

7. ORNITHOLOGY

7.1 Introduction

This chapter assesses the likely significant effects that the Curraglass 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 as amended 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 7-6, 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 CRA document which illustrates how the Collision Risk Modelling was undertaken for this site. The Proposed Development, core EIAR site boundary and areas surveyed are provided in Figures 7-1 – 7-9.

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).

7.1.1 Description of the Proposed Development

The site comprises an area that previously supported a wind farm granted to South Western Services Co-Op Ltd under Pl.Ref.00/6590. The previous wind farm comprised 10 no. turbines and associated infrastructure. However, due to issues arising from the nature of the turbine technology that was deployed on site, the turbines were removed by the operator. All turbines had been taken down by around the end of June 2018.

The basic infrastructure of the original wind farm including access track, turbine bases and substation remain within the current site. The surrounding habitats within the site largely comprise commercial forestry and peatland habitats.

The Proposed Development comprises:

1. Up to 7 no. wind turbines with an overall blade tip height of up to 178.5 metres and all associated foundations and hard-standing areas;
2. 2 No. borrow pits;
3. 1 No. permanent meteorological mast with a maximum height of up to 112 metres;
4. Upgrade of existing and provision of new site access roads;
5. Upgrade to existing access junction;
6. A 38kV electricity substation, including 4 no. battery storage containers, 1 no. control building with welfare facilities, associated electrical plant and equipment, security fencing, wastewater holding tank,
7. Forestry Felling;
8. A temporary construction compound;
9. Site Drainage;
10. All associated internal underground cabling, including underground grid connection cabling to the existing overhead line; and
11. All associated site development and ancillary works.

The Proposed Development will have an operational life of 30 years from the date of commissioning of the development and the application seeks a ten-year planning permission.

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 2012 as amended.
- 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 to 2018.
- Cork County Council (2014). Cork County Development Plan 2014-2020.
- EPA (2017). *Draft revised guidelines on the information to be contained in Environmental Impact Statements*. Environmental Protection Agency.
- 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.
- EPA (2003). *Advice notes on current practice (in the preparation of Environmental Impact Statements)* (where relevant).
- EPA (2015). *Advice notes for preparing of Environmental Impact Statements (Draft)* (where relevant).
- EPA (2002). *Guidelines on the information to be contained in Environmental Impact 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*.

7.1.3 Statement of Authority and Competence

This ornithology chapter has been prepared by Ornithologist/Ecologist, Margaux Pierrel (BSc., MSc., Eng.), Ecologist, David Naughton (BSc.) and Senior Ornithologist, Pdraig Cregg (BSc., MSc.), of McCarthy Keville O'Sullivan Ltd. (MKO). All 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 is fully compliant with recent SNH guidance. The chapter has been reviewed by Pat Roberts (B.Sc. Environmental Science) who has over 14 years' experience in management and ecological assessment. Field surveys were undertaken by Joe Kelly (BSc.), Tony Kennelly (BSc.), Ciaran McKenna (BSc.), Tom Ryan (BSc.), Colin Barton (BSc.), Ciaran Cronin (BSc.), John Meade (BSc.), Michael O'Clery (BA) and John Curtin (BSc.). All of the above surveyors are competent experts for the purposes of the surveys that they carried out and are suitably qualified.

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 which may potentially make use of the study area. 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 2014-2019 (Colhoun & Cummins, 2013).
- 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 2-2 of this EIAR. The recommendations of the consultees have informed the EIAR preparation process and the contents of this chapter. Table 2-4 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	Acknowledgement received 3 rd December 2019
03	Cork County Council - Environment Section	No response received to date
04	Cork County Council - Heritage Officer	No response received to date
05	Department of Agriculture, Food and the Marine	Response received 31 st January 2020
06	Department of Culture, Heritage, and the Gaeltacht	Response received 4 th February 2020
07	Fáilte Ireland	Response received 23 rd December 2019
08	Irish Peatland Conservation Council	No response received to date
09	Irish Raptor Study Group	No response received to date
10	Irish Red Grouse Association	No response received to date
11	Irish Wildlife Trust	No response received to date
12	NPWS Rare and Protected Species Database	Response received on 20 th January 2020

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” susceptible to impacts from this type of development and to occur in the zone of influence of the Proposed Development was devised. 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 (see 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 1976-2012 as amended.

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 which were not recorded during the extensive surveys and those for which pathways for significant effect could not be identified.

7.2.4 Field Surveys

Field surveys at Curraglass Renewable Energy Development site were undertaken by MKO during the survey period April 2018 - March 2020. 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 were 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 2018 and March 2020 forms the core dataset for the assessment of effects on ornithology. 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 and its hinterland and which are potentially susceptible to impacts from this type of development.

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 2018 to March 2020. Surveys were conducted monthly throughout this survey period from three fixed point vantage points (VP1, VP2 and VP3) to allow comprehensive coverage of the 500m study area surrounding the proposed turbines. The VP locations were slightly changed in May 2018 to optimise the viewshed (i.e. VPs 1(a), 2(a), 3(a)). Vantage point surveys are designed to quantify the level of flight activity and its distribution over the survey area. The primary purpose of the survey is to provide data to inform the collision risk model, which makes predictions of mortality, from collisions with 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 2018. The proposed turbine layout is entirely covered from three fixed VPs (VP1, VP2 & VP3). Figure 7-1 shows the locations of all vantage points relative to the development site.

Viewshed Analysis

Viewshed analysis was carried out to confirm coverage of the study area from fixed vantage point locations (i.e. VPs 1, 2 and 3). 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 a worst-case scenario turbine model. 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 the 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 wind farm development in line with SNH (2017). The aim of the viewshed analysis is to identify the visible airspace of the turbine rotor swept area, using the fewest VPs. All proposed turbines are visible, at the rotor swept height, from a minimum of one of the VP locations. The visible view sheds at 25m are presented on Figures 7-2, 7-2-1, 7-2-2 and 7-2-3.

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, in accordance with SNH guidance (2017). Surveys were scheduled to provide a spread over the full daylight hours including dawn and dusk watches to coincide with the highest peaks of bird activity. Target species were as per listed in Table 1 of Appendix 7-1.

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
2018 Breeding Season (3 VPs)	Apr - Sep	36 hours/VP
2018/2019 Non-Breeding Season (3 VPs)	Oct - Mar	36 hours/VP
2019 Breeding Season (3 VPs)	Apr - Sep	36 hours/VP
2019/2020 Non-Breeding Season (3 VPs)	Oct - Mar	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 bands 25-175m and >175m is considered to be within the Potential Collision Height (PCH) with regard to the turbine swept area, based on a worst-case scenario for turbine modelling.

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 Bird 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').

Transect routes were devised to ensure coverage of different habitat complexes between vantage point locations within the study area. Transects were selected in order to survey all area of suitable breeding/foraging habitat to within 100m, where access allowed. Target species included 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 during daylight hours throughout the core breeding season months of April, May, June and July (2018 and 2019), with the site being visited a minimum of two 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.

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 and areas 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 surrounds. Survey methodology was as outlined in Hardey et al. (2013), as per SNH (2017) recommendations. The aim of these surveys was to identify breeding attempts by raptor pairs and locate territories within the study area. Raptor surveys were undertaken onsite and to a 2km radius from the planning/development 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 2018 & 2019). Each visit required a survey effort of approximately two days to survey the entirety of the study area.

The focus of 2019 surveys was informed by the surveys undertaken in 2018.

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

7.2.4.2.4 **Breeding Woodcock Surveys**

Breeding woodcock surveys were undertaken in accordance with Gilbert et.al (1998). Two dusk surveys were undertaken in areas of suitable breeding habitat (i.e. forestry/woodland) during June 2018 and three dusk surveys between May and June 2019. Surveys commenced one hour before sunset and continued for one hour after sunset or until it was too dark to see. Transects were slowly walked through areas of suitable woodland habitat within the survey area and all observations of woodcock (as well as the areas covered) were recorded. The aim of the survey was to record the presence of roding (displaying) male woodcock and thereby establish the distribution and abundance of the species in the study area. This survey method also allowed the observer to survey for owls, i.e. barn owls and long-eared owls.

Survey effort is presented in Appendix 7-2, Table 4. This includes full details of dates, times, survey locations, survey duration and weather conditions for each survey. Figure 7-5 shows the transect routes surveyed.

7.2.4.2.5 **Red Grouse Surveys**

Red Grouse surveys were undertaken during (March) 2019 and (March) 2020. 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) within 500m of the Proposed Development area. Areas of forestry were not surveyed as they do not have potential to support red grouse. The survey consisted of tape luring transects. Survey details are provided in Appendix 7-2, Table 5. Figure 7-6 shows the areas surveyed.

The work was carried out under NPWS Licence Numbers 001/2019 and 017/2020.

7.2.4.2.6 *Hen Harrier Roost Surveys*

Suitable habitat for roosting hen harrier within 2km of the Proposed Development area (as per SNH 2017) were surveyed for the presence of hen harrier during both winter seasons. 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 surveyed (October 2018 - March 2019 & Oct 2019 - Mar 2020). Full details of survey effort are provided in Appendix 7-2 Table 6. Figure 7-7 shows the locations of Hen Harrier Roost Survey VP locations.

7.2.4.2.7 *Winter Transect Surveys*

Winter transect surveys were undertaken to determine the presence of bird species of high conservation concern within areas of potential suitable habitat in the study area. The survey area extended 500m outside the site boundary.

Transect routes were devised to ensure coverage of different habitat complexes between vantage point locations within the study area, during winter months. Methodology was broadly based on methods described in Bibby et al. (2000). 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 7. Figure 7-8 shows the surveyed area.

7.2.4.2.8 *Wildfowl Distribution Surveys*

Significant wetland sites and waterbodies within one kilometre of the study area were surveyed for waterbird populations during the 2018/19 and 2019/20 winter seasons. The survey area extended to 500m for foraging wildfowl and one kilometre for roosting wildfowl as stipulated by SNH (SNH, 2017). The count methodology was in line with survey methodology guidelines issued by SNH (2017) and BirdWatch Ireland (2015). Counts were undertaken during daylight hours from suitable vantage points at the wetland sites.

Survey effort for all wildfowl distribution surveys is provided in Appendix 7-2, Table 7. Figure 7-8 shows the wetland site survey locations.



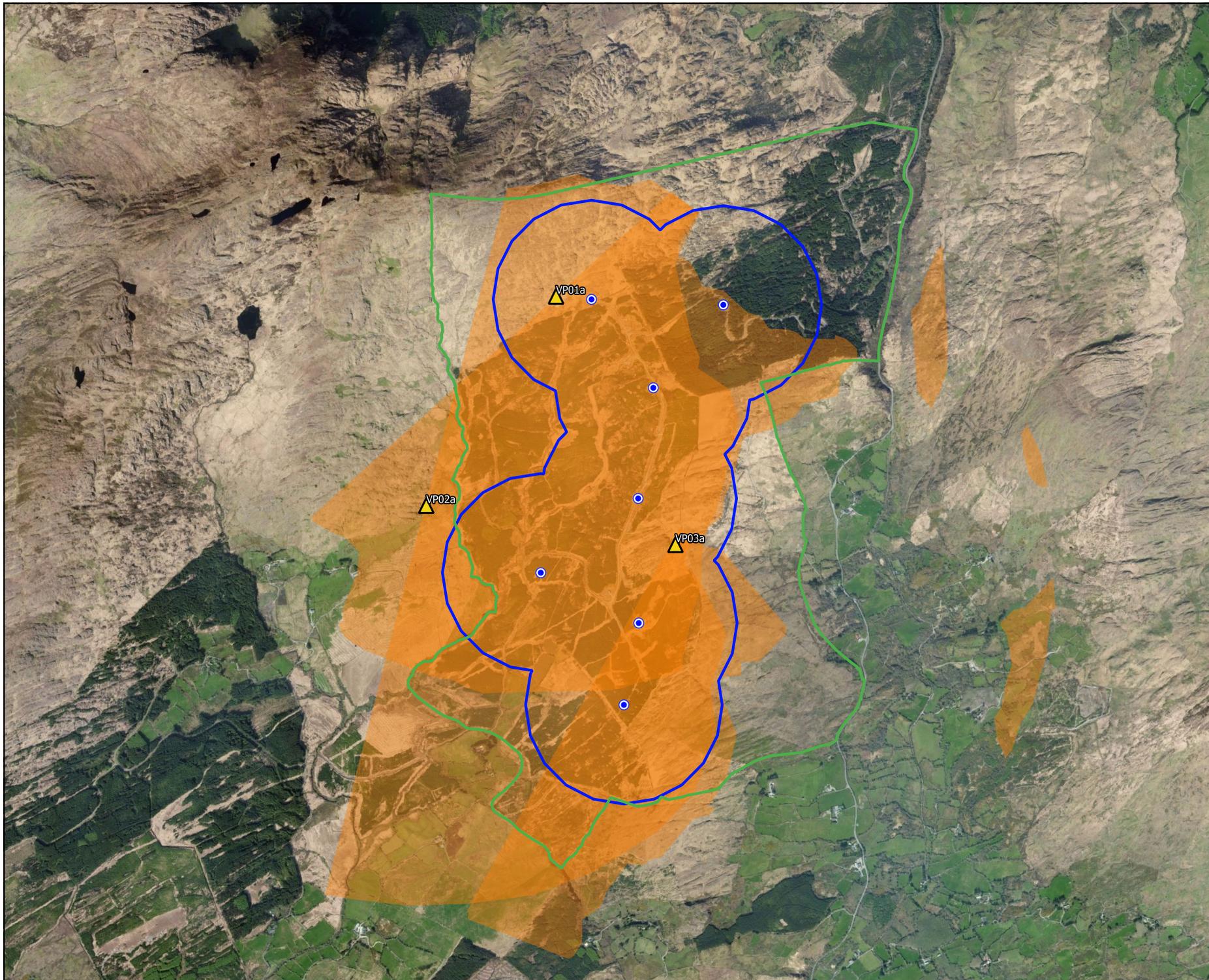
Map Legend

- E.I.A.R. Site Boundary
- Turbine Location
- ▲ Vantage Point Location



Map Title	
Vantage Point Survey Locations	
Project Title	
Curraglass Renewable Energy Development, Co. Cork	
Drawn By	Checked By
Margaux Pierrel	Padraig Cregg
Project No.	Map No.
190301	Fig 7-1
Scale	Date
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Map Legend

