Appendix 3

EIAR Chapter 10 - Ornithology

FEHILY TIMONEY

DESIGNING AND DELIVERING A SUSTAINABLE FUTURE

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) FOR THE PROPOSED DERRYNADARRAGH WIND FARM, CO. KILDARE AND CO. OFFALY

VolumeII - MAIN EIAR

CHAPTER 10 - Ornithology

Dara Energy Limited

Dara Energy Limited

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TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

10. ORNITHOLOGY

10.1 Introduction

This chapter assesses the likely significant effects of the proposed Derrynadarragh Wind Farm on birds (ornithological receptors). Receptors including species deemed to be of high conservation interest that are afforded protection under national and international legislation such as the Wildlife Acts 1976-2024 as amended and the EU Birds Directive 2009/147/EC.

The chapter outlines the assessment methodology, describes the baseline environment from survey data, and evaluates key species. The assessment identifies potential impacts for all project phases, proposes corresponding mitigation measures, and concludes by determining the significance of any residual effects post-mitigation.

The Proposed Development refers to all elements of the application for the construction, operation and decommissioning phases (as described in detail in **Chapter 2 Description of the Proposed Development**).

This chapter is supported by several Appendices included in **Volume III** of the **EIAR (Appendix 10-1 to Appendix 10-5)**.

10.1.1 Outline Site Description

The Proposed Wind Farm Site (the Site) comprises approximately 213.64 hectares of land, and is contained within the townlands of Cushina, Clonsast Lower, and Chevychase or Derrynadarragh in County Offaly, and Aughrin and Derrylea in County Kildare. It is located within both the jurisdictions of Kildare County Council and Offaly County Council, approximately 2km south of the village of Bracknagh, 5km northwest of Monasterevin, and approximately 6.5km northeast of Portarlington.

The Cushina River flows through the Site and part of the flood plain of this river is within the Site. The Figile River occurs in proximity to the north eastern boundary of the Proposed Wind Farm Site. Both rivers meet approximately 260m downstream (to the east) of the Proposed Wind Farm Site. The south of the Site borders the north-eastern edge of Derrylea Bog and another raised bog lies partly within the north of the Site. The main land uses are agriculture and turf harvesting. The dominant habitats within the Site are a mosaic of wet grassland and improved agricultural grassland, bog woodland, cutover bog, conifer plantation, hedgerows, treelines, and drainage ditches. Large areas of cutover and cutaway bog occur adjacent to the Site.

The site is not located within or adjacent to any site designated for nature conservation. A detailed ecological description of the site is given in **Chapter 09 Biodiversity.**

10.1.2 Outline Proposed Development Description

A detailed description of the Proposed Development is presented in **Chapter 2** of the EIAR.
In summary, the Proposed Wind Farm Site comprises a total of 9 no. turbines, with the positioning of 4 no. turbines will have a tip height of 186m above existing ground level with a hub height of 105m and rotor diameter of 162m, and 5 no. turbines will have a tip height of 187m above existing ground level with a hub heigh of 106m and rotor diameter of 162m.

The Proposed Development also includes the following elements:

- A new proposed access road will link the site to the R419 road and there will be new and upgraded access tracks within the site.
- A proposed substation in the west of the site
- Three temporary construction site compounds
- Spoil deposition areas
- Surface water management system
- Laying of underground electrical and communications cabling connecting the proposed turbines to the proposed onsite substation
- The laying of an Underground Grid Connection. The Proposed Grid Connection (GC) will exit the site to the south and follow the public road to Bracklone Substation (currently under construction) through the following townlands; Derrylea, Inchacooly, Ballyhast, and Loughmansland Glebe.

The Turbine Delivery Route (TDR) route is described in Chapter 2 Section 2.5 It will exit the M6 at junction 5 and continue to the site via Tullamore and Daingean.

A 10-year planning permission and an operational period of 35 years from the date of commissioning of the Proposed Wind Farm is being sought. This reflects the lifespan of modern-day turbines.

10.1.3 Purpose of the Chapter

The purpose of this Chapter is to:

- Establish and evaluate the baseline ornithological environment as relevant to the Proposed Development;
- Identify, describe and assess any potentially significant ornithological effects associated with the Proposed Development;
- Set out the prevention and mitigation measures required to address any potentially significant ornithological effects and ensure compliance with relevant nature conservation legislation;
- Provide an assessment of the significance of any residual ornithological effects; and
- Identify any appropriate enhancement and / or post-construction monitoring requirements.

10.1.4 Statement of Authority

This chapter was prepared by Dr. Mary Catherine Gallagher (BSc. MSc. PhD.), Caroline Lalor (BSc. MSc. MCIEEM), and Dr. Patrick Crushell (BSc., MSc., PhD., CEcol., MCIEEM) all of whom are professional ecologists working with Wetland Surveys Ireland Limited (WSI). Field surveys were undertaken by Mr. Brendan Dunlop and Mr. Gary Wilkinson (October 2021 - September 2022 inclusive) and Mr. Daniel Moloney and Mr. Mark Davenport (October 2022 – September 2023). Bird surveys in 2017-2019 were undertaken by Mr Rob Wheeldon. All surveyors are experienced ornithologists with a familiarity with the locality of the Wind Farm Site.

Dr. Mary Catherine Gallagher

Dr. Mary Catherine Gallagher received an honours degree (BSc) in Zoology and a Masters degree (MSc) in Marine Biology from UCC. She followed this with a PhD on an invasive barnacle species. Mary Catherine has experience in project management, coastal and freshwater habitat and biodiversity surveys, monitoring surveys and mapping, Geographical Information Systems (GIS), report compilation and has created a range of public information resources and educational materials for various clients including the Pearl Mussel Project.

Caroline Lalor

Caroline Lalor (BSc., MSc., MCEIEEM) received an honours degree in Applied Ecology from University College Cork and a Masters degree in Ecosystem Conservation and Landscape Management from National University of Ireland, Galway. She is a full member of the Institution of Ecology and Environmental Management (CIEEM). Caroline has 20 years of postgraduate experience, working in peatland conservation and ecological consulting. She has experience working on environmental impact assessment for various developments, including renewable energy projects, preparing chapters of the EIARs, preparing AA Screening and NIR reports.

Dr. Patrick Crushell

Dr. Patrick Crushell (BSc., MSc., PhD., CEcol., MCIEEM) has been working in the area of nature conservation and ecological assessment since 2002. He has worked as a consultant ecologist in the preparation of Ecological Impact Assessments on various projects across Ireland for a range of organisations including government agencies, engineering firms, local environmental groups and NGOs and has appeared as an expert witness on numerous occasions. Projects that he has been involved in include impact assessments of various development proposals; pre and post – construction monitoring; wetland surveys; evaluation of proposed designated sites; bird surveys; flora and fauna surveys; restoration and management of habitats and baseline ecological surveys.

Daniel Moloney

Daniel is a respected local ornithologist who has been conducting bird surveys since 2006 for wind farm impact assessments and other construction works across a range of projects and consultancy companies in the Republic of Ireland, Northern Ireland, and Scotland. Daniel has been working with BirdWatch Ireland for over 15 years across a range of projects and species including the Corncrake Conservation project on behalf of the NPWS, Curlew in the border counties as part of the Halting Environmental Loss project in conjunction with the RSPB, a project manager on the INTERREG VA Cooperation Across Borders for Biodiversity project on waders in the border counties and more recently a bird specialist on the ACRES Co-operation Project in Donegal.

Mark Davenport

Mark Davenport is an ecologist specialising in ornithology who has been conducting bird surveys for wind farm impact assessment and other various construction projects for several years. Mark has experience working with red listed species such as breeding Curlew on the NPWS Curlew Conservation Project. Through this project, Mark has gathered a wealth of experience in assisting and implementing conservation measures for threatened wader species in Ireland. Mark is a committee member of the Inishtrahull Bird Observatory conducting conservation measures for endangered seabird species.

Brendan Dunlop

Brendan is a highly experienced avian fieldworker specialising in a wide range of EIA and research surveys. He is skilled in surveying farmland, upland and coastal birds including Brown & Shepard walked transects and vantage point methodology for breeding season, winter / spring migratory and over wintering surveys and is conversant in habitat mapping for a wide range of protected species. Brendan has worked closely with the Irish Raptor study group Red Kite projects monitoring nest locations, breeding productivity and winter roosts. He is particularly experienced in Hen harrier and Merlin surveys of Northern Ireland SPAs for wind farm proposals. He has worked on numerous wind farm projects across the UK and Ireland. Brendan has in depth experience and a sound knowledge of SNH Guidelines and protocols for wind farm monitoring and post construction monitoring. Brendan has been an active member of the Northern Ireland Raptor Study Group since 2004 and previously held the posts of Treasurer and assistant secretary. He also worked closely with the Ulster Wildlife Trust and RSPB monitoring Barn Owls and Red Kites.

Gary Wilkinson

Gary has been an active Ornithologist for over fifty years. He is currently Chairman of the Northern Ireland Ornithologists Club 2005-present and was formerly Treasurer from 1987-2005. Gary is also the field trip leader for the NIOC leading trips from 1984 in the U.K. and Ireland as well as in Europe and Africa. Gary is a member of the NI Raptor Study Group and has been a life fellow of the RSPB and Norfolk Ornithologists Association since 1992. Gary has taken part in a variety of ornithological surveys for BTO and NIOC over the last 50 years including being the Regional Coordinator of *Project Barn Owl* for Northern Ireland for BTO/Hawk & Owl Trust; conducting BTO Waterway Breeding Bird Surveys at Annacloy River, Co. Down and conducting the BTO Wetland Bird Census for part of Belfast Lough.

Rob Wheeldon

Rob Wheeldon is an experienced ornithologist possessing a comprehensive knowledge and experience of bird identification and surveys. He has worked undertaken numerous bird surveys to inform impact assessment and has contributed to targeted bird survey work on contract to NPWS and Birdwatch Ireland. Rob previously worked with BirdWatch Ireland, RSPB, Norfolk Wildlife Trust, and the National Trust.

10.1.5 Relevant Legislation and Published Guidance

The main pieces of legislation and policy relevant to this chapter are:

- The Wildlife Act 1976 - 2021 as amended
- The EU Birds Directive (2009/147/EC)
- EU EIA Directive (2014/52/EU)
- European Communities (Birds and Natural Habitats) Regulations 2011, as amended (S.I. no. 477 of 2011).
- The National Biodiversity Action Plan (2023 – 2030)

The following guidance was consulted in relation to ornithological survey methods and assessment of effects of the Proposed Development:

- Balmer, D., Gillings, S., Caffrey, B., Swann, B., Downie, I. and Fuller, R. (2013). Bird Atlas 2007-11: The breeding and wintering birds of Britain & Ireland. BTO Books, Thetford

- Band, W. (2024) Using a collision risk model to assess bird collision risks for onshore wind farms. NatureScot Research Report 909.
- Band, W. (2012) Using a collision risk model to assess bird collision risks for offshore wind farms.
- Band, W., Madders, M. and Whitfield, D.P. (2007). Developing field and analytical methods to assess avian collision risk at wind farms. In: Birds and wind power: risk assessment and mitigation. M. De Lucas, G.F.E. Janss and M. Ferrer, Eds.: 259-275. Quercus, Madrid.
- CIEEM (2024). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.3. Chartered Institute of Ecology and Environmental Management, Winchester
- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022)
- European Commission (2017) Environmental Impact Assessment of Projects. Guidance on the preparation of the Environmental Impact Assessment Report. (Directive 2011/92/EU as amended by 2014/52/EU)
- Gilbert, G., Stanbury, A. and Lewis, L. (2021). Birds of Conservation Concern in Ireland 4: 2020-2026. Irish Birds, Volume 43, 1-22
- Goodship, N.M. and Furness, R.W. (MacArthur Green) (2022). Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. *NatureScot Research Report* 1283.
- Irish Wind Energy Association (2012). Best Practice Guidelines for the Irish Wind Energy Industry. Available at https://windenergyireland.com/images/files/9660bdfb5a4f1d276f41ae9ab54e991bb600b7.pdf
- NRA (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes
- Percival, S.M. (2003). Birds and Wind Farms in Ireland: A Review of Potential Issues and Impact Assessment. Ecological Consulting.
- Scottish Natural Heritage (2017). Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms. Version 2. Scottish Natural Heritage
- Scottish Natural Heritage (2018). Avoidance Rates for the onshore SNH Wind Farm Collision Risk Model. September 2018 v2.
- Scottish Natural Heritage (2016). Assessing Connectivity with Special Protection Areas (SPAs). Version 3. Scottish Natural Heritage
- McGuinness, D., Muldoon, C., Tierney, N., Cummins, S., Murray, A., Egan, S. and Crowe, O. (2015). Bird Sensitivity Mapping for Wind Energy Developments and Associated Infrastructure in the Republic of Ireland. Birdwatch Ireland, Wicklow, Ireland.

10.2 Methodology

10.2.1 Desktop Study

A desktop study was undertaken to identify features of ornithological interest within the study area and surrounding area. The following key information sources were queried:

- National Parks and Wildlife Service (NPWS) website and web map for data on sites designated for nature conservation
- Environmental Protection Agency (EPA) AA tool for data on distance and connectivity to designated sites
- BirdWatch Ireland I-WeBS (Irish Wetland Bird Surveys) site information
- National Biodiversity Data Centre (NBDC) records for the 10km grid square within which the proposed Wind Farm occurs (N51) and the adjacent 10km grid square between the proposed Wind Farm and the Figile River (N61)
- Birds of Conservation Concern in Ireland 2020-2026 (Gilbert *et al.* 2021)
- The 2022 National Survey of breeding Hen Harrier in Ireland (Ruddock *et al*. 2024)
- European Bird Atlas 2 (second version) online maps (https://ebba2.info/maps/)
- General information available from the BirdWatch Ireland website
- Review of impact assessments associated with nearby developments including wind farms.
- Review of supplementary survey data collected at the Wind Farm Site.

10.2.2 Consultation

This EIAR chapter has been compiled in light of the comments received from consultees throughout the EIA process, the relevant elements of which are summarised hereunder and presented in detail in Chapter 5 - Scoping and Consultation. The issues raised in consultation in relation to birds have been addressed within this Chapter.

Table 10-1 Summary of consultation undertaken in relation to Ornithology

Consultee	Date Response Received	Response
An Taisce	N/A	No response received to date
BirdWatch Ireland	N/A	No response received to date
Department of Housing, Local Government and Heritage	N/A	No response received to date
Development Application Unit	25/04/2025	Facilitated organising a meeting between NPWS Ecologist and WSI
Irish Raptor Study Group	N/A	No response received to date
Irish Wildlife Trust	N/A	No response received to date
Kildare County Council	N/A	No response received to date
Laois County Council	N/A	No response received to date

Consultee	Date Response Received	Response
National Parks and Wildlife Service	N/A	Meeting held between NPWS and WSI staff members on 9th May 2025. Various issues were discussed, of relevance to Ornithology were the proximity of the site to a known Curlew breeding site; migratory species such as Whooper Swan; cumulative collision risk; post construction monitoring and lighting on turbines.
Offaly County Council	N/A	No response received to date

10.2.3 Identification of Target Species and Valued Ornithological Receptors

Following the completion of the desk study, consultation and initial field visits, a list of targeted species likely to occur in the study area was identified. In particular, of the bird species known to frequent the site, the target species were identified from the following:

- Species of European conservation importance (as listed on Annex I of the Birds Directive); and
- Species Red-listed in Ireland under the latest list of Birds of Conservation Concern Ireland (BoCCI), (Gilbert et al. 2021).
- Species of known sensitivity to wind farm development.

The Field surveys were designed to obtain further information on the occurrence and use of the site by these targeted species in accordance with SNH (2017) guidance.

The identified list of target species for the current project based on known distribution of the above categories is presented in Appendix 10-1. Valued Ornithological Receptors (VORs) were subsequently identified from this list of target species based on the outcome of observations and their confirmed occurrence in proximity to the site and identified potential impact pathway.

10.2.4 Field Surveys of Target Species

In the absence of specific national bird survey guidelines, the ornithological surveys were designed and undertaken in accordance with 'Recommended bird survey methods to inform impact assessment of onshore wind farms' (SNH, 2017). Data collected from field surveys undertaken from October 2021 to September 2023 largely informs the assessment of significant effects. The survey period covered by the dataset includes two full non-breeding (winter) and breeding seasons. The data has been collected within 5 years of the planning submission, as specified for sites where bird populations are not rapidly changing. Additional supplementary surveys were undertaken over a 24 month period between April 2017 and March 2019 (see Section 10.2.4.8 below for further details). This data was reviewed as part of the scoping of bird survey requirements of the site.

10.2.4.1 Initial Reconnaissance Surveys

The likely bird interest of the site was determined following initial reconnaissance walkover surveys of the site together with the outcome of desktop studies. These initial site visits coupled with the desktop review of existing data (including previous data collected at the site between 2017-2019, see Section 10.2.4.8) informed the target species and the scope of the bird surveys to be undertaken at the site.

10.2.4.2 Vantage Point (VP) Watches

Vantage Point (VP) Surveys comprise a series of watches from a fixed location/s to quantify the flight activity of birds at a Proposed Wind Farm Site. The data informs bird usage of the site while also providing data to estimate the turbine collision risk. The surveys were undertaken in accordance with SNH (2017) guidance from October 2021 to September 2023. VP surveys were carried out during daylight hours and were distributed throughout the day from dawn to dusk.

During the VP surveys, the flight behaviour of target species (see Section 10.2.3 above) was recorded. At the time of each observation information such as the time the bird was detected, flight duration within various height categories, and type of activity (hunting, displaying, flying etc.) was recorded. A unique identifier was assigned to each flight record. Flight height bands were split into three bands, 0-25m, 25-185m, and >200m. All birds recorded within the 25-185m flight band are within the Potential Collision Height (PCH), while a proportion of birds in the >200m band were deemed to also occur within the PCH, details on the calculations to determine this proportion is presented in the Collision Risk Assessment report as presented in Appendix 10-6. Prevailing weather conditions for each watch were also recorded. During the VP surveys, all other non-target/secondary species were also recorded, where recording did not infringe on recording of target species flight data.

Watches were undertaken monthly throughout the survey period from three fixed VP locations from which observations of all turbine locations including a 500m buffer were made (see Figure 10-1). A viewshed analysis of each VP was undertaken to determine coverage across the entire Wind Farm Site (see below).

In all, 432 hours of vantage point watches were undertaken across the two year period. A total of 159 hours of survey effort was carried out at VP1 and VP2 over the entire survey period. The total survey effort at VP3 was 117 hours. The survey effort at VP3 was lower than that at VP1 and VP2 as VP3 was only established in April 2022. Survey effort per VP and season is summarised in Table 10-2. A detailed summary of VP watches carried out between October 2021 and September 2023 is presented in Appendix 10-1, Table 1.

Table 10-2: Details of vantage point watches carried out at Derrynadarragh Wind Farm

	Viewshed area (km^2)	Seasonal surveys	Total survey effort (hrs)	VP Location
VP1	3.24	Winter (Oct 21 – Mar 22): 36hrs Summer (Apr – Sep 22): 36hrs Winter (Oct 22 – Mar 23): 54hrs Summer (Apr – Sep 23): 36hrs	162	658138, 716055
VP2	3.65	Winter (Oct 21 – Mar 22): 36hrs Summer (Apr – Sep 22): 36hrs Winter (Oct 22 – Mar 23): 48hrs Summer (Apr – Sep 23): 42hrs	162	660008, 715795
VP3	1.79	Winter (Oct 21 – Mar 22): na Summer (Apr – Sep 22): 36hrs Winter (Oct 22 – Mar 23): 42hrs Summer (Apr – Sep 23): 42hrs	120	660224, 714647

** VP3 has a lower survey effort compared to VP1 and VP2 as it was not established until April 2022*

** A number of additional watches were undertaken during winter 2022-23 and summer 2023 to increase coverage of the Spring and Autumn migration periods.*

10.2.4.2.1 Viewshed Analysis

Viewshed analysis was carried out to confirm coverage of the study area from fixed VP locations (i.e. VP1 – VP3). During the Winter 2021 – 2022 season two VPs were utilised (VP1 and VP2) and the third VP location (VP3) was added in Summer 2022 following a review by surveyors to provide further coverage of the very southern part of the site. Figure 10-1 illustrates the locations of the VPs and the extent of the 500m buffer from proposed turbine locations which formed the primary study area for Vantage Point Surveys and Walkover Surveys of the Wind Farm Site. While the relevance of being able to view as much of the site to ground level is acknowledged, the SNH (2017) guidance emphasises 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. Viewsheds were calculated using ESRI ArcGIS software using the Airbus World DEM4 Ortho 24m dataset. The input data for the viewshed analysis were:

- observer height (1.7m)
- height of objects being viewed (both 0m and 20m were used for each VP, 0m represents ground level while 20m is the lowest swept rotor height of most turbines)
- and the distance that an object could be viewed (2km in this case)

The resulting viewshed was then cropped to 180 degrees to give the viewshed orientation and visible survey area from each VP location in line with SNH (2017). In order to ensure that the viewsheds provided sufficient coverage of the turbines and the area within 500m of the turbines, a 500m buffer was applied to the outer most turbines of the wind farm in line with SNH (2017). The outputs of the viewshed analysis was reviewed and amended by surveyors based on actual viewshed considering nearby trees and other local obstacles. The final visible viewshed at 20m is presented for each VP in Figure 10-2 (VP1), Figure 10-3 (VP2), Figure 10-4 (VP3), and the combined overlapping viewshed of the entire study area is presented in Figure 10-5.

10.2.4.3 Winter Walkover Surveys

Winter transect surveys were undertaken on eighteen occasions between October 2021 - March 2022 and October 2022 - March 2023 to record the presence of bird species of high conservation concern within areas of potentially suitable habitat for these species during winter. The overall aim of the walkover surveys at Derrynadarragh was to assess the general bird distribution throughout the site and gather data on bird usage of the site. The area subject to survey included the Wind Farm Site and included areas out to 500m from turbine locations.

Transects were selected in order to ensure good spatial coverage of the site and ensure that the full variation of habitat occurring within and surrounding the site was captured. The methodology was broadly based on an adapted Brown and Shepherd surveys (SNH 2017). Target species included raptors and waterbirds although all additional species observed were also recorded. Details of the winter walkover surveys (date, surveyor, time, weather conditions) are presented in Appendix 10-1, Table 2. The transect routes followed during walkover surveys are presented in Figure 10-6 Figure 10-7.

