section describes the mitigation measures to be implemented during each phase of the Proposed Development.

7.9.2.1 Construction Phase Mitigation

The following measures are proposed for the construction phase:

- A Construction and Environmental Management Plan (CEMP) has been prepared. The CEMP will be in place prior to the start of the construction phase. Best practice measures which form part of the design of the project are included in Chapter 4 of the EIAR. The CEMP is included as Appendix 4-4 to Chapter 4.
- The removal of woody vegetation will be undertaken in full compliance with Section 40 of the Wildlife Act 1976 – 2018. The removal of wetland vegetation and clearance/cutting of hedges and trees will be undertaken outside the breeding season (i.e. outside of the 1st of March and the 31st of August) including along the cable route.
- The Site is located to the north of the North and West Clare regionally important area for hen harrier. The cable route is however within this hen harrier stronghold. In acknowledgement of the significance of this stronghold for hen harrier it is proposed to undertake all construction works associated with the relevant section of the cable route outside of the breeding season (i.e. outside of the 1st of March and the 31st of August).
- During the construction phase, noise limits, noise control measures, hours of operation (i.e. dusk and dawn is high faunal activity time) and selection of plant items will be considered in relation to disturbance of birds.
- Plant machinery will be turned off when not in use.
- All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations 1996 (SI 359/1996) and other relevant legislation.
- An Ecological Clerk of Works (ECoW) will be appointed. Duties will include:
 - Undertake a pre-construction transect/walkover bird survey to ensure that significant effects on breeding birds will be avoided.
 - Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Proposed Development area.
 - Oversee management of ornithological and ecological issues during the construction period and advise on ornithological issues as they arise.
 - Provide guidance to contractors to ensure legal compliance with respect to protected species onsite.
 - Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress.

7.9.2.2 Operational Phase Mitigation

No operational phase impacts requiring mitigation were identified.

7.9.2.3 Decommissioning Phase Mitigation

The following measures are proposed for the decommissioning phase:

- During the decommissioning phase, disturbance limitation measures will be as per the construction phase.
- Plant machinery will be turned off when not in use.
- All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (SI 359/1996).

7.10 Enhancement Plan

It is noted that an impact assessment of hen harrier displacement impacts is provided in Section 7.8.2.1 of the EIAR, which identified no significant displacement effect. Notwithstanding this and in acknowledgement of the significance of the surrounding uplands to hen harrier and the decline of the local population, it is proposed to create enhanced habitat for hen harrier. It is proposed to actively manage 124ha of upland grassland, peatland and forestry. Please refer to Figure 1-1 of Appendix 7-7 for location details. The enhancement lands are outside a 500m radius of proposed and existing turbines and are additional to the similarly managed lands within the Slievecallan Wind Farm. Thereby, increasing the overall enhanced lands in the area as a whole. This newly proposed land will be managed for the benefit of hen harrier. The programme will aim to safeguard existing hen harrier habitat and promote the creation of new supporting habitat for hen harrier and their prey. The programme will broadly follow the approach taken by the Hen Harrier Project (www.henharrierproject.ie).

A similar hen harrier enhancement plan is ongoing within the nearby Slievecallan Wind Farm. It is of note that in 2020 and 2021 there has been an active hen harrier nest within this operational wind farm. The grant of planning permission by ABP for the Slievecallan Wind Farm stated:

“The Inspector also had concerns in relation to protection of the hen harrier and its habitats and cited this as another consideration leading to refusal of permission. The Board sought a more detailed Conservation and Habitat Management Plan (with particular reference to the Hen Harrier), as recommended by the Inspector. The Board was satisfied that the plan submitted in response was satisfactory in relation to protection of the hen harrier and its habitat.”

ABP granted planning permission for that project and in doing so, accepted the Conservation and Habitat Management Plan as a satisfactory means of protecting hen harrier and its habitat. Condition 5 of that ABP grant of planning permission on Slievecallan stated:

“Prior to commencement of development, the developer shall enter into a written agreement with the planning authority under section 47 of the Planning and Development Act, 2000 (as amended) in respect of implementation and monitoring (by a suitably qualified ecologist or environmental scientist) of the Conservation and Habitat Management Plan (submitted to An Bord Pleanála on the 24th day of May 2011). The said Conservation and Habitat Management Plan shall be adhered to throughout the site for the life-time of the wind farm development.”