- EIA Site Boundary
- Turbine Location
- 500m Radius of Turbine
- ▲ VP Location
- Viewshed Coverage



Map Title

Viewshed Analysis Coverage

Project Title

Curraglass Renewable Energy Development, Co. Cork

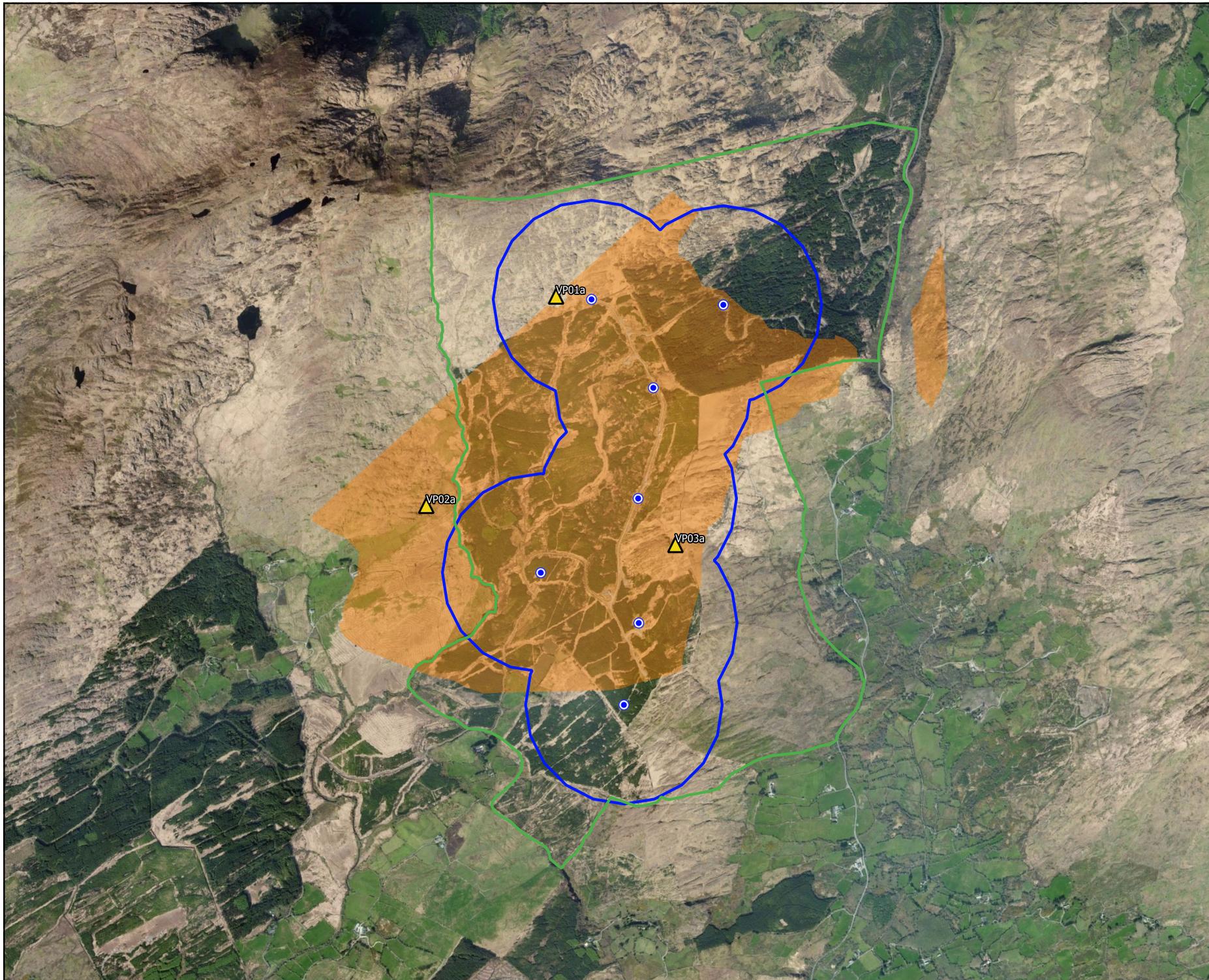
Drawn By	Checked By
Margaux Pierrel	Padraig Cregg

Project No.	Map No.
190301	Fig 7-2

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Map Legend

- EIAR Site Boundary
- Turbine Location
- 500m Radius of Turbines
- VP Location
- Viewshed Coverage



Map Title
VP01a Viewshed Analysis Coverage

Project Title
Curraglass Renewable Energy Development, Co. Cork

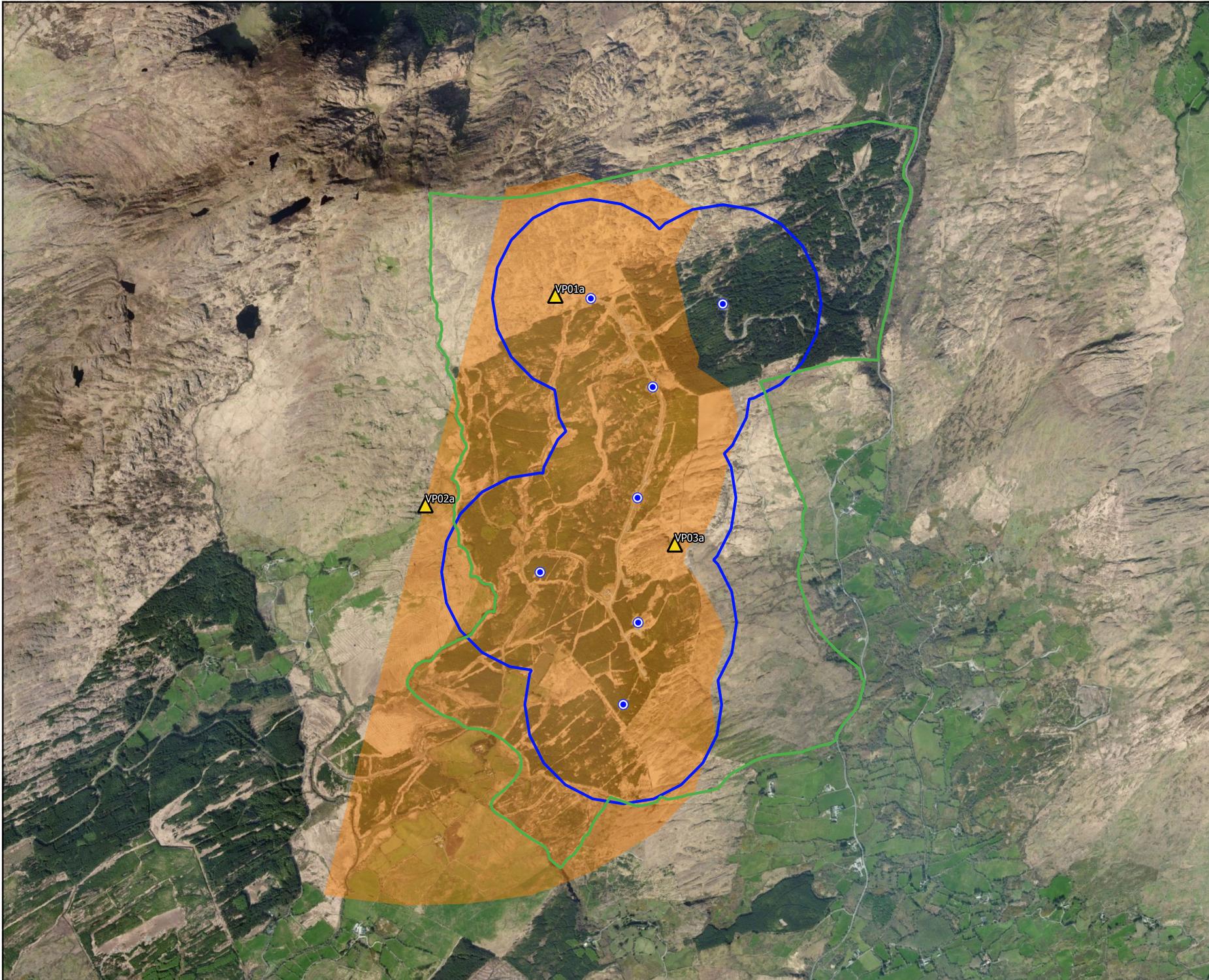
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Map Legend

- EIAR Site Boundary
- Turbine Location
- 500m Radius of Turbines
- VP Location
- Viewshed Coverage



Map Title
VP02a Viewshed Analysis Coverage

Project Title
Curraglass Renewable Energy Development, Co. Cork

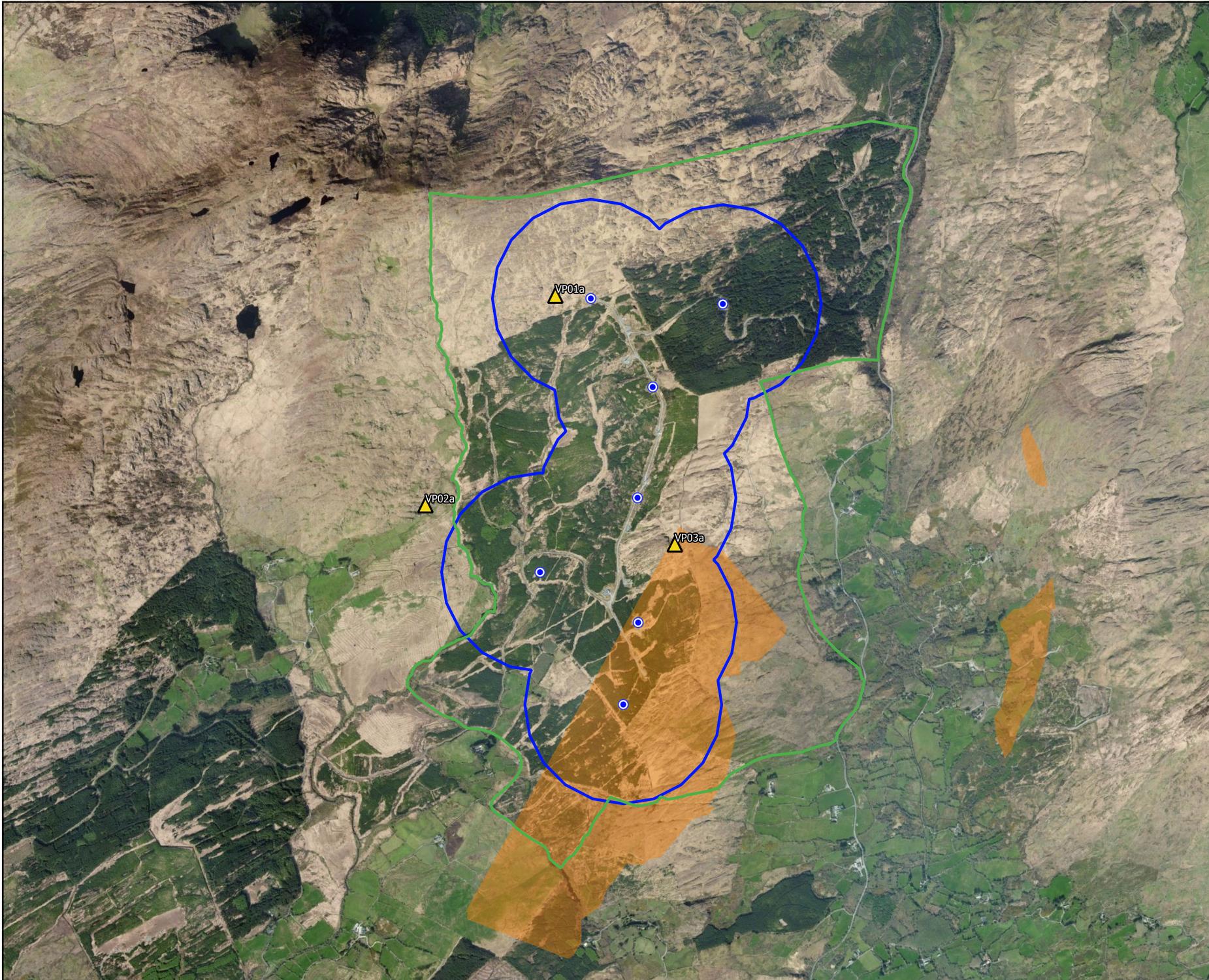
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Map Legend

- EIAR Site Boundary
- Turbine Location
- 500m Radius of Turbines
- ▲ VP Location
- Viewshed Coverage



