Planning and Environmental Consultants

Environmental Impact Assessment Report

Lemanaghan Wind Farm, Co. Offaly

Chapter 7 Birds

Table of Contents

GLOSSARY OF TERMS

Term	Meaning
Breeding Season	April to September
Collision Risk Model	a mathematical model to predict the number of birds that may be killed by collision with moving wind turbine rotor blades
Key Ornithological Receptor	a bird species upon which potential impacts are anticipated and assessed
Potential Collision Height	The rotor-swept area of the proposed turbines
Winter Season	October to March

GLOSSARY OF ACRONYMS

Acronym	Meaning
BoCCI	Birds of Conservation Concern in Ireland
BTO	British Trust for Ornithology
CRA	Collision Risk Assessment
I-WeBS	Irish Wetland Bird Survey
KOR	Key Ornithological Receptor
NPWS	National Parks and Wildlife Service
PCH	Potential Collision Height
SNH	Scottish Natural Heritage
SPA	Special Protection Area
VP	Vantage Point

7. BIRDS

7.1 Introduction

This chapter assesses the likely significant impacts of the proposed Lemanaghan Wind Farm development (hereafter the "Proposed Project") on avian receptors. Particular attention has been paid to bird species with national and international protection under the Irish Wildlife Acts 1976-2022 and the European Union (EU) Birds Directive (2009/147/EC). Where potential significant effects on avian receptors are identified, mitigation is described (to avoid, reduce or offset) and the residual effects are assessed.

This chapter is supported by Technical Appendices 7-1 to 7-7. Technical Appendix 7-1 to 7-4 contains data from the surveys undertaken including full details of the survey times, weather conditions, and other relevant information together with the bird records themselves. Confidential Appendix 7-5 contains sensitive records of protected species breeding and roosting sites. Appendix 7-6 contains the Collision Risk Assessment (CRA) document which illustrates how the collision risk modelling was undertaken for the Proposed Project. Appendix 7-7 contains the bird monitoring programme. The proposed bird enhancement measures are included in Appendix 6-5 Biodiversity Management and Enhancement Plan, of Chapter 6 Biodiversity. The Proposed Project site and survey radii (i.e. the study areas) are provided in Figures 7.1 – 7.10 further below.

The chapter is structured as follows:

- The Introduction provides a description of the Proposed Project and the relevant legislation, guidance and policy context.
- The Assessment Approach and Methodology section is a comprehensive description of the ornithological surveys and impact assessment methodology used to inform a robust assessment of the potential impacts of the Proposed Project on birds.
- The Baseline Ornithological Conditions section describes the existing bird population at the Proposed Project site.
- The Receptor Evaluation section identifies key ornithological receptors and determines their sensitivity.
- The Potential Impacts section details the impact assessment (including direct habitat loss, disturbance/displacement and collision risk). Impacts are described with regard to each phase of the Proposed Project: construction, operation and decommissioning.
- The Mitigation and Best Practice Measures section describes proposed mitigation and best practice measures to ameliorate the identified impacts.
- The Monitoring section outlines a schedule for monitoring birds during each phase of the Proposed Project if planning permission is granted: commencement and construction, operation and decommissioning.
- The Residual Effects section considers the implications of the proposed mitigation, best practice, enhancement measures and monitoring.
- Finally, the Cumulative Effects section fully assesses potential cumulative effects of the Proposed Project in combination with other projects.
- The Conclusion provides a summary statement on the overall significance of predicted effects on birds.

As detailed in Section 1.1.1 of Chapter 1: Introduction to the Proposed Project, for the purposes of this EIAR, the various project components are described and assessed using the following references: 'Proposed Project', 'the Proposed Wind Farm', 'Proposed Grid Connection', 'Proposed Project site' and 'site'.

Note: within this Chapter, in the sections below, where the "Proposed Project site" is referred to and distances provided, this relates to the entire EIAR Site Boundary minus proposed turbine delivery route

accommodation works at Kennedy's cross. The proposed turbine delivery route, including proposed accommodation works is assessed in Section 7.5.4 below.

The following other definitions are used in this chapter:

- "Key Ornithological Receptor" (KOR) is defined as a species occurring within the zone of influence of the Proposed Project upon which potential impacts are anticipated and assessed.

7.1.1 Description of the Proposed Project

A full description of the Proposed Project is provided in Chapter 4 of this EIAR. In brief, Lemanaghan Wind Farm DAC (the Applicant) is seeking a ten-year planning permission for a project consisting of 15 turbines and the associated ancillary infrastructure. The turbines will be 145m at hub height, with 3 blades of a diameter of 150m, giving a rotor height of 220m. The Proposed Project will have an operational life of 35 years from the date of commissioning.

7.1.2 Legislation, Guidance and Policy Context

This EIAR is prepared in accordance with the requirements of EU Environmental Impact Assessment Directive 2014/52/EU. The following key legislative provisions are applicable to habitats and fauna in Ireland:

- The Wildlife Act 1976. This Act was revised in October 2022 to present amendments since enactment.
- The Birds Directive (EU Directive 2009/147/EC on the conservation of wild birds)
- The European Communities (Birds and Natural Habitats) Regulations 2011, as amended (S.I. no. 477 of 2011). These regulations transpose the EU Birds Directive into Irish law. The regulations were amended in 2013 (290/2013 and 499/2013), 2015 (355/205) as well as Chapter 4 of the Planning, Heritage and Broadcasting (Amendment) Act 2021 (11/2021) and in 2021 (293/2021).
- The International Convention on Wetlands of International Importance (the Ramsar Convention), 1971. This convention protects 45 wetland sites of significant value for nature in Ireland.

In the absence of specific national ornithological survey guidance for Ireland, the following guidance documents published by NatureScot (formerly Scottish Natural Heritage [SNH]) have been followed to inform this assessment:

- SNH (2000). Wind farms and birds: calculating a theoretical collision risk assuming no avoidance action. Scottish Natural Heritage, Inverness, Scotland. Available at: https://www.nature.scot/sites/default/files/2017-09/Guidance%20Note%20-%20Windfarms%20and%20birds%20-%20Calculating%20a%20theoretical%20collision%20risk%20assuming%20no%20avoiding%20action.pdf
- SNH (2009). Monitoring the impact of onshore wind farms on birds. Scottish Natural Heritage, Inverness, Scotland. Available at: https://www.nature.scot/sites/default/files/2017-09/Guidance%20Note%20-%20Monitoring%20the%20impact%20of%20onshore%20windfarms%20on%20birds.pdf
- SNH (2016). Assessing connectivity with Special Protection Areas (SPAs). Scottish Natural Heritage, Inverness, Scotland. Available at: https://www.nature.scot/sites/default/files/2018-08/Assessing%20connectivity%20with%20special%20protection%20areas.pdf
- SNH (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage, Inverness, Scotland. Available at:

https://www.nature.scot/sites/default/files/2018-06/Guidance%20Note%20-%20Recommended%20bird%20survey%20methods%20to%20inform%20impact%20assessment%20of%20onshore%20windfarms.pdf

- SNH (2018a) Avoidance rates for the onshore SNH wind farm collision risk model. Scottish Natural Heritage, Inverness, Scotland. Available at: https://www.nature.scot/sites/default/files/2018-09/Wind%20farm%20impacts%20on%20birds%20-%20Use%20of%20Avoidance%20Rates%20in%20the%20SNH%20Wind%20Farm%20Collision%20Risk%20Model.pdf
- SNH (2018b). Assessing the cumulative impacts of onshore wind farms on birds. Scottish Natural Heritage, Inverness, Scotland. Available at: https://www.nature.scot/sites/default/files/2018-08/Guidance%20-%20Assessing%20the%20cumulative%20impacts%20of%20onshore%20wind%20farms%20on%20birds.pdf
- SNH (2018c). Assessing significance of impacts from onshore wind farms outwith designated areas. Scottish Natural Heritage, Inverness, Scotland. Available at: https://www.nature.scot/doc/guidance-assessing-significance-impacts-bird-populations-onshore-wind-farms-do-not-affect-protected
- NatureScot (2024). Guidance on using an updated collision risk model to assess bird collision risk at onshore wind farms. NatureScot, Inverness, Scotland. Available at: https://www.nature.scot/doc/guidance-using-updated-collision-risk-model-assess-bird-collision-risk-onshore-wind-farms
- NatureScot (2025). Guidance - Assessing the cumulative impacts of onshore wind farms on birds. https://www.nature.scot/doc/guidance-assessing-cumulative-impacts-onshore-wind-farms-birds
- NatureScot (2025). Recommended bird survey methods to inform impact assessment of onshore wind farms. https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms

The following Irish guidance documents were also consulted:

- Percival, S.M. (2003). Birds and wind farms in Ireland: A review of potential issues and impact assessment. Ecology Consulting, Durham, UK. Available at: https://tethys.pnnl.gov/sites/default/files/publications/Percival_2003.pdf
- 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. Available at: https://birdwatchireland.ie/app/uploads/2019/09/BWI-Bird-Wind-Energy-devt-Sensitivity-Mapping-Guidance_document.pdf
- Gilbert, G., Stanbury, A. and Lewis, A. (2021). Birds of Conservation Concern in Ireland 4: 2020-2026. Irish Birds, 43:1-22. Available at: https://birdwatchireland.ie/birds-of-conservation-concern-in-ireland/

Furthermore, this assessment has been prepared with respect to the various planning policies and strategy guidance documents listed below and as detailed in Chapter 1 of this EIAR:

- European Commission (2002). Assessment of plans and projects significantly affecting Natura 2000 sites. Publications Office of the European Union, Luxembourg.
- European Commission (2020). Guidance document on wind energy developments and EU nature legislation. Publications Office of the European Union, Luxembourg.
- Planning and Development Acts 2000 (as amended).
- NRA (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes. National Roads Authority, Ireland.

- EPA (2022). Guidelines on the information to be contained in Environmental Impact Statement reports. Environmental Protection Agency, Johnstown Castle Estate, Wexford.
- DoHPLG (2018). Guidelines for planning authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. Department of Housing, Planning and Local Government, Government of Ireland, Dublin.
- Offaly County Development Plan 2021 – 2027.

7.1.3 Statement of Authority and Competence

This ornithology chapter has been prepared by Kathryn Sheridan (MSc.), Project Ornithologist Donnacha Woods (MSc.), Senior Ornithologist and reviewed by Padraig Cregg (MSc), Principal Ornithologist of MKO. All of whom are suitably qualified ornithologists with experience in completing avifaunal assessments and competent experts for the purposes of the preparation of this EIAR. The scope of works and survey methodology was devised by Padraig Cregg and is fully compliant with recent NatureScot (formerly Scottish Natural Heritage) guidance (SNH, 2017). Field surveys were undertaken by John Hehir, Sheriene Acun, Tom Ryan, Paul Troake, Sean O'Brien, Shay Fennelly, Jonah Gaine, Conor Rowlands, Andrew O'Donoghue, Niamh Scanlon, John Downes, Nessa Lee, Susan Doran, Susan Doyle, Conor Geoghegan, Peter Capsey, Patrick Manley, Cian Cahalin, Ben Clarke, Fionn O'Donoghue, Shawn Dowdall, Zuzana Erosova and Kathryn Sheridan. Surveyors are suitably qualified competent experts for the purposes of ornithological surveying.

7.2 Assessment Approach and Methodology

7.2.1 Desk Study

A comprehensive desk study was undertaken to search for any relevant information on species of conservation concern that may use the Proposed Project site and the surrounding area. The assessment included a thorough review of the available ornithological data including:

- Designated sites within the likely Zone of Influence (ZOI) of the Proposed Project.
- Bird atlases.
- Bird sensitivity mapping tool.
- Online web-mappers from the National Biodiversity Data Centre.
- Irish Wetland Bird Survey data.
- Review of specially requested records from the National Parks and Wildlife Service Rare and Protected Species Database.

7.2.2 Consultation

Consultation was undertaken with the relevant statutory and non-statutory organisations as part of the EIAR scoping to inform the current assessment. Full details can be found in Section 2.8 of Chapter 2: Background of the Proposed Project of this EIAR. Scoping was initially conducted in November 2020. Further scoping was conducted in March 2025 due to time elapsed from when previous scoping was carried out, updates in local and national policy and legislation, updates in relevant EIAR guidance, changes in the environmental baseline and refinement of the Proposed Project design.

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

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

Table 7-1 Consultation responses

	Consultee	Date of Response – 2020 Scoping	Date of Response – 2025 Scoping
01	An Taisce	No response received.	No response received.
02	BirdWatch Ireland	No response received.	No response received.
03	Department of Agriculture, Food and the Marine	Response received 05/05/2021 outlining tree felling requirements. No correspondence relating to birds received.	No response received.
04	Development Applications Unit (NPWS)	No response received.	Acknowledgement of receipt of consultation on 23/10/2024. Meeting held with the NPWS on 25/11/2025. Please see Section 2.8.3 of Chapter 2 for further details.
05	Irish Peatland Conservation Council	No response received.	No response received.
06	Irish Red Grouse Association	No response received.	No response received.
07	Irish Raptor Study Group	No response received.	No response received.
08	Inland Fisheries Ireland	Response received on 14/06/2021 outlining recommended measures for the protection of aquatic resources and associated riparian habitat. No correspondence relating to birds received.	No response received.
09	Irish Wildlife Trust	No response received.	Response received 23/10/2024 outlining that IWT do not have staff capacity to respond to consultation.
10	Waterways Ireland	No response received.	Response received 21/11/2024 outlining that Proposed Project is not the zone of influence of Waterways Ireland waterways and the organisation will therefore not be commenting.

7.2.3 Identification of Target Species and Key Ornithological Receptors

Following a comprehensive desk study, initial site visits and consultation, a list of "target species" likely to occur in the ZOI of the Proposed Project was compiled. Bird surveys conducted in the Proposed Project site were then specifically designed to survey for these target species, in accordance with NatureScot guidance (2017, revised 2025). The target species list was drawn from:

- Species listed on Annex I of the EU Birds Directive.
- Special Conservation Interests (SCI) of Special Protection Areas (SPA) within the zone of likely significant effects.
- Red listed Birds of Conservation Concern in Ireland (BoCCI).
- Species that can be particularly sensitive to wind farm developments, such as raptors.