10.2.4.4 Breeding Walkover Surveys

Breeding season walkover transect surveys were undertaken on seventeen occasions between April and September in 2022 and April and September 2023 (see Appendix 10-2 for details of survey effort). The surveys aimed to determine the presence of bird species of high conservation concern and identify areas of possible, probable, or confirmed breeding for bird species observed within the Wind Farm Site. The study area included the Wind Farm Site and included areas out to 500m from turbine locations. The survey methodology followed the Brown and Shepherd (1993) approach.

Transect routes were devised to ensure the required coverage of different habitat was achieved within the survey area. Transects were selected to ensure all areas of suitable breeding/ foraging habitat were approached to within 100m. The transect routes followed during walkover surveys are presented in Figure 10-6 and Figure 10-7.

Target species included waders, raptors, waterbirds, 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 and were distributed throughout the day from dawn to dusk. 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.

10.2.4.5 Breeding Raptor Survey

Breeding raptor surveys (i.e. birds of prey and owls) were undertaken within the hinterland of the proposed Wind Farm Site. Survey methodology followed Hardey et al. (2013) and the survey extended to 2km beyond the site. The breeding raptor surveys were conducted during the 2023 Breeding season (May, June and July 2023), totalling 18hrs of survey effort (see Appendix 10-2 for details of survey effort). The aim of these surveys was to determine if there were any breeding raptors within, or in the vicinity of, the proposed Wind Farm site. Survey effort details are provided in Appendix 10-2. This includes full details of dates, times, survey locations, survey duration and weather conditions for each survey. Figure 10-8 shows the area subject to the breeding raptor survey (targeted within suitable habitat within this area).

10.2.4.6 Breeding Wader Survey

Initial reconnaissance surveys of the study area within 2km of the Proposed Wind Farm Site were conducted to identify any potential areas suitable for breeding waders Figure 10-11 shows the extent of the area subject to the breeding wader survey (targeted within suitable habitat within this area). An area to the east of the proposed wind farm was identified as a possible breeding wader site, with Curlew, Lapwing and Snipe previously recorded in the area (data from supplementary surveys in 2017 and 2018 below). Targeted surveys for were carried out covering the 2022 breeding season in this area following the O'Brien and Smith (1992). Additional breeding wader surveys were undertaken during the 2025 survey season to establish the status of Curlew in areas in proximity to the Wind Farm Site. This includes a transects survey with shortened VPs in an area to the east of the site (in proximity to the 2022 survey area) and deploying passive acoustic recorders onsite to record displaying/territorial males when surveyors are not on site.

10.2.4.7 Breeding Woodcock Surveys

A targeted breeding woodcock survey were undertaken in June 2025 to confirm the current status as an update to the previous surveys undertaken at the site during 2017 and 2018 (see supplementary surveys from 2017 and 2018 below). The 2025 single night survey focussed on suitable habitat within the site and was also informed by the outcome of the 2017 / 2018 observations.. This nocturnal survey would be expected to also pick up any owl activity occurring in the area The aim of the survey was to determine the number of breeding woodcock. A transect was walked amongst areas of suitable woodland habitat in proximity the Wind Farm Site. The presence of roding (displaying) male woodcock was noted and mapped. Areas of suitable habitat identified within the 500m buffer zone of the Wind Farm Site were assessed for their suitability to support Woodcock. Areas that represented suitable habitat were subject to targeted surveys.

10.2.4.8 Surveys of Turbine Transport Route and Grid Connection Route

The ornithological value of the turbine transport and grid connection routes was assessed through multi-disciplinary ecological surveys. The potential for impacts on birds is considered low due to the nature of the proposed works—which are minor and primarily within existing road corridors—and the low sensitivity of the receiving environment. Given the project's limited scale in these areas, the surveys provided an adequate baseline to inform the impact assessment A map showing the route of the Turbine Delivery Route and the Grid Connection that were subject to survey is presented in Figure 10-9.

10.2.4.9 Supplementary Surveys

Additional comprehensive bird surveys were undertaken at the site by Mr Rob Wheeldon from April 2017 though to December 2018, covering two full breeding seasons (2017, 2018) and one full winter season (October 2017 to March 2018) and half of the next winter season (October 2018 to December 2018). Surveys followed SNH (2017) guidelines and included VP watches, winter and breeding walkover surveys, breeding woodcock surveys, and waterbird distribution and abundance surveys. Surveys undertaken at that time covered a similar area to the current Wind Farm Site and 500m buffer.

10.2.4.9.1.1 Vantage Point Surveys

A total of 276hrs vantage point watches were undertaken from two of the VP locations used in the 2021-2023 assessment (VP1 and VP2). The VP surveys commenced in April 2017 and continued through March 2019 covering two breeding and non-breeding winter seasons. Thirty six hours from each VP were undertaken during each season.

10.2.4.9.1.2 Breeding Wader Survey

Breeding wader surveys were undertaken during both the 2017 (8 visits) and 2018 (7 visits) breeding seasons from April through July. Survey methods followed O'Brien and Smith (1992).

10.2.4.9.1.3 Breeding Woodcock Surveys

Woodcock breeding surveys were undertaken in areas of suitable habitat within the site in the summer of 2017 and 2018. Survey methods followed the BTO Woodcock Survey methods with minimum 2hr watches taking place from dusk over the breeding season. Surveys were undertaken on three dates in 2017 and on tow dates during summer 2018.

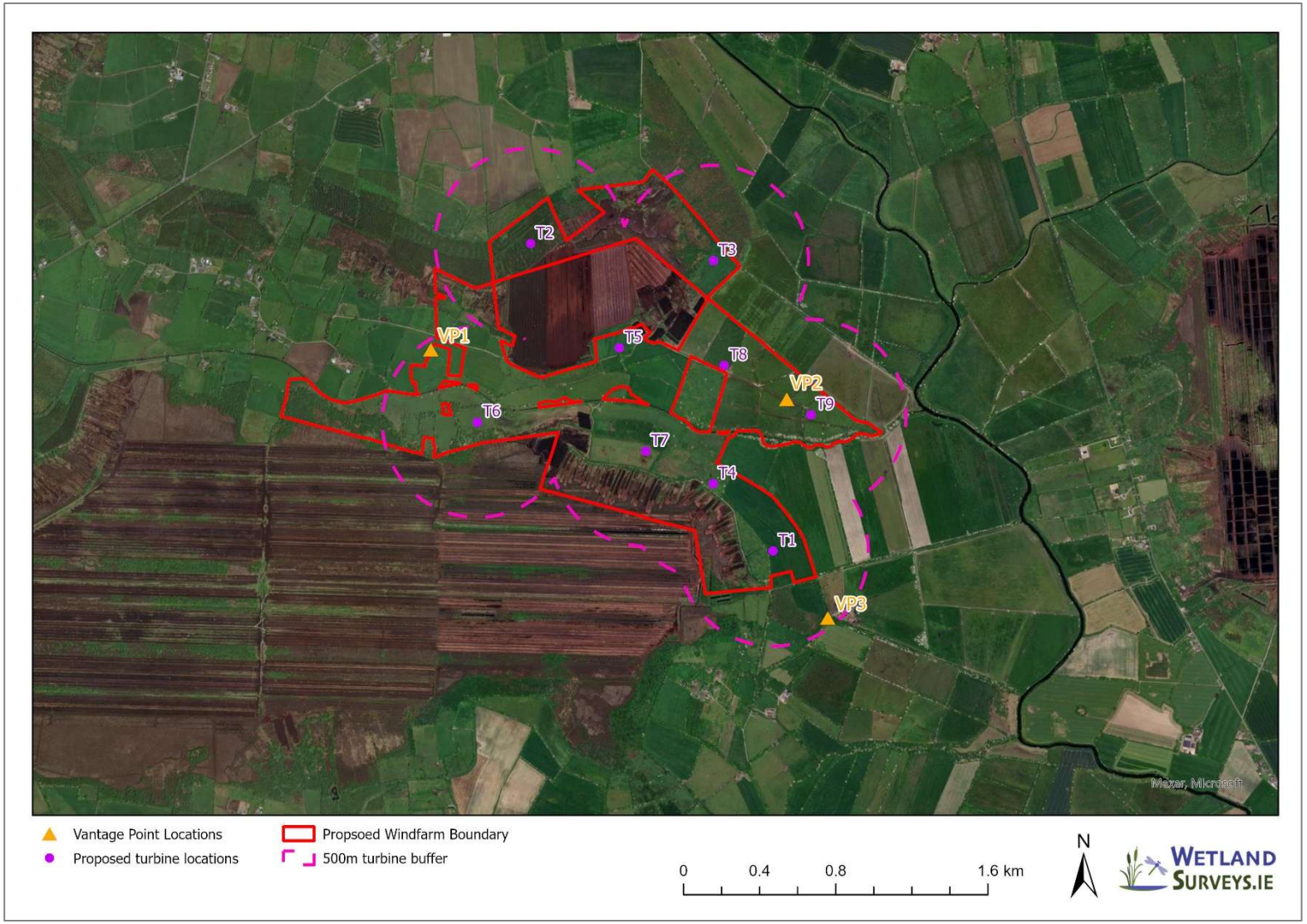

Figure 10-1: Vantage Point locations at the proposed Derrynadarragh Wind Farm site.

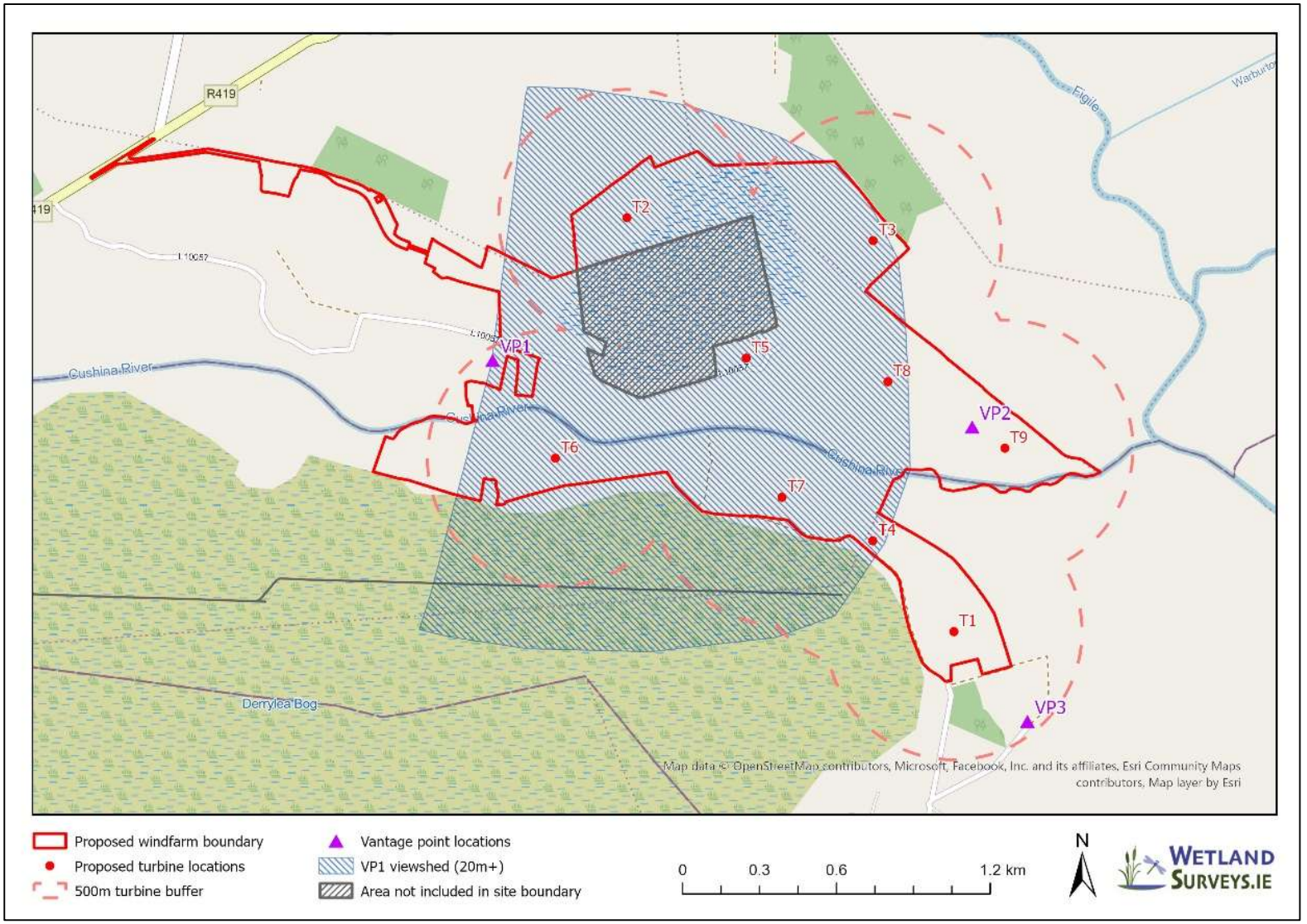

Figure 10-2: Viewshed from VP1 (20m height).

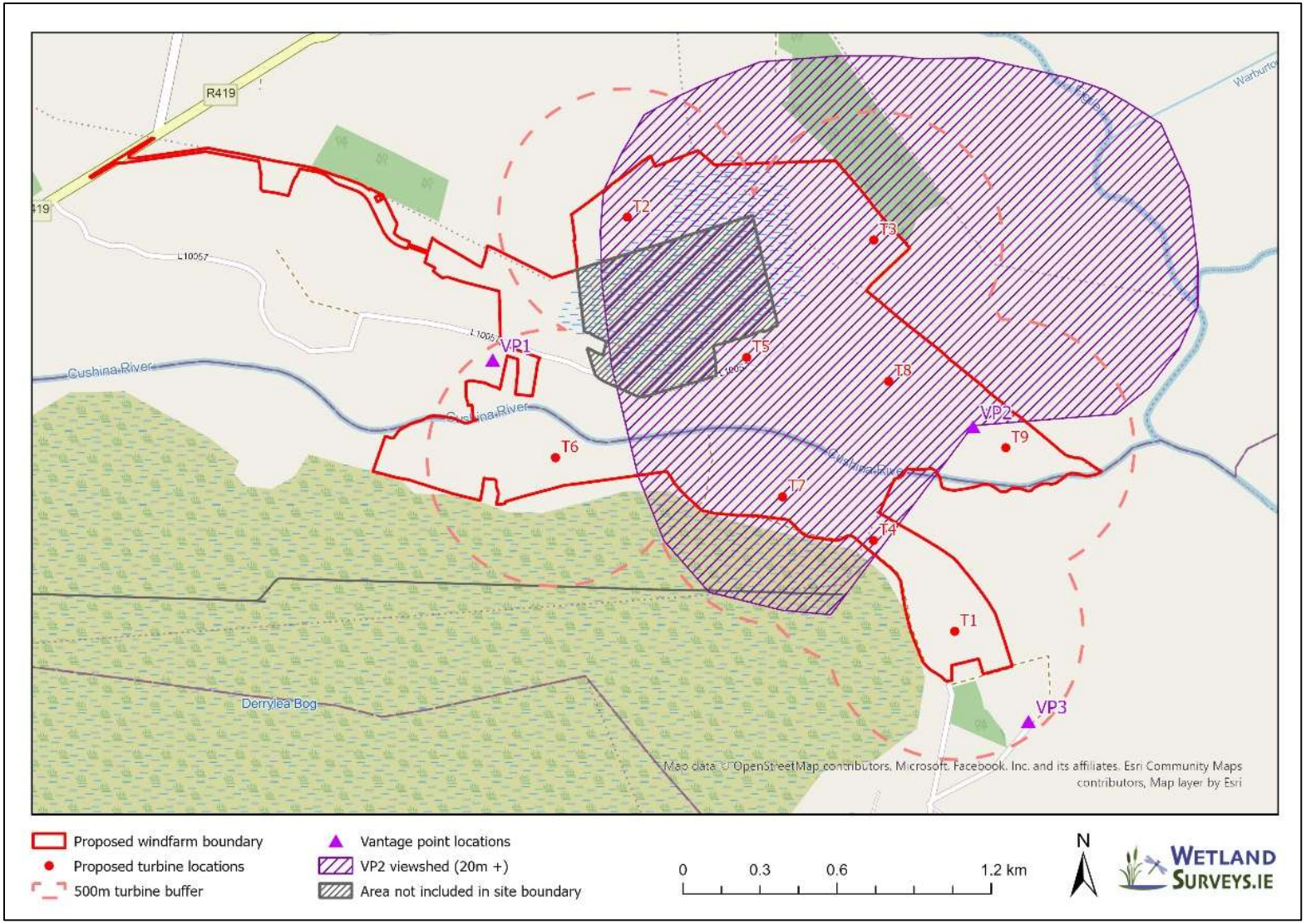

Figure 10-3: Viewshed from VP2 (20m height).

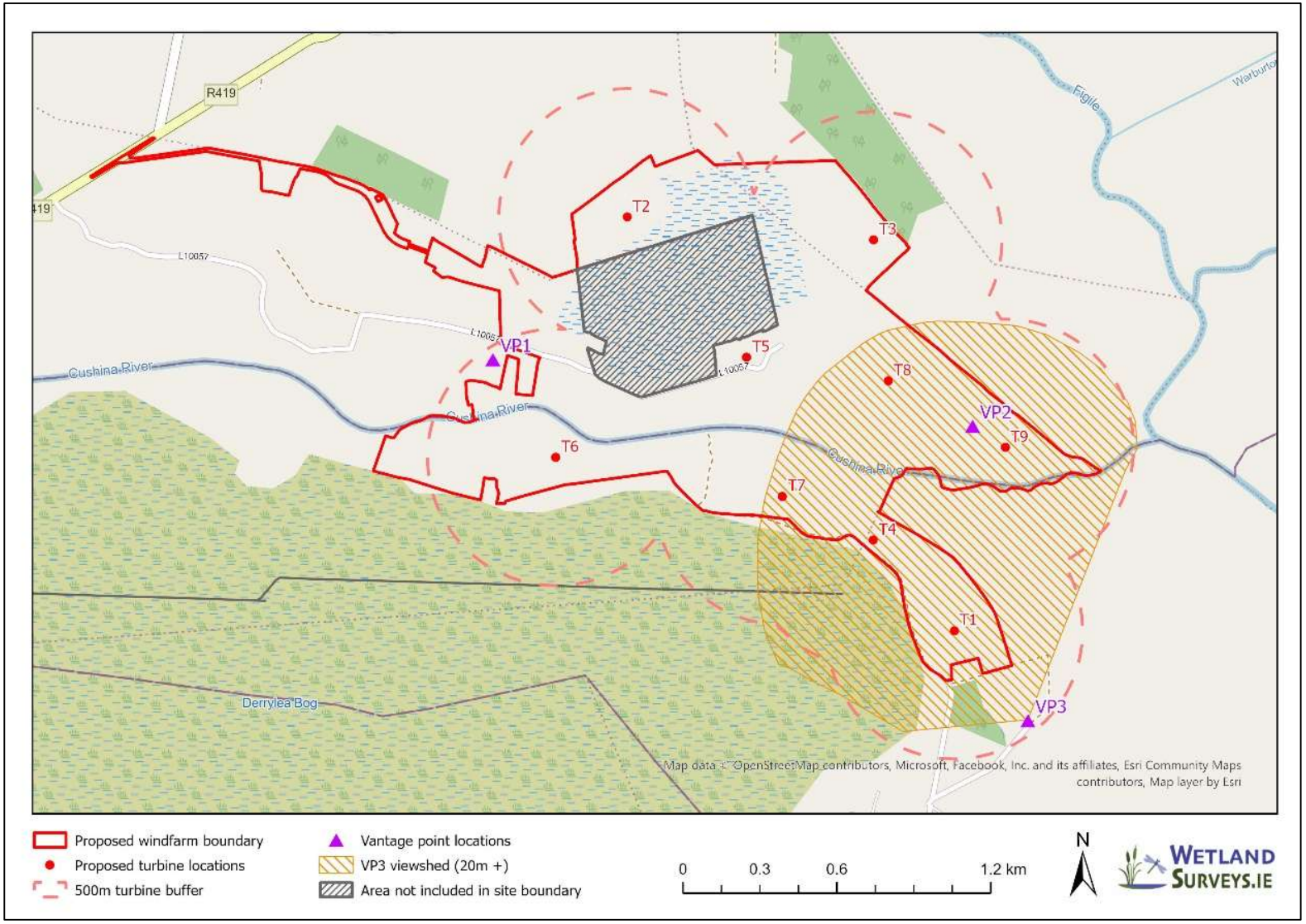

Figure 10-4: Viewshed from VP3 (20m height).