Map Title
VP03a Viewshed Analysis Coverage

Project Title
Curraglass Renewable Energy Development, Co. Cork

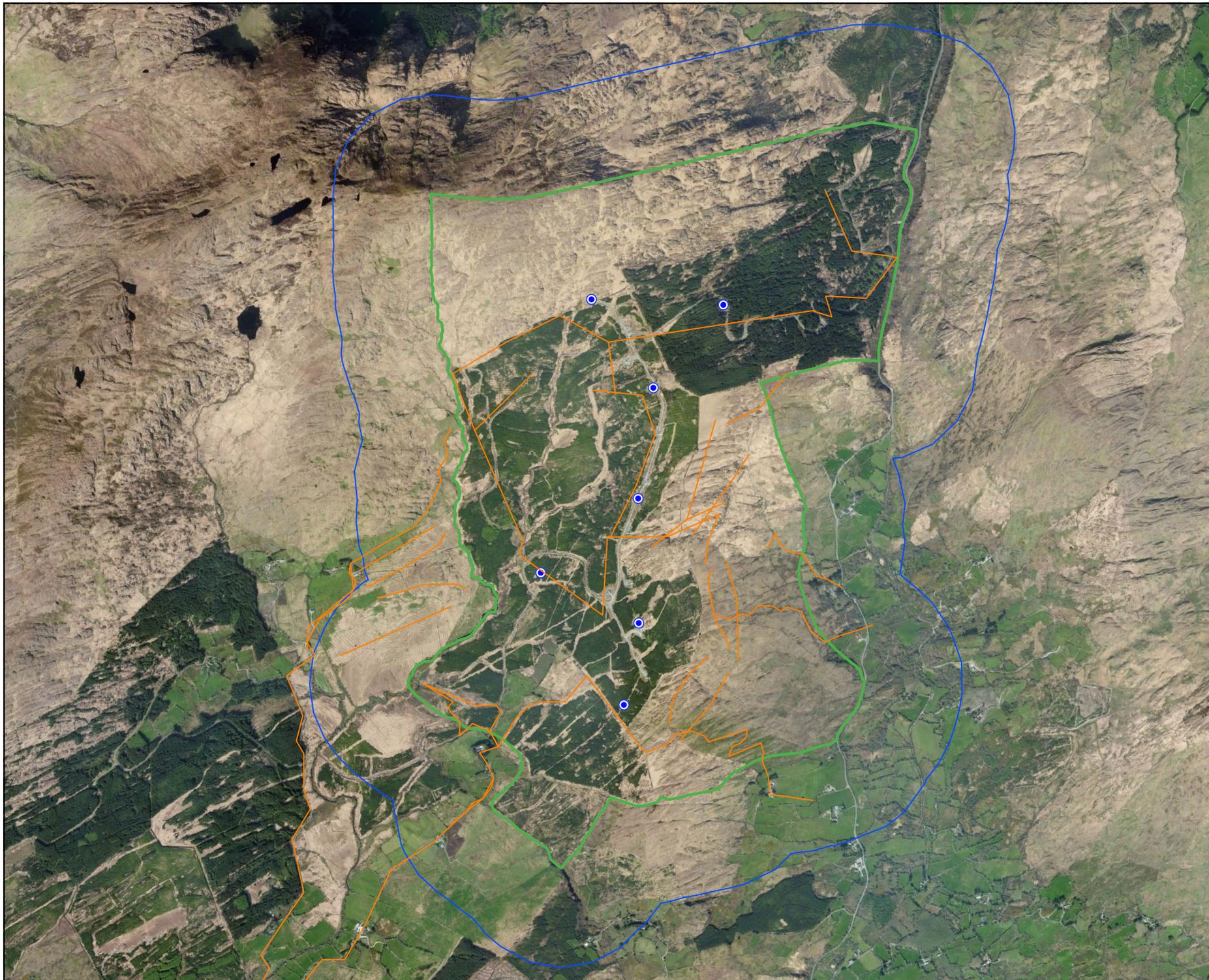
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Project No. 190301	Map No. Fig 7-2-3
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Map Legend

- EIA Site Boundary
- 500m Survey Radius
- Turbine Location
- Survey Transects



<p>Map Title</p> <p>Breeding Bird Survey Area (500m Radius)</p>	
<p>Project Title</p> <p>Curraglass Renewable Energy Development, Co. Cork</p>	
<p>Drawn By</p> <p>Margaux Pierrel</p>	<p>Checked By</p> <p>Padraig Cregg</p>
<p>Project No.</p> <p>190301</p>	<p>Map No.</p> <p>Fig 7-3</p>
<p>Scale</p> <p>1:25000</p>	<p>Date</p> <p>06.05.2020</p>
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Map Legend

- EIA Site Boundary
- 2km Survey Radius
- Turbine Location
- ▲ Breeding Raptor VP



Map Title
Breeding Raptor Survey Area (2km Radius)

Project Title
Curraglass Renewable Energy Development, Co. Cork

Drawn By Margaux Pierrel	Checked By Padraig Cregg
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Project No. 190301	Map No. Fig 7-4
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Scale 1:40000	Date 06.05.2020
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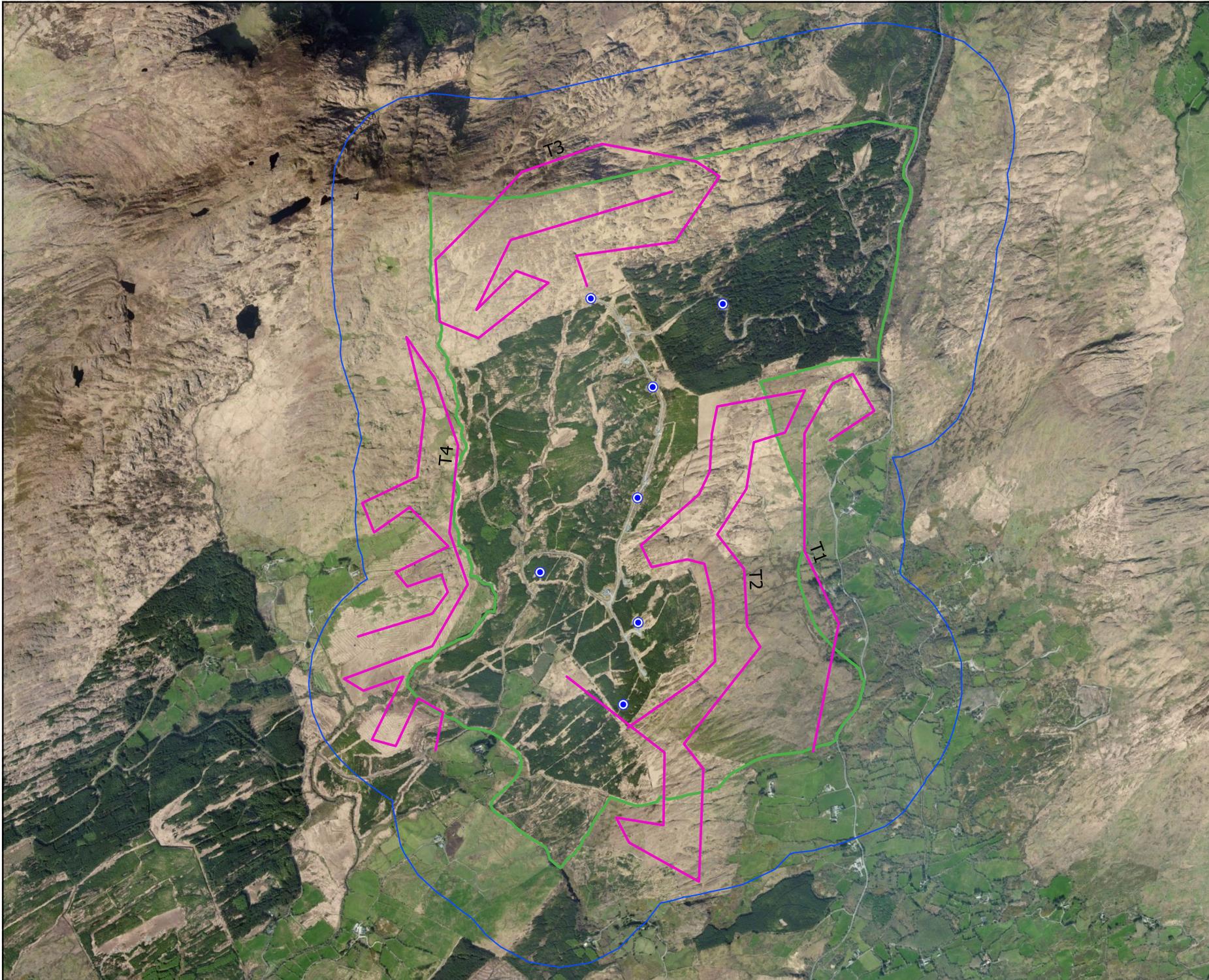
Map Legend

- Eiar Site Boundary
- Turbine Location
- 500m radius survey
- Woodcock Survey Transects



<p>Map Title</p> <p>Breeding Woodcock Survey Transects</p>	
<p>Project Title</p> <p>Curraglass Renewable Energy Development, Co. Cork</p>	
<p>Drawn By</p> <p>Margaux Pierrel</p>	<p>Checked By</p> <p>Padraig Cregg</p>
<p>Project No.</p> <p>190301</p>	<p>Map No.</p> <p>Fig 7-5</p>
<p>Scale</p> <p>1:25000</p>	<p>Date</p> <p>06.05.2020</p>
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Map Legend

- EIA Site Boundary
- Turbine Location
- 500m Survey Radius
- Red Grouse Survey Transects



Map Title	
Red Grouse Survey Area	
Project Title	
Curraglass Renewable Energy Development, Co. Cork	
Drawn By	Checked By
Margaux Pierrel	Padraig Cregg
Project No.	Map No.
190301	Fig 7-6
Scale	Date
1:25000	06.05.2020
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Map Legend

-  EIA Site Boundary
-  Turbine Location
-  2km Radius
-  HHVP Location



Map Title	
Hen Harrier Roost Survey VP Locations	
Project Title	
Curraglass Renewable Energy Development, Co. Cork	
Drawn By	Checked By
Margaux Pierrel	Padraig Cregg
Project No.	Map No.
190301	Fig 7-7
Scale	Date
1:40000	06.05.2020



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Map Legend

- EIAR Site Boundary
- Winter Transect Survey Area (500m)
- Waterfowl Survey Area (1km)



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Map Title
Winter Transect/Waterfowl Surveys

Project Title
Curraglass Renewable Energy Development, Co. Cork

Drawn By Margaux Pierrel	Checked By Padraig Cregg
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Project No. 190301	Map No. Fig 7-8
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Scale 1:30000	Date 06.05.2020
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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 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 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)

Magnitude	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

Significance		Sensitivity			
		Very High	High	Medium	Low
High	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)

Impact Type	Criteria
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)

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 Proposed Development site between April 2018 and March 2020. Results are derived from a continuous two years 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. They 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.

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

Using GIS software, an inspection for nature conservation designated sites within the potential ZOI of the Proposed Development was conducted. The ZOI was derived utilising a precautionary approach. Initially, the search consisted of sites within a 15-kilometer radius of the proposed works. Then designated sites located outside the 15km buffer zone were taken into account and assessed. In this case, no Special Protections Areas (SPA) were recorded within a 15-kilometer radius. No potential for direct or indirect impacts for species listed as Special Conservation Interest of SPAs more than 15km from the development site were identified. The Gearagh SPA (004109) is located 26 km from the development site and support conservation interest bird species such as wigeon, teal, mallard and coot. There will be no direct effects as the Proposed Development is located entirely outside and more than 26km from the designated site. Furthermore, given the distance from the Proposed Development there is no potential for disturbance related impacts to SCI species.

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 entire development site lies within hectads W06 and W16. Table 7-8 presents a list of species of conservation interest species recorded from the relevant hectads:

Table 7-8 Breeding Bird Atlas Data (Hectads W06 and W16)

Species Name	Breeding Atlas 68-72		Breeding Atlas 88-91		Breeding Atlas 07-11		Conservation Status
	W06	W16	W06	W16	W06	W16	
Hen Harrier (<i>Circus cyaneus</i>)	-	-	-	-	-	Poss	BD
Peregrine (<i>Falco peregrinus</i>)	-	-	Breed	-	Prob	Poss	BD
Corncrake (<i>Crex crex</i>)	-	Prob	-	-	-	-	BD
Chough (<i>Pyrrhonorax pyrrhonorax</i>)	Conf	-	Breed	Breed	Prob	-	BD
Tufted Duck (<i>Aythya fuligula</i>)	-	Conf	-	-	-	-	RL
Red Grouse (<i>Lagopus lagopus</i>)	-	Poss	Seen	-	-	-	RL
Lapwing (<i>Vanellus vanellus</i>)	-	Prob	-	-	-	-	RL

Species Name	Breeding Atlas 68-72		Breeding Atlas 88-91		Breeding Atlas 07-11		Conservation Status
	W06	W16	W06	W16	W06	W16	
Curlew (<i>Numenius arquata</i>)	Conf	Conf	-	-	-	-	RL
Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	-	Conf	-	Breed	-	Non-B	RL
Meadow Pipit (<i>Anthus pratensis</i>)	Conf	Conf	Breed	Breed	Conf	Conf	RL
Grey Wagtail (<i>Motacilla cinerea</i>)	Conf	Conf	Breed	Breed	Poss	Poss	RL
Yellowhammer (<i>Emberiza cintrinella</i>)	Prob	Conf	-	Breed	-	-	RL

Seen = recorded; Possible = possible breeding; Probable = probable breeding; Confirmed = confirmed breeding; - = not-recorded; Non-B = Non-Breeding Record

Table 7-9 shows those species recorded in the relevant hectads (W06 and W16) 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 7-9 Wintering Bird Atlas Data (Hectads W06 and W16)

Species Name	Wintering Atlas 81-84		Wintering Atlas 07-11		Conservation Status
	W06	W16	W06	W16	
Whooper Swan (<i>Cygnus cygnus</i>)	-	-	-	Pres	BD
White-Tailed Eagle (<i>Haliaeetus albicilla</i>)	-	-	Pres	-	BD, RL
Chough (<i>Pyrrhocorax pyrrhocorax</i>)	Pres	-	Pres	Pres	BD
Kingfisher (<i>Alcedo atthis</i>)	-	-	-	Pres	BD
Peregrine (<i>Falco peregrinus</i>)	Pres	-	-	-	BD
Wigeon (<i>Anas penelope</i>)	-	Pres	-	Pres	RL
Pochard (<i>Aythya ferina</i>)	Pres	Pres	-	-	RL
Tufted Duck (<i>Aythya fuligula</i>)	-	Pres	-	-	RL
Goldeneye (<i>Bucephala clangula</i>)	-	Pres	-	-	RL
Lapwing (<i>Vanellus vanellus</i>)	-	Pres	-	-	RL
Woodcock (<i>Scolopax rusticola</i>)	Pres	Pres	Pres	Pres	RL
Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	-	Pres	-	-	RL
Red Grouse (<i>Lagopus lagopus</i>)	Pres	-	-	-	RL
Curlew (<i>Numenius arquata</i>)	-	Pres	-	-	RL

BD = EU Birds Directive Annex I; RL = BoCCI Red List; Pres = present in hectad; - = not recorded

7.3.3 Bird Sensitivity Mapping Tool

A Bird Sensitivity Mapping Tool for wind energy development was created by BirdWatch Ireland which 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 majority of the development site is not located within a bird sensitivity zone (i.e. there is no data available). There is a very small fraction of the development site, in the northeast corner around Doughill Mountain, which is classified as an area of "Low" Bird Sensitivity to Wind Energy. This is approximately 500m to the east of the nearest proposed turbine.