Following analysis of field survey data (described below), a precautionary screening approach was followed to identify KORs: the list of target species observed during surveys (see Appendix 7-1) was refined to KORs, excluding those for which pathways for a significant effect could not be identified. This will be discussed in greater detail in Section 7.4.

7.2.4 Field Surveys

Field surveys were undertaken during the survey period, October 2020 to March 2025, consisting of four breeding seasons (April – September) and five non-breeding seasons (October – March). The survey work that was undertaken between October 2020 and March 2025 forms the core dataset for the assessment of impacts on ornithology. It is noted that the duration of surveys greatly exceeds the typical minimum requirement of two years of surveying.

These field surveys were undertaken in compliance with NatureScot guidance (SNH, 2017). Following the completion of these surveys, updated survey Guidance was published by NatureScot (i.e. SNH, 2017; revised in NatureScot, 2025). The surveys are also in accordance with the revised Guidance (NatureScot, 2025). The considerable duration of surveys provides confidence that the results of surveys are representative of the baseline condition. The data provided in this report is robust and allows clear, precise and definitive conclusions to be made in relation to the avian receptors identified within the Proposed Project site and its surroundings.

Field survey methodologies were devised to survey for the bird species composition and assemblages that occur within the Proposed Project site and its surroundings. The study area surveyed for each type of survey is discussed in the methodology section below. The survey locations / areas are shown in Figures 7-1 to 7-8. The survey radii were devised in relation to the Lemanaghan Bog boundary, as provided to MKO by Bord na Móna (BnM) during initial survey design. The Lemanaghan Bog boundary is largely analogous to the EIAR Site Boundary (the site), with the site encompassing additional areas outside of the Lemanaghan Bog boundary. As such, in most cases the survey radii discussed in the relevant sections below exceeded the respective distances from the site and the requirements of SNH (2017).

The Proposed Grid Connection will consist of approximately 0.8km of overhead line (OHL) (comprising 0.4km of OHL from the proposed steel masts for the double loop-in/loop-out from the proposed onsite 220kV substation to the existing OHL) connecting from the proposed on-site substation to the existing Shannonbridge-Maynooth 220kV OHL, and is situated in the north of the Proposed Project site in the townland of Cooldorragh, Co. Offaly. The Proposed Grid Connection infrastructure was thoroughly covered during ornithological surveys, as detailed in the relevant sections below.

7.2.4.1 Initial Site Assessment

Based on the results of the desk study, consultation and reconnaissance site visits undertaken in September 2020, the likely importance of the Proposed Project site for bird species was ascertained. Based on the collated information available from the above preliminary assessment and adopting a precautionary approach, a site-specific survey scope for the ornithological survey was developed.

7.2.4.2 Survey Methodologies

7.2.4.2.1 *Vantage Point Surveys*

Vantage point surveys were undertaken in accordance with NatureScot guidance (2017, revised 2025) to monitor flight activity within the Proposed Project site and within a 500m radius of the potential turbine positions. Surveys were conducted from six fixed point vantage points with comprehensive coverage of the Proposed Project site (Figure 7-1). The vantage point locations were selected by undertaking a viewshed analysis (described below) and confirmed by a reconnaissance visit and initial field surveys to ensure that the proposed turbine layout was entirely covered.

Viewshed Analysis

The viewshed analysis aims to identify the most suitable locations to site vantage points such that the airspace of the proposed turbine rotor swept area is in view using the fewest possible number of vantage points. Viewsheds were calculated using visibility analysis over raster DEM (Version 1.8) in QGIS (Version 3.28) using a notional layer suspended at 70m, which is representative of the minimum swept height of the proposed turbines. While the relevance of being able to view as much of the site to ground level is acknowledged, the NatureScot guidance (2017, revised 2025) 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.

The vantage point location was tested for visibility coverage of the proposed turbines and to a 500m radius of the outermost turbines in line with NatureScot (2017, revised 2025). The viewshed analysis was undertaken by creating a viewshed point 1.75m in height (to represent the height of the observer) on a map using a 25m resolution digital terrain model (DTM). The relative height of any surrounding vegetation and its effects on visibility was recorded during a site visit and is also accounted for in the analysis. Using QGIS (Version 3.28), a viewshed of 360° was produced calculating an area 70m from ground level up to a 2km radius. The resulting viewshed image was then cropped to 180° to give the viewshed. A 500m buffer was applied to the outer most turbines of the Proposed Wind Farm. The visible viewshed at 70m is presented in Figure 7-2.

Data Recording and Digitisation

Survey methodology followed NatureScot guidance (2017, revised 2025). The surveyor collected data on bird observations and flight activity from the scanning arc of 180° to a 2km radius at the fixed vantage point locations for two 3 hour watches separated by a minimum 30 minute break (i.e. 6 hours total) per month. Surveys were conducted from October 2020 to March 2025 inclusive, and were scheduled to provide a minimum of 36 hours per winter or breeding season and spread over the full daylight period, including dawn and dusk watches, to coincide with the highest periods of bird activity (Table 7-2).

Table 7-2 Vantage point survey effort

Survey Season and Number of Vantage Points (VPs)	Effort per Vantage Point (VP)
Winter Season 2020/2021 (6 VPs)	21/24 hours per VP[1]
Breeding Season 2021 (6 VPs)	36 hours per VP
Winter Season 2021/2022 (6 VPs)	36 hours per VP

[1] *A total of 36 hours were not completed at VPs in 2020/2021, however this is not of concern as the minimum requirement of two years' of bird surveys (2017, revised 2025) was greatly exceeded throughout the overall survey period.*

Breeding Season 2022 (6 VPs)	36 hours per VP
Winter Season 2022/2023 (6 VPs)	36 hours per VP
Breeding Season 2023 (6 VPs)	36 hours per VP
Winter Season 2023/2024 (6 VPs)	36 hours per VP
Breeding Season 2024 (6 VPs)	36 hours per VP
Winter Season 2024/2025 (6 VPs)	36 hours per VP

Flight activity of target species was mapped and recorded as per defined flight bands, which were chosen in relation to the dimensions of potential turbine models for the site. Bands were split into 0-15m, 15-25m, 25-200m and >200m. All flight activity within height bands 25-200m and >200m is considered to be within the Potential Collision Height (PCH) as the turbine swept area of the proposed turbine dimension overlaps with these height bands (lowest swept height 70m, maximum tip height 220m). Please see Appendix 7-6 for further details. In addition, the presence of any non-target species was recorded to inform the evaluation of supporting habitat. The survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions.

Note: the Proposed Grid Connection OHL was included within the viewsheds of VP4/VP4a.

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

7.2.4.2.2 *Breeding Walkover Surveys*

Breeding walkover surveys were undertaken to determine the presence of bird species of high conservation concern and identify areas of possible, probable or confirmed breeding for bird species observed within the Proposed Project site and a 500m radius. The methodology was based on Brown and Shepherd (1993) and Calladine *et al.* (2009), combined with Common Bird Census methods (British Trust for Ornithology, 2021) for dense habitat. Transect routes were walked across different habitat complexes within the survey area where access allowed. Using binoculars, the surveyor regularly scanned the surroundings of each transect for target species. All target species were mapped and breeding status was assigned following British Trust for Ornithology (BTO) breeding status codes[2]. In addition, the presence of any non-target species was recorded to inform the evaluation of supporting habitat.

Breeding walkover surveys were carried out at dawn over four visits during the core breeding season months April to July (2021, 2022, 2023 & 2024), with the Proposed Project site being visited three consecutive days per month on each occasion. Following all survey visits, the field maps were analysed to determine the number and location of breeding territories. All non-breeding individuals and species encountered were also recorded. Survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions for each survey.

Note: the site of the Proposed Grid Connection infrastructure was covered during breeding walkover surveys as part of Transect 2. Please see Figure 7-3 for transect routes.

[2] https://www.bto.org/our-science/projects/birdatlas/methods/breeding-evidence

7.2.4.2.3 Breeding Raptor Surveys

Breeding raptor surveys were undertaken within the Proposed Project site and to a 2km radius to identify occupied territories and monitor their breeding success near or within the Proposed Project site. Raptors include all harrier, falcon, buzzard, eagle, hawk, owl, kite and osprey species. Survey methodology followed Hardey *et al.* (2013). Breeding raptor watches of 3 hours (supplemented by transects if necessary) were conducted during daylight at a total of eleven breeding raptor locations over the four breeding seasons. All raptor species observed were recorded, mapped and breeding status was assigned following BTO breeding status codes. Surveyors did not approach nest sites to avoid disturbance.

Each breeding raptor location was surveyed once per month during the core breeding season between April and July. Survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions.

Note: the survey location BR3 was situated adjacent to the Proposed Grid Connection infrastructure. Figure 7-4 shows the breeding raptor locations.

7.2.4.2.4 Breeding Woodcock Surveys

Breeding woodcock surveys were undertaken in suitable habitat within the Proposed Project site and to a 500m radius. The survey aimed to identify breeding woodcock territories within the Proposed Project site by locating roding (breeding display) males. Survey methodology followed Gilbert *et al.* (1998): the surveyor walked transects within the survey area for two hours from dusk until last visible light during which all woodcock observations were mapped, with particular reference to roding observations.

Each transect was surveyed three times during the core breeding season of May and June (2021, 2022, 2023 & 2024). Survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions. Figure 7-5 shows the transect routes.

7.2.4.2.5 Breeding Kingfisher Survey

Following an incidental observation of kingfisher activity along a bog drain during a vantage point survey in early May 2023, a dedicated breeding kingfisher survey was undertaken at this location in May 2023. The survey aimed to confirm the presence of a breeding kingfisher territory at this location by locating kingfishers or signs of nesting. Survey methodology followed Cummins *et al.* (2010): the surveyor walked along the subject drains searching for kingfisher, nest holes or suitable nesting banks during daylight hours. All such observations were recorded and mapped. Survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions. The survey location is shown in Confidential Appendix 7-5 Figure 3-3.

This location was subsequently surveyed as part of breeding walkover surveys in breeding season 2024.

7.2.4.2.6 Breeding Barn Owl Survey

Following an incidental observation of a barn owl within a building in March 2021 during a dusk vantage point survey, breeding barn owl surveys were subsequently undertaken at this location during breeding seasons 2021, 2022 & 2023. Survey methodology followed TII (2021). The surveyor conducted a watch at potential nest sites from 30 mins before sunset until 1 hour after sunset, searching for barn owls provisioning young, listening for the sound of chicks, and observing for barn owl pellets, feathers or whitewash. All such observations were recorded and mapped and a breeding status was assigned following TII (2021). The potential nest site was surveyed a minimum of three times during the core breeding season May to July (2021, 2022 & 2023).

Survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions. The survey location is shown in Confidential Appendix 7-5, Figure 7-5-20 to Figure 7-5-22.

7.2.4.2.7 Winter Walkover Surveys

Winter walkover surveys were undertaken to record the presence of bird species within the Proposed Project site to a 500m radius, including areas between vantage point locations. The methodology was adapted from the breeding walkover methodology outlined in Bibby *et al.* (2000) and adapted Brown and Shepherd surveys', combined with Common Bird Census methods (British Trust for Ornithology, 2021). Transect routes were walked across different habitat complexes within the survey area where access allowed. All target species were recorded and mapped. In addition, the presence of any non-target species was recorded to inform the evaluation of supporting habitat.

Winter walkover surveys were conducted in daylight hours over four visits between October and March (i.e. four visits in winter 2020/2021, four visits in winter 2021/2022, four visits in winter 2022/2023, four visits in winter 2023/2024 and four visits in winter 2024/2025). Survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions for each survey. Figure 7-6 shows the transect routes.

7.2.4.2.8 Hen Harrier Roost Surveys

Hen harrier roost surveys were undertaken in areas of suitable habitat within a 2km radius of the Proposed Project site. These surveys aimed to identify active winter hen harrier roosts near or within the Proposed Project site. Survey methodology followed Gilbert *et al.* (1998) and O'Donoghue (2019). Roost watches of 2-3 hours were conducted at a total of six hen harrier vantage point locations over the five winter seasons surveyed. Surveys were carried from dusk until last visible light during which all hen harrier observations were recorded and mapped.

Each hen harrier vantage point was surveyed once per month during the winter season between October and March inclusive (in winters 2020/2021, 2021/2022, 2022/2023, 2023/2024, 2024/2025). Survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions. Figure 7-7 shows the hen harrier vantage point locations.

7.2.4.2.9 Waterbird Distribution and Abundance Surveys

Significant wetlands and waterbodies within 8km of the Proposed Project site were surveyed for waterbirds during the 2020/2021, 2021/2022, 2022/2023, 2023/2024 and 2024/2025 winter and passage seasons (August to May inclusive) to provide information on their distribution and abundance in relation to the Proposed Project site. Waterbirds include: swans, geese and ducks; cormorant, shag, divers and grebes; auks and seabirds; gulls, terns and skuas; herons, egrets and crane; rails and crakes; waders; and kingfisher. The area surveyed exceeds the 500m for foraging waterbirds and 1km for roosting waterbirds requirements of SNH (2017) and follows the recommendations of SNH (2016) to account for the core foraging ranges of whooper swan (<5km) and Greenland white-fronted goose (5-8km) which are Annex I waterbirds listed as species of special conservation interest (SCI) of SPAs within 15km of the Proposed Project site.

Survey methodology follows Gilbert *et al.* (1998) and the Irish Wetland Bird Survey (BirdWatch Ireland, 2021). Surveys were undertaken during daylight hours from suitable vantage points at wetlands and waterbodies. All target waterbird species were recorded and mapped. Survey effort, including details of survey duration and weather conditions, is presented in Appendix 7-2. Figure 7-8 shows the surveyed area.