The prescriptive management measures proposed and details on how these measures will be implemented in practice at the proposed Slieveacurry wind farm are listed in Appendix 7-7.

7.11 Monitoring

The following monitoring measures are proposed as industry best practise rather than in response to any identified impacts associated with the Proposed Development.

7.11.1 Commencement and Pre-Construction Monitoring

Taking a precautionary approach, it is proposed that construction works will commence outside the bird nesting season (1st of March to 31st of August inclusive). Pre-commencement surveys will be undertaken prior to the initiation of works at the Site. The survey will include a thorough walkover survey to a 500m radius of the development footprint and/or all works areas, where access allows. If winter roost sites or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter season or breeding season (respectively) of the construction phase. If it is found to be active during the construction phase no works shall be undertaken within a 500m buffer (Forestry Commission Scotland, 2006; Ruddock & Whitfield, 2007) in line with best practice. No works shall be permitted within the buffer until it can be demonstrated that the roost or nest is no longer occupied.

7.11.2 Post-Construction Monitoring

A detailed post-construction Bird Monitoring Programme has been prepared for the operational phase of the Proposed Development, please refer to Appendix 7-6 for further details. The programme of works will monitor parameters associated with collision, displacement/barrier effects and habituation during the lifetime of the project. Surveys will be scheduled to coincide with Years 1, 2, 3, 5, 10 & 15 of the life-time of the wind farm. Monitoring measures are broadly based on guidelines issued by the Scottish Natural Heritage (SNH, 2009). The following individual components are proposed:

- Flight activity surveys: breeding season vantage point surveys
- Targeted bird collision surveys (corpse searches) will be undertaken with trained dogs. The surveys will include detection and scavenger trials, to correct for these two biases and ensure the resulting data is robust.
- Enhancement plan monitoring (Please see Appendix 7-7 for details).

7.12 Residual Effects

The following species were identified as KORs and were subject to detailed impact assessment:

- Hen Harrier
- Golden Plover
- Merlin
- Peregrine Falcon
- Osprey
- Common Snipe
- Kestrel
- Red Grouse
- Sparrowhawk

As per Percival 2003 criteria, effect significance of greater than **Low** was not identified for any KOR.

As per EPA 2017 criteria, effect significance of greater than **Slight** was not identified for any KOR.

Taking into consideration the effect significance levels identified and the proposed best practice and mitigation; significant residual effects on KORs with regard to direct habitat loss, displacement or collision mortality are not predicted.

7.13 Assessment of Cumulative Effects

As per SNH guidance on Assessing the Cumulative Impacts of onshore Wind Energy Developments (2012), cumulative effects arising from two or more developments may be:

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

Assessment material for this in combination impact assessment was compiled on the relevant developments within the vicinity of the proposed development and was verified on the 8th of October 2020. The material was gathered through a search of relevant online Planning Registers, reviews of relevant EIS/EIAR documents, planning application details and planning drawings, and served to identify past and future projects, their activities and their environmental impacts. The projects considered in relation to the potential for in combination effects and for which all relevant data was reviewed (e.g. individual EIS/EIAR, layouts, drawings etc.) include those listed below.

7.13.1 Plans Considered in the Cumulative Impact Assessment

The following plans were considered in the cumulative impact assessment:

- Clare County Development Plan 2017-2023
- National Biodiversity Action Plan 2017-2021

The policies and objectives of these plans have been taken into account in this cumulative assessment.

7.13.2 Projects Considered in the Cumulative Impact Assessment

A review of the Planning Register for Clare County Council shows that there has been a number of planning applications lodged within the vicinity of the EIAR study area. While planning applications lodged within the EIAR study area primarily relate to one-off housing or are agricultural in nature, there are a number of previous applications for wind farm developments and associated infrastructure. Further details on these applications are available below.

Forestry Practices

The areas within the Site and some of the surrounding area are dominated by commercial forestry. The forestry works (felling/planting) associated with the forestry in the wider surroundings of the Proposed Development will be subject to relevant licencing and guidance from the Forestry Service. These practices have been taken into account in this cumulative assessment.