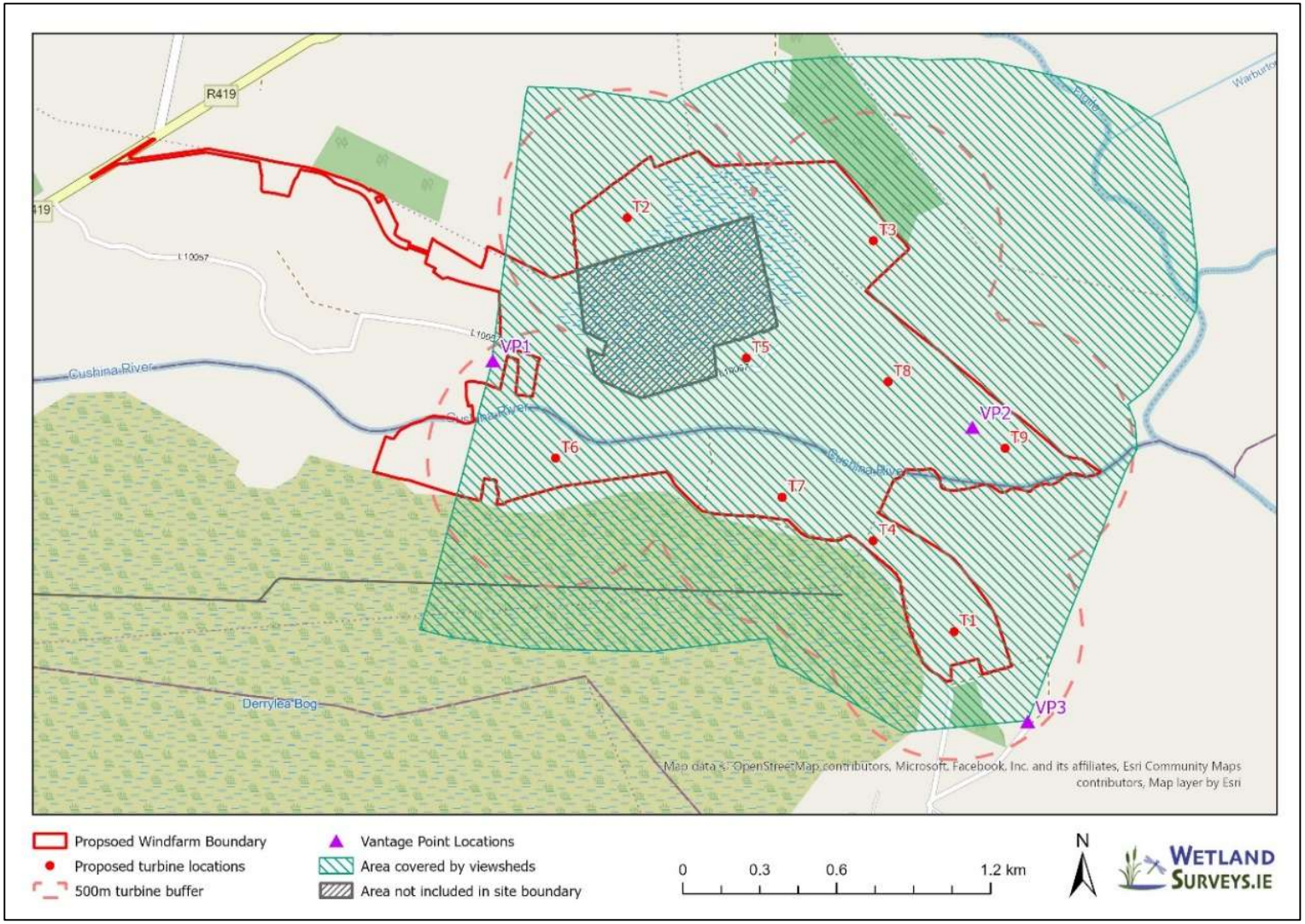

Figure 10-5: Overall coverage of study area by three VP viewsheds (20m height).

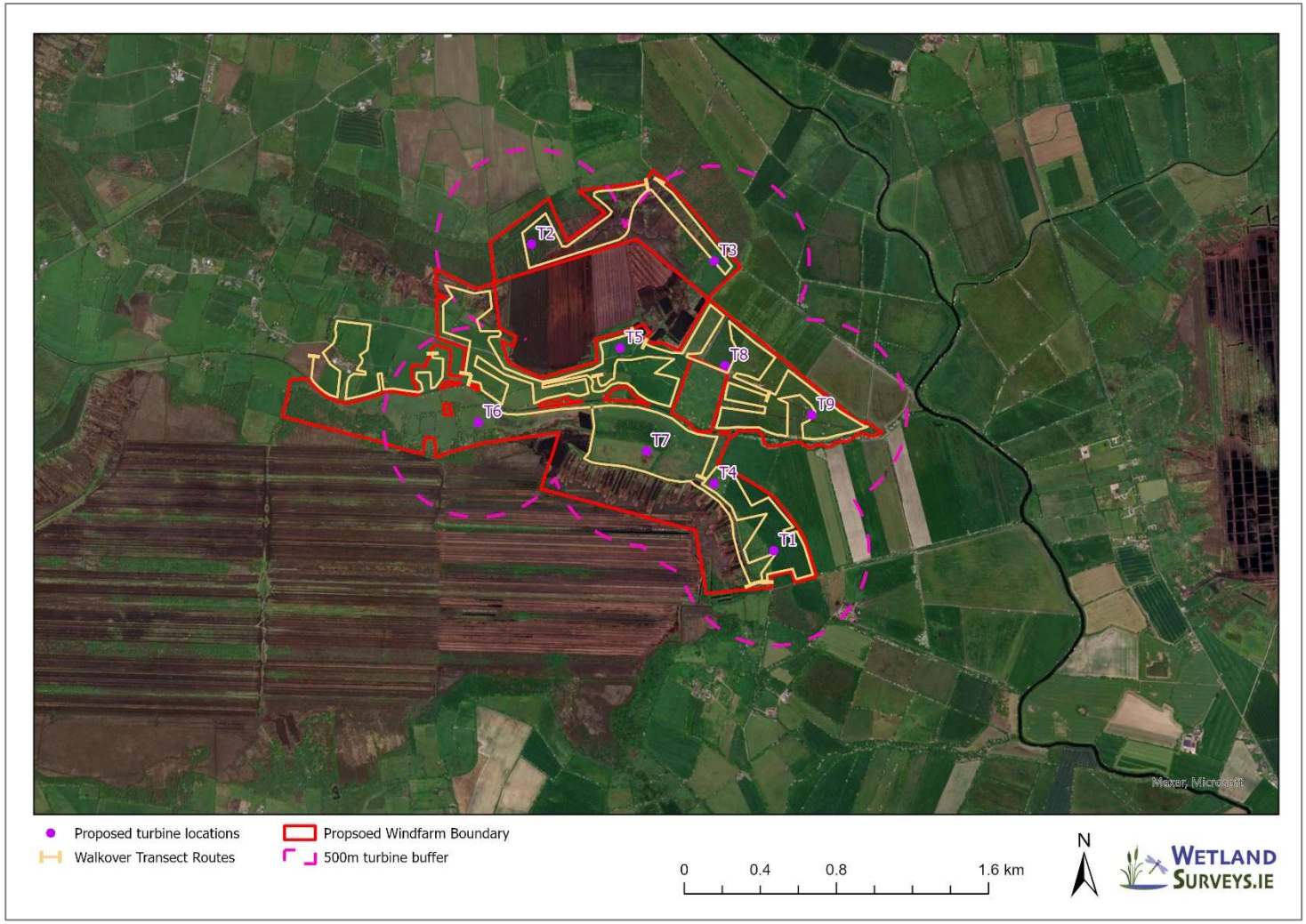

Figure 10-6: Walkover transect routes at the proposed Derrynadarragh Wind Farm site in Winter 2021 – 2022 and Summer 2022.

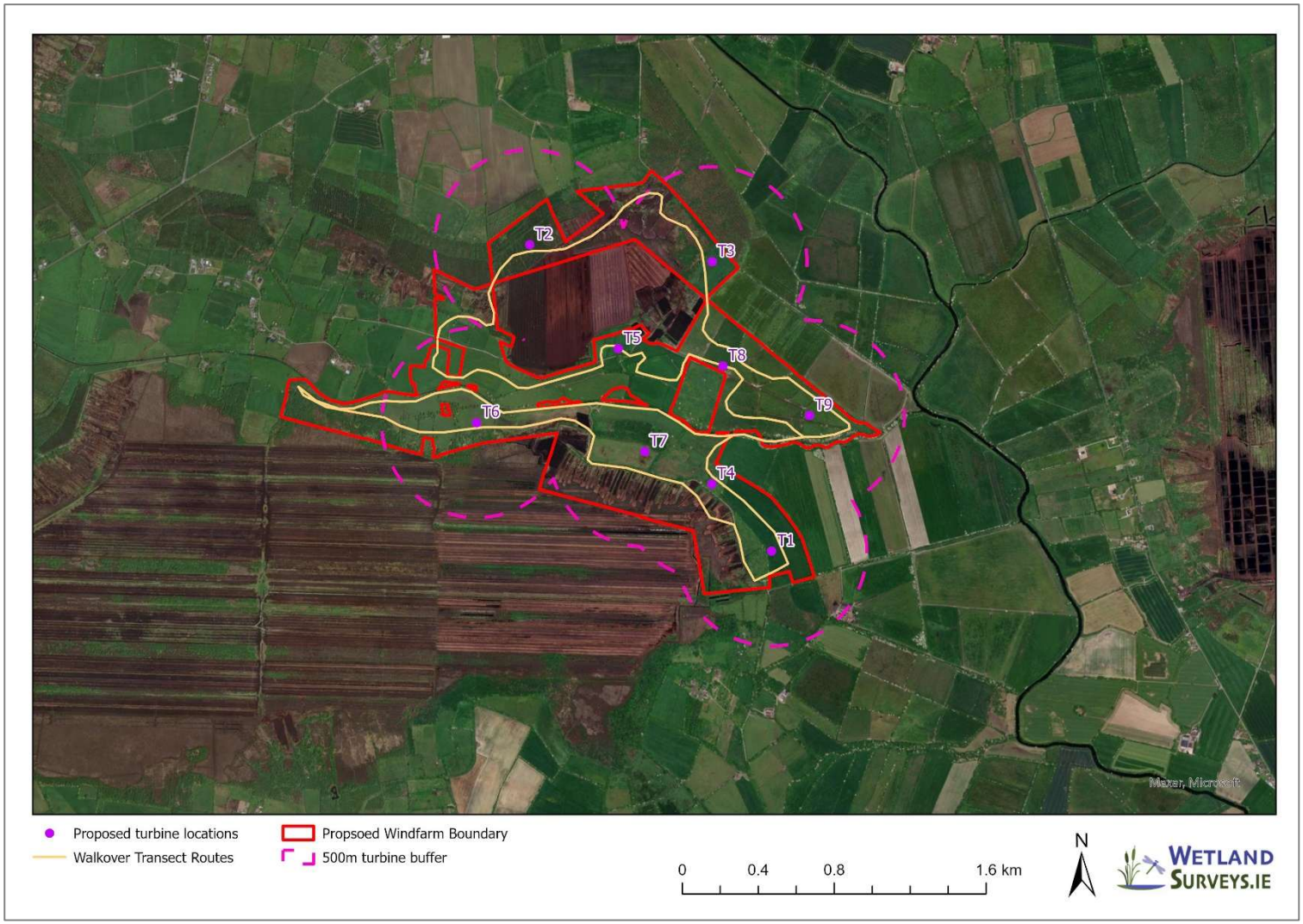

Figure 10-7 Walkover transect routes at the proposed Derrynadarragh Wind Farm site in Winter 2022 – 2023 and Summer 2023.

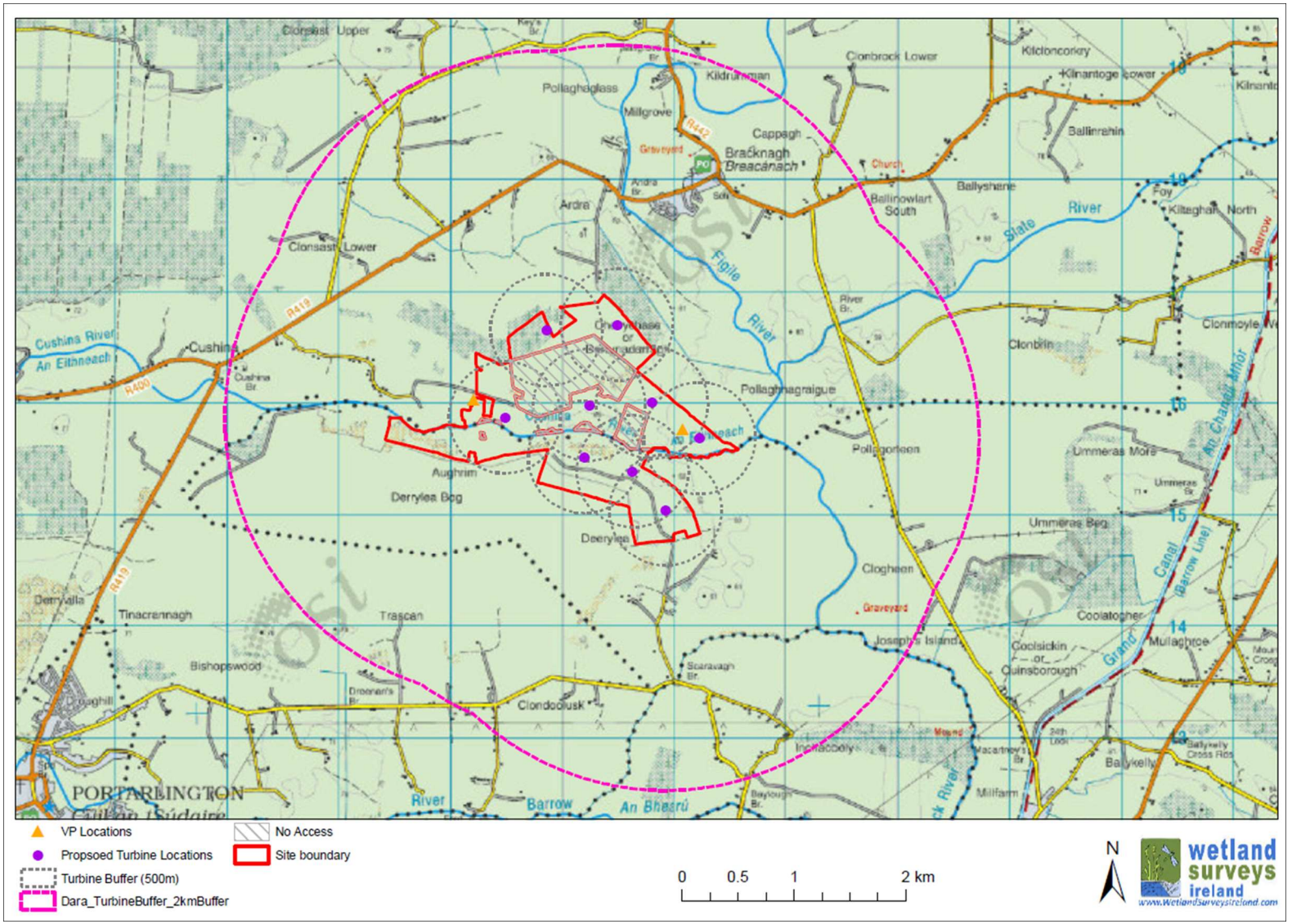

Figure 10-8: Study area showing 2km buffer around Wind Farm Site that was subject to breeding raptor surveys and breeding wader surveys.

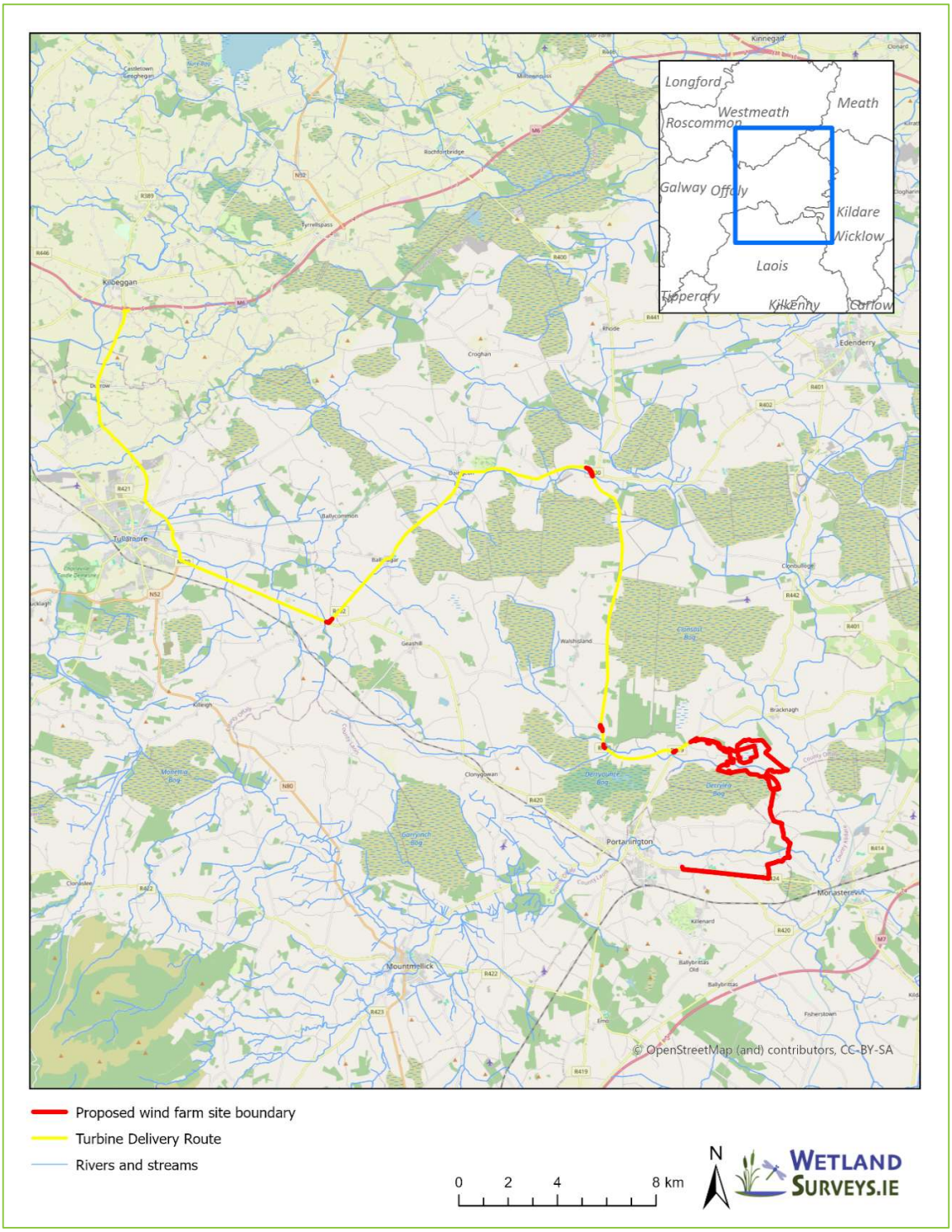

Figure 10-9: Map showing the Turbine Delivery Route and Underground Grid Connection (to south of main Wind Farm Site).

10.2.5 Evaluation and Impact Assessment Methodology

The ecological evaluation and impact assessment approach used in this report is based on "Guidelines on the information to be contained in Environmental Impact Assessment Reports" (EPA, 2022) and "Guidelines for Ecological Impact Assessment in the UK and Ireland" (CIEEM, 2018) (henceforth referred to as the CIEEM guidelines).

For the purposes of this assessment, in accordance with CIEEM guidelines, a 'significant effect' is an effect that either supports or undermines conservation objectives for VORs. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy). Effects can be considered significant at a wide range of scales from local to international. For example, a significant effect on a regionally important population of a species is likely to be of regional significance.

Wind farm development is known to potentially give rise to three impacts to birds:

- **Habitat loss.** Direct habitat effects are changes that are directly attributable to a defined action, e.g. the physical loss of habitat occupied by a bird species during the construction process. Indirect ecological effects are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process or receptor, e.g. the creation of roads which cause hydrological changes, which, in the absence of mitigation, could lead to the drying out of wetland habitats used by important bird species. The resultant habitat alteration may represent a loss of habitat to dependant bird species.
- **Displacement due to disturbance.** Disturbance effects have been assessed with reference to the relevant literature (e.g. Ruddock and Whitfield 2007, Drewitt and Langston, 2006; Hötker et al., 2006; Pearce-Higgins et al., 2009), and the literature has also been used to recommend appropriate disturbance-free buffer zones considered likely to be required to help prevent nest failure due to disturbance during construction and operation.
- **Collision of birds with turbine structures.** The standard Band Collision Risk Model (CRM) (Band et al. 2007, update 2024) was used to estimate collision risk based on recorded target species activity levels and flight behaviour, proposed turbine numbers and specifications, and the relevant species biometrics and flight characteristics. Modelling collision risk under the Band CRM is a two-stage process. Stage 1 estimates the number of birds that fly through the rotor swept area. Stage 2 predicts the proportion of these birds that have the potential to be hit by a rotor blade. Combining both stages produces an estimate of collision mortality in the absence of any avoidance action/behaviour by birds. Avoidance rates are then applied to generate predicted rates of collision mortality. Further details of the CRM methodology are provided in Technical Appendix 10-5.

Information on bird usage of the site gathered primarily by extensive onsite field surveys is used as the basis to predict the effects of the proposed wind farm development on birds during each phase of the development taking account of the characteristics of the Proposed Development.

10.2.5.1 Site Evaluation

To standardise the assessment of ecological value, this report follows the geographical framework advocated by CIEEM (2018). A suitable approach proposed by the NRA (2009) has been adopted in this assessment. This framework categorises sites based on their designated status and inherent ecological importance at international, national, regional, and local scales.

The categories used in this assessment are:

- **International Importance:** Sites designated as part of the Natura 2000 network (Special Areas of Conservation or Special Protection Areas) or which support habitats/species populations of international significance.
- **National Importance:** Sites designated as Natural Heritage Areas or deemed to be important for the conservation of species / habitats at the national level.
- **County Importance:** May include non-statutory sites identified by the Local Authority or support habitats or species that are rare or declining at the county scale. In relation to birds, these sites may support populations that are rare or declining at the county scale.
- **Local Importance (Higher Value):** This category captures sites that are valuable within a more immediate local area but do not meet county or national criteria. In relation to birds, these sites may be used for breeding by common but declining birds.
- **Local Importance (Lower Value):** Sites supporting common, widespread habitats and species whose ecological significance is confined to the immediate local context.

This tiered approach ensures a consistent and transparent evaluation of potential impacts on nature conservation receptors.

10.2.5.2 Evaluation Of Ornithological Receptors and Impact Assessment

The methodology for assessing the sensitivity of bird species to wind farm development, along with the subsequent assessment of effect magnitude and significance, follows Percival (2003). The criteria for each stage of the assessment is set out in Table 10-3, Table 10-4, and

Table 10-5 below.

While the assessment of effects are in the first instance identified following Percival (2003) as it is adapted specifically for use on effects on birds, the effects are also described according the EPA (2022) terminology and criteria as set out in Table 10-7 to standardise approach with other disciplines.

Table 10-3 Evaluation of Sensitivity for Birds (Percival 2003)

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

Table 10-4: Determination of Magnitude of Effects (Percival 2003)

Sensitivity	Description
Very High	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. Guide: < 20% of population / habitat remains.
High	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. Guide: 20-80% of population/ habitat lost.
Medium	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. Guide: 5-20% of population/ habitat lost.
Low	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. Guide: 1-5% of population/ habitat lost.
Negligible	Very slight change from baseline condition. Change barely distinguishable, approximating to the "no change" situation. Guide: < 1% population/ habitat lost.