Map Legend

- EIAR Site Boundary
- Proposed Turbine Layout
- 500m Radius of Proposed Turbine Layout
- Vantage Point Locations

Microsoft product screen shots reprinted with permission from Microsoft Corporation

N

Drawing Title	Vantage Point Locations
Project Title	Lemanaghan Wind Farm, Co. Offaly
Drawn By: CC	Checked By: PC
Project No.: 200804	Drawing No.: Fig. 7 - 1
Scale: 1:45,000	Date: 19.02.2026

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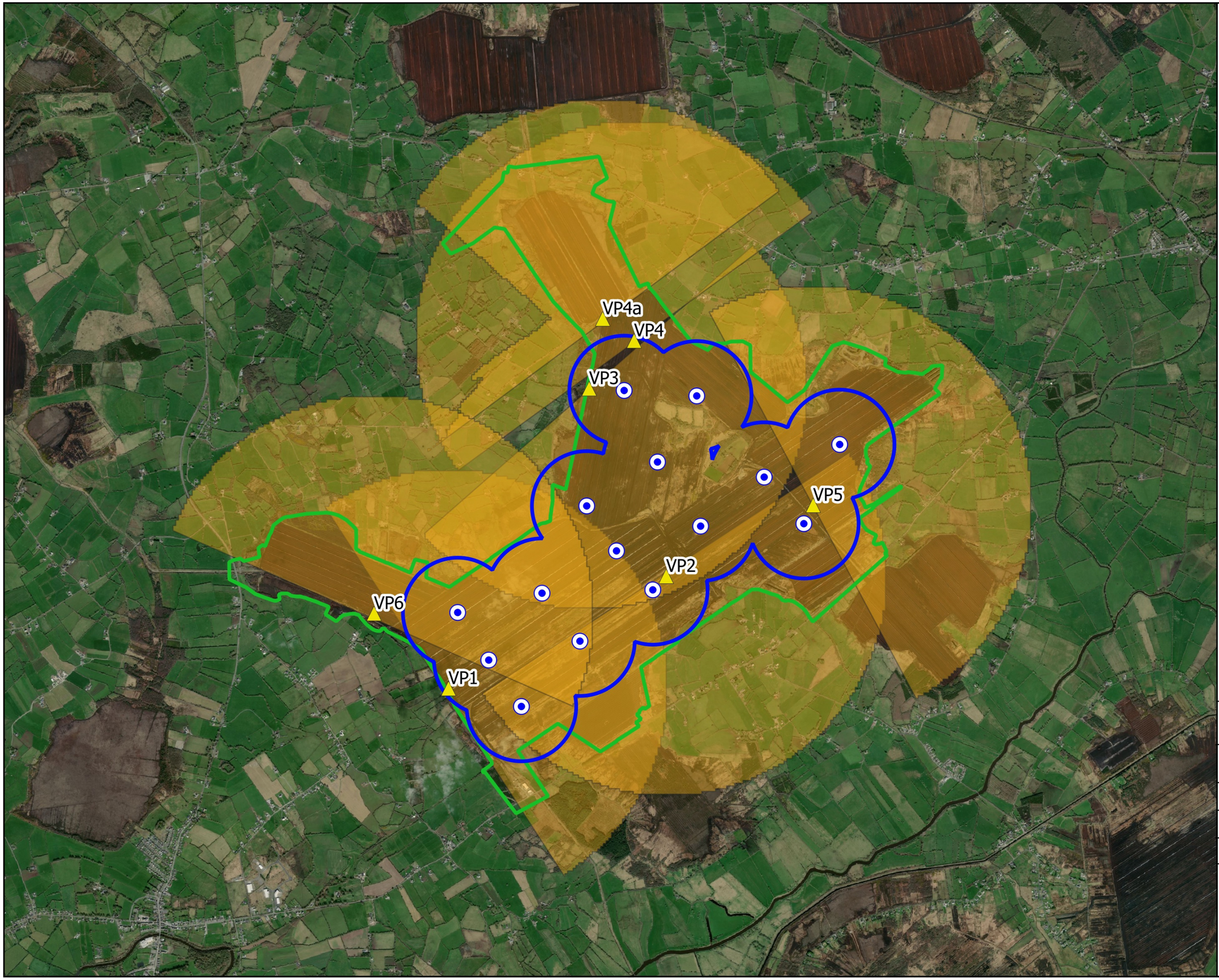

Map Legend

- EIAR Site Boundary
- Proposed Turbine Layout
- 500m Radius of Proposed Turbine Layout
- Vantage Point Locations
- Viewshed

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N

Drawing Title

Vantage Point
Viewshed Coverage

Project Title

Lemanaghan Wind Farm,
Co. Offaly

Drawn By	Checked By
CC	PC
Project No.	Drawing No.
200804	Fig. 7 - 2
Scale	Date
1:45,000	19.02.2026

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Map Legend

- EIAR Site Boundary
- Survey Area
- Proposed Turbine Layout
- Transcript

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N

Drawing Title

Breeding Walkover Survey Area

Project Title

Lemanaghan Wind Farm,
Co. Offaly

Drawn By	Checked By
CC	PC
Project No.	Drawing No.
200804	Fig. 7 - 3
Scale	Date
1:50,000	19.02.2026

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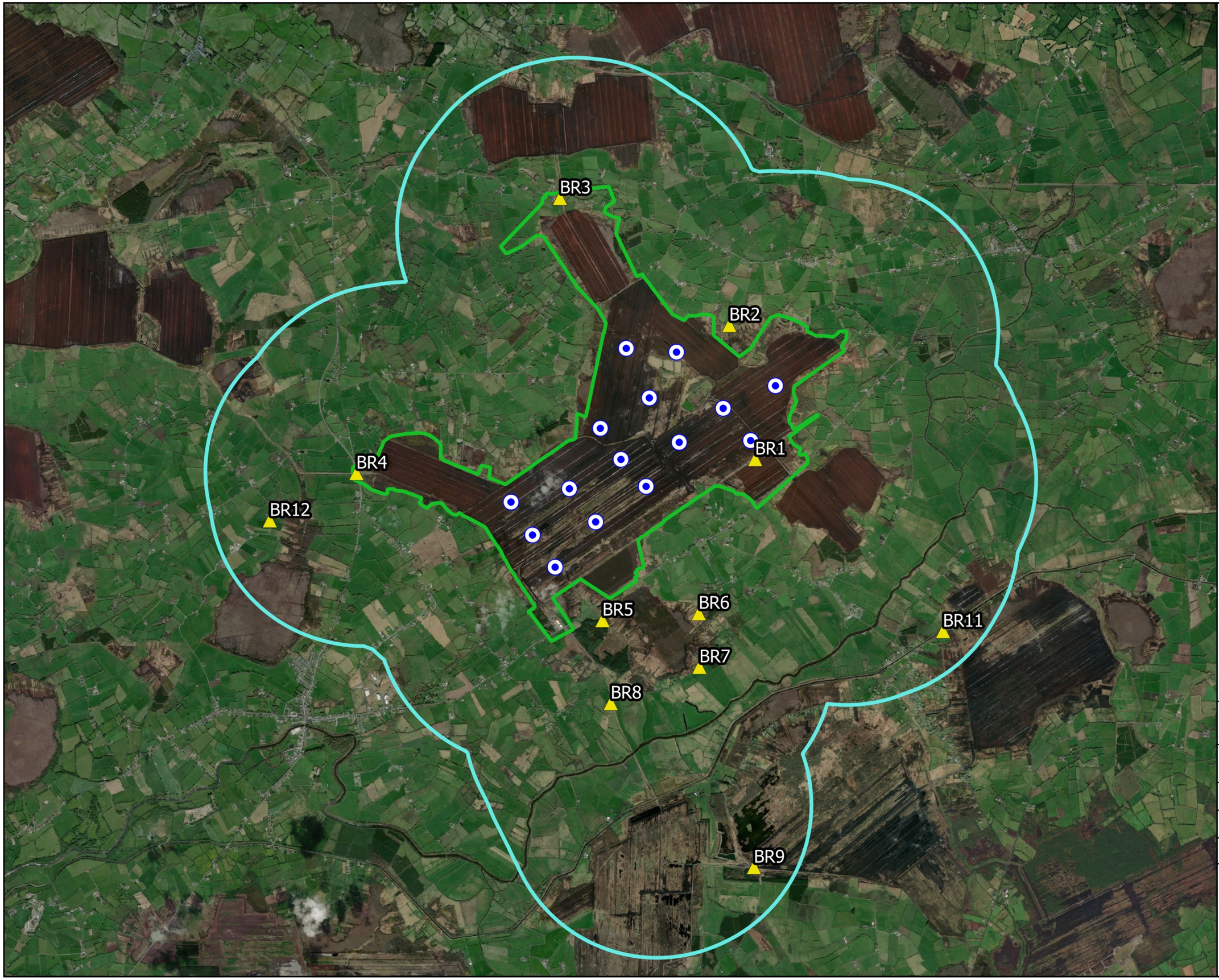

Map Legend

- EIAR Site Boundary
- Survey Area
- Proposed Turbine Layout
- Breeding Raptor VP

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Drawing Title

Breeding Raptor Survey Locations

Project Title

Lemanaghan Wind Farm,
Co. Offaly

Drawn By	Checked By
CC	PC
Project No.	Drawing No.
200804	Fig. 7 - 4
Scale	Date
1:65,000	19.02.2026

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Map Legend

- EIAR Site Boundary
- Proposed Turbine Layout
- Transect

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N

Drawing Title	Breeding Woodcock Survey Area
Project Title	Lemanaghan Wind Farm, Co. Offaly
Drawn By: CC	Checked By: PC
Project No.: 200804	Drawing No.: Fig. 7 - 5
Scale: 1:50,000	Date: 05.02.2026

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Map Legend

- EIAR Site Boundary
- Survey Area
- Proposed Turbine Layout
- Transect

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N

Drawing Title	Winter Walkover Survey Area
Project Title	Lemanaghan Wind Farm, Co. Offaly
Drawn By: CC	Checked By: PC
Project No.: 200804	Drawing No.: Fig. 7 - 6
Scale: 1:50,000	Date: 19.02.2026

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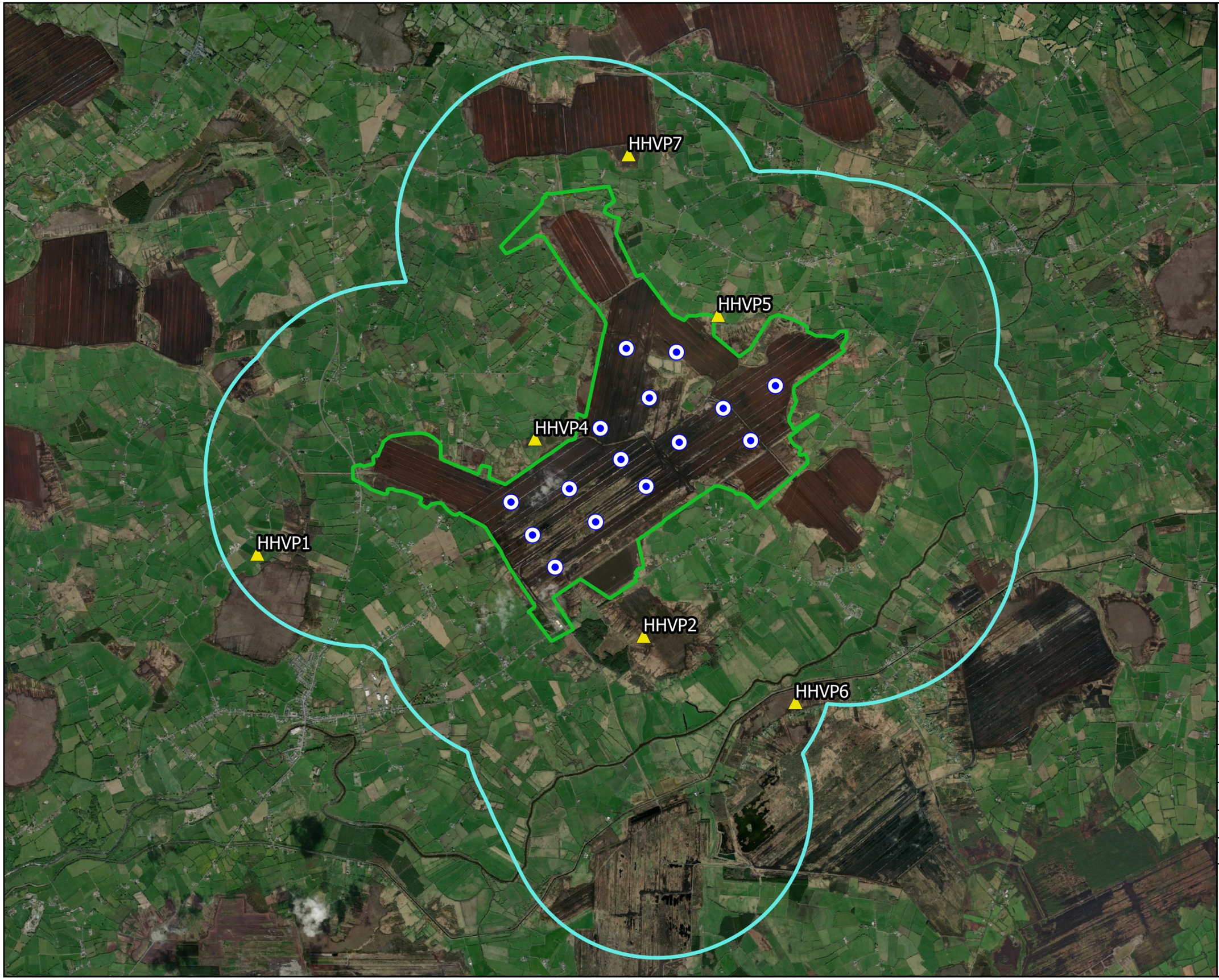

Map Legend

- EIAR Site Boundary
- Survey Area
- Proposed Turbine Layout
- Hen Harrier Roost VP

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N

Drawing Title

Hen Harrier Roost Survey Locations

Project Title

Lemanaghan Wind Farm,
Co. Offaly

Drawn By	Checked By
CC	PC
Project No.	Drawing No.
200804	Fig. 7 - 7
Scale	Date
1:65,000	19.02.2026

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Ballycumber river walk

Ferbane Bridge

Grand Canal

Turraun Nature Park

Noggusduff

Finnamore Lakes

Cloghan Lake

Lough Boora

Tumduff

Drinagh

Derrybrat

Map Legend

- EIAR Site Boundary
- Survey Area
- Proposed Turbine Layout
- Waterbird Survey Surveyor Locations

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N

Drawing Title

Waterbird Distributiona and Abundance Survey Area

Project Title

Lemanaghan Wind Farm, Co. Offaly

Drawn By	Checked By
CC	PC
Project No.	Drawing No.
200804	Fig. 7 - 8
Scale	Date
1:122,000	19.02.2026

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7.2.5 Receptor Evaluation and Impact Assessment Methodology

7.2.5.1 Potential Impacts Associated with the Proposed Project

As per SNH Guidance (2017) wind farms and associated infrastructure present three potential risks to birds (Drewitt and Langston 2006, 2008; *Band et al.,* 2007):

- **Direct habitat** loss due to wind farm infrastructure[3].
- **Disturbance/displacement** (sometimes called indirect habitat loss) if birds avoid the wind farm and its surrounding area due to construction works or turbine operation. Displacement may also include barrier effects in which birds are deterred from using normal routes to feeding or roosting grounds.
- Death through **collision** or interaction with turbine blades and other infrastructure.