Irish Wetland Bird Survey (I-WeBS) Records

The study area is not covered by an I-WeBS site and the nearest site is located approximately 11km southeast of the development site at Bantry Bay. Data from I-WeBS sites in County Cork 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:

Cork IWeBS Sites

- > Adrigole Harbour
- > Argideen River
- > Ballin Lough
- > Ballybranagan
- > Ballybutler (Butlerstown) Lake
- > Ballycotton Shanagarry
- > Ballycrenane/Warren
- > Baldehob Estuary
- > Ballyhea Gravel Pit
- > Ballyhonock Lough
- > Ballymacoda
- > Ballynacarriga Lake
- > Bandon Estuary
- > Bandon River
- > Bantry Bay
- > Barley Cove Bay
- > Bear Haven
- > Blackwater Valley
- > Blarney Fen - Clogheenmilcon
- > Blarney Lake
- > Carrigillihy Lake
- > Castlemartyr Lake
- > Castlenalact Lake
- > Charleville Lagoons
- > Classes Lakes/Gravel Pits
- > Clonakilty Bay
- > Cloonties Lake
- > Cork Harbour
- > Corran Lake
- > Courtmacsherry Bay, Broadstrand Bay & Dunworley
- > Crough Bay
- > Crookhaven
- > Curraghlicky Lake
- > Gallanes Lough, Clonakilty
- > Garrhesta Gravel Pit
- > Glandore Harbour/Union Hall
- > Illen Estuary
- > Inishcarra Reservoirs
- > Kilcolman Marsh
- > Kilkieran Lake
- > Lissagriffin Lake
- > Lough Aderry
- > Lough Atarriff
- > Lough Cluhir
- > Lough Gorm
- > Madame Lake (Batemans Lough)
- > Mahona Lough
- > Myross Island & Inlet (Blind Harbour)
- > Nohoval Lake
- > Ringabella Creek

- > Roaringwater Bay
- > Rosbrin Cove
- > Rosscarbery
- > Sherkin Island
- > Shreeland Lakes (incl. Lough Doo)
- > Stick Estuary (Oysterhaven)
- > The Lough Cork
- > Toormore Bay

7.3.5 NPWS Rare and Protected Species Dataset

An information request was sent to the NPWS on the 6th of August 2019 requesting records from the Rare and Protected Species Database. The sections below provide the records obtained from the NPWS (31st December 2019) regarding rare and protected bird species. The NPWS was contacted *via* email on the 13th of January 2020, prior to finalising this EIAR chapter. Their subsequent response was received on the 20th January 2020 and confirmed no new records were available since the response received on the 31st of December 2019.

Peregrine

The NPWS identified that there were two records of peregrine nest sites from the 2017 National Survey. One known breeding peregrine site is located between 1-3km from the development site boundary, which has been occupied since 2002. However, it was also revealed that this historic nest site was unoccupied/inactive during the 2017 national peregrine survey. The second breeding peregrine site is located 5-7km from the development site boundary, it has been occupied since 2002 but was not surveyed in 2017.

Red Grouse

The NPWS identified that there was only one record of breeding red grouse between 1-3km of the development site boundary while there were three records within 3-5km of the site during the 2002-2004 Upland Bird Survey.

7.3.6 Kealkil Wind Farm EIS 2000

The development site comprises an area that previously supported a wind farm granted to South Western Services Co-Op Ltd under Pl.Ref.00/6590. The previous wind farm comprised 10 no. turbines and associated infrastructure.

As per the previous Environmental Impact Assessment (EIA, 2000), only four bird species (kestrel, meadow pipit, [hooded] crow, rook) were observed overflying the development site. No species of conservation interest were further observed in the vicinity of the development site. The predicted impact of the windfarm development was deemed negligible, especially in comparison to the then-recent land-use change with extensive conifer plantation.

Field Survey Results

A comprehensive list of all bird species recorded during surveys is provided in Table 2 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 and Amber-listed species and raptors.

- Golden Plover (Annex I species; Red-listed with regard to Breeding & Wintering populations)
- Hen Harrier (Annex I species)
- Short-eared Owl (Annex I species)
- Chough (Annex I species)
- Peregrine (Annex I species)
- White-tailed Eagle (Annex I species)
- Barn Owl (Red-listed with regard to Breeding populations)
- Red Grouse (Red-listed with regard to Breeding populations)
- Herring Gull (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)
- Kestrel (Raptor, Schedule IV of the Wildlife Act; 1976)
- Common Snipe (Amber-listed with regard to Breeding & Wintering populations)
- Red-listed passerine species with regard to Breeding populations (Meadow Pipit & Grey Wagtail)

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 monthly distribution of target species during Winter Transect Surveys.
- Summary of monthly distribution of Waterfowl Survey results.

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 only recorded on four occasions during Vantage Point Surveys on only two survey days (see Appendix 7-4, Figure 7-1-1). Each of the four observations occurred during the 2018/2019 winter season at VP1a. Three observations occurred on the 9th of December 2018, on this occasion flocks of approximately 15 birds were seen in flight throughout the day. The remaining observation occurred on the 28th of January 2019 when a flock of 15 birds was observed in flight. Three of these four observations were within, or partially within the Proposed Development area. The last observation was recorded approximately 50m from the Proposed Development area. Only one flight occurred within Potential Collision Height (PCH) of the turbine swept area.

Incidental Observations

There were two incidental observation of golden plover between April 2018 and March 2020 (see Appendix 7-4, Figure 7-9-1). On the 9th of December 2018, two golden plover were observed flying towards the lakes to the west of the site during a Hen Harrier Roost Survey. On the 24th March 2020, three individuals were recorded on an upland section of heath/acid grassland/exposed rock within the Proposed Development area during a Red Grouse 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.

Breeding Bird Surveys

There was only one observation of Hen harrier during Breeding Bird Surveys (see Appendix 7-4, Figure 7-3-1). On the 19th of April 2019, an adult male was recorded foraging in an area of upland blanked bog in a low flight, approximately 300m northwest from the turbine layout.

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

7.4.3 Short-eared Owl

Raw Survey data for short-eared owl is provided in Appendix 7-4. Results summary tables are present in Appendix 7-3.

Incidental Observations

There was one incidental observation of short-eared owl between April 2018 and March 2020 (see Appendix 7-4, Figure 7-9-2). On the 21st of November 2018, an adult bird was observed in a brief flight over an area of bog at dusk during a Hen Harrier Roost Survey. The bird was recorded within the Proposed Development area, approximately 500m north of the turbine layout.

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

7.4.4 Chough

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

Vantage Point Surveys

Chough were only recorded once during Vantage Point Surveys (see Appendix 7-4, Figure 7-1-2). On the 11th of June 2019, two chough was recorded travelling over the development site during a survey at VP3. The birds were recorded below the Potential Collision Height (PCH).

Breeding Bird Surveys

There was a single observation of this species during Breeding Bird Survey in 2018 (see Appendix 7-4). On the 25th of April 2018, a chough was heard calling, but not seen, while in flight over an area of

improved agricultural grassland and conifer plantation approximately 900m north of the Proposed Development area.

Incidental Observations

There were two incidental observations of chough between April 2018 and March 2020 (see Appendix 7-4, Figure 7-10-3). Two observations occurred during Breeding Raptor Surveys in 2018. On the 16th of May 2018, a single chough was heard calling and feeding in agricultural fields, approximately 50m from the Proposed Development area. On the 27th of June 2018, a single chough was heard calling once from an area close to the VP location, approximately 2.5km from the development site, but was not seen.

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

7.4.5 Peregrine

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

Vantage Point Surveys

Peregrine was only recorded once during Vantage Point Surveys (see Appendix 7-4, Figure 7-1-3). On the 16th of December 2019, an individual male was recorded travelling and soaring partially over the Proposed Development area during a survey at VP3. The flight was recorded within Potential Collision Height (PCH).

Breeding Raptor Surveys

Peregrine was only recorded on one date during Breeding Raptor Surveys (see Appendix 7-4, Figure 7-4-1). On the 16th of May 2018, an individual bird was recorded soaring on two occasions. One flight occurred over the Proposed Development area while the other flight was recorded approximately 100m south-west of the Proposed Development area.

Winter Transect Surveys

Peregrine was only recorded once during Winter Transect Surveys (see Appendix 7-4, Figure 7-8-1). On the 9th of December 2019, an individual male was recorded travelling over an area of upland blanket bog and conifer plantation approximately 1.8km from the Proposed Development area.

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

7.4.6 White-tailed Eagle

Raw Survey data for white-tailed eagle is provided in Appendix 7-4. Results summary tables are present in Appendix 7-3.

Vantage Point Surveys

White-tailed eagle were only recorded twice during Vantage Point Surveys (see Appendix 7-4, Figure 7-1-4). On the 8th of May 2018, an individual male was recorded travelling and soaring at PCH partially within the Proposed Development area during a survey at VP1. On the 11th of February 2019, an individual was recorded soaring high over the slope of the mountain, just off site near the same area, at PCH.

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

7.4.7 Barn Owl

Raw Survey data for barn owl is provided in Appendix 7-4. Results summary tables are present in Appendix 7-3.

Incidental Observations

There was one incidental observation of barn owl between April 2018 and March 2020 (see Appendix 7-4, Figure 7-9-4). On the 24th of September 2018, an individual barn owl was recorded perched on a fence post, approximately 2km from the Proposed Development area, while the surveyor was en route to a vantage point survey at VP02a.

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 were recorded in flight on six occasions during Vantage Point Surveys between April 2018 and March 2020 (see Appendix 7-4, Figure 7-1-5). Five observations occurred within the Proposed Development area, the last one occurred approximately 100m from the Proposed Development area. All observations were of birds recorded in heath and blanket bog. Four observations occurred during a survey at VP1 on the 9th of December 2018. One to two birds were recorded in flight on each occasion. On the 28th of January 2019, a pair was also recorded in flight during a survey at VP1. The remaining observation occurred on the 19th of August 2019 when an individual was heard calling from heather before flying over conifer plantation out of sight. All flight activity was less than 10m above ground level (i.e. below PCH).

Breeding Bird Surveys

Red grouse was only observed once during Breeding Bird Surveys (see Appendix 7-4, Figure 7-3-2). On the 19th of April 2019, an adult male was heard calling from an area of bog, within the Proposed Development area, approximately 300m south-east of the nearest turbine.

Red Grouse Surveys

Dedicated Red Grouse Surveys were undertaken on the 20th and 21st of March 2019 and on the 23rd and 24th March 2020. No individuals were seen or heard in response to the tape lure surveys in March 2019 nor in March 2020.

Winter Transect Surveys

Red grouse were recorded on two survey dates during Winter Transect Surveys (see Appendix 7-4, Figure 7-8-2). On the 10th of December 2018, there were two observations of individual birds. An individual was heard calling and was later observed in flight during the same survey, approximately 100m from the Proposed Development area. On the 21st of January 2019, a pair of red grouse was flushed from an area of bog, approximately 150m from the Proposed Development area.

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

7.4.9

Herring Gull

Raw Survey data for herring gull is provided in Appendix 7-4. Results summary tables are present in Appendix 7-3.

Vantage Point Surveys

Herring gull were recorded in flight on thirteen occasions during Vantage Point Surveys between April 2018 and March 2020 (see Appendix 7-4, Figure 7-1-6). All thirteen observations occurred during the 2019 breeding season across four different survey dates as birds were recorded travelling over the Proposed Development area. All observations are from birds travelling from south/south-west to north, with birds following sections of the Lackavane River or Owvane River. Observations ranged from an individual bird to a flock of 16. Nine of the thirteen observations occurred between the 11th and the 12th of June. Nine flights occurred within Potential Collision Height (PCH).

Breeding Bird Surveys

Herring gull were observed on four occasions during Breeding Bird Surveys (see Appendix 7-4, Figure 7-3-3). All observations occurred during the 2019 breeding seasons. All observations are from birds travelling from south/south-west to north/north-east, most of them following Lackavane River or Owvane River. Observations ranged from a pair of birds to a flock of twelve birds recorded travelling over the site and/or within a 500m Proposed Development area on the 13th of May 2019.

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 recorded in flight on five occasions during Vantage Point Surveys between April 2018 and March 2020 (see Appendix 7-4, Figure 7-1-7). All observations were of individual birds, in flight over the Proposed Development area, in areas of blanket bog and conifer plantation. Only one observation occurred during the core breeding season. On the 6th of April 2019 an individual was recorded soaring over the site. Four of the five observations occurred within PCH.