Table 10-5: Significance matrix: combining magnitude and sensitivity to assess significance (Percival 2003)

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

Table 10-6: EPA Criteria and means of describing different effects (EPA 2022)

Quality or type of effect	
Positive Effects	A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative / Adverse Effects	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).
Describing the Significance of Effects	
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.
The Extent and Context of Effects	
Extent	Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Probability / Likelihood of Effects	
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Duration and Frequency of Effect	
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, or constantly, hourly, daily, weekly, monthly, annually).

10.2.5.3 Potential Cumulative Effects

Cumulative effects result from effects arising from two or more developments and/or from different elements of the same project. The approach to assessing cumulative effects follows methods outlined by SNH (2018) which considers the additive model of effects.

Cumulative effects have been assessed for all species for which detailed assessment has been undertaken in this EIA Report for which potential negative effects are likely. The potential for cumulative effects with other wind farms due to disturbance and collision mortality has been assessed. The cumulative assessment is based on consideration of residual effects, i.e. assuming that proposed mitigation measures for other wind farm projects are implemented.

With regard to the spatial extent of the cumulative assessment, current SNH (2018) guidance indicates that the default approach should be to assess cumulative effects at the Natural Heritage Zone (NHZ) scale, unless there is a reasonable alternative. As there are no NHZs in Ireland, the approach used is based on a 20km search distance recommended by IWEA (2012).

The significance of potential cumulative effects has been determined using the same method adopted in the assessment of effects for the Proposed Development considered on its own. Cumulative effects are therefore considered significant if they undermine conservation objectives for important ornithological receptors. Cumulative effects can be considered significant at a wide range of scales from local to international. For example, a significant cumulative effect on a regional population of a species is likely to be of regional significance.

10.2.5.4 Survey Limitations

The information provided in this EIAR chapter accurately and comprehensively describes the baseline environment against which effects were assessed. The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines.

No significant limitations were encountered. However, there was a minor limitation in the use of only two VPs for the first winter season. A third VP (VP3) was introduced in April 2022 to ensure adequate coverage of the southern part of the site following feedback from surveyors once an early draft of the proposed layout was available. The area of the wind farm and 500m turbine buffers covered by VP3 largely overlaps with the viewsheds of VP 1 and VP2 particularly at the Potential Collision Height which is greater than 25m and therefore this limitation is not deemed significant.

The site is lowing with hedgerow and trees common features along field boundaries in some parts of the site presented a difficulty in viewing lower parts of the site in places. However, this did not obstruct views at Potential Collision Height (25m to 185m). presented difficulties of viewing lower part of the site that obstructed from view. The extensive coverage by walkover surveys regularly ensured that all lower parts of the site were adequately surveyed to determine the baseline ornithological interest of the entire site.

10.3 Baseline Conditions

A desktop review was conducted to determine the likely bird interest of the site and the surrounding landscape based on known ecological sites and bird species distribution. The desktop review included a review of sites designated for nature conservation, non-designated bird sites, and a review of bird atlas records as held by the National Biodiversity Data Centre. In addition, extensive site specific records from surveys undertaken at the site between 2017 and 2019 were reviewed and informed the determination of Target Species and Valued Ornithological Receptors.

10.3.1 Designated Sites

Statutory designated sites designated for their ornithological interest (i.e. SPAs, NHAs and pNHAs) are shown in Figure 10-10. A brief description of each site designated in full or in part for its ornithological interest, within 15 km of the site, is provided in Table 10-7 (other designated sites are considered in **Chapter 9: Biodiversity (Flora and Fauna)**.

The review of Special Protection Areas (SPAs) in proximity to the proposed Wind Farm site revealed that there are no SPAs within 15km of the proposed Wind Farm site (Figure 10-10).

NatureScot guidance (SNH, 2016) recommends that the core foraging range should be used when determining whether there is potential connectivity between a Special Conservation Interest (SCI) of an SPA. The determination of potential connectivity between the proposed Wind Farm site and SPAs considered the habitats that occur at the Proposed Wind Farm Site and their suitability in terms of the ecological requirements of different species. As the closest SPA to the proposed Wind Farm site is 19.6km away and the SCI species (Hen Harrier) has a maximum of 10km foraging range in the breeding season (SNH, 2016), it is determined that there is no connectivity between the proposed Wind Farm and the SPA. However, as hen harrier disperse from their upland breeding sites to lowland areas during winter there is a possibility for birds associated with SPAs interacting with the Wind Farm Site during winter. Other SPAs are sufficiently removed that they lie outside of the core foraging ranges of their Special Conservation Interests (SCIs).

There are no sites designated as Wetlands of International Importance under the Ramsar Convention within 15km of the proposed Wind Farm site. The closest Ramsar site to the proposed Wind Farm site is Pollardstown Fen (RAMSAR Site 474, NPWS Site Code 000396), which is located approximately 16km to the east of the proposed Wind Farm site.

The Important Bird and Biodiversity Areas (IBAs) Programme which is overseen by Birdlife international has identified areas throughout the world that can be considered of greatest importance to bird populations. There are no IBA sites within 15km of the proposed Wind Farm site, and the closest IBA is Wicklow Mountains, which is located over 40km to the east.

Legal backing for the protection of candidate SPAs and SACs in Ireland is provided by the EU Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC; commonly known as the 'Habitats Directive') which has been transposed into Irish Law through the enacted European Communities (Birds and Natural Habitats) Regulations 2011 (SI 411/11). A Stage 2 Appropriate Assessment Report (Natura Impact Statement, NIS) was prepared in order to determine the potential for effects on Natura 2000 sites in the surroundings. This assessment concludes that the Proposed Development will not adversely affect the integrity and conservation status of the network of Natura 2000 sites.

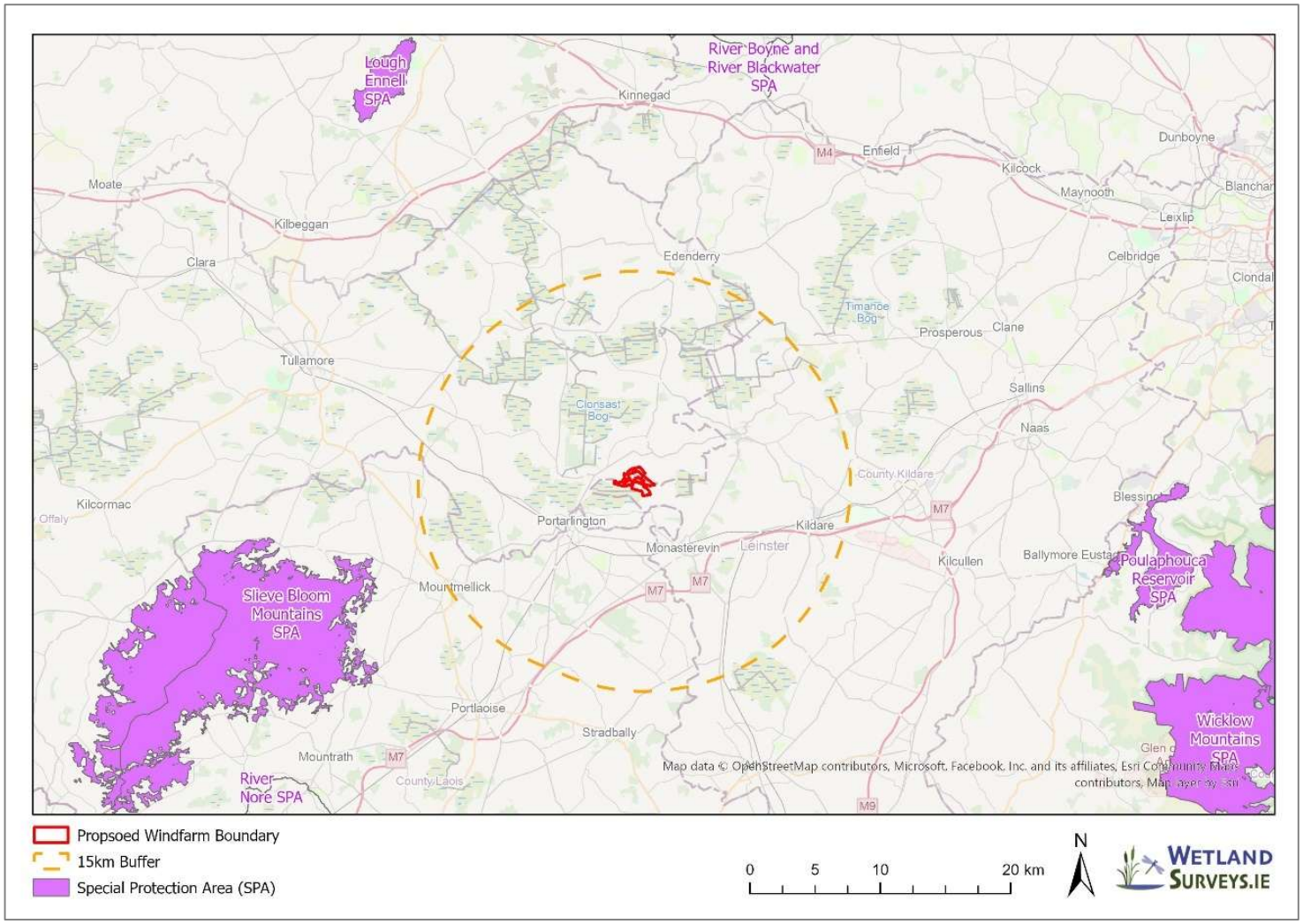

Figure 10-10 Location of Special Protection Areas in relation to the proposed Derrynadarragh Wind Farm site.

Table 10-7 Designated sites within 15km of the study area (Source: www.npws.ie 2025)

Site Name	Site Code	Site Description	Distance and direction from Proposed Wind Farm Site	Determination of connectivity and Likely Zone of Impact
Raheen Lough pNHA	000917	The main interest of this lake is in the variety and numbers of wildfowl and waders it attracts, particularly as open water bodies are infrequent in this area. The open water and the adjacent level wet pasture are much used by feeding birds. Birds that use the site include Whooper Swans, diving ducks such as Pochard and Goldeneye, waders such as Greenshank, Jack Snipe and Purple Sandpipers.	This pNHA lies approx. 10km to the west of the Site at its nearest point.	Whooper Swans are a wintering species in Ireland and their core foraging range from night roosts during the winter is, according to NatureScot (SNH, 2016), less than 5km. This pNHA is therefore NOT considered to be connected to or within the Likely Zone of Impact of the Proposed Development and no further assessment is required.

10.3.1 Non-designated sites

Other known sites of bird interest in the surroundings include those sites that are surveyed as part of the Irish Wetland Bird Survey (IWeBS). Many IWeBS sites do not occur within designated areas and therefore are not afforded formal protection, those IWeBS sites occurring within 5km of the proposed wind farm are presented in Table 10-8 below.

Table 10-8: List of IWeBS Sites within 5km of the Proposed Wind Farm Site.

IWEBS Site	Subsite	Location relevant to Wind Farm Site	Site details[1]
River Barrow (Monasterevin-Portarlington) [IWEBS Site Code OS 301]	Derrylea North of Monasterevin [Sub-site Code: OS 310] Grid Ref. N6120013800	1.5km southeast	Mix of arable and lowland pasture on the floodplain of the River Figile. Peak counts [1995/96]: Whooper swan (100), Mute Swan (4), Lapwing (130)
	Derrylea/Inchacooly [Sub-site Code: OS 310] Grid Ref. N6120013500	1.7km southeast	Mix of arable and lowland pasture on the floodplain of the River Figile.

[1] *Data were supplied by the Irish Wetland Bird Survey (I-WeBS), a scheme coordinated by BirdWatch Ireland under contract to the National Parks and Wildlife Service of the Department of Housing, Local Government and Heritage*

IWEBS Site	Subsite	Location relevant to Wind Farm Site	Site details[1]
			Peak counts [1999/98]: Whooper swan (89), Mute Swan (2), Greylag Goose (resident) (2)
	River Barrow (Monasterevin-Portarlington) Grid Ref. N6100013000	2km southeast	Mix of arable and lowland pasture on the floodplain of the River Figile. Peak counts [1995/96]: Whooper swan (60), Mute Swan (25)
	Quinsborough [Sub-site Code: OS 399] Grid Ref. N6240013000	3km south-east	Mix of arable and lowland pasture on the floodplain of the River Figile. Peak counts [2009/10]: Curlew (47)

10.3.2 BirdWatch Ireland Bird Sensitivity Tool

The wind energy development site falls entirely within a 'low sensitivity' zone as defined by the Bird Sensitivity Mapping Tool (McGuiness et al., 2015). This tool, developed by BirdWatch Ireland, provides a spatially explicit assessment of potential sensitivity of protected birds to wind energy projects, based on a review of species-specific behavioural, ecological, and distributional criteria.

10.3.3 Local bird species records

Bird records held by the NBDC for the 10km grid square (N51) within which the proposed Wind Farm site occurs were reviewed and are presented in Table 10-9 In addition, records from the adjacent grid square (N62) are also included due to its proximity to the wind farm location. These records are a helpful guide but should not be considered as a comprehensive list of bird species occurring in the area as it is possible that some species are under recorded.

Table 10-9: Bird species recorded within NBDC 10km grid square (N51) within which the proposed wind farm occurs.

Species name	Grid Square	Date of last record	Title of dataset	Conservation status
Barn Owl	N51, N61	29/02/1984	The First Atlas of Wintering Birds in Britain and Ireland: 1981/82-1983/84.	BoCCI 4 Red List
Blackbird	N51, N61	08/05/2024	Birds of Ireland	BoCCI 4 Green List
Blackcap	N51, N61	19/04/2019	Birds of Ireland	BoCCI 4 Green List
Black-headed Gull	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Amber List
Blue Tit	N51, N61	08/05/2024	Birds of Ireland	BoCCI 4 Green List
Brambling	N61	06/12/2021	Birds of Ireland	BoCCI 4 Amber List
Bullfinch	N51, N61	27/12/2020	Birds of Ireland	BoCCI 4 Green List
Buzzard	N51, N61	26/08/2024	Birds of Ireland	BoCCI 4 Green List
Chaffinch	N51, N61	08/05/2024	Birds of Ireland	BoCCI 4 Green List
Chiffchaff	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List
Coal Tit	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List
Collared Dove	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List
Common Gull	N61	29/02/1984	The First Atlas of Wintering Birds in Britain and Ireland: 1981/82-1983/84.	BoCCI 4 Amber List
Common Sandpiper	N51	31/07/1972	The First Atlas of Breeding Birds in Britain and Ireland: 1968-1972.	BoCCI 4 Amber List
Coot	N51	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List
Cormorant	N51, N61	02/03/2022	Birds of Ireland	BoCCI 4 Amber List
Corn Bunting	N61	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Extinct
Corncrake	N51, N61	31/07/1972	The First Atlas of Breeding Birds in Britain and Ireland: 1968-1972.	BoCCI 4 Red List, Annex I EU Birds Directive
Crossbill	N51	07/07/2021	Birds of Ireland	BoCCI 4 Green List
Cuckoo	N51, N61	04/05/2022	Birds of Ireland	BoCCI 4 Green List
Curlew	N51, N61	31/12/2001	Irish Wetland Birds Survey (I-WeBS) 1994-2001.	BoCCI 4 Red List
Dipper	N51, N61	28/02/2014	Birds of Ireland	BoCCI 4 Green List
Dunlin	N61	29/02/1984	The First Atlas of Wintering Birds in Britain and Ireland: 1981/82-1983/84.	BoCCI 4 Red List
Dunnock	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List
Fieldfare	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List

Species name	Grid Square	Date of last record	Title of dataset	Conservation status
Goldcrest	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Amber List
Golden Plover	N51, N61	17/12/2019	Birds of Ireland	BoCCI 4 Red List; Annex I EU Birds Directive
Goldfinch	N51, N61	27/12/2020	Birds of Ireland	BoCCI 4 Green List
Grasshopper Warbler	N51, N61	24/04/2023	Birds of Ireland	BoCCI 4 Green List
Great Spotted Woodpecker	N51, N61	27/01/2023	Birds of Ireland	BoCCI 4 Green List
Great Tit	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List
Green Sandpiper	N61	21/01/2021	Birds of Ireland	BoCCI 4 Green List
Greenfinch	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Amber List
Grey Heron	N51, N61	08/05/2024	Birds of Ireland	BoCCI 4 Green List
Grey Partridge	N51	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	BoCCI 4 Red List
Grey Wagtail	N51, N61	23/09/2022	Birds of Ireland	BoCCI 4 Red List
Greylag Goose	N61	10/10/2021	Birds of Ireland	BoCCI 4 Amber List
Hen Harrier	N51, N61	29/02/1984	The First Atlas of Wintering Birds in Britain and Ireland: 1981/82-1983/84.	BoCCI 4 Amber List, Annex I EU Birds Directive
Herring Gull	N61	29/11/2022	Birds of Ireland	BoCCI 4 Amber List
Hooded Crow	N51, N61	19/04/2019	Birds of Ireland	BoCCI 4 Green List
House Martin	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Amber List
House Sparrow	N51, N61	08/05/2024	Birds of Ireland	BoCCI 4 Amber List
Jack Snipe	N51	31/12/2001	Irish Wetland Birds Survey (I-WeBS) 1994-2001.	BoCCI 4 Green List
Jackdaw	N51, N61	08/05/2024	Birds of Ireland	BoCCI 4 Green List
Jay	N51, N61	08/08/2020	Birds of Ireland	BoCCI 4 Green List
Kestrel	N51, N61	21/03/2022	Birds of Ireland	BoCCI 4 Red List
Kingfisher	N51, N61	31/08/2023	Birds of Ireland	BoCCI 4 Amber List; Annex I EU Birds Directive
Lapwing	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Red List
Lesser Black-backed Gull	N61	29/11/2022	Birds of Ireland	BoCCI 4 Amber List
Lesser Redpoll	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List

Species name	Grid Square	Date of last record	Title of dataset	Conservation status
Linnet	N51, N61	27/12/2020	Birds of Ireland	BoCCI 4 Amber List
Little Egret	N51, N61	02/03/2022	Birds of Ireland	BoCCI 4 Green List
Little Grebe	N51, N61	07/07/2021	Birds of Ireland	BoCCI 4 Green List
Long-eared Owl	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List
Long-tailed Tit	N51, N61	15/09/2016	Birds of Ireland	BoCCI 4 Green List
Magpie	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List
Mallard	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Amber List
Meadow Pipit	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Red List
Merlin	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Amber List; Annex I EU Birds Directive
Mistle Thrush	N51, N61	19/04/2019	Birds of Ireland	BoCCI 4 Green List
Moorhen	N51, N61	07/07/2021	Birds of Ireland	BoCCI 4 Green List
Mute Swan	N51, N61	07/07/2021	Birds of Ireland	BoCCI 4 Amber List
Peregrine	N51, N61	22/06/2017	Birds of Ireland	Annex I EU Birds Directive
Pheasant	N51, N61	19/04/2019	Birds of Ireland	BoCCI 4 Green List
Pied Wagtail	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List
Purple Sandpiper	N51	31/12/2001	Irish Wetland Birds Survey (I-WeBS) 1994-2001.	BoCCI 4 Red List
Raven	N51, N61	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	BoCCI 4 Green List
Red Grouse	N51	29/02/1984	The First Atlas of Wintering Birds in Britain and Ireland: 1981/82-1983/84.	BoCCI 4 Red List
Redshank	N51	31/12/2001	Irish Wetland Birds Survey (I-WeBS) 1994-2001.	BoCCI 4 Red List
Redwing	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Red List
Reed Bunting	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List
Robin	N51, N61	08/05/2024	Birds of Ireland	BoCCI 4 Green List
Rock Dove	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List
Rook	N51, N61	08/05/2024	Birds of Ireland	BoCCI 4 Green List
Ruddy Shelduck	N51	31/12/1892	Rare birds of Ireland	BoCCI 4 Green List

Species name	Grid Square	Date of last record	Title of dataset	Conservation status
Sand Martin	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Amber List
Sedge Warbler	N51, N61	08/05/2024	Birds of Ireland	BoCCI 4 Green List
Short-eared Owl	N61	13/03/2021	Birds of Ireland	BoCCI 4 Amber List; Annex I EU Birds Directive
Siskin	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List
Skylark	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Amber List
Snipe	N51, N61	02/03/2022	Birds of Ireland	BoCCI 4 Red List
Song Thrush	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List
Sparrowhawk	N51, N61	02/03/2022	Birds of Ireland	BoCCI 4 Green List
Spotted Crake	N51	31/12/1834	Rare birds of Ireland	BoCCI 4 Amber List; Annex I EU Birds Directive
Spotted Flycatcher	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Amber List
Starling	N51, N61	08/05/2024	Birds of Ireland	BoCCI 4 Amber List
Stock Dove	N51, N61	31/07/1972	The First Atlas of Breeding Birds in Britain and Ireland: 1968-1972.	BoCCI 4 Red List
Stonechat	N51, N61	02/03/2022	Birds of Ireland	BoCCI 4 Green List
Swallow	N51, N61	08/05/2024	Birds of Ireland	BoCCI 4 Amber List
Swift	N51, N61	26/05/2024	Swifts of Ireland	BoCCI 4 Red List
Teal	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Amber List
Tree Sparrow	N61	17/07/2024	Birds of Ireland	BoCCI 4 Amber List
Treecreeper	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List
Tufted Duck	N51	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Red List
Tundra Swan	N51	29/02/1984	The First Atlas of Wintering Birds in Britain and Ireland: 1981/82-1983/84.	BoCCI 4 Green List
Tundra Swan	N61	29/02/1984	The First Atlas of Wintering Birds in Britain and Ireland: 1981/82-1983/84.	na
Water Rail	N51	07/07/2021	Birds of Ireland	BoCCI 4 Green List
Wheatear	N61	20/04/2021	Birds of Ireland	BoCCI 4 Amber List
Whinchat	N51, N61	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	BoCCI 4 Red List
Whitethroat	N51, N61	07/07/2021	Birds of Ireland	BoCCI 4 Green List
Whooper Swan	N51, N61	21/12/2019	Birds of Ireland	BoCCI 4 Amber List; Annex I EU Birds Directive

Species name	Grid Square	Date of last record	Title of dataset	Conservation status
Willow Warbler	N51, N61	31/03/2022	Birds of Ireland	BoCCI 4 Amber List
Woodcock	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Red List
Woodpigeon	N51, N61	31/12/2011	Bird Atlas 2007 - 2011	BoCCI 4 Green List
Wren	N51, N61	08/05/2024	Birds of Ireland	BoCCI 4 Green List
Yellowhammer	N51, N61	05/08/2019	Birds of Ireland	BoCCI 4 Red List

10.3.3.1 Supplementary data

As described in Section10.2.4.9 above, previous surveys were undertaken at the Wind Farm Site for a period of 24 months, from April 2017 to March 2019. These surveys provide a comprehensive site-specific dataset of bird records through two complete breeding and winter seasons. A summary of the observations made during this survey relevant to target species follows:

Black-headed Gull

Black-headed gull were observed on two occasions (a single bird and a flock of 40 individuals) between April 2017 and March 2019. Both observations were of commuting birds in proximity to the Wind Farm Site.