For each of these three risks, the detailed knowledge of bird distribution and flight activity within and surrounding the Proposed Project site has been used to predict potential impacts of the Proposed Project on birds. In addition to some of the key likely impacts described above, there is the potential for operational phase disturbance associated with foot traffic on the proposed amenity tracks within the Proposed Wind Farm. These impacts are also assessed cumulatively with other projects. The geographical framework and description of impacts are described below.

7.2.5.2 Geographical Framework

Guidance on Ecological Impact Assessment (CIEEM, 2019) recommends categories of ornithological value that relate to a geographical framework (e.g. international through to local). This EIAR utilises the geographical framework described in '*Guidelines for Assessment of Ecological Impact of National Road Schemes*' (NRA, 2009). The following geographic frame of reference should be used when determining the value of a bird population:

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

Locally Important (Lower Value) receptors are habitats and species that are widespread and of low ecological significance and important only in the local area. In contrast, Internationally Important sites are designated for conservation as part of the Natura 2000 Network (SAC or SPA) or provide the best examples of habitats or internationally important populations of protected flora and fauna.

7.2.5.3 Description of Impacts

The sensitivity, magnitude and significance of impacts on bird populations resulting from the Proposed Project was quantified according to two assessment criteria: Percival (2003) and the Environmental Protection Agency (EPA, 2022). The two assessment criteria have been used to independently characterise impacts to inform a robust assessment of potential impacts. EPA impact assessment criteria has been used for consistency between the Biodiversity (Chapter 6) and Birds (Chapter 7) chapters of this EIAR, while Percival (2003) has also been followed given its specific focus on birds.

[3] *Potentially significant hydrological effects and associated mitigation are considered in detail for biodiversity in Chapter 6.*

Percival (2003) criteria

The Percival (2003) methodology quantifies the sensitivity of a given species to the development type, the magnitude of the effect and the significance of the potential impact. Table 7-3 (Sensitivity), Table 7-4 (Magnitude of effect) and

Table 7-5 (Determination of significance) outline the assessment criteria for each stage.

Table 7-3 Evaluation of sensitivity for birds (from Percival, 2003)

Sensitivity	Determining Factor
Very High	Species that form the cited interest of SPAs 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 a 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% of the Irish population)
Medium	Species listed on Annex 1 of the EU Birds Directive. Species present in regionally important numbers (>1% 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 7-4 Determination of magnitude of effects (from 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 7-5 Significance matrix combining magnitude and sensitivity to assess significance (from 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

EPA (2022) Criteria

EPA criteria use the following terms to describe the quality of the effect:

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

The significance of the effect is quantified as:

- **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** - an effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
- **Moderate** - an effect that alters the character of the environment that is consistent with existing and emerging baseline trends.
- **Significant** - an effect which, by its character, magnitude, duration or intensity significantly 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** - an effect which obliterates sensitive characteristics.

The duration of effects can be:

- **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 (e.g. through remediation or restoration).

The frequency of effects (i.e., how often the effect will occur) can be:

- **Once, rarely, occasionally, frequently or constantly**
- **Hourly, daily, weekly, monthly or annually**

The probability of the effect may be:

- **Likely** – the effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
- **Unlikely** – the effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

The effects may also be described in relation to their extent and context. Extent describes the population affected by an effect, while context relates the effect to the established baseline conditions.

7.2.5.4 Collision Risk Assessment

Collision risk is calculated using a mathematical model to predict the number of individual birds of a particular species that may be killed by collision with moving wind turbine rotor blades. This assessment calculates an annual collision rate using a mathematical model to predict the number of birds that may be killed by collision with moving wind turbine rotor blades. The modelling method used is the Collision Risk Model provided by Band (2024). This method is recommended by NatureScot and provides a standardised approach to collision risk assessment for onshore wind farms. Note that these are theoretical predictions, therefore the results must be interpreted with a degree of caution. Please see Appendix 7-6 for full details on the collision risk modelling method.

As previously outlined, the vantage point surveys collected flight activity information in set height bands, i.e. into 0-15m, 15-25m, 25-200m and >200m. As the proposed turbine dimensions overlap with the two height bands 25-200m and >200m, all the flight activity from these two height bands was included in the collision risk analysis. It is noted, however, that a majority of the recorded flight activity was likely in the lower reaches of the 25-200m height band, well below the actual turbine's lowest swept height of 70m.

7.2.6 Assessment Justification

7.2.6.1 Survey Data

A comprehensive suite of bird surveys was undertaken at the Proposed Project site between October 2020 and March 2025. Results derived from a continuous 4.5 years of surveying at the Proposed Project site and hinterland, undertaken in line with NatureScot guidance, are analysed to inform this assessment. It is noted that the duration of surveys greatly exceeds the typical minimum requirement of two years of surveying. This considerable duration of surveys provides confidence that the results of surveys are representative of the baseline condition. As such, the surveys undertaken provide the information necessary to allow a complete, comprehensive and robust assessment of the potential impacts of the Proposed Project on avian receptors.

7.2.6.2 Mitigation

The Proposed Project has been designed to specifically avoid, reduce and minimise impacts on all avian receptors. Where potential impacts on KORs are predicted, mitigation has been prescribed to avoid, reduce and remove such impacts. Proposed best practice design and mitigation measures are specifically set out and are realistic in terms of cost and practicality. They have been subject to detailed design and will effectively address the effects on the identified KORs. As such, the potential impacts of the Proposed Project have been considered and assessed to ensure that all impacts on KORs are adequately addressed and no significant residual effects are likely to remain following the implementation of mitigation measures and best practices (refer to Section 0 for further details).

7.2.6.3 Limitations

The information provided in this EIAR chapter accurately and comprehensively describes the baseline environment and provides an informed prediction of the likely impacts of the Proposed Project. It also prescribes mitigation as necessary and describes the predicted residual effects. Furthermore, the desk study, surveys, analysis and reporting have been undertaken in accordance with the appropriate guidelines. Therefore, no significant limitations in the scope, scale or context of the assessment have been identified.

7.3 Baseline Ornithological Conditions

7.3.1 Designated Sites within the Likely ZOI of the Proposed Project

A screening assessment and Natura Impact Statement (NIS) were prepared to provide the competent authority with the information necessary to complete an Appropriate Assessment for the Proposed Project in compliance with Article 6(3) of the EU Habitats Directive (92/43/EEC). According to EPA (2022) "*A biodiversity section of an EIAR ... should not repeat the detailed assessment of potential effects on European sites contained in documentation prepared as part of the Appropriate Assessment process, but it should refer to the findings of that separate assessment*". Therefore, this section provides a summary of the key findings regarding SPAs. For a detailed assessment of any potential impacts on SPAs, refer to the Appropriate Assessment and NIS associated with Chapter 6 of this EIAR.

Sites designated for nature conservation within the potential ZOI[4] of the Proposed Project were identified using GIS software. The ZOI is derived utilising a precautionary approach. Initially, sites within a 15km radius of the proposed works are identified. Then designated sites located outside the 15km buffer zone are accounted for and assessed for pathways for impacts. In addition (and in the absence of any specific European or Irish guidance), the guidance document '*Assessing Connectivity with Special Protection Areas*' (SNH, 2016) was consulted. This document provides guidance on identifying of connectivity between the Proposed Project and SPAs. It considers the distances some species may travel beyond the boundary of their SPAs and outlines dispersal and foraging ranges. Potential effects on wetlands and supporting habitats associated with SPAs and potential indirect pathways in the form of surface water pollution are considered in the Appropriate Assessment and NIS and summarised below.

The SPAs are listed and summarised in Table 7-6. Apart than sites which are encompassed by these SPAs, no other nationally designated sites of ornithological significance occur within the potential ZOI.

[4] *As defined in the screening assessment and Natura Impact Statement (NIS).*

Table 7-6 Designated sites in the Zone of Influence

Site Name Distance from proposed works	Special Conservation Interests for which the site has been designated	Conservation Objectives	Zone of Influence Determination and Identification of Pathways for Effect
Special Protection Area			
Dovegrove Callows SPA [004137] **Distance:** 2km from the Proposed Project site at its nearest point 2km from the proposed TDR accommodation area	› [A395] Greenland White-fronted Goose (*Anser albifrons flavirostris*)	Detailed conservation objectives for this site, (Version 1, January 2025[5]), were reviewed as part of the assessment and are available at www.npws.ie	No pathway for direct effects was identified as this European Site lies entirely outside of and 2km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connectivity between the Proposed Project site and this European Site. Therefore, no potential for indirect effect on supporting wetland habitat for SCI bird species due to deterioration in water quality exists. There were no observations of Greenland white-fronted geese within 500m of the Proposed Project site during ornithological surveys undertaken between October 2020 and March 2025. The Proposed Wind Farm lies outside the core foraging distance of the SCI species Greenland white-fronted goose (core range of 5-8km) as per Scottish Natural Heritage (SNH) Guidelines (SNH, 2016). This SPA lies within the core foraging distance of the Turbine Delivery Route accommodation area, however the works at this location are small in scale and the area does not provide suitable habitat to support Greenland white-fronted geese. Given this, and the distance between the Proposed Wind Farm and the SPA, no potential for significant indirect disturbance effects on Greenland white-fronted goose activities was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
River Little Brosna Callows SPA [004086]	› [A038] Whooper Swan (*Cygnus cygnus)*	Detailed conservation objectives for this site, (Version 1, January	No pathway for direct effects was identified as this European Site lies entirely outside of and >5km from the Proposed Project site.

[5] *NPWS (2025) Conservation Objectives: Dovegrove Callows SPA 004137. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.*

Site Name Distance from proposed works	Special Conservation Interests for which the site has been designated	Conservation Objectives	Zone of Influence Determination and Identification of Pathways for Effect
Special Protection Area			
Distance: 5.4km from the Proposed Project site at its nearest point 5.4km from the proposed TDR accommodation area	› [A050] Wigeon (*Anas penelope)* › [A052] Teal (*Anas crecca)* › [A054] Pintail (*Anas acuta)* › [A056] Shoveler (*Anas clypeata)* › [A140] Golden Plover (*Pluvialis apricaria)* › [A142] Lapwing (*Vanellus Vanellus)* › [A156] Black-tailed Godwit (*Limosa limosa)* › [A179] Black-headed Gull (*Chroicocephalus ridibundus)* › [A395] Greenland White-fronted Goose (*Anser albifrons flavirostris)* › [A999] Wetlands	2025[6]), were reviewed as part of the assessment and are available at www.npws.ie	The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connectivity between the Proposed Project site and this European Site. Therefore, no potential for indirect effect on supporting wetland habitat for SCI bird species due to deterioration in water quality exists. The potential for effects on SCI bird species was also considered. The Proposed Wind Farm is located a considerable distance from the SPA (over 20km), and no pathway for connectivity between the Proposed Project site and populations with potential to be associated with this SPA has been identified. While the SPA is located 5.4km from the proposed TDR accommodation area, the works at this location are small in scale and the area does not provide suitable supporting habitat for these SCI species. On this basis, no potential for significant indirect effects due to disturbance or ex situ habitat loss has been identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
All Saints Bog SPA [004103] **Distance:** 5.9km from the Proposed Project site at its nearest point	› [A395] Greenland White-fronted Goose (*Anser albifrons flavirostris*)	Detailed conservation objectives for this site, (Version 1, April 2025[7]), were reviewed as part of the assessment and are available at www.npws.ie	No pathway for direct effects was identified as this European Site lies entirely outside of and >5km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connectivity between the Proposed Project site and this European Site. Therefore, no potential for indirect

[6] *NPWS (2025) Conservation Objectives: River Little Brosna Callows SPA 004086. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.*
[7] *NPWS (2025) Conservation Objectives: All Saints Bog SPA 004103. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.*

Site Name Distance from proposed works	Special Conservation Interests for which the site has been designated	Conservation Objectives	Zone of Influence Determination and Identification of Pathways for Effect
Special Protection Area			
5.9km from the proposed accommodation area			effect on supporting wetland habitat for SCI bird species due to deterioration in water quality exists. There were no observations of Greenland white-fronted geese within 500m of the Proposed Project site during ornithological surveys undertaken between October 2020 and March 2025. The Proposed Project site lies outside the core foraging distance of the SCI species Greenland white-fronted goose (core range of 5-8km) as per Scottish Natural Heritage (SNH) Guidelines (SNH, 2016). Given the distance between the Proposed Project site and the SPA, no potential for significant indirect disturbance effects on Greenland white-fronted goose activities was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Middle Shannon Callows SPA [004096] **Distance:** 8.3km from the Proposed Project site at its nearest point 9.5km from the proposed TDR accommodation area	› [A038] Whooper Swan (*Cygnus cygnus*) › [A050] Wigeon (*Anas Penelope*) › [A122] Corncrake (*Crex crex*) › [A140] Golden Plover (*Pluvialis apricaria*) › [A142] Lapwing (*Vanellus vanellus*) › [A156] Black-tailed Godwit (*Limosa limosa*)	Detailed conservation objectives for this site, (Version 1, November 2022[8]), were reviewed as part of the assessment and are available at www.npws.ie	A potential pathway for direct effects was identified as result of collision risk and displacement/barrier effects to SCI bird species due to the Proposed Wind Farm. A potential pathway for indirect effects on SCI bird species due to deterioration of water quality was also identified. There is hydrological connectivity between the Proposed Project site and this SPA (approximately 9.9km) via watercourses within the Proposed Project site which discharge to the Brosna River and the River Shannon, both of which are designated as part of the SPA. There is potential for deterioration in surface water quality due to run-off of pollutants, including silts and hydrocarbons, to watercourses within and downstream of the site. This has potential to result in degradation of SCI supporting wetland habitat and negatively affect availability of food resources for SCI species.