Breeding Raptor Surveys

Buzzard were recorded on three occasions during Breeding Raptor Surveys (see Appendix 7-4, Figure 7-4-2). All three observations occurred during the 2019 breeding season. On the 28th of May 2019, a pair was observed soaring and hunting over blanket bog and conifer plantation within the Proposed Development. On the 2nd of July 2019, an individual was recorded soaring over an area of improved grassland and conifer plantation, approximately 900m from the Proposed Development area. On the 26th of July 2019, three buzzard - an adult pair and juvenile bird - were recorded soaring over an area of improved grassland and conifer plantation, more than 1.5km from the Proposed Development area.

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 in flight on twenty-three occasions during Vantage Point Surveys between April 2018 and March 2020 (see Appendix 7-4, Figure 7-1-8). All observations consisted of individual birds recorded hunting or travelling. The only exception being one observation in which a pair was observed soaring. Eight observations occurred during the 2018 breeding season between April and July, while there were four observations during the 2018/19 winter season between November 2018 and March 2019. There were three observations of sparrowhawk during the 2019 breeding season, between April and August, while there were eight observations of sparrowhawk during the 2019/2020 winter season between October 2019 and March 2020. Seventeen of these twenty-three observations occurred within, or partially within, the Proposed Development area. Only five of these observations occurred within, or partially within, PCH.

Breeding Raptor Surveys

Sparrowhawk were only recorded twice during Breeding Raptor Surveys (see Appendix 7-4, Figure 7-4-3). Both observations were during the 2018 breeding season. On the 26th of April 2018, an individual was recorded soaring over an area of conifer plantation and improved grassland, approximately 700m from the Proposed Development area. On the 27th of June 2018, a pair (male and female) was recorded circling and displaying over an area of broadleaved woodland, approximately 20m from the Proposed Development area.

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

7.4.12

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 recorded in flight on forty-eight occasions during Vantage Point Surveys between April 2018 and March 2020 (see Appendix 7-4, Figure 7-1-9). All observations consisted of individual birds seen in hunting or travelling flights. Ten observations occurred during the 2018 breeding season between April and August, while there were sixteen observations during the 2018/19 non-breeding season between September 2018 and March 2019. There were eight observations of kestrel during the 2019 breeding season, between April and July, while there were fourteen observations of kestrel during the 2019/2020 winter season between October 2019 and March 2020. A total of forty-four observations occurred within the Proposed Development area. Only six flights occurred within, or partially within PCH.

Breeding Bird Surveys

Kestrel were observed on four occasions during Breeding Bird Surveys (see Appendix 7-4, Figure 7-3-4). All four observations occurred during the 2019 breeding season. Three observations consisted of individual birds recorded foraging over the Proposed Development area between May and June. The remaining observation consisted of five birds observed hunting and soaring together, two adults and three juveniles, on the 4th of July 2019. This observation confirms that kestrel were breeding locally within the vicinity of the development site during 2019.

Breeding Raptor Surveys

Kestrel were recorded on thirteen occasions during Breeding Raptor Surveys (see Appendix 7-4, Figure 7-4-4). All thirteen observations consisted of individual birds observed hunting. Seven observations occurred during the 2018 breeding season, while the remaining six observations occurred during the 2019 breeding season. A total of five observations were recorded within the Proposed Development area. No evidence of breeding activity was recorded during hinterland breeding raptor surveys.

Winter Transect Surveys

Kestrel were only recorded on five occasions during Winter Transect Surveys (see Appendix 7-4, Figure 7-8-3). On the 10th of December 2018, an adult male was observed hunting over an area of upland blanket bog. On the 21st of January 2019, another bird was observed hunting over an area of bog, within the Proposed Development area. On the 16th of January 2020, a female kestrel was observed hunting or travelling over improved agricultural grassland on two occasions, approximately 20m south of the Proposed Development area. On the 27th of March 2020, a male kestrel was observed hunting over young plantation, approximately 400m south of the Proposed Development area.

Incidental Observations

There were seven incidental observations of kestrel between April 2018 and March 2020. Four observations occurred during Hen Harrier Roost Surveys from the 2018/19 winter season. On these occasions, individuals were recorded hunting. Two observations occurred during Hen Harrier Roost Surveys from the 2019/2020 winter season these observations also involved hunting birds. The last observation was of an individual observed hunting in March 2020 during a Red Grouse Survey. Six of these seven observations occurred within the Proposed Development area.

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

7.4.13 Common Snipe

Raw Survey data for 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 five occasions during Vantage Point Surveys between April 2018 and March 2020 (see Appendix 7-4, Figure 7-1-10). Only one of these observations occurred during the core breeding season. On the 1st of June 2018, an individual was recorded in a displaying flight over the Proposed Development area. The remaining four observations occurred during the 2018/19 winter season. On these occasions, birds were recorded in flight, including three observations over the Proposed Development area. Only one of these five total observations were recorded at Potential Collision Height (PCH).

Wildfowl Distribution Surveys

Snipe were observed on one occasion during Wildfowl Distribution Surveys (see Appendix 7-4, Figure 7-8-4). A pair of snipe was recorded in flight over an area of cutover bog on the 17th of December 2018, north of the development site.

Winter Transect Surveys

Snipe were recorded on eight occasions during Winter Transect Surveys (see Appendix 7-4, Figure 7-8-4). All observations occurred during the 2018/19 winter season as birds were observed between October 2018 and March 2019. Observations ranged from individuals to a flock of three birds. Three of these observations were recorded within the development site. The other five observations were recorded approximately 100m to the west of the Proposed Development site.

Incidental Observations

There were fourteen incidental observations of snipe during surveys between April 2018 and March 2020 (see Appendix 7-4, Figure 7-9-6.). Eleven observations were recorded within the Proposed Development.

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

7.4.14 **Passerines (Red-listed)**

The BoCCI Red-listed species meadow pipit and grey wagtail were recorded during the surveys undertaken.

7.5 Evaluation

A determination of 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. Where relevant, estimates for mean county populations has been derived following a review of I-WeBS sites in County Cork or other relevant published information.

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).

Golden plover are a widespread and abundance species in Ireland during the winter, however this species was only recorded on three occasions within the development site. Due to the infrequency and low numbers per observations, the site was not found to be of significance to wintering populations.

Breeding

This species was not observed during the breeding season. No evidence of breeding was recorded. The species is not dependent on the development site for breeding.

7.5.2 Hen Harrier

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.

This species was recorded only once throughout two years of surveys. The observation occurred in April 2019 when a male hen harrier was observed hunting over an area of upland blanket bog. No indication of territorial and/or breeding behaviour was observed either on site or within 2km of the development boundary. This species was not observed during the winter season. No evidence of roosting was recorded.

The species is not dependent on the development site with respect to breeding or wintering populations.

7.5.3 Short-eared Owl

Short-eared Owl is a scarce winter visitor throughout Ireland and a rare breeding species. There was only one incidental observation of short-eared owl during the 2018 winter season. This observation was of an adult briefly flying over upland blanket bog within the Proposed Development area, approximately 500m north of the turbine layout. No evidence of breeding or roosting activity was recorded within the development site.

The species is not dependent on the development site with respect to breeding or wintering populations.

7.5.4 Chough

Chough is predominantly a coastal species nesting in caves or crevices along coasts, or less frequently, in old buildings. As per the latest NPWS Article 12 reporting document, the national breeding population is estimated at 839 pairs of chough breeding throughout Ireland and a total of 756 individual non-breeding birds. During the 2002/2003 national chough census, 765 chough were recorded in County Cork, and a further 767 in County Kerry (Gray et al., 2003).

A pair of chough was observed on one occasion while travelling over improved agricultural grassland during the core breeding season (June 2019). There were three additional recordings of individual birds during the breeding season in April, May and June 2018, of which two recordings were of birds heard but not seen. No evidence of breeding was recorded within the development site.

The birds recorded during surveys require further consideration, given this species has a restricted range in Ireland. The population recorded was assigned **Local Importance (Higher Value)**.

7.5.5 Peregrine

The estimated national breeding population of peregrine in Ireland is 425 breeding pairs as per the National Breeding Peregrine Survey 2017 (IRSG 2018, Unpublished Report). Peregrine were reported on only four occasions during surveys between April 2018 and March 2020. Only two of these observations occurred during the core breeding season for this species (April-August). There was no evidence of breeding activity either on site or within 2km of Proposed Development area.

On a precautionary basis, birds recorded during the extensive surveys undertaken are likely to be associated with a population of **Local Importance (Higher Value)** from the wider area.

7.5.6 White-tailed Eagle

White-tailed Eagle have been reintroduced to Ireland between 2007 and 2011 in Killarney Co. Kerry. There are an estimated 12 active territories of white-tailed eagle in the country, as well as several unpaired individuals. This species was recorded only twice between April 2018 and March 2020, of which only once during the two breeding seasons (May 2018). This observation is likely to be associated with a bird travelling through the area, given how infrequently this species was observed. The species is not dependent on the development site with respect to breeding or wintering populations.

However, given this species has experienced significant historical population declines in Ireland, on a highly precautionary basis, these two observations have been given further consideration.

7.5.7 Barn Owl

Barn Owl is BoCCI Red-Listed during the breeding season in Ireland. This species is a scarce resident, with a declining population, mainly concentrated in the Midlands and Southwest of Ireland. As per the latest NPWS Article 12 reporting document, the national breeding population is estimated at 400-500 pairs.

Barn owl were recorded only on one occasion, with an individual perched on a fence post, 2km from the development site, in September 2018. No evidence of foraging, breeding or roosting activity was recorded within the Proposed Development area. Furthermore, the Proposed Development area does not contain habitat suitable to support a barn owl population (i.e. upland blanket bog and conifer plantation).

The development site was not found to be of significance to the species.

7.5.8 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. Therefore 1% of the ROI National breeding population is 19 breeding pairs. As per NRA 2009, a regularly occurring breeding population of 19 red grouse pairs is required for classification as Nationally Important. The red grouse 2006-2008 (national) survey estimated the regional population for the southwest to be 132 individuals (Cummins *et al.* 2010).

The population recorded at Curraglass does not correspond to national importance and falls well below the threshold of 19 breeding pairs with only ten total observations, of which only two were recorded during breeding season within 500m of the Proposed Development area.

On a precautionary basis, birds recorded during the extensive surveys undertaken are assumed to be associated with a regionally important population from the wider area (i.e. 1% of the southwest population). The red grouse recorded during surveys are therefore considered to be associated with a population of **County Importance** from the wider surroundings.

7.5.9 Herring Gull

Herring gull is Red-listed during the breeding season only in Ireland (BoCCI).

Herring gull were recorded on seventeen occasions during surveys between April 2018 and March 2020. All these observations occurred during the breeding season 2019. On these occasions, individuals to a maximum flock of sixteen birds were recorded travelling over the Proposed Development area. This species was not observed to utilise the Proposed Development area or surrounding areas for foraging or breeding. Observations of this species were restricted to travelling birds, with birds following rivers from a south/south-west to a north/north-east direction.

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

7.5.10 Buzzard

Buzzard is not listed on Annex I of the Birds Directive. The species is Green-listed in Ireland (BoCCI). The population recorded across the seasons was assigned **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

7.5.11 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.

7.5.12 Kestrel

Kestrel 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.

7.5.13 Common Snipe

Snipe are Amber-listed in Ireland during both the breeding and winter seasons (BoCCI). The population recorded within the development site was assigned **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

7.5.14 Passerines (Red Listed)

Meadow pipit and grey wagtail are Red-listed in Ireland during the breeding season. Both populations recorded were deemed to be of no greater than **Local Importance (Lower Value)**.