Other Developments

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

The projects considered in relation to the potential for cumulative impacts and for which all relevant data was reviewed (e.g. individual EIS/EIAR, layouts, drawings, etc) are listed below.

The review of the Clare County Council planning registers documented relevant general development planning applications in the vicinity of Site, most of which relate to the provision and/or alteration of one-off rural housing and agriculture-related structures. Owing to the nature and scale of these

developments, significant cumulative or in-combination effects are not anticipated. More details can be found in Chapter 2, Section 2.4.

Other Wind Farms

SNH guidance on *Assessing the Cumulative Impacts of onshore Wind Energy Developments* (2012 and 2018) was consulted when undertaking cumulative assessment. SNH (2012 and 2018) emphasises that the main concern of SNH is to ‘maintain the conservation status of the species population at the national level.’ However, it is acknowledged that consideration should also be allowed for impacts at the regional level, ‘where regional impacts have national implications (e.g. where a specific region holds the majority of the national population)’. A 12km radius of the Site was considered an appropriate regional scale given the foraging range of the key ornithological receptors identified within the Proposed Development area. For example, the maximum foraging range of merlin is 5km, 10km for hen harrier (SNH, 2016) and golden plover have been recorded to regularly fly 12km between winter foraging areas (Gillings and Fuller, 1999).

The wind farm projects within a 12-kilometre radius of the Site are provided in Table 7-24 below and are presented in terms of whether the project is permitted/operational or pending/under appeal. A total of 8 wind farms, and 86 existing/permitted/proposed turbines, fall within a 12-kilometre radius of the Site. On the 15th of June 2021, a request was sent to Clare County Council for Bird Monitoring Reports for relevant operational wind farms. On the 14th of October 2021, MKO was informed that all available information was online at www.eplanning.ie/ClareCC/SearchExact. Where relevant information was available it has been summarised below.

Table 7-24 Wind Farms within 12km of the Site

Wind Farm	Status	No. of Turbines	Distance from development Site (km)
Co. Clare			
Slievecallan (Ref. 10/9)	Operational	29	Less than a 1km
Shanavogh (Ref. 11/360)	Pending Application	4	4.3
Booltiagh and Ext. (Ref. 00/567 - 07/2900)	Operational	19	4.6
Cahermurphy (Ref. 14/551 - 19/159)	Operational	3 operational, 1 conditional	6.8
Cahermurphy Two (Ref. P20/658)	Pending Application	10	7.5
Kilmaley/Letteragh (Ref. 11/361)	Operational	6	7.1
Glenmore (Ref. 14/575)	Constructed	12	7.2
Kiltumper (Ref. 09/358)	Operational	2	8.5
TOTAL (Operational/Permitted)		72	
OVERALL TOTAL		86	

The following wind farms from the wider surroundings of the Site were considered in further detail.

➤ **Slievecallan Wind Farm, Co. Clare**

Slievecallan Wind Farm is the closest wind farm to the Site situated within the Proposed Development area, to the south-east. The EIS was consulted to determine cumulative impacts from the Proposed Development. The EIS outlined that “important bird species was thought to be present on site: Hen Harrier, Merlin, Golden Plover, Red Grouse.” There were records of hen harrier (one breeding pair), red grouse (one breeding pair), golden plover (wintering), short-eared owl and woodcock. A short-term moderate negative impact was assigned to breeding hen harrier during construction phase. As mitigation, construction works began outside of the breeding season, along with a hen harrier monitoring plan. Impacts no greater than slight negative were assigned for other birds of conservation concerns. The EIS concluded that “the loss of breeding areas or secondary habitats (avoidance) in the immediate vicinity of operating wind turbines is not likely to be significant.”

No significant residual effects on avian receptors were identified.

In 2020 and 2021, during operational phase monitoring of this wind farm, MKO identified a hen harrier nest, as previously discussed 2.6km from the Slieveacurry Wind Farm site and c.1km from the proposed Cable Route. The majority of the flight activity associated with this nest occurred within the Slievecallan Wind Farm site. There is no evidence that this pair utilises the habitats found within the nearby Site with any regularity, as per Figure 7-10 in Confidential Appendix 7-8. Therefore, this pair was not found to be dependent on the habitats of the proposed Site.