[8] *NPWS (2022) Conservation Objectives: Middle Shannon Callows SPA 004096. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.*

Site Name Distance from proposed works	Special Conservation Interests for which the site has been designated	Conservation Objectives	Zone of Influence Determination and Identification of Pathways for Effect
Special Protection Area			
	› [A179] Black-headed Gull (*Chroicocephalus ridibundus*) › [A999] Wetlands		A potential pathway for indirect effects on SCI species where they occur outside the SPA, as a result of disturbance and loss of ex situ habitat, has also been identified. While much of the Proposed Project site comprises cutover bog and regenerating habitats of limited ecological value, SCI bird species with potential to be connected with SCI populations associated with the Middle Shannon Callows SPA have been recorded using areas within the Proposed Project site. The construction of the Proposed Project will result in a permanent loss of habitat within the footprint of turbines, tracks and associated infrastructure. Although the overall footprint is small relative to the extent of available habitat within the site and wider landscape, this has the potential to represent a loss of ex situ habitat for SCI species. On a precautionary basis, a potential pathway for effect due to habitat loss has therefore been identified. **A complete source pathway receptor chain was identified and in the absence of mitigation, there is potential for likely significant effects on this European Site. Therefore, the European Site is located within the Likely Zone of Influence and further assessment is required.**
Mongan Bog SPA [004017] **Distance:** 8.5km from the Proposed Project site at its nearest point 22.9km from the proposed TDR accommodation area	› [A395] Greenland White-fronted Goose (*Anser albifrons flavirostris*)	Detailed conservation objectives for this site, (Version 1, April 2025[9]), were reviewed as part of the assessment and are available at www.npws.ie	No pathway for direct effects was identified as this European Site lies entirely outside of and >8km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connectivity between the Proposed Project site and this European Site. Therefore, no potential for indirect effect on supporting wetland habitat for SCI bird species due to deterioration in water quality exists.

[9] *NPWS (2025) Conservation Objectives: Mongan Bog SPA 004017. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage..*

Site Name Distance from proposed works	Special Conservation Interests for which the site has been designated	Conservation Objectives	Zone of Influence Determination and Identification of Pathways for Effect
Special Protection Area			
			There were no observations of Greenland white-fronted geese within 500m of the Proposed Project site during ornithological surveys undertaken between October 2020 and March 2025. The Proposed Project site lies outside the core foraging distance of the SCI species Greenland white-fronted goose (core range of 5-8km) as per Scottish Natural Heritage (SNH) Guidelines (SNH, 2016). Given the distance between the Proposed Project site and the SPA, no potential for significant indirect disturbance effects on Greenland white-fronted goose activities was identified. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
Lough Ree SPA [004064] **Distance:** 14.9km from the Proposed Project site at its nearest point 34.9km from the proposed TDR accommodation area	› [A004] Little Grebe (*Tachybaptus ruficollis*) › [A038] Whooper Swan (*Cygnus cygnus*) › [A050] Wigeon (*Anas Penelope*) › [A052] Teal (*Anas crecca*) › [A053] Mallard (*Anas platyrhynch*os) › [A056] Shoveler (*Anas clypeata*) › [A061] Tufted Duck (*Aythya fuligula*) › [A065] Common Scoter (*Melanitta nigra*)	Detailed conservation objectives for this site, (Version 1, April 2025[10]), were reviewed as part of the assessment and are available at www.npws.ie	No pathway for direct effects was identified as this European Site lies entirely outside of and >14km from the Proposed Project site. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connectivity between the Proposed Project site and the SPA, which are located within separate hydrological catchments. Therefore, no potential for indirect effect on supporting wetland habitat for SCI bird species due to deterioration in water quality exists. During ornithological surveys undertaken between October 2020 and March 2025, the following SCI species were recorded within the Proposed Project site and/or within 500m of the Proposed Project site: little grebe, whooper swan, wigeon, mallard, golden plover and lapwing. The distance between the SPA and the Proposed Project site is greater than the core foraging range of little grebe, whooper swan (<5km), wigeon (2.5 - 2.8km)

[10] *NPWS (2025) Conservation Objectives: Lough Ree SPA 004064. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.*

Site Name Distance from proposed works	Special Conservation Interests for which the site has been designated	Conservation Objectives	Zone of Influence Determination and Identification of Pathways for Effect
Special Protection Area			
	› [A067] Goldeneye (*Bucephala clangula*) › [A125] Coot (*Fulica atra*) › [A140] Golden Plover (*Pluvialis apricaria*) › [A142] Lapwing (*Vanellus vanellus*) › [A193] Common Tern (*Sterna hirundo*) › [A999] Wetlands		and mallard (0.5-1.3km) (SNH, 2016; Johnston *et al.,* 2013), and no regular or patterned flight activity of these species was recorded during surveys such as would suggest connectivity between the Proposed Project site and the SPA. Furthermore, in relation to whooper swan, regularly used closely located roost sites were identified within the Proposed Project site. Flock sizes recorded in the vicinity of the Proposed Project site were broadly in line with numbers observed at the roost sites, and therefore the birds recorded in the vicinity of the Proposed Project site are considered to be associated with these roost sites, and not the SPA. Therefore, based on published core foraging ranges and recorded flight activity, there is no evidence to suggest connectivity between the SPA and the Proposed Project site for whooper swan. There is no widely recognised foraging range for wintering golden plover or lapwing and these species were recorded using the Proposed Project site. However, the Proposed Project site is not considered to represent an important foraging or roosting resource for the SCI populations of Lough Ree SPA, given its distance from the designated site (15.2 km). If any connectivity potentially exists between birds using the Proposed Project site and an SPA population, it is likely to be with the Middle Shannon Callows SPA, which lies closer to the Proposed Project site and supports significant populations of these species. Therefore, it is considered that there is no potential for significant indirect impacts due to ex situ habitat loss or disturbance effects on any SCI species as a result of the Proposed Project. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**
River Suck Callows SPA [004097]	› [A038] Whooper Swan (*Cygnus cygnus*) › [A050] Wigeon (*Anas Penelope*)	Detailed conservation objectives for this site, (Version 1,	No pathway for direct effects was identified as this European Site lies entirely outside of and >15km from the Proposed Project site.

Site Name Distance from proposed works	Special Conservation Interests for which the site has been designated	Conservation Objectives	Zone of Influence Determination and Identification of Pathways for Effect
Special Protection Area			
Distance: 15.6km from the Proposed Project site at its nearest point 20km from the proposed TDR accommodation area	› [A140] Golden Plover (*Pluvialis apricaria*) › [A142] Lapwing (*Vanellus vanellus*) › [A395] Greenland White-fronted Goose (*Anser albifrons flavirostris*) › [A999] Wetlands	November 2022[11]), were reviewed as part of the assessment and are available at www.npws.ie	The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is no hydrological connectivity between the Proposed Project site and the SPA, which are in separate hydrological catchments. Therefore, no potential for indirect effect on supporting wetland habitat for SCI bird species due to deterioration in water quality exists. During ornithological surveys undertaken between October 2020 and March 2025, the following SCI species were recorded within the Proposed Project site and/or within 500m of the Proposed Project site: whooper swan, wigeon, golden plover and lapwing. The distance between the SPA and the Proposed Project site is greater than the core foraging range of whooper swan (<5km) and wigeon (2.5 - 2.8km) (SNH, 2016; Johnston *et al.*, 2013), and no regular or patterned flight activity of these species was recorded during surveys such as would suggest connectivity between the Proposed Project site and the SPA. Furthermore, in relation to whooper swan, regularly used closely located roost sites were identified within the Proposed Project site. Flock sizes recorded in the vicinity of the Proposed Project site were broadly in line with numbers observed at the roost sites, and therefore the birds recorded in the vicinity of the Proposed Project site are considered to be associated with these roost sites, and not the SPA. Therefore, based on published core foraging ranges and recorded flight activity, there is no evidence to suggest connectivity between the SPA and the Proposed Project site for whooper swan. There is no widely recognised foraging range for wintering golden plover or lapwing and these species were recorded using the Proposed Project site. However, the site is not considered to represent an important foraging or roosting

[11] *NPWS (2022) Conservation Objectives: River Suck Callows SPA 004097. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.*

Site Name Distance from proposed works	Special Conservation Interests for which the site has been designated	Conservation Objectives	Zone of Influence Determination and Identification of Pathways for Effect
Special Protection Area			
			resource for the SCI populations of River Suck Callows SPA, given its distance from the designated site (15.7km). If any connectivity potentially exists between birds using the Proposed Project site and an SPA population, it is likely to be with the Middle Shannon Callows SPA, which lies closer to the site and supports significant populations of these species. Therefore, it is considered that there is no potential for significant indirect impacts due to ex situ habitat loss or disturbance effects on any SCI species as a result of the Proposed Project. **There is no potential for significant effect on this European Site,it is not located within the Likely Zone of Influence, and no further assessment is required.**
Lough Derg (Shannon) SPA [004058] **Distance:** 18.2km from the Proposed Project site at its nearest point 18.2km from the proposed TDR accommodation area	› [A017] Cormorant (*Phalacrocorax carbo*) › [A061] Tufted Duck (*Aythya fuligula*) › [A067] Goldeneye (*Bucephala clangula*) › [A193] Common Tern (*Sterna hirundo*) › [A999] Wetlands	Detailed conservation objectives for this site, (Version 1, August 2024[12]), were reviewed as part of the assessment and are available at www.npws.ie	No pathway for direct effects was identified as this European Site lies entirely outside of and >18km from the Proposed Project site boundary. The potential for the Proposed Project to result in indirect effects on this European Site was considered. There is hydrological connectivity between the Proposed Project site and this SPA via watercourses within and adjacent to the Proposed Project site which discharge to the River Shannon which eventually discharges to Lough Derg. This European Site is located >18km from the Proposed Project site and a significant distance downstream of the Proposed Project (approximately 63.9km). Given the significant distance between the site and the SPA, and the attenuation properties of the intervening watercourses, no potential for significant indirect effects on the European Site was identified. The SCI species of this SPA were not recorded during ornithological surveys undertaken between October 2020 and March 2025. On this basis, and given the

[12] *NPWS (2024) Conservation Objectives: Lough Derg (Shannon) SPA 004058. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage*

Site Name Distance from proposed works	Special Conservation Interests for which the site has been designated	Conservation Objectives	Zone of Influence Determination and Identification of Pathways for Effect
Special Protection Area			
			considerable distance between the site and the SPA, and the lack of significant suitable habitat, there is no potential for significant indirect effects due to disturbance or ex situ habitat loss on any SCI species. **There is no potential for significant effect on this European Site, it is not located within the Likely Zone of Influence, and no further assessment is required.**

7.3.2 Breeding and Wintering Bird Atlas Records

'*Bird Atlas 2007-11: The breeding and wintering birds of Britain and Ireland*' (Balmer *et al.*, 2013) is the most recent comprehensive work on wintering and breeding birds in Ireland. Previous bird atlases have been the primary source of information on the distribution and abundance of British and Irish birds prior to Bird Atlas 2007–11. The three previously published atlases were:

- The atlas of breeding birds in Britain and Ireland (Sharrock, 1976)
- The atlas of wintering birds in Britain and Ireland (Lack, 1986)
- The new atlas of breeding birds in Britain and Ireland: 1988-1991. (Gibbons *et al.,* 1993)

The Proposed Project site lies within hectads N12 and N13. Table 7-7 and Table 7-8 present a list of species of conservation interest recorded from the relevant hectads, with regard to breeding and wintering respectively.

Table 7-7 Breeding Bird Atlas data (Hectads N12 & N13).

Species Name	Breeding Atlas 1968-1972		Breeding Atlas 1988-1991		Breeding Atlas 2007-2011	
	N12	N13	N12	N13	N12	N13
Barn Owl	Conf	Prob	Bred	-	Poss	-
Black-headed Gull	Prob	-	Seen	Seen	-	-
Buzzard	-	-	-	-	Poss	-
Common Sandpiper	Poss	-	-	-	Poss	-
Coot	Prob	Conf	Bred	Bred	Conf	-
Corncrake	Conf	Prob	-	-	-	-
Curlew	Poss	Conf	Seen	Seen	Prob	-
Great Black-backed Gull	-	-	Seen	Seen	-	-
Great Crested Grebe	-	-	-	-	Conf	-
Grey Heron	Conf	Poss	Seen	Seen	Conf	-
Grey Partridge	Conf	-	Bred	-	Conf	-
Grey Wagtail	Conf	Conf	Bred	Bred	Poss	-
Hen Harrier	Prob	-	-	-	-	-
Kestrel	Prob	Prob	-	Seen	Conf	Poss
Kingfisher	Conf	Prob	-	-	Poss	Poss
Lapwing	Conf	Conf	Bred	Seen	Conf	Prob
Little Grebe	-	Conf	-	Bred	Conf	-
Long-eared Owl	Prob	Prob	-	Seen	Prob	-
Mallard	Conf	Conf	Seen	Seen	Prob	Conf
Meadow Pipit	Conf	Conf	Bred	Bred	Prob	Prob
Moorhen	Conf	Conf	Bred	Bred	Conf	Conf
Mute Swan	Conf	Conf	Bred	Bred	Conf	-
Red Grouse	Conf	Prob	-	-	-	-
Redshank	-	-	-	-	Conf	-
Ringed Plover	-	-	-	-	Conf	-

Species Name	Breeding Atlas 1968-1972		Breeding Atlas 1988-1991		Breeding Atlas 2007-2011	
	N12	N13	N12	N13	N12	N13
Snipe	Conf	Conf	Bred	Bred	Prob	-
Sparrowhawk	Conf	Prob	-	Seen	Conf	Prob
Stock Dove	Conf	Conf	Seen	Seen	Pres	-
Swift	Prob	Conf	Bred	Bred	-	Conf
Teal	Poss	-	-	-	Prob	-
Tufted Duck	-	-	-	-	Conf	-
Water Rail	-	Prob	Seen	Seen	Conf	-
Whinchat	-	Prob	-	-	-	-
Woodcock	-	Prob	-	Bred	Prob	-
Yellowhammer	Conf	Conf	Bred	Bred	Poss	-

Table 7-8 Wintering Bird Atlas data (Hectads N12 & N13).