Buzzard

Buzzard were on 334 occasions between April 2017 and March 2019. Majority of observations were of single individuals, with up to three birds recorded on a few occasions. Birds were recorded commuting, hunting and soaring within and surrounding the site. The species was recorded throughout both the breeding and non-breeding seasons. A single pair likely to have bred in proximity to the site during the survey period (2017-2019).

Cormorant

Cormorant were observed flying over the site on two occasions.

Curlew

No observations of Curlew were made within the site throughout the survey period (April 2017- March 2019). Curlew were heard calling on two occasions during the breeding wader survey undertaken off-site to the east during Apr and May 2018, suggesting possible breeding nearby.

Kestrel

Kestrel were recorded on 60 occasions. All observations were of single birds, partaking in hunting or commuting. The species was recorded during both breeding and non-breeding seasons.

Snipe

A single Snipe was recorded across the survey period. Snipe were flushed from grassland area during off-site breeding wader surveys to the east of the site.

Lapwing

Lapwing were observed flying over the site on eight occasions. All observations were of flocks flying through the area during winter. Flock size ranged from 32 to 250 birds. Lapwing were also recorded during waterbird counts to the east of the site, foraging on improved grassland and stubble ground with a peak count of 60 birds during December 2017. Breeding bird surveys off-site to the east recorded a probable breeding pair during both breeding seasons amongst grassland habitat.

Sparrowhawk

Sparrowhawk were recorded on 25 occasions. Most observations were of single birds, partaking in hunting or commuting. The species was recorded during both the breeding and non-breeding seasons.

Golden Plover

Golden Plover were observed on fourteen occasions across the winter non-breeding season. Most observations were of birds flying in flocks. Maximum flock size recorded was ca 1,500 individuals circling to the east of site during February 2018.

Grey Heron

Grey Heron were observed on 19 occasions across the survey period. Most observations were of single birds flying in proximity to the Cushina River.

Lesser back-backed Gull

Lesser Black-baked Gull were observed on nine occasions, flying in small flocks of up to fourteen individuals.

Mallard

Mallard were observed on ten occasions, usually in small groups of up to 10 individuals. All observations were of flying birds in proximity to the Cushina River.

Merlin

Merlin were observed on four occasions. All observations were of single birds hunting within the site during the non-breeding winter season

Mute Swans

Mute Swan were observed on three occasions. All observations were of single birds flying through the site. Mute Swan were also recorded in low numbers during waterbird counts off-site to the east, foraging on improved grassland.

Peregrine

Peregrine were observed on three occasions. All observations were of single birds hunting within the site during the non-breeding winter season. Birds were recorded commuting and hunting.

Whooper Swan

Whooper Swan were observed on six occasions. All observations were of flocks ranging in size from 4 to 32 individuals flying through / nearby the site. The species were not recorded foraging or roosting within the site. Whooper Swan were recorded off-site during waterbird counts to the south-east of the site foraging on stubble and improved grasslands. Peak Flock size was 90 individuals was recorded during December 2017.

Woodcock

Woodcock were observed amongst conifer planation and cutover bog during targeted nocturnal surveys through the breeding season 2017 and 2018. Birds were recorded flying and partaking in Roding behaviour. Estimated that a single pair breed amongst suitable habitat within the site.

10.3.4 Field Survey Results

A comprehensive list of all bird species recorded during field surveys is provided in Appendix 7-1. Target bird species recorded within the zone of influence of the Wind Farm Site during the field surveys of the site undertaken from October 2021 to September 2023 are listed in Table 10-10 below. The conservation significance and an indication of the survey type(s) during which the species were observed is also presented.

The following sections describe the observations of each target species under the survey headings. Summary survey data for each survey type are presented in Appendix 7-3. The full dataset of species observations for each survey method and associated maps are presented in Appendix 7-4.

Table 10-10: List of target species recorded during field surveys.

Species	Survey Method	Conservation significance
Buzzard (*Buteo buteo*)	Breeding Walkover, Winter Walkover, Breeding Raptor, Vantage Point Survey	BoCCI Green List
Curlew (*Numenius arquata*)	Breeding Walkover, Vantage Point Survey, Breeding Wader Survey	BoCCI Red List
Golden Plover (*Pluvialis apricaria*)	Breeding Walkover, Winter Walkover, Vantage Point Survey	BoCCI Red List; Annex I EU Birds Directive
Grey Heron (*Ardea cinerea*)	Breeding Walkover, Winter Walkover	BoCCI Green List
Grey Wagtail (*Motacilla cinerea*)	Breeding Walkover, Winter Walkover	BoCCI Red List
Hen Harrier (*Circus cyaneus*)	Vantage Point Survey	Annex I EU Birds Directive (BoCCI Amber List)
Kestrel (*Falco tinnunculus*)	Breeding Walkover, Winter Walkover, Breeding Raptor, Vantage Point Survey	BoCCI Red List
Kingfisher (*Alcedo atthis*)	Winter Walkover	Annex I EU Birds Directive (BoCCI Amber List)
Lapwing (*Vanellus vanellus*)	Breeding Walkover, Vantage Point Survey	BoCCI Red List
Mallard (*Anas platyrhynchos*)	Breeding Walkover, Winter Walkover, Vantage Point Survey	BoCCI Amber List
Meadow Pipit (*Anthus pratensis*)	Breeding Walkover, Winter Walkover	BoCCI Red List

Merlin (*Falco columbarius*)	Vantage Point Survey	Annex I EU Birds Directive (BoCCI Amber List)
Peregrine Falcon (*Falco peregrinus*)	Vantage Point Survey	Annex I EU Birds Directive (BoCCI Green List)
Redwing (*Turdus iliacus*)	Winter Walkover	BoCCI Red List
Snipe (*Gallinago gallinago*)	Breeding Walkover, Winter Walkover, Vantage Point Survey	BoCCI Red List
Sparrowhawk (*Accipiter nisus*)	Breeding Walkover, Winter Walkover, Breeding Raptor, Vantage Point Survey	BoCCI Green List
Swift (*Apus apus*)	Breeding Walkover	BoCCI Red List
Whooper Swan (*Cygnus cygnus*)	Vantage Point Survey	Annex I EU Birds Directive (BoCCI Amber List)
Woodcock (*Scolopax rusticola*)	Winter Walkover, Nocturnal Woodcock, Vantage Point Survey	BoCCI Red List
Yellowhammer (*Emberiza citrinella*)	Breeding Walkover, Winter Walkover	BoCCI Red List

10.3.4.1 Buzzard

Vantage Point Survey

Buzzard (*Buteo buteo*), a Green Listed raptor species (Gilbert *et al*. 2021) was recorded on 139 occasions over the two-year survey period and were present throughout the year. It was the most frequently recorded bird species, accounting for just over half of the flightlines recorded over the entire two-year period.

Typically flightline records related to a single bird, with a maximum of three birds recorded for any one observation. Buzzard flightlines were recorded throughout the proposed Wind Farm site and were not concentrated in any one particular area. Buzzard were typically recorded to be commuting or foraging/hunting / soaring. Numerous observations indicating breeding close by the site, during both breeding seasons (2022 and 2023) juvenile birds were recorded, with the nest most likely occurring in the nearby forestry, within 500m of T01.

Winter Walkover

Buzzard were observed on nine occasions. A single individual was recorded on each observation and the activity included soaring, travelling, hunting and perching. Records are evenly spread throughout the winter seasons.

Breeding Walkover

Buzzard were observed on nine occasions. Observations were all of one or two individuals and the activity included soaring, travelling, hunting and perching. The birds were observed in various locations throughout the site. Tow observations of related to a juvenile bird.

Breeding Raptor

Based on the outcome of observations across the two years it is concluded that a pair have nested and successfully fledged a juvenile in both seasons. The nest site has been identified as being approximately 500m from T01 in an area of conifer woodland.

10.3.4.2 Curlew

Vantage Point Survey

Curlew (Numenius arquata) were recorded on two occasions during the survey period, both during the breeding 2022 season (April and May 2022). Each flightline recorded an individual bird. Both flightlines were recorded in the central part of the proposed Wind Farm site. Curlew were not recorded from the site or surroundings during either winter season.

Breeding Walkover

A possible pair of curlew were heard to the east of the site from potential breeding grounds in June 2023. No other records of curlew during the walkover surveys.

Breeding Wader Survey

During the 2022 survey of potential breeding habitat three individuals were observed in flight in the latter half of May while an individual adult female was observed foraging at the end of May. No observations were made during the final visit in early June 2022.

During the 2025 survey an adult male and adult female Curlew were observed foraging within suitable breeding habitat on 20 April 2025. Remote acoustic monitoring was deployed at the site following the April visit. Calls noted each day until the 7th May, when the last call was recorded. Pair presumed to have failed breeding and dispersed site after this date. No Curlew were observed during the final site visit in mid-June.

10.3.4.3 Golden Plover

Vantage Point Survey

Golden Plover (*Pluvialis apricaria*), a Red Listed species (Gilbert *et al.* 2021) also listed on Annex I of the EU Birds Directive, were recorded on 34 occasions over the survey period. All observations were from the winter period (September to April). All observations related to flocks, with flock size ranging from 4 individuals to an estimate of 4,000 birds in a single flock observed during October 2022. In all, an estimated 15,358 bird flights were recorded. The range of flock sizes is as follows:

- Fifteen observations related to flocks of between 4 and 100 birds.
- Fourteen observations related to flocks of between 100 and five hundred birds.
- Five observations related to flocks of more than 1,000 birds

The larger flocks were recorded during the Autumn period in both years with October 2022 accounting for 12,900 bird flights (84% of all flights), while November 2023 accounted for 1,000 bird flights (7% of all flights) meaning that only 9% of bird flights occurred outside of these two months. Golden Plover were not observed utilising the habitats within the site for feeding or roosting. They were generally concentrated in lands to the east and southeast of the Wind Farm Site in proximity to the River Figile. An off-site observation of ca 8,000 birds was made on 25th October 2022 from this area where birds were seen circling and dropping (assumed foraging) throughout much of the day.

Based on the occurrence of the large numbers of birds during the migration period it is likely that the birds may on occasion use the lands nearby the Wind Farm Site as a staging area. The regularly observed circling flight behaviour is typical. Based on observed flight times and behaviour it is likely that the birds roost in proximity to the Derryounce lakes 4km WSW of site.

Winter Walkover

Four observations of Golden Plover were made during winter walkover surveys. All of these records were of birds flying over the site. Two records were of flocks estimated to include 1,500 birds and 200 birds respectively. Both observations were made on the 31st of October 2022 and are likely to be the same flock as recorded during VP watches in late October 2022.

Breeding Walkover

A single observation of Golden Plover was made during the breeding walkover surveys from September 2023. It comprised a flock of 20 individuals flying over the site. The autumn migration period for Golden Plover is typically September to November, and this record therefore relates to wintering birds.

10.3.4.4 Grey Heron

There were no records of Grey Heron during Vantage Point Surveys.

Winter Walkover

Two observations of a single individual each time. One was flushed (February 2022) from the Cushina River that passes through the Wind Farm Site. The other observation (March 2022) was of an individual foraging within improved grassland.

Breeding Walkover

Two observations of a single individual each time. One was flushed from the Cushina River while the other was of an individual flying through the site. No evidence of breeding within the site.

10.3.4.5 Grey Wagtail

There were no records of Grey Wagtail during Vantage Point Surveys.

Winter Walkover

Two observations of a single individual on a single visit occurring in proximity to the Cushina River within the site.

Breeding Walkover

Single observation of a male carrying food during April 2022 at the Cushina River. Likely breeding within the site.

10.3.4.6 Hen Harrier

Vantage Point Survey

A total of five Hen Harrier (Circus cyaneus) observations were recorded during the survey period. Flightlines were recorded in Winter 2021/2022 (November 2021), Summer 2022 (June and July 2022), and Winter 2022/2023 (February 2023). Each flightline recorded a single individual. Hen Harrier flightlines were concentrated in the east of the proposed Wind Farm site, often adjacent to areas of cutover peatland. Flightlines were recorded in the vicinity of proposed turbines T01, T03, and T08. The two winter records indicate that the site is visited on occasion by wintering birds. A single observation (7 Feb 2023)of a bird dropping into vegetation around dusk suggested a possible roost. However, based on no further observations it is concluded that the site is not regularly used as a winter roost. Anecdotal records suggest the presence of a roost ca 3.5km from the site.

Hen Harrier were not recorded during the winter walkover, breeding walkover, or breeding raptor surveys.

10.3.4.7 Kestrel

Vantage Point Survey

Thirty-five Kestrel (Falco tinnunculus) flightlines were recorded within the study area during the survey period. Flightlines were recorded year-round but were more commonly recorded during the winter periods. Each flightline recorded an individual bird, most often noted to be hunting. Flightlines were distributed throughout the proposed Wind Farm site but were most concentrated in the central area (in proximity to proposed turbines T03, T05, T07, and T08).

Breeding Walkover

Kestrel were observed on five occasions during breeding walkover surveys, all were individual sightings of hunting birds during the 2022 survey season.

Winter Walkover

Kestrel were observed on seven occasions during winter walkover surveys, all were individual sightings of hunting birds recorded during both winter seasons.

Breeding Raptor

Kestrel observed on one occasion during the breeding raptor survey. No nest site was identified within the study area.

10.3.4.8 Kingfisher

There were no records of Kingfisher during Vantage Point Surveys.

Winter Walkover

A single observation of Kingfisher was observed along the Cushina River in the central part of the site during December 2021. No other observations throughout the survey period.

No observations of Kingfisher during the breeding walkover surveys.

10.3.4.9 Lapwing

Vantage Point Survey

Lapwing (*Vanellus vanellus*) were recorded from VPs on six occasions over the two-year survey period. One single observation was made early in the breeding season (April 2022), while the remaining 5 observations were in the non-breeding season. Other observations were of birds noted to be travelling and were typically in small flocks of 8-30 birds, however on one occasion (November 2021) 150 birds were recorded. Lapwing flightlines were distributed through the proposed Wind Farm site.

There were no observations of Lapwing during winter walkover surveys.

Breeding Walkover

A single pair of Lapwing and chick were observed during May 2023 in the northeast of the Wind Farm Site within 500m of T3. This observations confirmed successful breeding attempt.

10.3.4.10 Mallard

Vantage Point Survey

A single observation of two mallard flying through the site during November 2022.

Winter Walkover

Four observations of mallard were made during winter walkover surveys, two in each winter season. The observations were of two or three individuals, and most were flushed in proximity to the Cushina River.

Breeding Walkover

Eight observations of mallard were made during breeding walkover surveys in 2023. Most records were in proximity to the Cushina River. A pair with four juveniles were observed in June 2023.

10.3.4.11 Meadow Pipit

Meadow Pipit were not recorded during the Vantage Point Surveys.

Winter Walkover

There were 34 observations made during the winter walkover surveys across both winter seasons. Most observations were of foraging birds. Two observations relate to displaying birds during March 2023.

Breeding Walkover

There were 42 observations of Meadow Pipit were made during the breeding season walkover surveys. Number of birds during each observation varied from one to twelve and many were deemed to be of family parties. Activities included foraging, displaying, and flying. Breeding behaviour was observed on numerous occasions including carrying food, adult with fledging, and display flights.

10.3.4.12 Merlin

Vantage Point Survey

Merlin was recorded on two occasions during the survey period, once in December 2021 and once in March 2022. A single bird was recorded on each occasion. Both flightlines occurred in a very similar area, in the centre of the southern part of the proposed Wind Farm site between T04 and T07.

Merlin were not observed during the winter walkover, breeding walkover, or breeding raptor surveys.

10.3.4.13 Peregrine

Vantage Point Survey

Two Peregrine (*Falco peregrinus*) flightlines were recorded during the winter 2021/2022 season, one in November 2021 and the other in March 2022. Both flightlines recorded an individual bird flying within the proposed Wind Farm site boundary (eastern part of the Proposed Wind Farm Site) in proximity to T08 and T09.

Merlin were not observed during the winter walkover, breeding walkover, or breeding raptor surveys.

10.3.4.14 Redwing

This winter visitor was not recorded during Vantage Point Surveys.

Winter Walkover

There were 33 observations of redwing during the Winter Walkover Surveys, all records are from the 2022 – 2023 winter season and were of foraging or flying individuals. Observations were all of multiple birds ranging in group size from two to 25. While the species was also observed in the 22021-2022 season, it was not identified as a target species and therefore not recorded by surveyors (only added to the BoCCI red list in 2021 (Gilbert *et al.* 2021).

10.3.4.15 Snipe

Vantage Point Survey

Snipe were recorded from VPs on 14 occasions during the survey period. The majority of records were during the winter season activity was recorded as flying. Most flightlines related to individual birds. A group of 11 birds were observed in October 2023. Snipe flightlines were distributed throughout the central part of the proposed Wind Farm site.

Winter Walkover

Fourteen observations were made during the winter walkover surveys across both seasons. Most birds were flushed by surveyors and were recorded amongst both peatland (bog) and grassland habitat. Records included individual birds and small groups up to fine birds.

Breeding Walkover

Three observations were made during the breeding walkover surveys during 2023 season. All birds were flushed by surveyors and were observed amongst both peatland (bog) and grassland habitat. All records were of individual birds.

Breeding Wader Survey

Two Snipe were recorded drumming during targeted Curlew surveys to the east of the Wind Farm Site during summer 2025, suggesting possible breeding Snipe in the area.

10.3.4.16 Sparrowhawk

Vantage Point Survey

A total of 35 Sparrowhawk flightlines were observed during the survey period. Sparrowhawk flightlines were recorded year-round but were most frequently recorded in the winter 2022/2023 season (18 flightlines). Each flightline recorded an individual bird, often travelling or hunting. Sparrowhawk flightlines were recorded throughout the proposed Wind Farm site and were not concentrated in any one area. Most flights were recorded below turbine rotor height.

Winter Walkover

Six observations of Sparrowhawk were made during winter walkover surveys. All were of individual birds either flying or hunting.

Breeding Walkover

A single observation of Sparrowhawk was made during breeding walkover surveys, of an adult Male hunting over an area of scrub in September 2023.

Breeding Raptor

An adult male Sparrowhawk was observed carrying prey into forestry. Nest with chick likely within conifer plantation.

10.3.4.17 Swift

Swift were not recorded during Vantage Point Watches.

Breeding Walkover

This summer visitor was observed on eight occasions during the summer 2022-23 season. Observations ranged from one to four individuals. They were observed in flight foraging over the site on each occasion.

While the species was also observed in the 22021-2022 season, it was not identified as a target species and therefore not recorded by surveyors (only added to the BoCCI red list in 2021 (Gilbert *et al.* 2021). No breeding habitat was identified within the Wind Farm Site.

10.3.4.18 Whooper Swan

Vantage Point Survey

Three Whooper Swan flightlines (*Cygnus cygnus*), an Annex I listed species, were recorded over the two-year survey period. One flightline (4 birds) was recorded in November 2021, one flightline (7 birds) in December 2022, and one flightline (8 birds) in March 2023. All Whooper Swan flightlines were recorded across the northern part of the site and two of them were within rotor height. Whooper Swans were not observed foraging or roosting within the site. A flock of Whooper Swans are known to occasionally forage in farmland areas adjacent the River Figile to the southeast of the site (River Barrow (Monasterevin-Portarlington) IWEBS Site Code OS 301).

Whooper Swan were not observed during winter or breeding walkover surveys.

10.3.4.19 Woodcock

Vantage Point Survey

Two Woodcock flightlines were recorded during the survey period, one in Winter 2021 – 2022 (October 2021) and the second in Winter 2022 – 2023 (December 2022). An individual bird was recorded on each occasion. The two flightlines were recorded in the western part of the proposed Wind Farm site.

Winter Walkover

A single observation of an individual Woodcock was made in October 2021.

Nocturnal Woodcock

A targeted woodcock survey was undertaken amongst suitable habitat to the north of the Wind Farm Site during June 2025. During this survey a single roding male with a female participating in flight to display. This record confirms the likely presence of a breeding pair occurring in the area, in line with previous surveys undertaken in the area in 2017 and 2018. No owl activity was observed during woodcock nocturnal surveys.

10.3.4.20 Yellowhammer

Yellowhammer were not recorded during Vantage Point Watches.

Winter Walkover

There were twelve observations of Yellowhammer during winter walkover surveys. They were recorded either perching or foraging amongst hedgerow habitat. Numbers varied from single birds to nine individuals.

Breeding Walkover

There were 39 observations of Yellowhammer during breeding walkover surveys. They were recorded either perching or foraging mostly amongst hedgerow habitat. Numbers varied from single birds to nine individuals with a number of likely breeding pairs and family groups observed.

10.4 Evaluation of Ornithological Receptors

Applying the criteria outlined in the Sensitivity of Receptors section (Section 10.2.5.1), an evaluation of the importance of the relevant study areas for target species recorded during the baseline surveys is given in Table 10-11. The target species with a value of 'local' or above are taken forward as Valued Ornithological Receptors for detailed assessment. The outcome of the evaluation and the final determination of Valued Ornithological Receptors is presented in

To determine the regional importance of the site for wintering waterbirds, we used Irish Wetland Bird Survey (IWeBS) data from Birdwatch Ireland. The average peak counts from the five most recent winter seasons (2015/16 to 2020/21) were summed to estimate the population within each county.