Based on the information available in the Slievecallan Wind Farm EIS and on results of the operational monitoring conducted in 2020, significant cumulative impacts are not anticipated.

➤ **Proposed Shanavogh Wind Farm, Co. Clare**

Shanavogh Wind Farm is the next closest wind farm to the Site, situated approximately 4.3km to the south. The EIS was consulted to determine cumulative impacts from the Proposed Development. The EIS concluded that “there are likely to be no significant impacts from the Proposed Development of this site on any birds of conservation concern.”

No significant residual effects on avian receptors were identified.

Based on the information available in the Shanavogh Wind Farm EIS, significant cumulative impacts are not anticipated.

➤ **Booltiagh Wind Farm, Co. Clare**

Booltiagh Wind Farm is the next closest wind farm to the Site, situated approximately 8km to the south-east. The EIS was consulted to determine cumulative impacts from the Proposed Development. The revised EIS outlined that no migratory flight paths were identified for wildfowl. The EIS holds records of flying and foraging hen harrier on site, and breeding in the vicinity of the Proposed Development (1-3km from site). The EIS concluded that “no loss of breeding ground would result, as there are no suitable habitat types for breeding Hen Harriers on the proposed area for the wind farm.” Furthermore, no habitat loss, disturbance or collisions were deemed to be of significance for any bird species recorded on site.

No significant residual effects on avian receptors were identified.

Based on the information available in the Bootliagh Wind Farm EIS, significant cumulative impacts are not anticipated.

> Cahermurphy Wind Farm, Co. Clare

Cahermurphy Wind Farm is the next closest wind farm to the Site, situated approximately 9.5km to the south-west. The EIS and its revised document were consulted to determine cumulative impacts from the Proposed Development. Both outlined that hen harrier and peregrine were recorded during VP surveys. The EIS concluded that “the collision risk modelling results for Hen Harrier indicate that collisions of these species with rotating wind turbines within the Proposed Development are likely to be rare and it is thus highly unlikely that collision mortality would be a cause of significant impacts on the local population.” Moreover, the EIS concluded that “no significant effects on any species as a result of disturbance, displacement or habitat loss are anticipated.”

No significant residual effects on avian receptors were identified.

Based on the information available in the Cahermurphy Wind Farm EIS, significant cumulative impacts are not anticipated.

> Proposed Cahermurphy Two Wind Farm, Co. Clare

The proposed Cahermurphy Two Wind Farm is located approximately 9.5km to the south-west of Slievecurry. This Proposed Development is in the planning process and has been taken into account on a precautionary basis. The EIAR identified the following species as key ornithological receptors: golden plover, hen harrier, merlin, peregrine, common tern, herring gull, black-headed gull, buzzard, sparrowhawk, kestrel and snipe. The EIAR stated: “Taking into consideration the effect significance levels identified and the proposed best practice and mitigation; significant residual effects on KORs with regard to direct habitat loss, displacement or collision mortality are not anticipated, with the exception of hen harrier.” Enhancement measures were proposed to ensure a net gain for the local population of hen harrier.

Based on the information available in the Cahermurphy Two Wind Farm EIAR, significant cumulative impacts are not anticipated.

> Kilmaley/Letteragh Wind Farm, Co. Clare

Kilmaley/Letteragh Wind Farm is the next closest wind farm to the Site, situated approximately 10.8km to the south-east. The EIS was consulted to determine cumulative impacts from the Proposed Development. The EIS shows the presence of the following species on site or nearby: hen harrier, merlin, golden plover and red grouse. Habitat loss, displacement and collision were evaluated to be of no significance. Moreover, the EIS concludes that “as [hen harrier] nesting occurs in the surrounding area, birds could be at risk if a territory was established close to a turbine. Monitoring and possible mitigation is therefore required to minimise this risk.”

No significant residual effects on avian receptors were identified.

In addition, pre-construction monitoring was conducted at the Letteragh wind farm for breeding hen harrier in 2017. There was a male hen harrier observed displaying on site on the 5th, 14th, 21st of April 2017, with a female present on these dates. Surveys were also conducted throughout May 2017, however it was concluded that hen harrier did not breed within the wind farm site in 2017.