Species Name	Wintering Atlas 1981-1984		Wintering Atlas 2007-2011	
	N12	N13	N12	N13
Barn Owl	-	-	Pres	-
Black-headed Gull	-	Pres	-	Pres
Buzzard	-	-	-	Pres
Coot	-	Pres	Pres	Pres
Cormorant	-	-	Pres	-
Curlew	-	Pres	Pres	-
Golden Plover	Pres	-	Pres	-
Grey Wagtail	-	Pres	-	-
Grey Heron	Pres	-	Pres	Pres
Grey Partridge	Pres	-	Pres	-
Grey Wagtail	-	-	-	Pres
Greylag Goose	-	-	Pres	-
Hen Harrier	-	-	Pres	-
Herring Gull	-	Pres	-	-
Jack Snipe	-	-	Pres	-
Kestrel	Pres	Pres	Pres	Pres
Kingfisher	-	-	Pres	Pres
Lapwing	Pres	Pres	Pres	Pres
Lesser Black-backed Gull	-	-	-	Pres
Little Grebe	Pres	Pres	Pres	Pres
Mallard	Pres	Pres	Pres	Pres
Meadow Pipit	Pres	Pres	Pres	-
Merlin	-	-	Pres	-
Moorhen	Pres	Pres	Pres	Pres
Mute Swan	-	Pres	Pres	Pres
Pink-footed Goose	-	-	Pres	-
Pintail	-	-	Pres	-
Pochard	-	-	Pres	-
Redwing	Pres	Pres	Pres	Pres
Shoveler	-	-	Pres	-

Species Name	Wintering Atlas 1981-1984		Wintering Atlas 2007-2011	
	N12	N13	N12	N13
Snipe	Pres	Pres	Pres	Pres
Sparrowhawk	-	Pres	Pres	Pres
Stock Dove	Pres	Pres	Pres	-
Teal	Pres	Pres	Pres	Pres
Tufted Duck	-	-	Pres	-
Water Rail	-	-	Pres	-
Whooper Swan	-	-	Pres	-
Wigeon	-	-	Pres	-
Woodcock	Pres	-	Pres	Pres
Yellowhammer	Pres	Pres	-	-

7.3.3 Bird Sensitivity Mapping Tool

A Bird Sensitivity Mapping Tool for wind energy development was developed by BirdWatch Ireland to provide a measured spatial indication of where protected birds are likely to be sensitive to wind energy developments. The tool can be accessed via the National Biodiversity Data Centre Website (www.biodiversityireland.ie) and is accompanied by a guidance document (McGuiness *et al.*, 2015). The criteria for estimating a zone of sensitivity (i.e. 'low', 'medium', 'high' and 'highest') is based on a review of the behavioural, ecological and distributional data available for each species.

The Proposed Project site is located within areas of **low** bird sensitivity to wind energy developments. The Proposed Project site is 8.5km from the nearest area of high sensitivity.

7.3.4 National Biodiversity Data Centre Records

The National Biodiversity Data Centre (NBDC) Biodiversity Maps provide records of flora and fauna within 10km hectads across Ireland. Data is available from the map viewer on the NBDC website (https://maps.biodiversityireland.ie/Map). The Proposed Project site lies within hectads N12 and N13. Table 7-9 lists the bird species have been recorded in these 10km Grids.

Table 7-9 National Biodiversity Data Centre records

Common Name	NBDC Dataset
Barn Owl	Birds of Ireland
Black-headed Gull	Birds of Ireland
Black-winged Stilt	Rare Birds of Ireland
Buzzard	Birds of Ireland
Common Crane	Rare Birds of Ireland
Coot	Birds of Ireland
Curlew	Birds of Ireland
Golden Plover	Birds of Ireland
Great Crested Grebe	Birds of Ireland
Greenshank	Birds of Ireland
Hen Harrier	Birds of Ireland

Common Name	NBDC Dataset
Hobby	Rare Birds of Ireland
Kestrel	Birds of Ireland
Kingfisher	Birds of Ireland
Lapwing	Birds of Ireland
Little Grebe	Birds of Ireland
Long-billed Dowitcher	Rare Birds of Ireland
Long-eared Owl	Birds of Ireland
Little Egret	Birds of Ireland
Mallard	Birds of Ireland
Meadow Pipit	Birds of Ireland
Montagu's Harrier	Rare Birds of Ireland
Peregrine Falcon	Birds of Ireland
Redwing	Birds of Ireland
Ringed Plover	Birds of Ireland
Ruff	Birds of Ireland
Sparrowhawk	Birds of Ireland
Snipe	Birds of Ireland
Swift	Birds of Ireland
Temminck's Stint	Rare Birds of Ireland
White-rumped Sandpiper	Rare Birds of Ireland
Whooper Swan	Birds of Ireland

7.3.5 Irish Wetland Bird Survey Records

The Irish Wetland Bird Survey (IWeBS), coordinated by BirdWatch Ireland, monitors wintering waterbird populations at their wetland sites across Ireland. IWeBS site locations are available at https://birdwatchireland.ie/our-work/. Datasets for the following sites were sourced from www.birdwatchireland.ie and reviewed:

- Turraun Nature Reserve (3.0km from the Proposed Project site)
- Boora Lakes – Back lakes Finnamores (4.4km from the Proposed Project site)
- Cloghanhill (8.7km from the Proposed Project site)
- Blackwater Railway Lake (9.6km from the Proposed Project site)
- Shannon Callows[13] (11.1km from the Proposed Project site)
- Little Brosna Callows[14] (20.7km from the Proposed Project site)
- Raheen Lough (29.7km from the Proposed Project site)

[13] This I-WeBS site occurs along the county boundary of Co. Offaly, with sections divided partly within Co.'s Galway, Roscommon and Westmeath. Count data from this site has therefore been divided in two for inclusion in the Co. Offaly population of relevant waterbirds.
[14] This I-WeBS site lies partly within both Co. Tipperary and Co. Offaly. Count data from this site has therefore been divided in two for inclusion in the Co. Offaly population of relevant waterbirds.

7.3.6 Rare and Protected Species Dataset

An information request was sent to NPWS requesting records from the Rare and Protected Species Database. A response was received on the 25th of November 2025. The key records that were provided were from the 80s/90s and included information on Greenland white-fronted goose. Peak counts were in 1983/84 with 13 birds at River Suck, Doon. There were 6 birds at both Turraun Bog and Durran Bog in the 1991/92 count. The locations containing Greenland white-fronted goose were off-site, ranging from approx. 1.8km to 3.1km from the site boundary. Additionally, as outlined in Table 7-1 a meeting was held with NPWS in late 2025.

7.3.7 Field Survey Results

The target species recorded within the potential ZOI of the Proposed Project during field surveys are listed in Table 7-10, along with a summary of breeding and roosting status. The following sections describe the records of each target species under the individual survey headings. The table below includes the final determination of breeding status. Please see the subsequent sections for the information that informed the determinations.

Table 7-10 Target species recorded in the Potential ZOI of the Proposed Project.

Species	Overall breeding status	Overall wintering status
Golden Plover (Annex I & SCI of Middle Shannon Callows SPA & Lough Ree SPA)	Non-breeding. There was no evidence of breeding at the site during surveys.	No regularly used roosts identified. There were infrequent observations of birds on-ground within the Proposed Project site throughout the survey period.
Whooper Swan (Annex I & SCI of Middle Shannon Callows SPA & Lough Ree SPA)	Non-breeding. There was no evidence of breeding at the site during surveys.	**Regular roosts identified.** Roosting was recorded across a total of five closely located areas within the Proposed Project site across the five winter seasons surveyed, with a maximum of four areas being used in any one season. The maximum number of birds recorded roosting within the Proposed Project site was 71 birds.
Crane (Annex I)	Non-breeding. There was no evidence of breeding at the site during surveys.	Not recorded during winter season.
Hen Harrier (Annex I)	Non-breeding. There was no evidence of breeding at the site during surveys.	**Roost identified**. There was one roost site confirmed, situated in an area approximately 750m from the Proposed Project site, with roosting recorded on a total of four occasions (all individual birds) comprising one observation in winter 2020/21 and three in winter 2023/24. No

Species	Overall breeding status	Overall wintering status
		roosting was recorded within the Proposed Project site.
Kingfisher (Annex I)	**Confirmed Breeding.** A confirmed breeding territory was identified within the Proposed Project site during the 2023 breeding season.	No regularly used roosts identified.
Little Egret (Annex I)	Non-breeding. There was no evidence of breeding at the Proposed Project site during surveys.	No regularly used roosts identified.
Merlin (Annex I)	Non-breeding. There was no evidence of breeding at the site during surveys.	No regularly used roosts identified.
Peregrine Falcon (Annex I)	**Confirmed Breeding.** Survey results indicate the presence of a breeding pair across the four breeding seasons surveyed at a location approximately 100m from the Proposed Project site.	No regularly used roosts identified.
Lapwing (SCI of Middle Shannon Callows SPA & Lough Ree SPA & Red-listed)	**Confirmed Breeding.** Lapwing breeding activity was identified within the Proposed Project site, with an estimated two pairs breeding present in the most recent breeding seasons surveyed (i.e. 2023 & 2024).	No regularly used roosts identified. There were infrequent observations of birds on-ground within the Proposed Project site throughout the survey period, the majority of which related to breeding birds at the end of the winter season.
Black-headed Gull (SCI of Middle Shannon Callows SPA & Lough Ree SPA)	Non-breeding. There was no evidence of breeding at the site during surveys.	No regularly used roosts identified.
Barn Owl (Red-listed)	**Confirmed Breeding.** A confirmed breeding territory was identified within the Proposed Project site during the 2021 breeding season.	No regularly used roosts identified.
Curlew (Red-listed)	Non-breeding. There was no evidence of breeding at the site during surveys.	No regularly used roosts identified.
Kestrel (Red-listed)	**Confirmed Breeding.** There were up to seven breeding territories (including confirmed and probable) identified within the Proposed Project site and wider vicinity in any one season over the four breeding seasons surveyed.	No regularly used roosts identified.

Species	Overall breeding status	Overall wintering status
Snipe (Red-listed)	**Confirmed Breeding.** There was evidence of several breeding territories throughout the Proposed Project site in areas of suitable habitat, indicated by the presence of displaying males.	No regularly used roosts identified.
Woodcock (Red-listed)	**Confirmed Breeding.** There was evidence of several breeding territories throughout the Proposed Project site indicated by the presence of displaying males.	No regularly used roosts identified.
Buzzard (Raptor)	**Confirmed Breeding.** There were up to nine breeding territories (including confirmed and probable) identified within the Proposed Project site and wider vicinity in any one season over the four breeding seasons surveyed.	No regularly used roosts identified. Although roosting possible.
Long-eared Owl (Raptor)	There was no evidence of breeding at the site during surveys. However, owing to small number of observations during breeding season and the cryptic nature of this species and likely under-recording, breeding is considered possible in areas of suitable habitat.	No regularly used roosts identified. Although roosting possible.
Sparrowhawk (Raptor)	**Confirmed Breeding.** There were up to four breeding territories (including confirmed and probable) identified within the Proposed Project site and wider vicinity in any one season over the four breeding seasons surveyed.	No regularly used roosts identified. Although roosting possible.

The target species listed below were only recorded during waterbird distribution and abundance surveys, greater than 1.5km, and up to 8km, from the Proposed Project site. There were no observations of these species within or near the Proposed Project site over the 4.5 years of surveying and, therefore, the potential for significant effects can be reasonably excluded . As such, these species are not considered further in this assessment:

- **Brent Goose** (closest record = 5.9km distant from Proposed Project site).
- **Common Tern** (closet record = 7.7km distant from Proposed Project site).
- **Great White Egret** (closet record = 3.4km distant from Proposed Project site).
- **Marsh Harrier** (closest record = 6.1km distant from Proposed Project site).
- **Northern Harrier** (closet record = 7.8km distant from Proposed Project site).
- **Osprey** (closet record = 4.8km distant from Proposed Project site).
- **White-tailed Eagle** (closet record = 3.2km distant from Proposed Project site).
- **Black-tailed Godwit** (closet record = 6.0km distant from Proposed Project site).
- **Grey Partridge** (closet record = 8.1km distant from Proposed Project site).
- **Redshank** (closet record = 5.4km distant from Proposed Project site).
- **Shoveler** (closet record = 3.6km distant from Proposed Project site).

- **Coot** (closet record = 5.8km distant from Proposed Project site).
- **Teal** (closet record = 1.8km distant from Proposed Project site).
- **Tufted Duck** (closet record = 5.8km distant from Proposed Project site).

The following **non-target** species, comprising SCI species of SPAs outlined in Table 7-6 above, were recorded at the Proposed Project site. However, the distances between the Proposed Project site and the respective SPAs are significantly greater than the foraging ranges of these species. There is no evidence of connectivity between individuals recorded at the Proposed Project site and the respective SPAs and, as such, these species are not considered further in this assessment:

- **Wigeon** – SCI of Middle Shannon Callows SPA situated approx. 8.9km from Proposed Project site – core foraging range of wigeon is 2.5 – 2.8km (Johnston *et al.*, 2013).
- **Mallard** – SCI of Lough Ree SPA situated approx. 11.4km from Proposed Project site – core foraging range of mallard is 0.5 – 1.3km (Johnston *et al.*, 2013).
- **Little Grebe –** SCI of Lough Ree SPA situated approx. 11.4km from Proposed Project site.