As the Proposed Wind Farm Site is located near the boundaries of Counties Offaly, Kildare, and Laois, the combined population estimate for these three counties was divided by three to derive a local population figure. It is important to note that this method likely results in a significant underestimate for two reasons: first, IWeBS site coverage is limited and does not encompass all potential habitats; second, the key species of concern—Lapwing, Golden Plover, and Whooper Swan—frequently forage on agricultural land across the wider landscape, areas not fully captured by wetland-focused surveys.

Where reliable survey data is not available at the county level then the national populations is divided by 26 to give an estimate of a county population, the appropriateness of this approach in relation to each species is discussed considering known national distribution and range. If one is to assume relatively even distribution across the country this would equate to an area within ca 30km of the Wind Farm Site.

Note that, in line with CIEEM (2018) VORs are defined broadly, to those species present on the site which are afforded a higher level of protection, or are species which are recognised, due to their behaviour, as being more likely to be subject to effects from wind farms. For instance, SNH (2017) recognise that passerines are not generally considered to be effected by wind farms.

Table 10-11 Evaluation of target species populations within the Study Area.

Target Species	Species Information, Status & Baseline	Justification for Evaluation	Value
Buzzard (*Buteo buteo*)	• BOCCI 4: Green List • ROI: National population has increased rapidly • Baseline surveys: Likely 1 breeding pair within site. Total of 139 observations of buzzard over the 2-year survey period. Maximum of three birds recorded for any one flightline.	The site is deemed to be of local importance (higher value) on the basis that the species is regularly occurring and confirmed breeding within the study area.	Local importance (higher value)
Curlew (breeding	• BOCCI 4: Red List • ROI breeding population: 105 pairs (Colhoun 2022) • Baseline surveys: The Wind Farm Site itself is rarely used by Curlew having been recorded on one occasion. However, there is a breeding site within 2km of the site and attempted breeding has been recorded here in recent years.	A breeding pair has attempted to breed within the Study Area (within 2km of the Wind Farm Site). The breeding site occurs ca 1km of proposed turbines. This is approximately representative of 1% of the national population. The species has undergone rapid decline in recent decades. The study area is of national importance to breeding Curlew.	National Importance
Golden Plover (winter)	• Annex I • BOCCI 4: Red List • ROI wintering population: 80,707 (Burke *et al.*, 2018). • IWeBS based County Estimate 3,888 birds • Baseline surveys:	The non-breeding population of Golden Plover is of county importance based on the regular occurrence of more than 38 birds during winter (not using the site itself but flying over it and circling in the area).	County Importance

Target Species	Species Information, Status & Baseline	Justification for Evaluation	Value
	Golden Plover were present regularly from September to April but were only ever recorded in flight (transiting or circling). The absence of any observed roosting or foraging behaviour within the study area indicates it is not a core habitat feature for this species. Numbers flying in the area were highly variable, with large flocks of 1,000 to 4,000 birds occurring occasionally. Vantage Point (VP) surveys on 44 days during this period recorded numbers exceeding 800 birds (the 1% national population threshold) on three days, two of which were consecutive. Furthermore, numbers exceeded 38 birds (1% of the county population) on 17 days. On this basis, the site is deemed to be of county importance due to the regular occurrence of flocks exceeding the county population threshold circling and flying in the area. These birds are likely to be using suitable agricultural lands and extensive peatlands in the surrounding area for foraging and roosting. The most notable foraging site in proximity to the study area are the agricultural lands in proximity to the Figile River to the east.		
Grey Heron	• BoCCI 4: Green List • Baseline surveys • Baseline surveys: • No records during Vantage Point Surveys. Two observations during walkover surveys along the Cushina River.	Site is deemed to be no greater than Local Importance (lower value) for this common and widespread species.	
Gery Wagtail	• BOCCI 4: Red List • Only two records for the species during the study period during walkover surveys. Possible that the site is used by a breeding pair.	Sit is deemed to be no greater than Local Importance (lower value) for the species.	Local importance (lower value)

Target Species	Species Information, Status & Baseline	Justification for Evaluation	Value
Hen Harrier	• Annex I • BOCCI 4: Amber List • ROI wintering / breeding population: NPWS Article 12 reporting (2012-2018), is 311-345 wintering birds. NPWS (2015) estimates the breeding population is 108-157 pairs. • Baseline surveys: Five observations across the survey period all of a single bird. Occasionally used by hen harrier for hunting and commuting during winter. Two records of single birds passing through the site during Summer 2022. No indication of breeding nearby.	Low level of usage of the Site by this species. No known breeding population nearby (nearest known breeding population is in the Sliabh Blooms SPA approximately 19km from the Study Area). One possible, very infrequently used winter roost within the Study Area. Due to observations of birds flying northwards through site at dusk and anecdotal evidence, it is likely that birds are roosting north of the Site outside of the study area. Given the infrequency of observations over the two-year survey period and taking a precautionary approach, it is considered that the Study Area is of Local Importance (higher Value) for wintering Hen Harrier. Site deemed to be of no Ecological Importance to breeding Hen Harrier.	Local Importance (higher Value (winter season)
Kestrel	• BOCCI 4: Red List (qualifying criteria: breeding population decline over the short period) • ROI breeding population: approx. 13,500 birds (NPWS Article 12 reporting 2012-2018) • Baseline surveys: 35 VP flightlines, all of single birds. Most commonly in winter. No displaying or evidence of potential breeding noted. Hunting and travelling only behaviours observed. During walkovers 12 observations of single birds, hunting across all seasons. One observation of an adult male hunting during breeding raptor surveys. No evidence of breeding in study area.	This species is not listed as threatened in Ireland for the wintering population. There is no evidence of a breeding pair being resident within or close to the Study Area. The Study Area is used regularly for hunting by Kestrel. Taking the precautionary approach, the site is assessed as being of Local Importance (higher value) due to it's regular use for hunting by resident Kestrel.	Local Importance (higher value)
Kingfisher	• Annex I EU Birds Directive • BoCCI 4: Amber List • ROI Population: 368-1000 (Article 12 reporting 2008-2012) • A single observation of Kingfisher during the survey period in winter along the Cushina River.	The site is deemed to be of Local Importance (lower value) to Kingfisher. This is based on a single record of the species during the surveys and an absence of any evidence of breeding.	Local Importance (lower value)

Target Species	Species Information, Status & Baseline	Justification for Evaluation	Value
Lapwing (breeding and winter)	• BOCCI 4: Red List • ROI wintering population: 69,823 (Burke et al. 2018) • IWeBS based County Estimate 1,480 birds • ROI breeding population: 520 pairs (Article 12 reporting 2013-2018) • Baseline surveys: Observed on 6 occasions during VPs, 5 of which were during the non-breeding season and 1 in the breeding season (April 2022). Small flocks during winter (8 - 30 birds). One large flock observed (Nov. 2021) of 150 birds. Single pair confirmed breeding in summer 2023 within the study area in area of cutover bog.	The wintering population of Lapwing within the study area (based on a max. of 150 birds). This is well the threshold for national importance (698 birds). Based on review of IWeBS data in the three surrounding counties, the estimated regional / county population of wintering Lapwing is 1,480 birds, meaning a threshold for county importance would be 14 birds. Given that low numbers of birds were generally travelling through the site and recorded irregularly with a peak count of 150 birds, the area is assessed as being at most county importance. The area is assessed as being of County Importance for wintering Lapwing. Based on one breeding pair being observed within the Study Area, the estimated population of the Study Area is 1 pair, which represents 0.05% of the national breeding population. This is below the threshold of 1% for national importance. Assuming a county population of 20 pairs (crude estimate dividing national population by 26), this would be above the county threshold. Based on this and the sharp declines in the breeding population of the species, the Study Area is assessed to be of County importance for breeding Lapwing.	County Importance
Mallard	• BoCCI Amber List • ROI Population: Common and widespread. • Baseline surveys:	Site is deemed to be no greater than Local Importance (lower value) for this common and widespread species.	Local Importance (lower value)

Target Species	Species Information, Status & Baseline	Justification for Evaluation	Value
	A single observation of a two mallard was made during Vantage Point Surveys. Small numbers of Mallard were recorded during walkover surveys with a peak count of six birds. A single pair were confirmed breeding in within the study area.		
Meadow Pipit	• BoCCI Amber List • ROI Population: Common and widespread. • Baseline surveys: This resident species was recorded throughout the survey period and was confirmed breeding during each summer.	Site is deemed to be no greater than Local Importance (lower value) for this common and widespread species.	Local Importance (lower value)
Merlin	• Annex I • BOCCI 4: Amber List • ROI population estimated between 400-800 birds (NPWS Article 12 reporting 2008-2012) • Baseline surveys: Two observations of 1 individual bird on both occasions) during non-breeding season. No observations during walkover or targeted breeding raptor surveys.	Based on the infrequency of observations of Merlin within the Study Area and the lack of breeding season observations, the Study Area is assessed as being of less than Local Importance.	Less than Local Importance
Peregrine	• Annex I • BOCCI 4: Green List • ROI breeding population: 425 pairs (NPWS Article 12 reporting) • Baseline surveys: Two flightlines, both of single birds in winter during Vantage Point Surveys. No observations during walkover or targeted breeding raptor surveys.	There were no observations of Peregrine falcons within the Study Area in the summer breeding season and only 2 no. observations during winter. There is no suitable breeding habitat within the Study Area. The Study Area is assessed as being less than local importance for this species.	Less than Local Importance
Redwing	• BoCCI 4 Red List • ROI Population: Common and widespread during winter • Baseline surveys: Observed regularly during winter walkover surveys.	Site is deemed to be no greater than Local Importance (lower value) for this widespread winter passerine species.	Local Importance (lower value)

Target Species	Species Information, Status & Baseline	Justification for Evaluation	Value
Snipe	• BOCCI 4: Red List • ROI breeding population: 4,275 (NPWS Article 12 reporting) • Baseline surveys: Snipe were recorded on 14 occasions during the VP watches. The majority of records were during the Winter 2021 – 2022 season. Three observations of birds during summer walkover surveys (2023). No confirmed breeding within the Wind Farm Site. A potential breeding pair was recorded during targeted curlew surveys during 2025 within 2km of the Wind Farm Site.	The site is used by low numbers of Snipe throughout the year. Assuming an individual breeding pair within the study area, the site is deemed to be of Local importance (higher value) for breeding Snipe.	Local Importance (higher value)
Sparrowhawk	• BOCCI 4: Green List • ROI Population: 9100-14830 (NPWS Article 12 reporting) • Baseline surveys: 37 flightlines recorded in all four seasons. All records of individual birds, predominantly travelling or hunting. Two observations in April 2022 indicating breeding in forestry in north of the Study Area. Seven observations of individual birds hunting or travelling through the area during walkovers. Targeted breeding raptor survey one observation in July 2023 of an adult male carrying passerine prey into forestry – likely nest with chick in forestry approx. 1.2km from the Site boundary.	The Study Area is likely to support 1 - 2 breeding pairs of this widespread breeding raptor. The Study Area is assessed as being of Local Importance (higher value) for this resident / regularly occurring species.	Local Importance (higher value)
Swift	• BoCCI Red List • ROI Population: common and widespread • Baseline surveys: Low numbers recorded flying and foraging within the site during summer walkover surveys.	Site is deemed to be no greater than Local Importance (lower value) for this widespread summer passerine species.	Local Importance (lower value)
Whooper Swan (winter)	• Annex I • BOCCI 4: Amber List (qualifying criteria: internationally important wintering population in Ireland) • ROI wintering population: 14,467 (Burke *et al.*, 2021)	The population observed feeding in nearby fields outside of the Site represents approx. 0.6% of the national population.	County Importance

Target Species	Species Information, Status & Baseline	Justification for Evaluation	Value
	• IWeBS based County Estimate 291 birds • Baseline surveys: Rarely recorded flying through the site (three records of between 4 and 8 individuals) over the survey period. The site does not lie within a regularly used flight path. The birds were not recorded foraging or roosting within the site. Previous surveys and local consultation – flood plain of River Figile to southeast of site hosts a flock of up to 90 foraging birds (winter 2017/2018) (approx. 1.3km from Site boundary i.e. within wider Study Area).	The study area is considered to be of county importance for wintering Whooper Swan.	
Woodcock	• BOCCI 4: Red List • ROI breeding population: 27,434 males (O'Neill, 2024) • Baseline surveys: Rarely recorded during VP and walkover surveys (total of three observations. Targeted surveys undertaken at the site indicates 1-2 breeding pairs.	The Woodcock population within the Study Area represents approx. 0.004% of the national population falling well below the 274 threshold for national importance. An estimate of the county population is ca 1055 males. The breeding population of Woodcock in the Study Area is considered to be Local Importance (higher value)	Regional/County
Yellowhammer	• BoCCI Red List • ROI Population: common and widespread • Regular observations during winter and summer walkover surveys. Confirmed breeding within the site.	Site is deemed to be no greater than Local Importance (lower value) for this widespread passerine species.	Local Importance (lower value)

Table 10-12: Identification of Valued Ornithological Receptors

Target Species	Evaluation	VOR determination	Determined as VOR
Buzzard	Local importance (higher value) (all seasons)	Considering the use of the site by Buzzard the following potential effects require consideration: • Effects of habitat loss • Displacement effects • Collision risk	Yes
Curlew (breeding)	National Importance (breeding season)	Considering the use of the site by Curlew (no foraging or roosting observations in wind farm) the following potential effects require consideration: • Displacement effects • Collision risk	Yes
Golden Plover (wintering)	National Importance (winter season)	Considering the use of the site by Golden Plover (no foraging or roosting observations in wind farm) the following potential effects require consideration: • Displacement effects • Collision risk	Yes
Grey Heron	Less than Local Importance (all seasons)	Rarely recorded using the site. Not recorded during VP surveys. There is no potential for any significant effects.	No
Gery Wagtail	Local importance (lower value)	SNH guidance suggests wind farms do not significantly impact passerine species, largely because their populations are so large.	No
Hen Harrier	Local Importance (higher Value) (winter season)	Hen Harrier were rarely recorded within the site and were not fond to roost within the area. The following potential effects require consideration: • Collision risk	Yes
Kestrel	Local Importance (higher value) (all seasons)	Considering the use of the site by Kestrel the following potential effects require consideration: • Effects of habitat loss • Displacement effects • Collision risk	Yes
Kingfisher	Local Importance (lower value)	Rarely recorded using the site. Not recorded during VP surveys. There is no potential for any significant effects.	No

Target Species	Evaluation	VOR determination	Determined as VOR
Lapwing	County Importance (breeding)	Considering the use of the site by Lapwing the following potential effects require consideration: • Effects of habitat loss • Displacement effects • Collision risk	Yes
	County Importance (wintering)	Considering the use of the site by Lapwing the following potential effects require consideration: • Collision risk	Yes
Mallard	Local Importance (lower value)	Rarely recorded using the site. Not recorded during VP surveys. There is no potential for any significant effects.	No
Meadow Pipit	Local Importance (lower value)	As per SNH guidance, it is generally considered that passerine species are not significantly impacted by wind farms primarily due to their large populations.	No
Merlin	Less than Local Importance	Rarely recorded using the site. Not recorded during VP surveys. There is no potential for any significant effects.	No
Peregrine	Less than Local Importance	Rarely recorded using the site. Not recorded during VP surveys. There is no potential for any significant effects.	No
Redwing	Local Importance (lower value)	SNH guidance suggests wind farms do not significantly impact passerine species, largely because their populations are so large.	No
Snipe	Local Importance (higher value)	Considering the use of the site by Snipe the following potential effects require consideration: • Effects of habitat loss • Displacement effects • Collision risk	Yes
Sparrowhawk	Local Importance (higher value)	Considering the use of the site by Sparrowhawk the following potential effects require consideration: • Effects of habitat loss • Displacement effects • Collision risk	Yes
Swift	Local Importance (lower value)	SNH guidance suggests wind farms do not significantly impact passerine species, largely because their populations are so large.	No
Whooper Swan	County Importance	Considering the use of the site by Whooper Swan the following potential effects require consideration:	Yes

Target Species	Evaluation	VOR determination	Determined as VOR
		• Collision risk	
Woodcock	Regional/County	Considering the use of the site by Woodcock the following potential effects require consideration: • Effects of habitat loss • Displacement effects • Collision risk	Yes
Yellowhammer	Local Importance (lower value)	SNH guidance suggests wind farms do not significantly impact passerine species, largely because their populations are so large.	No

10.4.1 Sensitivity of Valued Ornithological Receptors

In all, eleven bird species have been identified as VORs as set out in Table 10-12 above. Following the criteria set out by Percival (2003), the sensitivity of each VOR is presented in Table 10-13 below.

Table 10-13: Sensitivity of VPROs to wind farm development (as per Percival 2003)

Target Species	Matched criteria	Sensitivity
Buzzard		Low
Curlew	BoCCI 4 Red List	Medium
Golden Plover	Annex I EU Birds Directive BoCCI 4 Red List	Medium
Hen Harrier	Ecologically sensitive species	**High**
Kestrel	BoCCI 4 Red List	Medium
Lapwing	BoCCI 4 Red List	Medium
Snipe	BoCCI 4 Red List	Medium
Sparrowhawk		Low
Whooper Swan	Annex I EU Birds Directive	Medium
Woodcock	BoCCI Red List	Medium

10.5 Assessment of Potential effects

10.5.1 The 'Do-Nothing' Effect

In the absence of the Proposed Development, it is expected that the current land use (a mix of intensive agriculture and peat mining) of the site will continue. In this scenario the value of the Proposed Wind Farm Site for birds would be expected to remain similar to the current situation, subject to ongoing changes in the population of some species across the wider landscape.

10.5.1 Key Elements of the project that Could Give rise to Significant Effects

Construction Phase

Potential impacts arise from two main sources:

(1) Habitat Loss: The construction of infrastructure will result in the permanent direct loss of habitat within the development footprint, removing areas previously used for foraging, breeding, or roosting.

(2) Disturbance: Operation of machinery and elevated levels of human activity may cause temporary disturbance to key species, potentially disrupting essential behaviours

Operational Phase

Long-term impacts during operation include:

(1) Collision Risk: The presence of rotating turbine blades presents a potential collision risk to birds throughout the project's lifespan.

(2) Disturbance & Displacement: The presence of turbines may cause displacement or barrier effects on sensitive species from adjacent habitats. Maintenance activities involving routine and remedial maintenance will necessitate periodic site access, resulting in recurring but short-term disturbance.

Decommissioning Phase

Impacts during decommissioning are anticipated to be similar in type to those during construction but significantly reduced in magnitude, duration, and spatial extent. The scale of works and associated habitat alteration will be contingent on the chosen decommissioning strategy, particularly regarding whether foundations and other sub-surface infrastructure are removed or left in situ. The latter scenario would greatly reduce the need for extensive ground excavation and its associated impacts.

10.5.2 Outcome of Collision Risk Model

A detailed description of the application of the Collision Risk Assessment undertaken is presented in Appendix 10-5. A summary output of estimated collisions per species is presented in Table 10-14. The outputs of the collision risk assessment are discussed in relation to the assessment of collision effects on each VOR species in the below.

Table 10-14: Expected number of collisions per year (assuming avoidance behaviour) for bird species at the proposed Derrynadarragh Wind Farm.

Species	Projected number of rotor transits per year	Collision Risk (single transit risk)			Annual Collision Rate			Estimated collisions over a 30-year period
		Flapping	Gliding	Average	Without avoidance	Avoidance rate	With avoidance	
Buzzard	281	6.87	6.8	6.84	16	98	0.3	9
Curlew	22	5.53	5.47	5.5	1.03	98	0.021	0.63
Golden Plover (Sep - Apr)	566,588	4.96	N/A	N/A	23878	98.6	47.8	1,434
Hen Harrier	2	7.85	7.8	7.83	0.14	99	0.001	0.03
Kestrel	57	6.37	6.32	6.35	3	95	0.2	6
Lapwing	267	5.28	N/A	N/A	12	98	0.2	6
Mallard	1	5.26	N/a	N/A	0.06	98	0.001	0.03
Merlin	0	0	0	0	0.02	98	0.0003	0.0009
Peregrine	1	6.21	6.14	6.18	0.06	98	0.001	0.03

Species	Projected number of rotor transits per year	Collision Risk (single transit risk)			Annual Collision Rate			Estimated collisions over a 30-year period
		Flapping	Gliding	Average	Without avoidance	Avoidance rate	With avoidance	
Snipe	26	4.3	4.27	4.29	0.93	98	0.019	0.57
Sparrowhawk	1	5.8	5.76	5.78	0.06	98	0.001	0.03
Whooper Swan (Oct - Mar)	14	8.82	n/a	N/A	1.07	99.5	0.005	0.15
Woodcock	0	4.62	4.57	4.6	0.02	98	0.0003	0.0009

10.5.3 Effects on Valued Ornithological Receptors

The potential effects on each VOR is assessed in the following sections. Potential effects of both the construction and operational phase of the development are included. The VORs are presented in order of sensitivity as set out in Table 10-13 above.

10.5.3.1.1 Buzzard (*Buteo buteo*)

Potential effects during wind farm construction and operation	**Significance (Percival 2003)**	**Significance (EPA 2022)**
Construction phase		
Habitat loss Buzzard were confirmed as nesting within the Wind Farm Site, within 500m of a turbine. The known breeding habitat will not be impacted by direct habitat loss and other areas of suitable habitat (mature trees and treelines) will largely be retained. Direct loss of foraging habitat relative to its availability onsite, will be minimal. The land lost to the development footprint is small relative to the total area within the Wind Farm Site (< 5% of the site). Substantial areas of undisturbed suitable foraging habitat will remain throughout much the wind fam site. The loss of foraging habitat for this low sensitive species is deemed to be very low magnitude impact giving rise to a very low significance effect.	Very low effect significance	Long term imperceptible negative effect.
Disturbance Buzzard were frequently observed throughout the survey periods and a confirmed breeding pair occur on site. The disturbance associated with construction works could lead to displacement of a breeding pair and temporary reduction in foraging activity within the site. Disturbance during construction phase is considered a medium magnitude impact of very low significance effect.	Very low effect significance	Short term, not significant effect.