Construction phase monitoring was conducted at the wind farm site in 2019, with only one hen harrier being observed hunting within the wind farm site on the 9th May 2019. No further monitoring information was available online (<http://www.eplanning.ie/ClareCC/SearchExact>).

Based on the information available in the Kilmaley/Letteragh Wind Farm EIS, and related to the pre-construction and construction monitoring significant cumulative impacts are not anticipated.

> Glenmore Wind Farm, Co. Clare

Glenmore Wind Farm is the next closest wind farm to the Site, situated approximately 11km to the south/south-east. The EIS was consulted to determine cumulative impacts from the Proposed Development. The EIS holds records of hen harrier and golden plover and identifies them as KORs. The EIS concluded that “[disturbance] impact is considered likely to be slight given the amount of similar habitats that are to be found in the wider area around the site of the Proposed Development.” A long-term negligible negative impact of turbine collision on birds (hen harrier and golden plover) was assessed for this development. The cumulative assessment of this EIS concludes that “the Glenmore site is situated at the southern edge of the Slievecallan/Ben Dash/West Clare upland area. This is characterised by hills and mountains of acidic shale with peaks up to 200-390 metres, with blanket bog, heath, large areas of conifer plantation and cutover peat, rough grassland and more improved pastures.” In the unlikely event of disturbance, extensive similar habitats are available in the wider surroundings. Moreover, the EIS underlined that in the worst-case scenario of 100% bird avoidance within 100m of any wind turbine in this region, displacement would represent a loss of only 1.3% of the overall territory. Given that 100% avoidance is unlikely, the effect of any secondary habitat loss was deemed to be negligible.

No significant residual effects on avian receptors were identified.

In addition, pre-construction surveys were completed between April and July 2017. There was one observation of a displaying hen harrier in April, but no breeding territory was established and the only other observations of hen harrier were of two males hunting on site. No further monitoring information was available online (<http://www.eplanning.ie/ClareCC/SearchExact>).

Based on the information available in the Glenmore Wind Farm EIS and relating to pre-construction surveys, significant cumulative impacts are not anticipated.

> Kiltumper Wind Farm, Co. Clare

Kiltumper Wind Farm is the next closest wind farm to the Site, situated approximately 12.5km to the south. The EIS was consulted to determine cumulative impacts from the Proposed Development. The EIS outlined that hen harrier was the only bird of special conservation concern to be recorded foraging onsite. The EIS concluded that “the site provides limited foraging opportunities for hen harriers that nest in the wider district. It is considered that the presence of two turbines, in this already highly disturbed area, would make little or no difference to the foraging behaviour of hen harriers which may be in the vicinity. It is now generally accepted that disturbance to birds such as hen harriers by the presence of wind turbines is less of a concern than previously thought.” Furthermore, “at Kiltumper, where there are no nest sites within the site or within at least 1km of it, the presence of two turbines is unlikely to pose a significant collision risk.”

No significant residual effects on avian receptors were identified.

Based on the information available in the Kiltumper Wind Farm EIS, significant cumulative impacts are not anticipated.

7.13.2.2 Cumulative Assessment per Key Ornithological Receptor

There were ten key ornithological receptors identified at the proposed Site: hen harrier, golden plover, merlin, peregrine falcon, osprey, red grouse, sparrowhawk, kestrel, common snipe. Of these species' impacts of no greater than **Very Low** (as per Percival 2003 criteria) and **Long-term Imperceptible** (as per EPA 2017 criteria) were predicted for merlin, peregrine falcon and osprey. These species, therefore, do not require further consideration given these predicted impacts are effectively zero.

Following the guidance of SNH (2012), the cumulative impact assessment has been carried out at the scale of the importance rating of the receptor. The populations recorded at the proposed Site were all assessed as of local importance (higher value). The only exception being hen harrier (international/national importance), common snipe and red grouse (county importance). For the purposes of the cumulative assessment the local scale is considered to be within a 5km radius of the Site. There are only two wind farms within 5km of the Site (i.e. existing Slievecallan Wind Farm and proposed Shanavogh Wind Farm), with a further six wind farms located between 5km and 12km of the Site. The assessment of cumulative effects on key ornithological receptors is provided in Table 7-26 below.