A list of all bird species recorded during surveys is provided in Appendix 7-1. Appendix 7-3 presents results summary tables including:

- Summary of vantage point survey records
- Summary of winter walkover survey records
- Summary of breeding walkover survey records
- Summary of waterbird distribution and abundance survey records
- Summary of hen harrier roost survey records
- Summary of breeding raptor survey records
- Summary of breeding woodcock survey records
- Summary of breeding kingfisher survey records
- Summary of breeding barn owl survey records
- Summary of non-target species recorded

Sensitive data relating to breeding and roosting sites are provided in Confidential Appendix 7-5.

Note: breeding territory polygons shown in respective maps in Confidential Appendix 7-5 are the estimated areas in which a suspected nest site is located, e.g. a confirmed territory where a bird was seen visiting a nest site will have a small targeted polygon whereas a probable territory where birds were seen displaying over suitable habitat will have a larger polygon for the estimated nest site location. Similarly, roosting area polygons shown in respective maps in Confidential Appendix 7-5 represent a conservative area within which roosting was observed. Distances from the Proposed Project site and proposed turbines given in sections below are taken from the outer edge of these polygons and therefore represent conservative minimum distances.

7.3.7.1 Golden Plover

Golden plover were observed in the winter and passage seasons. Raw survey data and maps are provided in Appendix 7-4.

Vantage Point Surveys

Golden plover were observed on 57 occasions during vantage point surveys (see Appendix 7-4, Figure 1-1) comprising 41 flight observations and 16 non-flight observations. Golden plover were observed on average once every 19 hours of vantage point survey over the months when present (i.e. September – April). Observations were recorded across the months of September – April and ranged from an individual up to 275 birds with the majority of observations comprising birds travelling and calling.

There were four observations of birds landing on bog within the Proposed Project site, comprising a flock of 29 birds in October 2021, two birds in December 2021, 80 birds in October 2023 and 46 birds in March 2024, in different locations. Birds were observed travelling at potential collision height on 30 occasions. Of the total 57 observations, 28 were within 500m of the proposed turbine layout and 52 within the Proposed Project site.

Winter Walkover Surveys

Golden plover was observed on nine occasions during winter walkover surveys (on average, one observation per 21.5 hours of survey) (see Appendix 7-4, Figure 1-3). Observations ranged from individuals up to 18 birds, with the majority of observations comprising birds flying or circling. There were two observations of birds roosting within the Proposed Project site, both within 500m of the proposed turbine layout, and comprising flocks of four and eight birds. Of the total nine observations, six were within 500m of the proposed turbine layout and six within the Proposed Project site.

Breeding Walkover Surveys

Golden plover was observed on five occasions during breeding walkover surveys (on average, one observation per 56 hours of survey) (see Appendix 7-4, Figure 1-2). Observations comprised birds travelling or roosting and ranged from five up to 80 birds. All observations were in the month of April (2022 and 2023), and are considered to comprise birds from the winter population. There was one observation of 11 birds roosting within the Proposed Project site (outside of 500m radius of proposed turbines). Of the five total observations, there were two observations within 500m of the proposed turbine layout and total three within the Proposed Project site.

Waterbird Distribution and Abundance Surveys

Golden plover were observed on 85 occasions during the waterbird distribution and abundance surveys (on average one observation per 6.5 hours of survey) (see Appendix 7-4, Figure 1-4). Observations comprised birds circling, travelling and roosting. Flock sizes ranged from an individual up to 4,000 birds. All observations were greater than 5km distant from the Proposed Project site.

Incidental Observations

Golden plover were observed on five occasions as incidental observations (see Appendix 7-4, Figure 1-5). Observations comprised birds circling and travelling and ranged from an individual up to 80 birds. Of the five observations, three were within/partially within the Proposed Project site and a 500m radius of proposed turbine locations.

7.3.7.2 Whooper Swan

Whooper swan were observed in the winter season. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to roost sites are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Whooper swan were observed on 142 occasions during vantage point surveys (see Appendix 7-4, Figure 2-1). Whooper swan were observed on average once every 7.5 hours of vantage point survey over the months when present (i.e. September – April). Observations ranged from an individual up to 71 birds, with the majority of observations comprising birds calling or travelling. Whooper swan were regularly observed roosting on flooded sections of bog within the Proposed Project site across the five winter seasons surveyed (2020/21 to 2024/25). The site was used for overnight roosting. These roosting areas were located in an area of flooded bog approximately 10m, 230m, 120m, 220m and 490m from the nearest proposed turbine locations, respectively (Refs: WS-a, WS-b, WS-c, WS-d & WS-e, see

Confidential Appendix 7-5 Figure 1-4). Birds were observed travelling at PCH on 36 occasions. Of the 142 total observations, 130 were within 500m of the proposed turbine layout.

Winter Walkover Surveys

Whooper swan was observed on 23 occasions during winter walkover surveys (on average, one observation per 8.5 hours of survey) (see Appendix 7-4, Figure 2-2). Observations comprised birds travelling and roosting, and ranged from an individual up to 80 birds. Roosting across two areas within the Proposed Project site across the five winter seasons surveyed (Refs: WS-a & WS-b). Of the 23 total observations, 20 were within 500m of the proposed turbine layout.

Waterbird Distribution and Abundance Surveys

Whooper swan were observed on 139 occasions during the waterbird distribution and abundance surveys (on average, one observation per four hours of survey) (see Appendix 7-4, Figure 2-3). Observations comprised up to 120 birds recorded foraging, travelling or roosting outside the Proposed Project site, between 6.2km and 9.7km from the nearest proposed turbine location.

Incidental Observations

Whooper swan were observed on 23 occasions as incidental observations (see Appendix 7-4, Figure 2-4). Observations comprised up to 60 birds travelling, foraging and roosting. A flock of 60 birds were recorded roosting near the River Brosna, approximately 2km from the Proposed Project site, in January 2024.

Roosting Summary

Roosting was recorded across a total of five areas within the Proposed Project site across the five winter seasons surveyed. The majority of observations related to one area (Ref: WS-a), with regular interchange of birds observed between this area and a second regularly used nearby area (Ref: WS-b). The maximum flock sizes recorded at each of the roosting areas across the five winter seasons surveys are provided below:

- **Winter 2020/21** – Roosting recorded at four areas Proposed Project site with max counts of 39, 42, 28 and 2 respectively (Refs: WS-a, WS-b, WS-c & WS-d).
- **Winter 2021/22** – Roosting recorded at two areas Proposed Project site with max counts of 15 and 23 respectively (Refs: WS-a & WS-b).
- **Winter 2022/23** – Roosting recorded at four areas Proposed Project site with max counts of 71, 20, 57 and 5 respectively (Refs: WS-a, WS-b, WS-c & WS-d).
- **Winter 2023/24** – Roosting recorded at two areas Proposed Project site with max counts of 11 and 5 respectively (Refs: WS-a & WS-e).
- **Winter 2024/25** – Roosting recorded at three areas Proposed Project site with max counts of 10, 6 and 2 respectively (Refs: WS-a, WS-b & WS-c).

Roosting locations are shown in Confidential Appendix 7-5 Figure 1-4.

7.3.7.3 Crane

Crane were observed in the winter and breeding season. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to nest/roosts are provided in Confidential Appendix 7-5.

Breeding Walkover Surveys

There were two observations of cranes during breeding walkover surveys (see Appendix 7-4, Figure 3-1). The observations were on consecutive days in late July 2024 and comprised a pair (male and female) travelling and foraging within the Proposed Project site. There were no observations of breeding activity.

Incidental Observations

Crane was observed on three occasions as an incidental observation. One observation was within the Proposed Project site, comprising a single bird flying in April 2024. The remaining two observations comprised individuals recorded during Waterbird Distribution and Abundance Surveys over 6km distant from the Proposed Project site (see Appendix 7-4, Figure 3-2).

7.3.7.4 Hen Harrier

Hen harrier were observed in the winter season. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to roosts are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Hen harrier were observed on 16 occasions during vantage point surveys (see Appendix 7-4, Figure 4.1). Hen harrier were observed on average once every 122 hours of vantage point survey. Observations were of individual birds and the majority were of birds hunting or travelling. Observations were of both male and ringtail birds. The majority of observations were from the passage and winter season months of September to March, with only one observation during the breeding season, comprising a female bird travelling in April 2021. Birds were observed travelling at PCH on four occasions. Of the total 16 observations, thirteen were within 500m of the proposed turbine layout. All observations were within/partially within the Proposed Project site.

Winter Walkover Surveys

Hen harrier was observed on four occasions during winter walkover surveys (on average, one observation per five survey days) (see Appendix 7-4, Figure 4-2). All observations comprised individuals travelling. There was one observation within the Proposed Project site, which was also within 500m of the proposed turbine layout.

Hen Harrier Roost Surveys

Hen harrier was observed on 35 occasions during hen harrier roost surveys (on average, one observation in every three surveys) (see Appendix 7-4, Figure 4-3). All observations were of individual birds, predominantly hunting and travelling. Of the 35 observations, 29 were from the same general area of bog approximately 500m from the Proposed Project site. A number of these observations were close to dusk. There were four observations of birds confirmed going to roost, all comprising individual birds, and all in an area of this bog approximately 750m from Proposed Project site and 1.5km from nearest proposed turbine at its closest point (Ref: HH-a, see Confidential Appendix 7-5 Figure 2-2). Of these four observations, one observation was in winter 2020/21 and three in winter 2023/24. There was an additional observation of a male bird deemed to be going to roost but disturbed by the presence of a surveyor in October 2024, in a different location to the above, situated approximately 2.4km from the Proposed Project site and 3.2km from the nearest proposed turbine (Ref: HH-b). Of the 35 total observations, two were partly within the Proposed Project site, and two within a 500m radius of proposed turbines.

Incidental Observations

Hen harrier were observed on 29 occasions as incidental observations (see Appendix 7-4, Figure 4-4). Observations comprised of individual birds hunting and travelling. All observations were distant from the Proposed Project site, situated between 3.7km and 10.2km from the nearest proposed turbine.

7.3.7.5 Kingfisher

Kingfisher were observed in the breeding and winter seasons. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to nest/roosts are provided in Confidential Appendix 7-5.

Breeding Kingfisher Surveys

Kingfisher were observed on four occasions during a dedicated breeding kingfisher survey undertaken in May 2023 (see Confidential Appendix 7-5, Figure 3-3). The observations comprised a pair present at a suitable nesting bank along a bog drain, with the male observed provisioning, confirming breeding at this location for the 2023 breeding season (Ref: KF-a, see Confidential Appendix 7-5, Figure 3-4). The nest site is situated within 500m of the proposed turbine layout, approximately 270m from the nearest proposed turbine. This location was subsequently surveyed as part of Breeding Walkover Surveys in the 2024 breeding season. No evidence of breeding was recorded in the 2024 breeding season.

Vantage Point Surveys

Kingfisher were observed on 15 occasions during vantage point surveys (see Appendix 7-4, Figure 5-1). Kingfisher were observed on average once every 130 hours of the vantage point survey. Observations were of individual birds and the majority were of birds calling or travelling. The majority of observations related to activity associated with a nest site within a bog drain in proximity to a VP location (see Breeding Kingfisher Survey results below). All observations of kingfisher were within the Proposed Project site and within 500m of the proposed turbine layout.

Winter Walkover Surveys

Kingfisher was observed on three occasions during winter walkover surveys (on average, one observation per 65 hours of survey) (see Appendix 7-4, Figure 5-3). The observations were of individuals travelling or calling. Of the three observations, one was within the Proposed Project site, which was also within 500m of the proposed turbine layout.

Breeding Walkover Surveys

Kingfisher was observed on 20 occasions during breeding walkover surveys (one observation over 2.4 survey dates) (see Appendix 7-4, Figure 5-2). The observations were of individuals travelling, calling and foraging. As outlined above, a confirmed nest was identified in 2023, with further observations of a male provisioning and a female entering/leaving a nest site during these surveys (see Confidential Appendix 7-5, Figure 3-3). Observations away from the identified nest site were predominantly associated with a section of the River Brosna, approximately 1.8km from the Proposed Project site. Of the total 20 observations, ten were within the Proposed Project site, with nine being within 500m of the proposed turbine layout.

Waterbird Distribution and Abundance Surveys

Kingfisher were observed on eight occasions during the waterbird distribution and abundance surveys (one observation every 2.5 surveys) (see Appendix 7-4, Figure 5-4). Observations comprised birds and were of birds perching, travelling, fishing or roosting and ranged from an individual up to three birds.

All observations were outside the Proposed Project site, approximately 2.6km to 8.1km from the nearest proposed turbine location.

Incidental Observations

Kingfisher were observed on 24 occasions as incidental observations (see Appendix 7-4, Figure 5-5). Observations comprised birds calling and travelling and ranged between 1-2 birds. Of the 24 total observations, there were four within the Proposed Project site (mostly relating to the identified nest site), with three of these being within 500m of the proposed turbine locations.

7.3.7.6 Little Egret

Little egret were observed in the breeding and winter seasons. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to nest/roosts are provided in Confidential Appendix 7-5.

Breeding Walkover Surveys

Little egret was observed on one occasion during breeding walkover surveys (one observation over 48 survey dates) (see Appendix 7-4, Figure 6-1). The observation was of an individual travelling and landing within the Proposed Project site (also within 500m of the proposed turbine layout).

Winter Walkover Surveys

Little egret was observed on two occasions during winter walkover surveys (on average, one observation per 10 surveys) (see Appendix 7-4, Figure 6-2). The observations were of individuals travelling and foraging. Of these two observations, one was within the Proposed Project site, with this also being within 500m of the proposed turbine layout.