Operational phase		
Displacement / Barrier effects Buzzard have been reported to show avoidance of wind turbines to 500m (Pearse Higgins et al. 2009). The wind farm development may lead to the displacement of breeding Buzzard from parts of the site. There is likely to be reduced Buzzard activity within the site. However, there is an abundance of suitable habitat in the wider area outside of Wind Farm Site. This medium magnitude impact will lead to a very low significance effect.	Very low effect significance	Long term slight negative effect
Collision The species was recorded flying with the potential collision risk zone during VP surveys. A "normal" collision risk analysis has been undertaken and full details are provided in Appendix 10-5. The collision risk has been calculated at a rate 0.3 collisions per year, which suggests nine collisions over the lifetime of the project. The predicted impact magnitude on this low sensitivity species over the lifetime of the project is considered low. Low sensitivity, low magnitude impact = very low effect significance	Low effect significance	Long term slight negative effect

10.5.3.1.2 Curlew (*breeding*)

Potential effects during wind farm construction and operation	**Significance (Percival 2003)**	**Significance (EPA 2022)**
Construction phase		
Habitat Loss Survey data indicates minimal use of the Wind Farm Site by curlews. Despite the confirmed presence of breeding Curlew in the wider study area (within 2km of the Proposed Wind Farm Site), there were no records of foraging or roosting within the site boundaries, and flights through the area were rare (only two occurrences in two years). Consequently, the direct loss of habitat from the development footprint is not expected to result in any significant adverse effects on the species.	No significant effect	No significant effect

Potential effects during wind farm construction and operation	Significance (Percival 2003)	Significance (EPA 2022)
Disturbance The Curlew is a red-listed species of high conservation concern, highly vulnerable to disturbance during construction. Literature indicates that wind farm development can cause a decline in breeding Curlew density, with populations failing to recover post-construction, leading to a recommended sensitivity zone of 800m (Pearce-Higgins et al., 2012; McGuinness et al., 2015). A breeding territory was confirmed east of the site in both 2022 and 2025. The nest was located 1.1-1.3km from the nearest turbines, a distance sufficiently removed that significant effects would not be expected. However, suitable breeding habitat and the birds' potential home range may extend to within 800m of the turbines. Therefore, while the known nest is safely distant, disturbance impacts during construction cannot be ruled out should a nest be established amongst suitable habitat closer to the development. Under a worst-case scenario where a nest is established within 800m, unmitigated construction activity could cause disturbance and lead to breeding failure. For this medium sensitivity species, this would constitute a medium magnitude impact, resulting in an effect significance of low.	Low effect significance	No significant effect
Operational phase		
Displacement / Barrier effects Survey data indicates minimal use of the Wind Farm Site by curlews. Despite the confirmed presence of breeding Curlew in the wider study area (within 2km of the Proposed Wind Farm Site), there were no records of foraging or roosting within the site boundaries, and flights through the area were rare (only two occurrences in two years). Studies by Whitfield et al. (2010) and Pearse Higgins et al. (2012) found no evidence of displacement of Curlew from operational wind farms. Based on surveys undertaken of the proposed wind farm study area, the breeding territory is grater than 800m from the nearest proposed wind turbine. It is therefore concluded that operational phase displacement of breeding Curlew is not expected. Furthermore, Curlew were very rarely recorded flying through the Wind Farm Site and therefore barrier effects are not expected.	No significant effects	No significant effects

Potential effects during wind farm construction and operation	Significance (Percival 2003)	Significance (EPA 2022)
Collision The species was rarely observed flying within the potential collision risk zone. A 'normal' collision risk model (Appendix 10-5) estimates a collision rate of 0.021 per year, equating to fewer than one collision (0.63) over the project's lifetime. Despite the species' high sensitivity, the impact is of negligible magnitude, resulting in an overall effect significance of very low.	Very low effect significance	Long term slight negative effect

10.5.3.1.3 Golden Plover

Potential effects during wind farm construction and operation	Significance (Percival 2003)	Significance (EPA 2022)
Construction phase		
Habitat loss Surveys have confirmed that the habitats within the site are not utilised by Golden Plover with no observations of Golden Plover foraging or roosting within the Wind Farm Site. Most Golden Plover records related to bird circling around or flying over the site. Birds were observed foraging in agricultural lands beyond the study aera, in particularly in grasslands to the east of the site adjacent to the River Figile. The project will not give rise to the loss of habitat used by foraging Golden Plover. Significant effects on Golden Plover due to direct habitat loss are not foreseen.	No significant effects	No significant effects

Potential effects during wind farm construction and operation	Significance (Percival 2003)	Significance (EPA 2022)
Disturbance Research indicates that this species is susceptible to disturbance impacts during the construction works (Pearce-Higgins et al., 2012). This species was not recorded utilising habitats within the site boundary for roosting or foraging. Areas of suitable roosting and foraging habitat for the species do occur in the wider landscape. Observations during the bird surveys suggest that agricultural lands along the River Figile are used regularly by flocks of foraging birds. Construction works may result in temporary displacement of birds from these foraging areas in the surroundings. There are extensive alternative habitats in the surroundings that this temporary displacement would not lead to any significant effects.	No significant effects	No significant effects
Operational phase		
Displacement / Barrier effects The main foraging site in the Study Area is located at least 800m from the nearest turbines. The species was not recorded foraging or roosting within the Wind Farm Site or in proximity to proposed wind turbines. displacement of non-breeding birds from roosting or foraging habitat is therefore not foreseen. There is no evidence to suggest the site lies within a regularly used flight path or migration route for this species and therefore barrier effects are not foreseen.	No significant effects	No significant effects

Collision Golden Plover were regularly observed flying within the potential collision risk zone over the winter season. A 'normal' collision risk model (Appendix 10-5) estimates a collision rate of 47.8 per year (equates to 1434 over collisions the project's lifetime). The national population for the wintering golden plover is estimated at 80,707. An estimate of the county population based on an average of the three surrounding counties IWeBS counts is estimated to be 3,888 birds (likely under estimate considering survey coverage and common occurrence of Golden Plover outside of wetland sites). The annual baseline mortality rate of Golden Plover is reported known to be 27%. A loss of 47.8 birds would increase the mortality rate by 4.55%. The species is medium sensitivity due to its importance at the county level. The relatively high predicted collision rate was due to the occasional occurrence of large flocks within the site. During the survey period, most of the large flocks (4 of the 5 flocks with >1,000 individuals) were recorded during late October 2022 (over four consecutive days 24th to 27th of October). This is likely to represent large numbers of birds on passage in the area over these few days which commonly occurs at either end of the winter season during migration periods. These four days comprised the full watch period for October 2022. By running the CRM on a monthly basis it is apparent that October accounts for the vast majority (99.46%) of estimated annual collisions relates to these observations in October 2022, the annual collision rate for the other 11 months combined amounts to just 0.17 collision. There were no observations of Golden Plover in October 2021, although it seems the same Autumn migration pulse may have occurred in November that year when 1,000 birds were recorded on 9th November 2021. On the basis that all sampling in October 2022 occurred on the four days when large flocks were present is likely to have caused a significant over-estimation in the CRM, as the model would have assumed that this density of birds were present for the entirety of the month. During supplementary surveys undertaken in 2017-2019, a similar pattern was noted, except that the larger flocks of Golden Plover (>1000 individuals) were recorded towards the end of February (spring migration) rather than October or November, when no larger flocks were recorded. It is clear that the high collision risk is related to the occasional occurrence of large flocks flying in proximity to the site, particularly at times when birds are on the move. In the absence of mitigation, the impact magnitude is deemed to be medium based on the potential increased mortality, leading to an overall low effect significance.	Low significance effect	Long term moderate effect

10.5.3.2 Hen Harrier (wintering)

Potential effects during wind farm construction and operation	**Significance (Percival 2003)**	**Significance (EPA 2022)**
Construction phase		
Habitat Loss Surveys recorded low-intensity use of the site by hen harrier, with a total of five observations. No evidence of breeding during the various surveys at the site. The nearest known breeding site is ca 19km to the south-west of the study area. This is well outside of the maximum foraging range of the species and therefore it is concluded that any loss of habitat within the site will not impact on breeding hen harrier. Five individual sightings of non-breeding birds suggests the site is not a core component of any individual's home range, the presence of hunting activity and a single likely roosting observation confirms that the habitat provides some functional value. Potential foraging habitat (bog, scrub and wet grassland) that will be lost equates to 2.7ha, which is a small fraction (ca6%) of the 42.8ha total potential foraging habitat at the site. The loss of this habitat will is deemed to be of negligible magnitude on a high sensitive species leading to a low effect significance.	Low significance effect	Long-term slight negative effect
Disturbance Hen Harriers are known to be sensitive to human-induced disturbance, with potential effects documented up to 500 metres from construction activity (Pearce-Higgins et al. 2009). No disturbance to breeding Hen Harriers is anticipated, as no breeding population is present within the project's zone of influence. For non-breeding (wintering or dispersing) individuals, construction may cause temporary displacement from the immediate site. However, given the extensive availability of alternative foraging habitat in the surrounding area and the low suitability of the project site itself for this species, the magnitude of this impact is predicted to be negligible. Consequently, the significance of the potential disturbance effect is considered low.	Low significance effect	Long-term slight negative effect

Potential effects during wind farm construction and operation	Significance (Percival 2003)	Significance (EPA 2022)
Operational phase		
Displacement / Barrier effects Given the significant distance from any known breeding sites, the potential for displacement effects on breeding Hen Harrier does not arise. For non-breeding individuals, while literature (e.g., Pearce-Higgins et al., 2009) indicates displacement can occur within 500m of turbines, site use by foraging and commuting Hen Harriers was infrequent. Specifically, they were observed within 500m of proposed turbine locations on only five occasions throughout the two-year survey period. Consequently, due to the exceptionally low rate of site utilisation, no significant displacement or barrier effects on Hen Harrier are anticipated.	Low significance effect	Short term slight negative effect
Collision The species was rarely observed flying within the potential collision risk zone. A 'normal' collision risk model (Appendix 10-5) estimates a collision rate of 0.001 per year, equating to fewer than one collision (0.3) over the project's lifetime. Despite the species' high sensitivity, the impact is of negligible magnitude, resulting in an overall effect significance of very low.	Very low significance effect	Long-term imperceptible negative effect

10.5.3.2.1 Kestrel

Potential effects during wind farm construction and operation	Significance (Percival 2003)	Significance (EPA 2022)
Construction phase		

Habitat loss While Kestrel were regularly observed foraging in the area they not observed breeding and no confirmed nests were identified. There will therefore be no loss of breeding habitat due to the wind farm development. Direct loss of foraging habitat relative to its availability onsite, will be minimal. The land lost to the development footprint is small relative to the total area within the Wind Farm Site (< 5% of the site). Substantial areas of undisturbed suitable foraging habitat will remain throughout much the wind fam site. The loss of foraging habitat for this medium sensitive species is deemed to be low magnitude impact causing a low significant effect.	Low significant effect	Long term slight significant effect
Disturbance As outlined above, no breeding was identified within or closeby the site. There is no potential for disturbance to breeding birds. Hunting and foraging birds may be temporarily displaced during construction phase. It is considered that there is abundant suitable habitat in the vicinity for Kestrels to continue hunting and foraging in adjacent areas during the construction phase. Significant effects are not foreseen	Very low effect significance	Short term not significant effect
Operational phase		
Displacement / Barrier effects Research indicates that Kestrel generally demonstrate low rates of avoidance behaviour toward operational wind turbines. Kestrel have been observed maintaining foraging activities in close proximity to turbine infrastructure. Significant adverse effects on the Kestrel population is not anticipated, as extensive areas of suitable habitat will persist within the wider landscape.	No significant effects	No significant effects

Collision Kestrel recorded flying within the potential collision risk zone during VP surveys. A "normal" collision risk analysis has been undertaken and full details are provided in Appendix 10-5. The collision risk has been calculated at a rate 0.2 collisions per year, which suggests six collisions over the lifetime of the project. The predicted impact magnitude of this collision risk over the lifetime of the project is therefore low. Medium sensitivity species, low magnitude impact = low effect significance.	Low significant effect	Long term slight negative effect

10.5.3.2.2 Lapwing

Potential effects during wind farm construction and operation	**Significance (Percival 2003)**	**Significance (EPA 2022)**
Construction phase		
Habitat loss Wintering Lapwing were not observed using habitats within the site for foraging or roosting. The loss of habitat therefore will not lead to any significant effects on wintering lapwing. A single breeding territory was identified during surveys undertaken during May 2023, the observation of a pair with chick in an area of cutover bog (dominated by bare peat) confirmed successful breeding. The construction of the wind farm will cause the loss of 1.03ha of cutover bog in this part of the site, estimated to be 1.03ha out of approximately 20.6ha of cutover bog that occurs within the site. The loss of this extent of habitat is minor considering the extent of the habitat within and surrounding the site. This impact may, assuming worst case, lead to the loss of a breeding territory within the site constituting a long term low magnitude impact on this medium sensitive species and lead to a low significance effect on the population within the site.	Low effect significance	Long term slight negative effect

Disturbance Construction works are likely to give rise to local disturbance of breeding Lapwing which have been confirmed breeding during one season on cutover bog in the northern part of the site. The short term effect of the disturbance could lead to breeding failure and temporary displacement in proximity to works. The effect would be short term as the availability of habitat within the site will persist post-development to be used by breeding lapwing. The impact would be medium in magnitude and lead to a low effect significance.	Low effect significance	Short term slight negative effect
Operational phase		
Displacement / Barrier effects No effects on wintering Lapwing. (wintering) Several studies of wind energy infrastructure and its impact on bird populations have found no discernible impact on populations of breeding Lapwings, either through displacement or avoidance (Pearce-Higgins et al. 2009; Pearce-Higgins et al. 2012). The presence of the wind farm is not expected to deter lapwing from breeding in proximity to the Wind Farm Site. Some studies (Pearce-Higgins et al. (2012), Langston et al. (2003)) found that Lapwing nesting occurred slightly closer to turbines possibly as a result of the creation of preferred areas of shorter vegetation. Overall the impact would be medium in magnitude and lead to a low effect significance. (breeding only) There is no evidence to suggest the site lies within a regularly used flight path or migration route for this species and therefore barrier effects are not foreseen.	No significant effects Low effect significance	No significant effects Long term slight negative effect

Collision (wintering) Lapwing flights within the collision risk zone were confined to the winter season. A 'normal' collision risk model (Appendix 10-5) predicts an average of 0.2 collisions per year, equating to an estimated 6 collisions over the project's lifetime. With a county population of 1,480 birds, this impact is considered low in magnitude for this species of medium sensitivity. Consequently, the overall significance of the effect is rated as low. Medium sensitivity species, low magnitude impact = low effect significance. <u>(breeding)</u> The species was not observed flying at rotor height and therefore no collisions are predicted within the CRM is applied. Based on survey results there is no collision risk foreseen.	Low effect significance No significant effects	Long term slight negative effect No significant effects

10.5.3.2.3 Snipe

Potential effects during wind farm construction and operation	**Significance (Percival 2003)**	**Significance (EPA 2022)**
Construction phase		
Habitat loss Direct loss of foraging habitat relative to its availability onsite, will be minimal. The land lost to the development footprint is small relative to the total area within the Wind Farm Site (< 5% of the site). Substantial areas of undisturbed suitable foraging habitat will remain throughout much the wind fam site. The loss of foraging habitat for this medium sensitive species is deemed to be very low magnitude impact causing no significant effect.	Very low effect significance	Not significant effect

Potential effects during wind farm construction and operation	Significance (Percival 2003)	Significance (EPA 2022)
Disturbance Snipe were not confirmed nesting in proximity to the site. A likely breeding site was observed ca 1.3km east of the site. Snipe primarily use the site for foraging. It is possible that they will experience some disturbance and displacement effects during the construction phase. However, it is considered that there is ample, suitable foraging habitat in the surrounding area and also that the distance of 1.3km to the nesting site ensures that any displacement will be limited to foraging.	Very low effect significance	Temporary imperceptible effect
Operational phase		
Displacement / Barrier effects Breeding Snipe were not observed breeding within the Wind Farm Site. The nearest nest site identified is sufficiently removed that displacement of breeding birds is not expected. Significant adverse effects on foraging Snipe are not anticipated, as extensive areas of suitable habitat exists within the wider landscape and they are also likely to continue to use extensive parts of the Wind Farm Site for foraging.	Low effect significance	Long term slight effect
Collision The species was recorded flying with the potential collision risk zone during VP surveys. A "normal" collision risk analysis has been undertaken and full details are provided in Appendix 10-5. The collision risk has 0.0003 collisions per year, and only 0.0009 collision over the lifetime of the project. The predicted collision risk over the lifetime of the project is therefore not significant.	Very low effect significance	Long-term Imperceptible Negative Effect

10.5.3.2.4 Sparrowhawk

Potential effects during wind farm construction and operation	Significance (Percival 2003)	Significance (EPA 2022)
Construction phase		
Habitat loss Direct loss of foraging habitat relative to its availability onsite, will be minimal. The land lost to the development footprint is small relative to the total area within the Wind Farm Site (< 5% of the site). Substantial areas of undisturbed suitable foraging habitat will remain throughout much the wind fam site. The loss of foraging habitat for this low sensitive species is deemed to be very low magnitude impact causing a low significant effect.	Very low effect significance	Not significant effect
Disturbance Sparrowhawk were assessed to be nesting within 1.2km of the Site and use the site for hunting and travelling. It is possible that they will experience some disturbance and displacement effects during the construction phase. However, it is considered that there is ample, suitable foraging habitat in the surrounding area and also that the distance of 1.2km to the nesting site ensures that any displacement will be limited to foraging/hunting. Considering also that this is a Green-Listed species in Ireland and a very widespread species, it is assessed that the construction phase is likely to result in short-term effects which are not significant.	Negligible effect significance	Imperceptible effect
Operational phase		
Displacement / Barrier effects Breeding Sparrowhawk are absent from the Wind Farm Site. The nearest nest site identified is sufficiently removed that displacement of breeding birds is not expected. Significant adverse effects on foraging Sparrowhawk are not anticipated, as extensive areas of suitable habitat exists within the wider landscape and they are also likely to continue to use parts of the Wind Farm Site for foraging.	Low effect significance	Long term slight effect

Potential effects during wind farm construction and operation	Significance (Percival 2003)	Significance (EPA 2022)
Collision The species was recorded flying with the potential collision risk zone during VP surveys. A "normal" collision risk analysis has been undertaken and full details are provided in Appendix 10-5. The collision risk has 0.001 collisions per year, and only 0.3 collision over the lifetime of the project. The predicted collision risk over the lifetime of the project is therefore insignificant. Low sensitivity, negligible magnitude impact = very low effect significance	Very low effect significance	Long-term Imperceptible Negative Effect

10.5.3.2.5 Whooper Swan

Potential effects during wind farm construction and operation	Significance (Percival 2003)	Significance (EPA 2022)
Construction phase		
Habitat loss Surveys have confirmed that the habitats within the site are not utilised by Whooper Swans with no observations of them foraging or roosting within the Wind Farm Site. The project will not give rise to the loss of habitat used by foraging Whooper Swans. Significant effects on Whooper Swans due to direct habitat loss are not foreseen.	No significant effects	No significant effects

Potential effects during wind farm construction and operation	**Significance (Percival 2003)**	**Significance (EPA 2022)**
Disturbance Low numbers pass through the site but relatively large numbers (up to 90 observed) use the nearby Figile River floodplains for feeding approximately 1.1km from the nearest proposed turbine, though small numbers (5 individuals) were observed within 400m of proposed turbine locations in 2017. McGuinness *et al.* (2015) suggest that 600m around wind turbines is the Zone of Sensitivity for Whooper Swans, while Goodship and Furness (2022) determine the buffer zone to be 200m-600m. The foraging area that was observed to be used by the Whooper Swans is an area along the Figile and Slate Rivers from 400m – 1,300m to the nearest turbine. Construction phase disturbance may cause temporary displacement of Whooper Swans from foraging lands to the east of the Wind Farm Site. There are extensive areas of alternative foraging habitat in the surroundings beyond the zone of influence of the development. This temporary displacement would therefore be an negligible magnitude and would lead to an effect of very low significance.	Very low effect significance	Short term not significant effect
Operational phase		
Displacement / Barrier effects The potential for wind turbines to create a barrier or displacement effect on Whooper Swans would arise where a regularly used established flight path crosses a site. In the case of the Proposed Wind Farm Site, Whooper Swan were only recorded flying through the area of the wind farm on three occasions with a maximum flock size of eight birds It is therefore clear that Whooper Swan do not regularly cross the site and therefore displacement or barrier effects are not foreseen. The foraging habitat at the River Figile that is occasionally used by flocks of Whooper Swans is sufficiently removed from the proposed wind farm that displacement effects on the site are not predicted. No significant effects are foreseen.	No significant effects	No significant effects

Potential effects during wind farm construction and operation	Significance (Percival 2003)	Significance (EPA 2022)
Collision Whooper Swan flights were rarely observed within the rotor height during winter. A 'normal' collision risk model (Appendix 10-5) predicts 0.005 collisions per year, equating to an estimated 0.15 collisions over the project's lifetime. With a local population of 90 birds, this negligible impact results in an overall very low significance effect for this species of medium sensitivity. Medium sensitivity species, negligible magnitude impact = very low effect significance.	Very low effect significance	Long-term Imperceptible Negative Effect

10.5.3.2.6 Woodcock

Potential effects during wind farm construction and operation	Significance (Percival 2003)	Significance (EPA 2022)
Construction phase		
Habitat loss Habitat used by breeding Woodcock includes the scrub and woodland habitats in the northern part of the site. Parts of this habitat will be lost during the construction of the wind farm and thus is likely to have a local effect on the use of the area by Woodcock. The habitats in question are extensive in proximity to the Wind Farm Site and surrounding landscape, such as surrounding the bogs at Derrylea to the South and Ummeras to the East. There will also be extensive areas of the habitat surviving in the area post-development. The unmitigated impact would in a worst case scenario lead to the loss of a breeding territory within the site constituting a long term low magnitude impact on this medium sensitive species and lead to a low significance effect on the population within the site.	Low effect significance	Long term slight negative effect

Disturbance Construction works are likely to give rise to local disturbance of breeding Woodcock which have been confirmed breeding in the northern part of the site. The short term effect of the disturbance could lead to breeding failure and temporary displacement in proximity to works. The effect would be short term as the availability of habitat within the site will persist post-development to be used by breeding woodcock. The impact would be medium in magnitude and lead to a low effect significance.	Low effect significance	Short term slight negative effect
Operational phase		
Displacement / Barrier effects The minor loss of breeding habitat for woodcock will cause a minor reduction in available habitat. However, a significant area of similar habitat will remain within the site and is common in the wider area. This potential long term displacement associated with the loss of habitat will be minor, the birch dominated habitat is likely to expand in certain parts of the site throughout the lifetime of the development.	Low effect significance	Long term slight negative effect
Collision Woodcock were rarely observed flying at rotor height. The collision risk model (Appendix 10-5) predicts an immeasurably low rate of 0.0003 collisions per year, or approximately 0.009 over the project's lifetime. This will have a negligible impact on the local population, resulting in an overall very low significance effect for this species of medium sensitivity.	Very low effect significance	Long-term Imperceptible Negative Effect

10.5.1 Potential Effects Associated with Turbine Delivery Route

A map showing the turbines delivery route is presented in Figure 10-9 above. Very minor works are required within roadside habitats at five locations along the turbine delivery route as described in Chapter 2. Multidisciplinary ecological surveys were undertaken in these areas to assess their potential to support sensitive species. The majority of habitats along the turbine delivery route are of low ecological value (i.e. existing roads/tracks, agricultural land) and do not have the potential to support species of conservation interest in the area. On a precautionary basis, it is assumed that some temporary displacement of common bird species may occur during construction works. However, given the extent of suitable habitat in the wider area; significant displacement effects are not predicted. The minor works associated with the turbine delivery route do not have the potential to result in any significant habitat loss or displacement of any Valued Ornithological Receptor species.