Table 7-25 Assessment of cumulative effects on key ornithological receptors

KOR	Evaluation of Cumulative Impacts	Determination
Hen Harrier (International/ national Importance)	<p>The decline in hen harrier populations in Ireland is a result of human related pressures, in particular habitat modification and loss. Habitat loss was therefore identified as the key cumulative impact for consideration. The potential for local developments to result in significant cumulative or in combination effects when assessed alongside the Proposed Development was considered. The available information on hen harrier in relation to other windfarms in the area was consulted. Of the wind farms located within a 12km radius of the Site, no significant impacts on this species were reported in their EIS/EIARs, e.g. following the successful implementation of mitigation significant impacts at the nearby Slievecallan were not predicted. Furthermore, based on the core dataset there is no potential for significant effects to result from the Proposed Development given that hen harrier were not dependant on the habitats of the Site for roosting or breeding.</p> <p>Furthermore, on the 15th June 2021, a request was sent to Clare County Council for Bird Monitoring Reports for relevant operational wind farms. On the 14th of October 2021, MKO was informed that all available information was online at www.eplanning.ie/ClareCC/SearchExact. While information was only available for pre-construction and construction monitoring at Glenmore and Letteragh wind farms (as outlined above), MKO has a good working knowledge of the distribution and abundance of hen harrier in</p>	Significant cumulative impacts are not predicted.

KOR	Evaluation of Cumulative Impacts	Determination
	<p>the surrounding uplands having been involved in the pre-planning and operational monitoring of several of the proposed and existing wind farms listed in Section 7.12 of the EIAR. These include but are not limited to Slievecallan Wind Farm, Booltiagh Wind Farm and Extension and Glenmore Wind Farm. This knowledge of hen harrier activity and in particular the identification of the active nest within the operational Slievecallan Wind Farm has been taken into consideration in the assessment of cumulative effect.</p> <p>As outlined in Section 7-10, in acknowledgement of the significance of the surrounding uplands to hen harrier and the decline of the local population, it is proposed to create enhanced habitat for hen harrier. It is proposed to actively manage 124ha of upland grassland, peatland and forestry. Please refer to Appendix 7-7 for further details. The management of this 124ha will result in a residual enhancement of the habitats near to the nearest known nest, at the Slievecallan Wind Farm. As the population of hen harrier within the surroundings uplands is so low, measures to benefit a single pair can have (positive) population-level impacts.</p> <p>Taking into consideration the above reported effects and the predicted effects with the Proposed Development, no significant residual additive, antagonistic or synergistic negative effects have been identified with regard to habitat loss, displacement or collision mortality.</p>	
<p>Golden Plover (Local Importance)</p>	<p>The potential for local developments to result in significant cumulative or in combination effects when assessed alongside the Proposed Development was considered. The nearby Slievecallan Wind Farm EIS does not note any significant impacts on this species. In summary the EIS concludes:</p> <ul style="list-style-type: none"> ➤ No significant operational impacts were identified. It is stated; “<i>the number of recorded flights of Golden Plover were so few that it was decided not to attempt to apply a collision risk model to the flightline data.</i>” <p>The Shanavogh Wind Farm does not specifically mention this species in the assessment section. In summary the EIS states:</p> <ul style="list-style-type: none"> ➤ “<i>there is no significant impact on wildfowl as a result of the proposed development.</i>” 	<p>Significant cumulative impacts are not predicted.</p>

KOR	Evaluation of Cumulative Impacts	Determination
	<p>Of the six other wind farms located within a 12km radius of the Site, no significant impacts on this species were identified.</p> <p>Taking into consideration the above reported effects and the predicted effects with the Proposed Development, no significant residual additive, antagonistic or synergistic effects have been identified with regard to habitat loss, displacement or collision mortality.</p>	
<p>Common Snipe (County Importance)</p>	<p>The potential for local developments to result in significant cumulative or in combination effects when assessed alongside the Proposed Development was considered. The nearby Slievecallan Wind Farm EIS notes that significant impacts on this species will be avoided. In summary the EIS concludes:</p> <ul style="list-style-type: none"> ➤ <i>“Snipe breed at the site and are important, though of lesser conservation significance than the harriers. Displaying birds were only encountered above the summit of Slievecallan Mountain where no turbines will be erected, however.”</i> <p>The Shanavogh Wind Farm does not specifically mention this species in the assessment section. In summary the EIS states:</p> <ul style="list-style-type: none"> ➤ <i>“there is no significant impact on wildfowl as a result of the proposed development.”</i> <p>Of the six other wind farms located within a 12km radius of the Site, no significant impacts on this species were identified.</p> <p>Taking into consideration the above reported effects and the predicted effects with the Proposed Development, no significant residual additive, antagonistic or synergistic effects have been identified with regard to habitat loss, displacement or collision mortality.</p>	<p>Significant cumulative impacts are not predicted.</p>
<p>Kestrel (Local Importance)</p>	<p>The potential for local developments to result in significant cumulative or in combination effects when assessed alongside the Proposed Development was considered. The nearby Slievecallan Wind Farm EIS</p>	<p>Significant cumulative impacts are not predicted.</p>