7.6

Identification of Key Ornithological Receptors

Table 7-10 Avifaunal Receptor Evaluation and Selection Criteria Rational

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.	<u>Wintering</u> No population of ecological significance recorded	This species was rarely recorded within the development site layout. The species was only recorded onsite on a single occasion and in addition was recorded flying above the site on four occasions in two years of surveying. 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 7.5.1 for further details.	No
Hen Harrier	Annex I, EU Birds Directive; BoCCI Amber List & 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 two-year survey period. No foraging 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 7.5.2 for further details.	No
Short-eared Owl	Annex I, EU Birds Directive; BoCCI Amber List & Irish Wildlife Act.	<u>Wintering</u> No population of ecological significance recorded	This species was only recorded on one occasion during the extensive suite of surveys undertaken within the two-year survey period. No foraging 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 7.5.3 for further details.	No

Species	Conservation Status	NRA Evaluation (NRA, 2009)	Rational for inclusion/exclusion as KOR	KOR Yes/No
Chough	Annex I, EU Birds Directive; BoCCI Amber List & Irish Wildlife Act.	<u>Breeding</u> Local Importance (Higher Value)	<p>This species was rarely recorded on site during the breeding season. No breeding evidence was recorded. 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>No flights were recorded at PCH during VP surveys. Collision risk modelling cannot therefore be carried out, with the available data.</p>	Yes
Peregrine	Annex I, EU Birds Directive; BoCCI Green List & Irish Wildlife Act.	<u>All Seasons</u> Local Importance (Higher Value)	<p>This species was infrequently recorded in flight and foraging within the Proposed Development area. There was no evidence of breeding or roosting within the development site. 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 within the potential collision risk zone. A collision risk assessment is required.</p>	Yes
White-tailed Eagle	Annex I, EU Birds Directive; BoCCI Red List & Irish Wildlife Act.	<u>All Seasons</u> National Importance	<p>This species was rarely recorded within the vicinity of the Proposed Development area. There was no evidence of breeding or roosting within the development site. The potential for habitat loss, while minimal, cannot be excluded. An assessment of direct habitat loss is required.</p> <p>The species was recorded along the margins the site boundary. An assessment of displacement effect is required.</p> <p>This species was recorded flying 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
Barn Owl	BoCCI Red List (Breeding Populations) & Irish Wildlife Act.	<u>Breeding</u> Local Importance (Higher Value)	This species was not recorded on site during the two-year extensive surveys undertaken. It was recorded off site on a single occasion, approximately 2km away from the development site. No evidence of breeding or foraging activity was recorded within the development site. The habitats present onsite are considered suboptimal for this species. No pathways for significant effects were identified. Please refer to Section 7.5.7 for further details.	No
Red Grouse	BoCCI Red Listed (Breeding Populations) & Irish Wildlife Act.	<u>All Seasons</u> County Importance	This species was occasionally recorded within the Proposed Development area. The potential for habitat loss cannot be excluded. An assessment of direct habitat loss is required. Birds were recorded within the Proposed Development area. The potential for displacement exists. No flights were recorded at PCH during VP surveys. Collision risk modelling cannot therefore be carried out, with the available data.	Yes
Herring Gull	BoCCI Red Listed (Breeding Populations) & Irish Wildlife Act.	<u>Breeding</u> Local Importance (Higher Value)	This species was occasionally recorded within the Proposed Development area. The potential for habitat loss cannot be excluded. An assessment of direct habitat loss is required. Birds were recorded within the Proposed Development area. Taking a precautionary approach, the potential for displacement exists. This species was recorded flying over the development site within the potential collision risk zone. A collision risk assessment is required.	Yes
Buzzard	Irish Wildlife Act.	<u>All Seasons</u>	The potential for habitat loss, while minimal, cannot be excluded. An assessment of direct habitat loss is required.	Yes

Species	Conservation Status	NRA Evaluation (NRA, 2009)	Rational for inclusion/exclusion as KOR	KOR Yes/No
		Local Importance (Higher Value)	<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>	
Sparrowhawk	BoCCI Amber List & Irish Wildlife Act.	<p><u>All Seasons</u></p> <p>Local Importance (Higher Value)</p>	<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 Amber List & Irish Wildlife Act.	<p><u>All Seasons</u></p> <p>Local Importance (Higher Value)</p>	<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
Common Snipe	BoCCI Amber List & Irish Wildlife Act.	<p><u>All Seasons</u></p> <p>Local Importance (Higher Value)</p>	<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.	
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 7-5 (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:

- Chough (Annex I; EU Birds Directive)

Medium Sensitivity KORs include:

- Peregrine (Annex I; EU Birds Directive)
- White-tailed Eagle (Annex I; EU Birds Directive)
- Red Grouse (BoCCI; Red-Listed)
- Herring Gull (BoCCI; Red-Listed)

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

- Buzzard
- Sparrowhawk
- Kestrel
- Common Snipe

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:

1. *Up to 7 no. wind turbines with an overall blade tip height of up to 178.5 metres and all associated foundations and hard-standing areas;*
2. *2 No. borrow pits;*
3. *1 No. permanent meteorological mast with a maximum height of up to 112 metres;*
4. *Upgrade of existing and provision of new site access roads;*
5. *Upgrade to existing access junction;*
6. *A 38kV electricity substation, including 4 no. battery storage containers, 1 no. control building with welfare facilities, associated electrical plant and equipment, security fencing, wastewater holding tank,*
7. *Forestry Felling;*
8. *A temporary construction compound;*
9. *Site Drainage;*
10. *All associated internal underground cabling, including underground grid connection cabling to the existing overhead line; and*
11. *All associated site development and ancillary works.*

7.8.1 Do-Nothing Effect

The land that forms the study area is dominated by conifer plantation, with areas in the surrounding landscape of upland blanket bog, dry siliceous heath, wet and improved agricultural grasslands. If the Proposed Development were not to proceed, no changes would be made to the current land-use practice of forestry and the site would continue to be managed under the existing commercial forestry arrangements.

If the Proposed Development for which this EIAR has been prepared does not go ahead, it is assumed that the character of the landscape and its uses will remain much as they are today. The avian communities on the site would likely remain similar to its current state as activity levels and land use would not change significantly.

7.8.2 Effects on Key Ornithological Receptors during Construction and Operation

7.8.2.1 Chough (*Breeding*)

Table 7-11 Impact Characterisation for Chough 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 traveling through the Proposed Development area during the breeding season (i.e. on four occasions). This species was not recorded utilising habitat within the site boundary for roosting or breeding. Significant effects are not anticipated particularly given the low levels of activity recorded. The unfavourable nature of onsite habitats (e.g. predominantly forestry) limits the potential for construction activities to result in significant habitat loss for chough. Chough foraging is restricted to open habitats with low, tightly cropped vegetation.</p> <p>Significant effects are not anticipated at any geographical scale.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of <i>High</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 recorded on four occasions within the Proposed Development area however no breeding sites were recorded within the study area.</p> <p>The Proposed Development area is dominated by conifer plantation, this habitat type is not favoured by chough. The potential loss of breeding and foraging habitat will therefore be minimal.</p> <p>Significant effects are not anticipated at any geographical scale.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of <i>High</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 anticipated	No Effect	No Effect
Displacement	<p>Significant effects are not anticipated particularly given the low levels of activity recorded and the unsuitability of the majority of the habitats present within the Proposed Development area for the species. The lack of suitable enough habitat within the Proposed Development area limits the potential for ecologically significant effect to result.</p> <p>Significant displacement effects are not anticipated.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of <i>High</i> sensitivity species and <i>Low</i> Impact corresponds to a Low effect significance.</p>	Long-term Slight Negative Effect
Collision	<p>None of the flights recorded during VP surveys were at potential collision height. Collision risk is not likely to significantly impact this species.</p> <p>Significant effects are not anticipated at any geographical scale.</p>	No Effect	No Effect

7.8.2.2 Peregrine (All Seasons)

Table 7-12 Impact Characterisation for Peregrine 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 along the margins of the Proposed Development area on two occasions. Significant effects are not anticipated 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 anticipated at any geographical 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 Slight Negative Effect

<p>Displacement</p>	<p>No breeding or roosting territories were recorded within the study area.</p> <p>There were two observations of this species onsite/ within 500m of the Proposed Development area throughout the entire survey period: April 2018 to March 2020. Significant displacement effects are not anticipated, given how infrequently this species was encountered and owing to the abundance of similar suitable foraging habitat in the wider surroundings of the Proposed Development.</p> <p>Significant effects are not anticipated at any geographical 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>	<p>Short-term Slight Negative Effect</p>
<p>Operational Phase</p>			
<p>Direct Habitat Loss</p>	<p>Direct or indirect effects are not anticipated.</p>	<p>No Effect</p>	<p>No Effect</p>
<p>Displacement</p>	<p>As previously discussed, the species was only recorded twice onsite or within 500m of the Proposed Development area. 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.</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>Medium</i> sensitivity species and <i>Low</i> Impact corresponds to a Low effect significance.</p>	<p>Long-term Slight Negative Effect</p>
<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 0.01 collisions per year or one bird every 100 years. Annual mortality of adult peregrine has been calculated at 20% per annum (Craig, 2004). If 0.01 collisions were to occur per year, it would mean that the losses at the proposed wind farm would increase the annual mortality of the National population (i.e. c.850 birds) by 0.006%. The predicted collision risk is therefore negligible in the context of the National peregrine population.</p>	<p>The magnitude of the effect is assessed as <i>negligible</i>.</p> <p>The cross tabulation of a <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	<p>Long-term Imperceptible Negative Effect</p>

	Significant effects are not anticipated at any geographical scale.		
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7.8.2.3 White-tailed Eagle (All Seasons)

Table 7-13 Impact Characterisation for White-tailed Eagle 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	The Proposed Development is located within a commercial forestry plantation which does not provide optimal habitat for this species. This therefore limits the potential for ecologically significant effects to result. This species was recorded flying/soaring within of the Proposed Development area on only two occasions. Significant effects are not anticipated at any geographical scale.	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 Slight Negative Effect
Displacement	No breeding or roosting territories were recorded within the study area. As previously discussed, this species was only recorded on two occasions in two years of surveying the Proposed Development area. It can reasonably be concluded that this species is not dependent on habitats within the study area given how infrequently they were visited. Significant displacement effects are not anticipated.	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.	Short-term Slight Negative Effect
Operational Phase			
Direct Habitat Loss	Direct or indirect effects are not anticipated.	No Effect	No Effect
Displacement	The Proposed Development is located within a commercial forestry plantation which does not provide optimal habitat for this species. As previously discussed,	The magnitude of the effect is assessed as <i>negligible</i> .	Long-term Slight Negative Effect

	<p>it can reasonably be concluded that this species is not dependent on habitats within the study area given how infrequently they were visited.</p> <p>Significant displacement effects are not anticipated.</p>	<p>The cross tabulation of <i>Medium</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	
<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>No flight activity was recorded within the commercial forestry where the majority of the proposed turbines are sited. Both recorded white-tailed eagle flights were associated with the slopes of an adjacent mountain several hundred meters from the proposed turbine layout. Therefore, the assessment provided below is likely an overestimate of collision risk for this species.</p> <p>However, on a precautionary basis a collision risk analysis has been undertaken for this species.</p> <p>The collision risk has been calculated at a ratio of 0.06 collisions per year or one bird every 16.7 years. One potential collision in the lifetime of the wind farm is not likely to significantly impact this species at the population level.</p> <p>Significant effects are not anticipated at any geographical 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>	<p>Long-term Slight Negative Effect</p>

7.8.2.4 Red Grouse (All Seasons)

Table 7-14 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			
Direct Habitat Loss	<p>This species was occasionally recorded within the Proposed Development area. However, the Proposed Development area is dominated by conifer forestry and does not provide significant areas of suitable habitat for red grouse. Therefore, the actual loss of the red grouse habitat to the development footprint will be minimal.</p> <p>Significant effects are not anticipated at any geographical 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
Displacement	<p>The dominant habitat within the Proposed Development area is coniferous plantation. This limits the potential for any potential displacement impact to be significant, given this habitat type is of no ecological value to red grouse.</p> <p>As per McGuinness et al (2015) a zone of sensitivity of 500m applies for breeding red grouse territories. There is potential for temporary displacement of grouse during construction around the margins of the site, however, the magnitude of this impacts will be limited as the majority of observations occurred in excess of 500m to the north/north-west of the Proposed Development site during the winter months. Furthermore, studies of red grouse have found that population densities recover within one year after disturbance caused by construction of wind farms (Pearce-Higgins et al. 2012).</p> <p>Significant effects are not anticipated at any geographical 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>	Short-term Slight Negative Effect
Operational Phase			
Direct Habitat Loss	Direct or indirect effects are not anticipated.	No Effect	No Effect

<p>Displacement</p>	<p>Red grouse are not considered to show significant levels of displacement due to the presence of operating turbines in the landscape (Douglas et.al 2011).</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 anticipated at any geographical 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>	<p>Long-term Slight Negative Effect</p>
<p>Collision</p>	<p>None of the flights recorded during VP surveys were at potential collision height. Collision risk is not likely to significantly impact this species.</p> <p>Significant effects are not anticipated at any geographical scale.</p>	<p>No Effect</p>	<p>No Effect</p>

7.8.2.5 **Herring Gull (Breeding)**

Table 7-15 Impact Characterisation for Herring Gull 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>This species was occasionally recorded flying over the development site in the 2019 breeding season, from a south/south-west to a north/north-east direction. This species was not recorded utilising habitat within the development boundary for roosting or breeding. The development site is dominated by conifer forestry and does not provide significant areas of suitable habitat for this species, therefore, significant effects are not anticipated at any geographical 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>	<p>Long-term Slight Negative Effect</p>
<p>Displacement</p>	<p>Observations of this species within the Proposed Development area were limited to flyovers of the site. This species was not found to utilise the onsite areas or adjacent land for foraging, breeding or roosting.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p>	<p>Short-term Slight Negative Effect</p>

	Significant displacement impacts are not predicted.	The cross tabulation of <i>Medium</i> sensitivity species and <i>Low</i> Impact corresponds to a Low effect significance.	
Operational Phase			
Direct Habitat Loss	Direct or indirect effects are not anticipated.	No Effect	No Effect
Displacement	<p>Seventeen observations of the species occurred during the 2019 breeding season, with a maximum flock number of 16 birds. As previously discussed, when recorded within the Proposed Development area, this species was only recorded commuting over the site. Furthermore, the majority of commuting flights were recorded to follow the Lackavane River or Owvane River away from the proposed turbine layout.</p> <p>Significant displacement or barrier effect is therefore 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
Collision	<p>The species was occasionally recorded flying in a south-north direction within the potential collision risk zone during VP surveys. A “Regular” 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 0.018 collisions per year, or one bird every 55.5 years. Therefore, it is highly unlikely that there will be any collisions of herring gull throughout the 30-year operational period of the windfarm. The predicted collision risk is therefore negligible.</p> <p>Significant effects are not anticipated at any geographical 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 Slight Negative Effect

7.8.2.6 Buzzard (All Seasons)

Table 7-16 Impact Characterisation for Buzzard 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 within the development site during the breeding and winter seasons. No evidence of breeding activity was recorded within the development site or 2km of the same. Significant areas of suitable nesting and foraging habitat will continue to exist within the development site.</p> <p>Substantial areas of undisturbed suitable nesting and foraging habitat will remain beyond the development footprint.</p> <p>Significant effects are not anticipated at any geographical scale.</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
Displacement	<p>Construction in forestry areas could potentially cause displacement of breeding buzzard. There was no evidence of breeding activity onsite or within 2km of the Proposed Development area during either the 2018 or 2019 breeding seasons. Given the availability of potential nesting and foraging habitat in the wider area, no significant effects are anticipated.</p> <p>Overall, disturbance during construction is unlikely to discourage flight activity in the vicinity of the Proposed Development, particularly given the low levels of activity recorded.</p> <p>Significant displacement effects are not anticipated at any geographical scale.</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 anticipated.	No Effect	No Effect