10.5.2 Potential Effects Associated with Grid Connection

A map showing the grid connection route is presented in Figure 10-9 above. The grid connection will involve excavations largely confined to within the road corridor along its length. Windscreen multidisciplinary ecological surveys were undertaken along the route of the grid connection. The habitats along the grid connection route are of low ecological value (paved roadway and roadside verges) and are unlikely to support VOR species. The excavation works associated with the installation of the underground cable will not give rise to any significant effects on VOR species.

On a precautionary basis, it is assumed that some temporary displacement of common bird species may occur during construction works. However, given the extent of suitable habitat in the wider area; significant displacement effects are not predicted. The minor works associated with the grid connection do not have the potential to result in any significant habitat loss or displacement of any Valued Ornithological Receptor species.

10.5.3 Decommissioning Phase Effects

Effects on Value Ornithological Receptors due to disturbance and displacement during decommissioning are expected to be comparable to those described in relation to the conservation phase above. The same and similar in magnitude and significance can be expected to occur. No direct habitat loss effects will arise during the decommissioning phase.

10.6 Mitigation

In accordance with CIEEM guidelines, a sequential process has been adopted to avoid, mitigate and, if necessary, compensate for ornithological effects. This is referred to as the 'mitigation hierarchy'. Note that the term 'compensation' as used here does not refer to compensation for adverse effects on the integrity of European sites. Furthermore, no compensation measures are considered necessary in respect of ornithology for this project.

The differences between avoidance, mitigation, compensation and enhancement are defined here as follows:

- avoidance is used where an effect such as disturbance or displacement has been avoided through changes in scheme design;
- mitigation is used to refer to measures to reduce or remedy a specific negative effect in situ, e.g. timing restrictions during construction to avoid key periods for certain species;
- compensation describes measures taken to offset residual effects, i.e. where mitigation in situ is not possible, e.g. creation of new habitats to compensate for habitats lost or effectively lost due to displacement; and
- enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

10.6.1 Mitigation By Avoidance

A process of 'mitigation by avoidance', as informed by constraints assessment and consultation, was undertaken by the EIAR team during the design of the wind farm layout and selection of grid connection (refer to **Chapter 3 - Site Selection and Alternatives for** further detail) with the objective of avoiding / minimising the potential for significant effects on ornithology. The Site layout and drainage infrastructure has been designed such that it is sympathetic to the existing ornithological interest of the site and aims to maintain the existing ornithological status of the Site. The project design has taken account of the sensitivity of terrestrial habitats by minimising land-take as much as possible and avoidance of higher value semi-natural habitat where possible with no infrastructure placed within 800m of the identified probable curlew breeding territory. The grid connection route was selected to utilise built infrastructure for the majority of its length (i.e. cables to be laid within public roads). Cables will be laid underground to avoid effects on roadside hedgerows and disturbance to nesting birds.

10.6.2 Construction Phase Mitigation

Appointment of Ecological Clerk of Works

- An Ecological Clerk of Works (ECoW) will be appointed to provide ongoing ecological advice and monitoring throughout the construction phase. The key responsibilities of the ECoW will include:
- Reviewing and Monitoring Mitigation: Overseeing the implementation of all ecological mitigation measures outlined in this document and other relevant plans.
- Pre-Construction Survey: Overseeing a pre-construction bird surveys to establish a baseline and ensure breeding birds are not adversely affected.
- Personnel Awareness: Informing and advising on-site personnel on the specific ornithological and ecological sensitivities present within the site.
- Oversight and Advice: Providing continuous oversight of ecological issues during the construction period, offering immediate advice on ornithological and other ecological matters as they arise.

- Legal Compliance Guidance: Providing guidance to the principal contractor and sub-contractors to ensure all works remain compliant with relevant wildlife legislation, including the protection of scheduled species and their habitats.

Avoidance of impacts on nesting birds and sensitive species

1. **Timing of Works:** Clearance of uncultivated vegetation (trees, hedgerows) will be strictly scheduled outside the main bird breeding season (March to August inclusive).

2. **Pre-Construction Surveys:** If works must occur during the breeding season, a pre-commencement bird nest survey will be conducted by a qualified ecologist immediately before the work starts (no more than 24-48 hours prior) to confirm the area is clear of active nests.

3. **Buffer Zones:** Where applicable, works will be prohibited within established disturbance-free buffer zones around the nests of sensitive species (e.g., breeding waders) for the duration of their nesting period.

   Based on survey data and the relevant literature (e.g. Goodship and Furness, 2022; McGuinness *et al.*, 2019) the following disturbance-free buffer zones will be applied to minimise potential disturbance during construction. It should be noted that these distances represent a guide only and these may vary according to topography and other factors at each nest site. Six VORs were confirmed within the study are during pre-planning surveys. These are listed below with the recommended disturbance-free buffer zones.

   - Buzzard 200m
   - Curlew 800m
   - Lapwing 350m
   - Snipe 300m
   - Sparrowhawk 200m
   - Woodcock 300m

4. **Ongoing Monitoring:** The Ecological Clerk of Works (ECoW) will monitor for any nesting activity that commences after the initial survey and will instruct the contractor to cease work and implement further buffers if necessary.

10.6.2.1 Operational Phase Mitigation

Mitigating Collision Risk To Sensitive Species

The Collision Risk Assessment undertaken for the project identified Golden Plover as being at most risk of collision. This was mainly related to large flocks that occasionally fly within and around the site. These large flocks tend to occur most regularly during the early (arrival) and late (departure) winter season coinciding with the main migration periods.

To effectively mitigate this risk, an adaptive management strategy is proposed to be agreed with the Local Authority and NPWS. This strategy is based on monitoring for the presence of large flocks and this would then trigger curtailment of turbines, which ensures turbine operation is modified only when high-risk conditions are present. To implement this strategy the following is proposed:

<u>Baseline monitoring</u>

Prior to and during the first two years of operation, dedicated monitoring will be undertaken to improve understanding of Golden Plover (to also include Lapwing and Whooper Swan as secondary species) occurrence at the site. Monitoring of the following parameters will be necessary: flock size and distribution, temporal patterns, and flight height analysis.

Develop Monitoring and curtailment protocol

An experienced ornithologist will conduct regular monitoring surveys during high -risk periods. Once certain criteria are met (threshold number of birds within defined distance of turbines) then a message is sent the wind farm controller to shut down specific turbines.

The mitigation strategy will incorporate the following:

- Review effectiveness annually
- Protocol is adapted as more data becomes available.
- Reporting to local authority on monitoring and curtailment events etc.

10.6.2.2 Decommissioning Phase Mitigation

Mitigation approach during decommissioning will replicate that done during construction so as to minimise any risk of disturbance to breeding birds due to site activities and works associated with decommissioning which will be of a similar nature to construction.

10.6.1 Monitoring

Construction Phase

A precautionary approach will be adopted, with construction works scheduled outside the bird nesting season (1 March to 31 August inclusive). Pre-commencement walkover surveys, conducted by a suitably qualified ornithologist, will be undertaken within a 500m radius of all work areas to identify nests or roosts of conservation concern. If works must extend into the breeding season, surveys will be repeated to confirm the absence of breeding birds. Should an active nest or roost of high conservation concern be identified, a species-specific buffer zone (as per Goodship & Furness, 2022, McGuinness *et al.*, 2019) will be established. No works will occur within this buffer until monitoring confirms the site is no longer in use.

Operational Phase

A detailed Bird Monitoring Programme will be implemented to monitor collision, displacement, and habituation effects. Following best practice guidelines (SNH, 2009), surveys will be conducted in Years 1, 2, 3, 5, 10, and 15 and will include:

- Monthly vantage point surveys of flight activity.
- Breeding bird surveys using an Adapted Brown & Shepard method.
- Targeted carcass searches using trained dogs, incorporating detection and scavenger rate trials to ensure data robustness.

Reports at the end of each monitoring year will be submitted to the Planning Authority and will inform any required adaptive mitigation.

Decommissioning Phase

The decommissioning process will mirror the monitoring approach of the construction phase. Pre-commencement surveys will be conducted outside the nesting season, with repeated surveys required if works extend into subsequent seasons. Identified active nests or roosts will trigger the same species-specific buffer zones and work prohibitions as during construction.

10.7 Residual Effects

Considering the significance of potential effects and incorporating the proposed mitigation and best practice measures, no significant residual impacts on Ornithological Receptors are anticipated in relation to direct habitat loss, displacement, or collision risk

A summary of residual effects relevant to each VOR that was subject to detailed assessment is presented in Table 10-15. As per Percival 2003 criteria, no residual effects of significance greater than Low were identified. As per EPA 2022 criteria, no residual effect significance of greater than Slight was identified.

Table 10-15: Summary of each VOR in relation to potential effects, mitigation, and residual effects.

VOR	Potential Effect	Mitigation	Residual effect (Percival 2003)	Residual effect (EPA 2022
Buzzard				
Construction - Habitat Loss	Very low effect significance	Design avoidance	Very low effect significance	Long term imperceptible negative effect.
Construction - Disturbance	Very low effect significance	ECoW / Nest Protection / Timing	Very low effect significance	Short term, not significant effect.
Operational – Displacement	Very low effect significance	n/a	Very low effect significance	Long term slight negative effect
Operational - Collision	Very low effect significance	n/a	Very low effect significance	Long term slight negative effect
Curlew (breeding)				
Construction - Habitat Loss	No significant effects	n/a	No significant effects	No significant effects
Construction - Disturbance	Low effect significance	ECoW / Nest Protection / Timing	Very low effect significance	No significant effect
Operational – Displacement	No significant effects	n/a	No significant effects	No significant effect
Operational - Collision	Very low effect significance	n/a	Very low effect significance	Long term slight negative effect
Golden Plover (wintering)				
Construction - Habitat Loss	No significant effects	n/a	No significant effects	No significant effects
Construction - Disturbance	No significant effects	n/a	No significant effects	No significant effects
Operational – Displacement	No significant effects	n/a	No significant effects	No significant effects
Operational - Collision	Low effect significance	Monitoring & Curtailment	Low effect significance	Long term slight effect
Hen Harrier				

VOR	Potential Effect	Mitigation	Residual effect (Percival 2003)	Residual effect (EPA 2022
Construction - Habitat Loss	Low effect significance	Design avoidance	Low effect significance	Long-term slight negative effect
Construction - Disturbance	Low effect significance	ECoW / Nest Protection / Timing	Low effect significance	Long-term slight negative effect
Operational – Displacement	Low significance effect	n/a	Low significance effect	Short term slight negative effect
Operational - Collision	Very low effect significance	n/a	Very low effect significance	Long-term imperceptible negative effect
Kestrel				
Construction - Habitat Loss	Low effect significance	Design avoidance	Low significance effect	Long term slight significant effect
Construction - Disturbance	Very low effect significance	ECoW / Nest Protection / Timing	Very low effect significance	Short term not significant effect
Operational – Displacement	No significant effects	n/a	No significant effects	No significant effects
Operational - Collision	Low effect significance	n/a	Low effect significance	Long term slight negative effect
Lapwing (winter)				
Construction - Habitat Loss	Low effect significance	Design avoidance	No significant effects	No significant effects
Construction - Disturbance	Low effect significance	ECoW / Nest Protection / Timing	No significant effects	
Operational – Displacement	No significant effects	n/a	No significant effects	No significant effects
Operational - Collision	Low effect significance	Monitoring & Curtailment	Very low effect significance	Long term slight negative effect
Lapwing (breeding)				
Construction - Habitat Loss	Low effect significance	Design avoidance	Low effect significance	Long term slight negative effect
Construction - Disturbance	Low effect significance	ECoW / Nest Protection / Timing	Very low effect significance	Short term slight negative effect
Operational – Displacement	Low effect significance	n/a	Low effect significance	Long term slight negative effect
Operational - Collision	No significant effects	n/a	No significant effects	No significant effects
Snipe				
Construction - Habitat Loss	Very low effect significance	n/a	Very low effect significance	Not significant effect
Construction - Disturbance	Very low effect significance	ECoW / Nest Protection / Timing	Very low effect significance	Temporary imperceptible effect
Operational – Displacement	Low effect significance	n/a	Low effect significance	Long term slight effect
Operational - Collision	Very low effect significance	n/a	Very low effect significance	Long-term Imperceptible Negative Effect

VOR	Potential Effect	Mitigation	Residual effect (Percival 2003)	Residual effect (EPA 2022
Sparrowhawk				
Construction - Habitat Loss	Very low effect significance	Design avoidance	Very low effect significance	Not significant effect
Construction - Disturbance	Negligible effect significance	ECoW / Nest Protection / Timing	Negligible effect significance	Not significant effect
Operational – Displacement	Low effect significance	n/a	Low effect significance	Imperceptible effect
Operational - Collision	Very low effect significance	n/a	Very low effect significance	Long term slight effect
Whooper Swan				
Construction - Habitat Loss	No significant effects	n/a	No significant effects	No significant effects
Construction - Disturbance	Very low effect significance	n/a	Very low effect significance	Short term not significant effect
Operational – Displacement	No significant effects	n/a	No significant effects	No significant effects
Operational - Collision	Very low effect significance	Monitoring & Curtailment	Very low effect significance	Long-term Imperceptible Negative Effect
Woodcock				
Construction - Habitat Loss	Low effect significance	Design avoidance	Low effect significance	Long term slight negative effect
Construction - Disturbance	Low effect significance	ECoW / Nest Protection / Timing	Very low effect significance	Short term Imperceptible Negative Effect
Operational – Displacement	Low effect significance	n/a	Low effect significance	Long term slight negative effect
Operational - Collision	Very low effect significance	n/a	Very low effect significance	Long-term Imperceptible Negative Effect

10.8 Cumulative Impacts

Other wind farm projects which could potentially interact with the proposed development and result in significant cumulative effects on birds are considered below. The various wind farm sites occur within 20km of the Proposed Wind Farm Site and include windfarms at various stages in the project cycle:

Wind Farm	No Turbines	Distance removed from proposed wind farm site	Project Development Status	Identificaiton of cumulative effects of significance
Cushina	9	3km	In planning	No
The details of the project are not currently available and therefore very limited assessment is possible. The site is located north-west of the Proposed Wind Farm Site, to the north of Derryounce Lakes. Site appears to be located within farmland habitat with degraded bog in proximity and conifer plantations closeby. Bird surveys at the Project Wind Farm Site did not identify any flight paths of birds suggesting any direct bird connectivity with this area. Further details on flight paths are available in Appendix 10.4. Considering the predicted impacts of the Proposed Wind Farm Site and our knowledge of the avifauna in the area no potential cumulative effects of significance are identified.				
Moanvane	12	6km	Operational	No
This site is located in area 6km west of the Proposed Wind Farm Site, in an area dominated by Conifer plantation and degraded and cutover raised bog. Farmland occurs in the surroundings. Bird surveys at the Project Site did not identify any flight paths of birds suggesting any direct bird connectivity with Moanvane (Refer to Appendix 10.4) The potential for additive Golden Plover fatalities due to collision risk has been considered. However, based on the post-mitigation effects predicted for the Proposed Wind Farm Site, it is concluded that cumulative effects of significance are not foreseen, furthermore the Moanvane assessment on birds concluded that '*the project would have an imperceptible residual impact on golden plover at a county and all-Ireland level. Habituation to the site is likely to also reduce the proposed risk.*' Considering the predicted impacts of the current project and those identified as part of pre-planning reports on Moanvane, no potential cumulative effects of significance are identified.				
Mount Lucas	28	10km	Operational	No
This is a large operational wind farm site located 10km north-west of the Proposed Wind Farm Site. The windfarm is located within an extensive area of cutaway bog with regenerating wetland and scrub habitats present. Bird surveys at the Proposed Wind Farm Site did not identify any flight paths of birds suggesting any direct bird connectivity with Mount Lucas (Refer to Appendix 10.4). The potential for additive Golden Plover fatalities due to collisions risk has been considered, based on the post-mitigation effects predicted for the Proposed Wind Farm Site, it is concluded that cumulative effects of significance are not foreseen. Considering the predicted impacts of the Proposed Wind Farm Site and those identified as part of planning reports on Mount Lucas, no potential for cumulative effects of significance in relation to birds are identified.				

Wind Farm	No Turbines	Distance removed from proposed wind farm site	Project Development Status	Identificaiton of cumulative effects of significance
Ballydermot	48	7km	In planning	No
The details of the project are not currently available and therefore very limited assessment possible. The site is located north-east of the Proposed Wind Farm Site within an expansive area of previously exploited Bord na Móna cutaway bog, with significant regeneration of scrub. Bird surveys at the Proposed Wind Farm Site did not identify any flight paths of birds suggesting any direct bird connectivity with this area (Refer to Appendix 10.4). Considering the predicted impacts of the Proposed Wind Farm Site and our knowledge of the avifauna in the area no potential cumulative effects of significance are identified.				
Cushaling	8	8km	Operational	No
Cushaling wind farm was granted planning subject to conditions in 2020. Bird surveys at the Proposed Wind Farm Site did not identify any flight paths of birds suggesting any direct bird connectivity with this area (Refer to Appendix 10.4). However, considering the proximity and connectivity provided by the Figile River which runs closeby both sites the potential for connectivity between Cushaling and the farmland used by wintering birds to the east of the Proposed Wind Farm Site. The potential for additive Golden Plover fatalities due to collision risk has been considered in this assessment. Collision was identified as a potential effect in the Cushaling site. Adaptive mitigation is built into the project to enact curtailment should the risk of collision arose during the operational phase. Based on the residual (post-mitigation) effects predicted for the Proposed Wind Farm Site and for Cloncreen it is concluded that cumulative effects of significance on birds are not foreseen.				
Cloncreen	21	9km	Operational	No
This is a large operational wind farm site located 9km north of the Proposed Wind Farm Site. The windfarm is located within an extensive area of Bord na Móna cutaway bog with regenerating wetland and scrub habitats present. Based on the residual impact. Bird surveys at the Proposed Wind Farm Site did not identify any flight paths of birds suggesting any direct bird connectivity with Cloncreen (Refer to Appendix 10.4). The potential for additive Golden Plover fatalities due to collisions risk has been considered. Based on the post-mitigation effects predicted for the Proposed Wind Farm Site and the low collision risk identified for Cloncreen, it is concluded that cumulative effects of significance are not foreseen. Considering the predicted impacts of the current project and those identified as part of planning reports on Cloncreen, no potential for cumulative effects of significance in relation to birds are identified.				
Cloncarrow	4	12km	In planning	No

Wind Farm	No Turbines	Distance removed from proposed wind farm site	Project Development Status	Identificaiton of cumulative effects of significance
The details of the project are not currently available and therefore very limited assessment possible. Cloncarrow is located north-east of the Proposed Wind Farm Site, adjacent to and to the north of Mount Lucas Wind Farm. Site appears to be located in an area of exploited Bord na Móna cutaway. Bird surveys at the Proposed Wind Farm Site did not identify any flight paths of birds suggesting any direct bird connectivity with this area (Refer to Appendix 10.4). Considering the predicted impacts of the Proposed Wind Farm Site and our knowledge of the avifauna in the area no potential cumulative effects of significance are identified.				
Dernacard	8	13km	Consented	No
An eight turbines wind farm located ca 13km to the south-west of the Proposed Wind farm Site. The project received planning permission in 2024. Bird surveys at the Proposed Wind Farm Site did not identify any flight paths of birds suggesting any direct bird connectivity with this area (Refer to Appendix 10.4). Considering the predicted impacts of the Proposed Wind Farm Site and those identified as part of planning reports on Dernacart, no potential for cumulative effects of significance in relation to birds are identified.				
Yellow River	29	19km	Operational	No
A 29 turbine turbines site three turbines located 19km from Proposed Wind Farm Site. The Yellow River wind farm is located on mostly agricultural fields (improved grassland, with some remnant raised bogs and cutover present in the surrounding landscape. The site is fully operational. Considering the distance removed and absence of any identifiable corridor it is highly unlikely that there is any significant connectivity between the Proposed Wind Farm Site and the Yellow River Wind Farm. Golden Plover and Whooper Swans were considered as ecological receptors at the planning stage. Significant effects on either species were not identified. Based on the residual (post-mitigation) effects predicted for the Proposed Wind Farm Site and for Yellow River Wind Farm it is concluded that cumulative effects of significance on birds are not foreseen.				

10.9 Conclusion

An assessment of effects on ornithology has been carried out for the proposed development, based on a desk-based review and detailed surveys conducted between 2017 and 2025. The consideration of residual effects (post-mitigation) leads to the conclusion that the Proposed Wind Farm Development will not result in any significant negative effects on the Ornithological Receptors. Therefore, provided the Proposed Development is constructed, operated, and decommissioned in accordance with the submitted design, proposed mitigation measures, and relevant best practice, no significant individual or cumulative effects on ornithology are anticipated.

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