KOR	Evaluation of Cumulative Impacts	Determination
	<p>does not specifically mention this species in the assessment section. In summary in relation to birds in general the EIS states:</p> <ul style="list-style-type: none"> ➤ <i>“If felling of forestry for the development were to occur during the breeding season for birds, there is potential for nests to be lost.”</i> This is assessed as a short-term negligible impact. <p>The Shanavogh Wind Farm does not indicate negative impacts on this species in the assessment section. In summary the EIS concludes:</p> <ul style="list-style-type: none"> ➤ <i>“as the total flight duration for this species was only 50s, we foresee no significant impact on this species during the winter period as a result of the proposed development.”</i> <p>Of the six other wind farms located within a 12km radius of the Site, no significant impacts on this species were identified.</p> <p>Taking into consideration the above reported effects and the predicted effects with the Proposed Development, no significant residual additive, antagonistic or synergistic effects have been identified with regard to habitat loss, displacement or collision mortality.</p>	
<p>Red Grouse (County Importance)</p>	<p>The potential for local developments to result in significant cumulative or in combination effects when assessed alongside the Proposed Development was considered. The nearby Slievecallan Wind Farm EIS does not note any significant impacts on this species. In summary the EIS concludes:</p> <p>No significant operational impacts were identified. It is stated; <i>“no records of flights by Red Grouse at heights that would have made the individuals involved vulnerable to collision with the type of turbines that are proposed for the site.”</i> Furthermore, it states: <i>‘Small numbers of Red Grouse are present in areas that will be avoided by the design of the wind farm.’</i></p> <p>The Shanavogh Wind Farm does not specifically mention this species in the assessment section. In summary the EIS concludes:</p>	<p>Significant cumulative impacts are not predicted.</p>

KOR	Evaluation of Cumulative Impacts	Determination
	<p>➤ <i>“provided the mitigation measures are followed, the residual effects show no significant negative impacts.”</i></p> <p>Of the six other wind farms located within a 12km radius of the Site, no significant impacts on this species were identified.</p> <p>Taking into consideration the above reported effects and the predicted effects with the Proposed Development, no significant residual additive, antagonistic or synergistic effects have been identified with regard to habitat loss, displacement or collision mortality.</p>	
Sparrowhawk (Local Importance)	<p>The potential for local developments to result in significant cumulative or in combination effects when assessed alongside the Proposed Development was considered. The nearby Slievecallan Wind Farm EIS does not specifically mention this species in the assessment section. In summary in relation to birds in general the EIS states:</p> <p>➤ <i>“If felling of forestry for the development were to occur during the breeding season for birds, there is potential for nests to be lost.’ This is assessed as a short-term negligible impact.”</i></p> <p>The Shanavogh Wind Farm does not specifically mention this species in the assessment section. In summary the EIS concludes:</p> <p>➤ <i>“provided the mitigation measures are followed, the residual effects show no significant negative impacts.”</i></p> <p>Of the six other wind farms located within a 12km radius of the Site, no significant impacts on this species were identified.</p> <p>Taking into consideration the above reported effects and the predicted effects with the Proposed Development, no significant residual additive, antagonistic or synergistic effects have been identified with regard to habitat loss, displacement or collision mortality.</p>	Significant cumulative impacts are not predicted.

7.14 Conclusion

Following consideration of the residual effects (post-mitigation), it is concluded that the Proposed Development will not result in any significant negative effects on any of the identified KORs.

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