<p>Displacement</p>	<p>The development footprint is dominated by commercial conifer plantation which has the potential to support buzzard populations. Pearce Higgins (2009) describes that buzzard has been found to show significant turbine avoidance extending to at least 500m. However, this species was only occasionally recorded within the development site during the breeding and winter seasons. There was no evidence of breeding activity onsite or within 2km of the Proposed Development area during either the 2018 or 2019 breeding seasons. Extensive areas of suitable breeding and foraging habitat exist and will remain in the wider area (i.e. outside the 500m buffer zone).</p> <p>Significant displacement effects are not anticipated at any geographical scale.</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>	<p>Long-term Slight Negative Effect</p>
<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 0.1 collisions per year, or one bird every 10 years. The predicted collision risk is insignificant in the context of the county, national and international population.</p> <p>Significant effects are not anticipated at any geographical scale.</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 Slight Negative Effect</p>

7.8.2.7 **Sparrowhawk (All Seasons)**

Table 7-17 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			
<p>Direct Habitat Loss</p>	<p>The Proposed Development area is dominated by mature forestry, which could provide breeding and foraging habitat for sparrowhawk. This species was regularly observed within the Proposed Development area throughout the</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p>	<p>Long-term Slight Negative Effect</p>

	<p>extensive two-year survey period. While a pair of sparrowhawk was observed displaying over mature forestry approximately 200m from the development site, no evidence of breeding was recorded within the Proposed Development area. Whilst felling of forestry will occur onsite, significant areas of suitable nesting habitat will continue to exist post-construction.</p> <p>Significant effects are not anticipated, particularly given the low levels of activity recorded.</p>	<p>The cross tabulation of <i>Low</i> sensitivity species and <i>Low</i> Impact corresponds to a Very Low effect significance.</p>	
Displacement	<p>No evidence of breeding was recorded within the development site. A possible nest site was identified in June 2018, approximately 200m south-west of the development site. The Proposed Development area and adjacent land do 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 anticipated at any geographical scale.</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	<p>Direct or indirect effects are not anticipated.</p>	No Effect	No Effect
Displacement	<p>Significant effects are not anticipated, given that extensive areas of suitable foraging habitat exist and will remain in the wider area. Onsite habitats are not considered unique to the Proposed Development area.</p> <p>Significant displacement effects are not anticipated at any geographical scale.</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
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 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></p>	Long-term Imperceptible Negative Effect

	<p>The collision risk has been calculated at a ratio of 0.03 collisions per year, or one bird every 33.3 years. The predicted collision risk is insignificant in the context of the county, national and international population.</p> <p>Significant effects are not anticipated at any geographical scale.</p>	<p>Impact corresponds to a Very Low effect significance.</p>	
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7.8.2.8 Kestrel (All Seasons)

Table 7-18 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			
<p>Direct Habitat Loss</p>	<p>The Proposed Development site is dominated by conifer plantation, with areas of potential foraging habitat around the margins of the site to the north, east, south-east and west. Direct loss of breeding and foraging habitat will be minimal.</p> <p>Substantial areas of undisturbed suitable breeding and foraging habitat will remain, both within the development site and the wider area.</p> <p>Significant effects are not anticipated at any geographical scale.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of a <i>Low</i> sensitivity species and a <i>Low</i> Impact corresponds to a Very Low effect significance.</p>	<p>Long-term Slight Negative Effect</p>
<p>Displacement</p>	<p>Construction in forested areas could potentially cause displacement of breeding kestrel. However, given the availability of extensive areas of alternative nesting sites in the wider area no significant effects are anticipated.</p> <p>Significant displacement effects are not anticipated at any geographical scale.</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>	<p>Short-term Slight Negative Effect</p>

Operational Phase			
Direct Habitat Loss	Direct or indirect effects are not anticipated.	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).</p> <p>Significant effects are not anticipated, given that extensive areas of suitable foraging habitat exist and will remain in the wider area. Onsite habitats are not considered unique to the Proposed Development area.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabature of <i>Low</i> sensitivity species and <i>Low</i> Impact corresponds to a Very Low 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 0.04 collisions per year, equating to one bird every 25 years. The predicted collision risk is insignificant in the context of the county, national and international population.</p> <p>Significant effects are not anticipated at any geographical scale.</p>	<p>The magnitude of the effect is assessed as <i>negligible</i>.</p> <p>The cross tabature of <i>Low</i> sensitivity species and <i>Negligible</i> Impact corresponds to a Very Low effect significance.</p>	Long-term Slight Negative Effect

7.8.2.8 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>The Proposed Development area is dominated by conifer plantation, this habitat type is not favoured by common snipe. Direct loss of breeding and foraging habitat will therefore be minimal.</p> <p>Snipe were occasionally recorded during VP surveys, with observations primarily during the winter season. There were two possible breeding territories identified through observations of calling and drumming snipe both in June 2018. However, these two possible breeding territories were located 500m from the proposed turbine layout. Direct habitat loss will therefore not result.</p> <p>Overall, there will be minimal loss of snipe habitat onsite (including as a result of the proposed drainage associated with development infrastructure) given the majority of the site is dominated by a coniferous plantation.</p> <p>Significant impacts are therefore not predicted at any geographical scale.</p>	<p>The magnitude of the effect is assessed as <i>low</i>.</p> <p>The cross tabulation of a <i>Low</i> sensitivity species and a <i>Low</i> Impact corresponds to a Very Low effect significance.</p>	Long-term Slight Negative Effect
Displacement	<p>The Proposed Development site is dominated by conifer plantation, with small areas of open habitat suitable for common snipe in the margins of the site. There were two possible breeding territories, located within 500m of the proposed turbine layout. Overall, the numbers recorded were considered to be low.</p> <p>Should any potential displacement effects occur, there are extensive areas of suitable habitat in the wider area, to render this potential impact inconsequential.</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

	Significant displacement effects are not anticipated at any geographical scale.		
Operational Phase			
Direct Habitat Loss	Direct or indirect effects are not anticipated.	No Effect	No Effect
Displacement	<p>Pearce Higgins et. al (2009), found that breeding common snipe showed significant avoidance of turbines extending to a distance of 400m. There were only two possible breeding territories, located within 500m of the proposed turbine layout.</p> <p>However, given the overall numbers recorded were low, the distance of the observed breeding territories from the proposed turbines and the availability of potential alternative breeding and foraging habitat in the wider area, significant effects are not anticipated at any geographical scale.</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
Collision	<p>It is acknowledged that the predicted number of transits, and hence predicted rate of collision for snipe may be underestimated, as flight activity for this species is predominantly crepuscular in nature while the VP surveys are largely diurnal (Table 1.4, SNH (2017)).</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 0.005 collisions per year, or one bird every 200 years. The predicted collision risk is insignificant in the context of the county, national and international population.</p> <p>Significant effects are not anticipated at any geographical scale.</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>	Long-term Imperceptible Negative Effect

7.8.3 Effects on Key Ornithological Receptors during Decommissioning

7.8.3.1 All Species

Table 7-20 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 anticipated.	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 Grid Connection Route

A connection between the proposed substation and the national electricity grid will be necessary to export the electricity generated by the Proposed Development. The Proposed Development will connect to the existing 38kV overhead line within the site, which is regularly maintained by ESB and connects into Ballylickey Substation, located approximately 12 kilometres southwest of the site. The connection will comprise of internal underground cable connection, approximately 120m in length, which will connect into the existing overhead line infrastructure within the site. The potential for this grid connection route to impact birds is discussed below.

The majority of onsite habitats are of low ecological value (i.e. existing forestry) and do not have potential to support species of conservation interest in the area. On a precautionary basis it is assumed that some temporary displacement may occur during construction works. However, given the extent of suitable habitat in the wider area; significant displacement effects are not predicted. The grid connection 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. chough) and **Negligible** Impact corresponds to a **Very Low** effect significance. Chough 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).

7.9

Effects on Designated Areas

None of the elements of the Proposed Development are located within the boundaries of any Nationally or European designated sites important for nature conservation (Figure 6-2 and Figure 6-3). There will be no direct effects on any designated site as a result of the construction, operation and decommissioning of the Proposed Development.

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. qualifying interest)

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 European Sites.

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:

- The Gearagh SAC (000108)
- The Gearagh SPA (004109)

As a result, an Appropriate Assessment of the Proposed Development is required, and a Natura Impact Statement has been prepared in respect of the Proposed Development. The Natura Impact Statement concludes as follows:

“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, operation and decommissioning of the Proposed Development does not adversely affect the integrity of European sites.

Following an examination, evaluation and analysis, in light of best scientific knowledge and the conservation objectives of the site, and, on the basis of objective information, having taken into account the relevant mitigation measures, it can be concluded that the Proposed Development will not have an adverse impact on any European Sites, either alone or in combination with other plans or projects.”

7.10 Mitigation and Best Practice Measures

This section describes best practice measures and those 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.

7.10.1 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 overhead line portion of the grid connection is already in situ, this eliminates the requirement for additional construction works in this element of the development.

7.10.2 Mitigation During Construction, Operational and Decommissioning

The following sections describe the mitigation measures to be implemented during each phase of the Proposed Development, where relevant.

7.10.2.1 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 an Appendix to Chapter 4.
- The removal of woody vegetation will be undertaken in full compliance with Section 40 of the Wildlife Act 1976 - 2018. Where sections of woody vegetation are removed for the purposes of the junction and road upgrades, these will be replaced with suitable hedge/tree species which are common in the local context.
- 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 site.
 - 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.

7.10.2.2 Operational Phase Mitigation

No operational phase impacts requiring mitigation were identified.

7.10.2.3 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).

7.11 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

In line with best practice, 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 wind farm. A breeding bird survey will be undertaken between April and July. 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 breeding activity of birds of high conservation concern is identified, the nest site will be located, and earmarked for monitoring at the beginning of the first breeding season of the construction phase. If it is found to be active during the construction phase no works shall be undertaken within a 500m buffer in line with best practise. No works shall be permitted within the buffer until it can be demonstrated that the 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.

7.12 Residual Effects

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

- Chough
- Peregrine
- White-tailed Eagle
- Red Grouse
- Herring Gull
- Buzzard
- Sparrowhawk

- > Kestrel
- > Common Snipe

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 anticipated.

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

7.13.1 Other Plans and Projects

Assessment material for this in combination impact assessment was compiled on the relevant developments within the vicinity of the proposed project and was verified on the 17th of April 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 EISs/EIARs, layouts, drawings etc.) include those listed below.

7.13.2 Plans Considered in the Cumulative Impact Assessment

The following plans were considered in the cumulative impact assessment:

- > Cork County Development Plan 2014-2020
- > National Biodiversity Action Plan 2017-2021

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

7.13.3 Projects Considered in the Cumulative Impact Assessment

A review of the Planning Register for Cork 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 is 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.

Other Developments

The review of the Cork and Kerry County Councils and An Bord Pleanála planning register documented relevant general development planning applications in the vicinity of Proposed Development 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.

It should also be noted that any potential cumulative effects in relation to the previously granted infrastructure on site is also considered. At present the Proposed Development site includes an existing substation that has an associated overhead line connection to the Ballylickey Substation, approximately 12km southwest of the site. The existing substation on site will be subject to decommissioning under the provisions of the previously granted permission and these works have been considered were appropriate in the cumulative assessments. Furthermore, ESB may from time to time require access to the site to perform maintenance works to the electrical infrastructure where relevant, this has been cumulatively assessed within the EIAR. On a precautionary basis it is assumed that some temporary displacement may occur during construction works and/or maintenance works along the existing overhead line. However, given the extent of suitable habitat in the wider area; significant cumulative displacement effects are not predicted.

More detail can be found in Chapter 2, Section 2.4.

7.13.4 Assessment of Cumulative Effects

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's, layouts, drawings etc) are listed below.

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 (for example where a specific region holds the majority of the national population)' A 25km radius of the Proposed Development 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 white-tailed eagle is 13km and 18km for peregrine (SNH, 2016). Herring gull foraging range can on occasion exceed 25km however it is typically less (Thaxter et al (2012)).

The wind farm projects within a 20-kilometre radius of Curraglass Renewable Energy Development proposal are provided in Table 7-21 below and are presented in terms of whether the project is permitted/existing or pending/under appeal. A total of 19 wind farms, and 204 existing/permitted turbines fall within a 20-kilometre radius of the proposal.

Table 7-21 Wind Farms within 25km of the development site

Wind Farm	Status	No. of Turbines	Distance from development site (km)
Co. Cork			
Cleanrath (Ref. 15/6966)	Existing	9 built	10.3
Derragh (Ref. 12/5270)	Existing	6	8.9

Wind Farm	Status	No. of Turbines	Distance from development site (km)
Shehy More (Ref. 13/551)	Permitted (Under Construction)	11	4.3
Carrigarierk (Ref. 15/730)	Permitted (Under Construction)	5	10.6
Derreenacrinnig West (Ref. 10/857)	Permitted	7	9.4
Millane Hill (Ref. 98/1482)	Existing	9	13.5
Currabwee (Ref. 98/680)	Existing	7	18.3
Knockeenboy (Ref. 11/59)	Permitted	6	16.9
Ballybane/Glanta Commns (Various)	Existing	21	17.9
Knocknamork (Ref. 19/4972)	Permitted	7	18.1
Killaveenogue (Ref. 13/635)	Existing	10	16.8
Co. Kerry			
Sillahertane/Coomagearlaghy II (Ref. 03/1359, 13/551)	Existing	10	6.4
Grousemount (Ref. PA0044)	Existing	38	4.2
Coomagearlaghy-Kilgarvan (Ref.02/1241)	Operational	15	11.4
Midas (Ref. 03/1188)	Existing	23	9.1
Inchicoosh (Ref. 07/1605)	Existing	6	12.7
Lettercannon (Ref.03/2508)	Existing	7	11.5
TOTAL EXISTING		170	
TOTAL PROPOSED		204	

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

➤ **Grousemount Wind Farm, Co. Kerry**

Grousemount Wind Farm is the closest wind farm to the Proposed Development at c.4.2km to the north. Two EIS/EIAR were consulted to determine cumulative impacts from the development site, one lodged in 2010 which was refused but gives access to survey results and the second lodged to An Bord Pleanála granted in 2015.

The 2010 EIS concluded that “the loss of relatively small amounts of habitat due to the Proposed Development would not be expected to have any significant impacts on the populations of any of the bird species that currently frequent the site or its surroundings.” There was no evidence to show that the site was within a regularly used migration route by birds or a route used by wintering waterfowl. Furthermore, from the area’s location and topography there was no reason to believe it would be used by significant

numbers of migrating birds or waterfowl. High concentrations of birds were not recorded on or near the windfarm during surveys. The presence of turbines was not expected to have any effects on Birds of Conservation Importance recorded on Grousemount site (i.e. Chough, Red Grouse, Peregrine, Hen Harrier and Golden Plover). Therefore, the possibility of an impact by disturbance on migrating birds was disregarded.

The Inspector's Report from An Bord Pleanála focuses, on a precautionary approach, on White-tailed Eagles flying over site. However, survey results showed that the site is not used on a regular basis and there is no flight path over the site (i.e. between feeding and roosting sites). Furthermore, it highlights the absence of suitable breeding habitat for the species on site. The report concludes that "the Proposed Development would not have a significant adverse effect on any sensitive habitats, protected species or areas of nature conservation interest within the site or the surrounding area subject to the full implementation of mitigation measures and planning conditions. The Proposed Development would not give rise to any significant adverse cumulative impacts in-combination with other windfarms, the grid connection route, or plans and projects in the area."

Based on the information available in the Grousemount EIS and the An Bord Pleanála's Inspector's Report, significant cumulative impacts are not anticipated.

No significant residual effects on avian receptors were identified.

➤ **Shehy More Wind Farm, Co. Cork**

Shehy More Wind Farm is the next closest wind farm to the Proposed Development, situated approximately 4.3km to the east. The EIS was consulted to determine cumulative impacts from the development site. The EIS outlined that "no species listed in the BoCCI Red list were recorded during the bird survey work." Hen Harrier, Golden Plover and Chough (Annex I; EU Birds Directive) were occasionally recorded on site or in its vicinity, in low numbers. The nature of the habitat on site, i.e. conifer plantation, were widespread and abundant within the surrounding areas resulting in a predicted low effect significance for both habitat loss and displacement for all bird species within the development site. It was therefore predicted that the site would have no significant impacts on bird populations. It was concluded that "in the longer term, the cumulative impact of wind energy developments (both in Counties Cork and Kerry and in the state as a whole) may contribute to the amelioration of climate change events that threaten to make the Hen Harrier and other upland birds as breeding birds in the Republic of Ireland."

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

No significant residual effects on avian receptors were identified.

➤ **Sillahertane/Coomagearlaghy II Wind Farm, Co. Kerry**

Sillahertane/Coomagearlaghy II Wind Farm is situated approximately 6.4km to the north of the development site. The EIS was consulted to determine cumulative impacts from the development site. The EIS concluded that "with the exception of one turbine which is sited in a small area of cutover peatland, all turbines are proposed to be sited in the newly planted coniferous plantation or its associated fire breaks. These areas are of low habitat value. The choice of these locations will ensure that peatland hydrology or wildlife will not be adversely affected by the development." It was anticipated that the Proposed Development consisting of ten turbines on solid tubular steel towers located in commercially planted and degraded areas would have no significant impact on the flora and fauna of the area.

Based on the information available in the Sillahertane/Coomagearlaghy II Wind Farm EIS, significant cumulative impacts are not anticipated.

No significant residual effects on avian receptors were identified.

> Derragh Wind Farm, Co. Cork

Derragh Wind Farm is situated approximately 8.9km to the north-east of the development site. The EIS was consulted to determine cumulative impacts from the development site. The EIS concluded that “the extent of habitat loss is less than 1% of the total area of the site. The habitats that will be affected are of low ecological value and the overall impact of the loss of these habitats are negligible.” No wintering or breeding birds of high conservation concern were recorded on the site. It was therefore predicted that the site would have no significant impacts on bird populations.

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

No significant residual effects on avian receptors were identified.

> Midas Wind Farm, Co. Kerry

The potential for the Proposed Development to result in significant cumulative or in combination effects when assessed alongside Midas wind farm, which is c. 9.1km from the wind farm site, was considered. The planning file was reviewed on the Kerry County Council Planning Register and no information regarding potential effects on bird species was available. However, given the location of the Midas wind farm, the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on bird species associated with the proposed Curraglass Wind Farm when considered on its own, significant cumulative or in-combination effects are not anticipated.

Taking into consideration the effect significance levels identified for the proposed Curraglass Wind Farm (i.e. no effect significance of greater than *Low* (Percival 2003) or *Slight Negative* (EPA 2017)), significant cumulative effects on KORs with regard to direct habitat loss, displacement or collision mortality are not anticipated.

> Derreenacrinnig West Wind Farm, Co. Cork

Derreenacrinnig West Wind Farm is situated approximately 9.4km to the south of the development site. In the absence of EIAR/EIS online, the An Bord Pleanála Inspectors’ Report was consulted to determine cumulative impacts from the development site. The Inspectors’ Report outlined that “there are no records of hen harrier in this area and the EIS indicates that consultations were undertaken with the Irish Raptor Study Group and NPWS in this regard. There are no records of Annex I birds for the area and none identified on the site.” Having regard to the characteristics of the site and the nature of development proposed, it was not considered that the Proposed Development would give rise to unacceptable impacts on habitats or species of conservation interest.

Based on the information available in An Bord Pleanála Inspectors’ Report for Derreenacrinnig West Wind Farm, significant cumulative impacts are not anticipated.

No significant residual effects on avian receptors were identified.

> Cleanrath Wind Farm, Co. Cork

Cleanrath Wind Farm is situated approximately 10.3km to the north-east of the development site. The EIS was consulted to determine cumulative impacts from the development site. The EIAR identified the following species as Key Ornithological Receptors: Hen Harrier, Chough, Golden Plover, Merlin, Peregrine, Kestrel, Sparrowhawk and Common Snipe. However, the EIAR concluded that “no significant effects are predicted on birds due to direct habitat loss or displacement during the construction, operational or decommissioning phases of the Proposed Development. The development will not have significant effects on any KOR recorded either in isolation or cumulatively with other plans

and projects.” The results of ongoing monitoring of this wind farm site do not contradict the conclusion of the Cleanrath EIS.

Therefore, based on the Cleanrath EIS, cumulative impacts on bird populations will be of no significance. No significant residual effects on avian receptors were identified.

➤ **Carrigarierk Wind Farm, Co. Cork**

Carrigarierk Wind Farm is situated approximately 10.6km to the east of the development site. The EIS was consulted to determine cumulative impacts from the development site. The EIS identified Peregrine, Hen Harrier and Golden Plover as Key Ornithological Receptors. However, the EIS concluded that collision risk would be no greater than negligible on birds of conservation concern. In addition, the EIS did not predict habitat loss and disturbance impacts to be greater than slight negative.

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

No significant residual effects on avian receptors were identified.

➤ **Coomagearlaghy-Kilgarvan, Co. Kerry**

Coomagearlaghy-Kilgarvan Wind Farm is situated approximately 11.4km to the north of the development site. The EIS was consulted to determine cumulative impacts from the development site. The EIS concludes that “the site is of limited biological interest” and that “evidence suggests the risk of collision between moving turbine blades and birds is minimal both migratory birds and local habitats.” No further details were given on the bird species recorded at the site.

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

No significant residual effects on avian receptors were identified.

➤ **Lettercannon Wind Farm, Co. Kerry**

Lettercannon Wind Farm is situated approximately 11.5km to the north of the development site. The EIS was consulted to determine cumulative impacts from the development site. The EIS concluded that “ecological assessments for the development predicted no likely significant impact on the ecology of the site.” No further information in relation to bird species recorded at the site was provided.

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

No significant residual effects on avian receptors were identified.

➤ **Inchicoosh Wind Farm, Co. Kerry**

Inchicoosh Wind Farm is situated approximately 12.7km to the north of the development site. The EIS was consulted to determine cumulative impacts from the development site. The EIS stated that “the extent of habitat loss is generally considered to be insignificant in the context of the size of the development”, that the “additional impacts to bird life from the frequency of human activity directly relating to windfarm operations post construction at the site are not anticipated to be of great significance.” It added that “none of the species recorded at the development site or within the buffer zone surrounding the site are considered to be at high risk of collision, giving consideration both to the species at the location and the relatively low densities of birds involved.”

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

No significant residual effects on avian receptors were identified.

➤ **Millane Hill, Co. Cork**

The potential for the Proposed Development to result in significant cumulative or in combination effects when assessed alongside Millane Hill wind farm, which is c. 13.5km from the wind farm site, was considered. The planning file was reviewed on the Cork County Council Planning Register and no information regarding potential effects on bird species was available. However, given the location of the Millane Hill wind farm, the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on bird species associated with the proposed Curraglass Wind Farm when considered on its own, significant cumulative or in-combination effects are not anticipated.

Taking into consideration the effect significance levels identified for the proposed Curraglass Wind Farm (i.e. no effect significance of greater than **Low** (Percival 2003) or **Slight Negative** (EPA 2017)), significant cumulative effects on KORs with regard to direct habitat loss, displacement or collision mortality are not anticipated.

➤ **Killaveenogue, Co. Cork**

Killaveenogue Wind Farm is situated approximately 16.8km to the south-east of the development site. The EIS was consulted to determine cumulative impacts from the development site. The EIS outlined that “there was no red listed or Annex I bird species recorded within the study area during the course of the study.” It concluded that “the impact on the bird population is deemed to be low and therefore should not be of concern.”

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

No significant residual effects on avian receptors were identified.

➤ **Knockeenboy, Co. Cork**

The potential for the Proposed Development to result in significant cumulative or in combination effects when assessed alongside Knockeenboy wind farm, which is c. 16.9km from the wind farm site, was considered. The planning file was reviewed on the Cork County Council Planning Register and no information regarding potential effects on bird species was available. However, given the location of the Knockeenboy wind farm, the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on bird species associated with the proposed Curraglass Wind Farm when considered on its own, significant cumulative or in-combination effects are not anticipated.

Taking into consideration the effect significance levels identified for the proposed Curraglass Wind Farm (i.e. no effect significance of greater than **Low** (Percival 2003) or **Slight Negative** (EPA 2017)), significant cumulative effects on KORs with regard to direct habitat loss, displacement or collision mortality are not anticipated.

➤ **Ballybane/Glanta Commons, Co. Cork**

Ballyban/Glanta Wind Farm is situated approximately 17.9km to the south of the development site. The EIS was consulted to determine cumulative impacts from the development site. The EIS concluded that “based on the site survey observations and published literature regarding habitat suitability for bird species an evaluation of ecological value of the habitats present within the site for birds, the site is considered to be of Low - Moderate value, local importance for birds.” No birds of high conservation concern were recorded on site.

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

No significant residual effects on avian receptors were identified.

> Knocknamork, Co. Cork

Knocknamork Wind Farm is situated approximately 18.1km to the north-east of the development site. The EIAR was consulted to determine cumulative impacts from the development site. The EIAR recorded the following species as KORs: Hen Harrier (on a precautionary basis), Golden Plover (wintering), Merlin, Red Grouse, Sparrowhawk and Kestrel. However, the EIAR concluded that “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.”

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

No significant residual effects on avian receptors were identified.

> Currabwee, Co. Cork

The potential for the Proposed Development to result in significant cumulative or in combination effects when assessed alongside Currabwee wind farm, which is c. 18.3km from the wind farm site, was considered. The planning file was reviewed on the Cork County Council Planning Register and no information regarding potential effects on bird species was available. However, given the location of the Currabwee wind farm, the nature of the habitats on that site (as reviewed on publicly available aerial photography) and the lack of significant residual impacts on bird species associated with the proposed Curraglass Wind Farm when considered on its own, significant cumulative or in-combination effects are not anticipated.

Taking into consideration the effect significance levels identified for the proposed Curraglass Wind Farm (i.e. no effect significance of greater than *Low* (Percival 2003) or *Slight Negative* (EPA 2017)), significant cumulative effects on KORs with regard to direct habitat loss, displacement or collision mortality are not anticipated.

7.13.5 Summary

The species assemblages and level of recorded activity for the developments listed in the sections above are broadly similar to that recorded at the Curraglass Site. Important migratory routes for any species were not identified in any of the assessments undertaken. Therefore, significant cumulative barrier effect is not anticipated.

No potentially significant residual disturbance, displacement or habitat loss effects were reported for any receptors within any of the nearby windfarm/other assessment reviewed.

No potentially significant cumulative disturbance, displacement or habitat loss effects on any of the KORs has been identified with regard to the Curraglass proposal.

Taking into consideration the reported residual effects from other plans and projects in the area and the predicted effects with the Curraglass proposal, no residual additive, antagonistic or synergistic effects have been identified with regard to habitat loss, displacement or collision mortality.

7.14 Conclusion

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

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.