Waterbird Distribution and Abundance Surveys

Little egret were observed on 82 occasions during the waterbird distribution and abundance surveys (one observation every 1.1 surveys) (see Appendix 7-4, Figure 6-3). All observations were outside of the Proposed Project site. Observations were of up to six birds and comprised birds perched, travelling, fishing or roosting between 4.2km and 9.7km from the nearest proposed turbine.

7.3.7.7 Merlin

Merlin were observed in the breeding and winter seasons. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to nest/roosts are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Merlin were observed on 24 occasions during vantage point surveys (see Appendix 7-4, Figure 7-1). Merlin were observed on average once every 81 hours of the vantage point survey. All observations were of individual birds and the majority of observations comprised birds perched, hunting or travelling. The majority of observations were during the winter months of November to March, with only five observations during the breeding season months, comprising three consecutive records of a male on a day in late August 2021 and two observations of a bird travelling on the same day in April 2022. There was one observation of an individual mobbing a kestrel within the Proposed Project site in December 2021. Due to the timing of this observation, in the middle of the winter season, this is not considered to indicate breeding activity in the area. Birds were observed travelling at potential collision

height on two occasions. All observations were within/partially within the Proposed Project site, with 12 being within 500m of the proposed turbine layout.

Winter Walkover Surveys

Merlin was observed on two occasions during winter walkover surveys (on average, one observation per 97 hours of surveys) (see Appendix 7-4, Figure 7-3). The observations comprised one to two birds travelling, both within the Proposed Project site and within 500m of the proposed turbine layout.

Breeding Raptor Surveys

Merlin was observed on two occasions during breeding raptor surveys (see Appendix 7-4, Figure 7-2). The observations both comprised female birds, with individuals seen travelling in April 2022 (within Proposed Project site) and hunting in July 2024 (approximately 1km from the Proposed Project site). There were no observations of breeding activity. Both observations were beyond 500m of the proposed turbine layout.

Incidental Observations

Merlin were observed on 10 occasions as incidental observations (see Appendix 7-4, Figure 7-4). The majority of observations were distant from the Proposed Project site, recorded during waterbird distribution and abundance surveys. Observations comprised individual birds hunting, calling and travelling. There was one observation within the Proposed Project site, comprising a female bird travelling in January 2023.

7.3.7.8 Peregrine

Peregrine were observed in the breeding and winter seasons. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to nest/roosts are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Peregrine were observed on 26 occasions during vantage point surveys (see Appendix 7-4, Figure 8-1). Peregrine were observed on average once every 75 hours of the vantage point survey. Observations were of up to two birds and the majority were of birds perched, hunting or travelling. There were two observations of peregrine mobbing a hen harrier, once in December 2020 and once in February 2022, both within the Proposed Project site. There was one observation of a bird carrying prey in May 2024, confirming a breeding territory in the area. Birds were observed travelling at potential collision height on 11 occasions. Of the total 26 observations, 25 were within the Proposed Project site, with 18 also being within 500m of the proposed turbine layout.

Winter Walkover Surveys

Peregrine were observed on four occasions during winter walkover surveys (on average, one observation per 49 hours of survey) (see Appendix 7-4, Figure 8-4). All observations comprised individual birds travelling, with two of these observations comprising juvenile birds (January 2023). All observations were both within/partly within the Proposed Project site and within 500m of the proposed turbine layout.

Breeding Walkover Surveys

Peregrine were observed on six occasions during breeding walkover surveys (on average, one observation per 47 hours of survey) (see Appendix 7-4, Figure 8-2). The majority of observations comprised individual birds travelling and hunting. All observations were within, or partially within, the Proposed Project site. There was an observation of a pair travelling and calling in July 2022 and an observation of a juvenile bird carrying prey in May 2023. All observations were within the Proposed Project site, with four also being within 500m of the proposed turbine layout.

Breeding Raptor Surveys

Peregrine were observed once during breeding raptor surveys (see Appendix 7-4, Figure 8-3). The observation comprised an individual travelling partially within the Proposed Project site. There were no observations of breeding activity recorded.

Incidental Observations

Peregrine were observed on six occasions as incidental observations (see Appendix 7-4, Figure 8-5). The majority of observations comprised individual birds hunting and travelling. There was one observation of breeding activity, in which an adult was observed mobbing another bird within the Proposed Project site (approximately 1km from the nearest proposed turbine) in March 2024. Of the total six observations, two were within the Proposed Project site, with none being within 500m of the proposed turbine layout.

Breeding Summary

Survey results indicate the presence of a peregrine breeding pair in the wider area across the breeding seasons surveyed. There is limited to no suitable breeding habitat for peregrine within the Proposed Project site. A pair was observed calling and in flight together in the vicinity of a suitable nesting structure situated within third-party lands in July 2022. The adult observed carrying prey in May 2024, as detailed above, was travelling in the general direction of this structure. As such, an analysis of survey results and assessment of potentially suitable nesting sites in the area indicate that this structure is the likely peregrine breeding location. This structure is situated approximately 100m distant from the Proposed Project site and approximately 1km from the nearest proposed turbine location (Ref: PE-a, see Confidential Appendix 7-5, Figure 4-3).

7.3.7.9 Black-headed Gull

Black-headed gull were observed in the breeding and winter season. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to nest/roosts are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Black-headed gull were observed on 16 occasions during vantage point surveys (see Appendix 7-4, Figure 10-1). Black-headed gull were observed on average once every 122 hours of the vantage point survey. The majority of observations comprised individual birds travelling, with a maximum flock of three birds recorded. The majority of observations were in the breeding season months of May, June and July, with only three observations outside this period (single observations from January, February and March). Birds were observed travelling at potential collision height on 10 occasions. Of the total 16 observations, nine were within the Proposed Project site, with seven also being within 500m of the proposed turbine layout.

Breeding Walkover Surveys

Black-headed gull was observed on six occasions during breeding walkover surveys (on average, one observation per 47 hours of survey) (see Appendix 7-4, Figure 10-2). Observations ranged from individuals up to 23 birds, and predominantly comprised birds travelling. There was one observation within the Proposed Project site, comprising a single bird travelling in June 2023. There was one observation of a flock of 23 birds foraging in a recently cut field, approximately 1.5km from the Proposed Project site. All observations were beyond 500m of the proposed turbine layout.

Waterbird Distribution and Abundance Surveys

Black-headed gull were observed on 156 occasions during the waterbird distribution and abundance surveys (on average, one observation per 3.5 hours of survey) (see Appendix 7-4, Figure 10-3). Observations ranged from individuals up to 200 birds and comprised birds foraging, travelling or roosting. All observations were outside of the Proposed Project site, ranging from between 4.3km and 9.8km from the nearest proposed turbine.

Incidental Observations

Black-headed gull were observed on nine occasions as incidental observations (see Appendix 7-4, Figure 10-4). Observations were of up to 12 birds travelling, foraging and circling. All observations were outside of the Proposed Project site, ranging from between 0.8km and 5km from the nearest proposed turbine.

7.3.7.10 Barn Owl

Barn owl were observed in the breeding and winter season. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to nest/roosts are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Barn owl were recorded on two occasions during vantage point surveys (see Appendix 7-4, Figure 11-1). Both observations comprised individual birds heard calling, in November 2021 and March 2023. Both these observations were within the Proposed Project site and within 500m of the proposed turbine layout.

Breeding Barn Owl Surveys

Barn owl was observed on four occasions during the dedicated breeding barn owl surveys (see Confidential Appendix 7-5, Figure 6-1). All observations were from May and July 2021. The observations comprised barn owl activity at a suitable nesting structure, with young heard begging/snoring from inside the structure, confirming breeding at this location in the 2021 breeding season, situated within the Proposed Project site and approximately 680m from the nearest proposed turbine.

Incidental Observations

Barn owl were observed on two occasions as incidental observations (see Confidential Appendix 7-5, Figure 6-2). The first observation comprised one, or possibly two, birds calling within the nesting structure outlined above in March 2021. The second incidental observation comprised a bird seen travelling in March 2023 in the general vicinity of the 2021 nest site.

Breeding Summary

In summary, there was one confirmed breeding territory in 2021 which was located within the Proposed Project site, approximately 680m from the nearest proposed turbine location. Further dedicated surveys were undertaken at this location in the 2022 and 2023 breeding seasons, however no barn owl activity was recorded. It is noted that this structure was boarded up outside of the breeding season following the 2021 breeding season surveys, rendering the structure unsuitable for barn owl in subsequent seasons.

7.3.7.11 Curlew

Curlew were observed in the breeding season. There were no observations of breeding activity. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to nest/roosts are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Curlew were observed on two occasions during vantage point surveys (see Appendix 7-4, Figure 12-1). Curlew were observed on average once every 973 hours of vantage point survey. Both observations were in close proximity on the same day in September 2024 and comprised a single bird first heard calling then seen travelling, within 500m of the proposed turbine layout.

Breeding Walkover Surveys

Curlew was observed on one occasion during breeding walkover surveys (one observation over 48 survey dates) (see Appendix 7-4, Figure 12-2). The observation was of five birds travelling and calling in late July 2023 within 500m of the proposed turbine layout.

Waterbird Distribution and Abundance Surveys

Curlew were observed on 68 occasions during the waterbird distribution and abundance surveys (on average, one observation per 8 hours of survey) (see Appendix 7-4, Figure 12-3). Observations were of up to 167 birds and were of birds foraging, travelling or roosting. All observations were outside of the Proposed Project site, ranging from between 8.3km and 10.4km from the nearest proposed turbine.

7.3.7.12 Kestrel

Kestrel were observed in the breeding and winter seasons. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to nest/roosts are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Kestrel were observed on 702 occasions during vantage point surveys (see Appendix 7-4, Figure 13-1). Kestrel were observed on average once every 3 hours of vantage point survey. The majority of observations comprised single birds perched, hunting or travelling, with a max of three birds recorded. Birds were observed travelling at PCH on 309 occasions. Of the total 702 observations, 503 were within 500m of the proposed turbine layout.

There were several observations of breeding activity. In 2021, there were six observations of behaviours indicating probable breeding territories, with birds observed mobbing and chasing other birds. In 2022, there were two observations of kestrels mobbing other birds indicating probable breeding territories. In 2023, there were three observations of kestrels mobbing other birds indicating probable breeding territories. In 2024, there were four observations of behaviours indicating confirmed breeding territories

including birds carrying prey and one juvenile bird begging as well as five observations indicating probable territories (mobbing).

Winter Walkover Surveys

Kestrel was observed on 43 occasions during winter walkover surveys (on average, one observation per 4.5 hours of survey) (see Appendix 7-4, Figure 13-4). The observations were of up to four birds hunting or travelling. There was one observation of a male carrying prey accompanied by a female in March 2023. There were 21 observations within 500m of the proposed turbine layout.

Breeding Walkover Surveys

Kestrel was observed on 84 occasions during breeding walkover surveys (on average, 1 observation per 3 hours of survey) (see Appendix 7-4, Figure 13-2). Observations were of up to three birds travelling, hunting or roosting. There were 41 observations within 500m of the proposed turbine layout.

There were 20 observations relating to breeding activity, comprising birds seen displaying, mobbing and agitated calling. Breeding was confirmed within/partly within the Proposed Project site in 2021 and 2023.

Breeding Raptor Surveys

Kestrel was observed on 129 occasions during breeding raptor surveys (on average, one observation per 2.8 hours of survey) (see Appendix 7-4, Figure 13-3). The majority of observations comprised individual birds hunting and travelling. There were 34 observations associated with breeding activity, comprising birds seen mobbing, provisioning and entering/leaving nest sites.

A bird was observed carrying prey in June 2021, confirming breeding at this location partially within the Proposed Project site and approximately 1.7km from the nearest proposed turbine (Ref: K-d, see Confidential Appendix, Figure 7-6). There were numerous observations of adults carrying prey to a nest site in 2022, approximately 1.3km from the Proposed Project site and 2.3km from the nearest proposed turbine location (Ref: K-f). There were several observations of adults mobbing other birds, indicating probable breeding at these locations in 2022 (Refs: K-a, K-g & K-h), 2023 (K-c & K-f) and 2024 (K-c & K-l).

Incidental Observation

Kestrel were observed on 91 occasions as incidental observations (see Appendix 7-4, Figure 13-5). The majority of observations comprised individual birds hunting and travelling. There were several observations of breeding behaviour. An adult was observed carrying prey into an area of suitable nesting habitat in May 2021 confirming breeding at this location partially within the Proposed Project site and approximately 300m from the nearest proposed turbine location (Ref: K-k). An adult was observed carrying prey to this area in April 2023 confirming breeding for the 2023 breeding season at this location (Ref: K-k). An adult was observed mobbing a buzzard in March 2022 at the recorded nest site (Ref: K-f). An adult was observed carrying prey in June 2024. While there is potential that this bird was travelling on to one of the previously recorded nest sites, adopting a precautionary approach a separate nest site has been assumed in this area within the Proposed Project site and approximately 100m from the nearest proposed turbine location (Ref: K-m).

Breeding Summary

- **2021 (Five territories)** – Three confirmed and two probable breeding territories (Refs: K-a, K-b, K-c, K-d & K-k) all partially within the Proposed Project site (490m, 1.8km, 830m, 1.7km & 300m from the nearest proposed turbines respectively).

- **2022 (Six territories)** – One confirmed and five probable breeding territories (Refs: K-a, K-c, K-e, K-f, K-g & K-h), four being within/partially within the Proposed Project site. Locations were 490m, 830m, 300m, 2.3km, 0m and 1.5km from the nearest proposed turbines respectively.
- **2023 (Seven territories)** – Two confirmed and five probable breeding territories (Refs: K-a, K-c, K-f, K-g, K-i, K-j & K-k), six being within/partially within the Proposed Project site. Locations were 490m, 300m, 2.3km, 0m, 160m, 700m & 300m from the nearest proposed turbines respectively.
- **2024 (Four territories)** – Three confirmed and one probable breeding territory (Refs: K-c, K-k, K-l & K-m), three being within/partially within the Proposed Project site. Locations were 300m, 300m, 950m & 100m from the nearest proposed turbines respectively.

Over the course of the four breeding seasons surveyed, multiple breeding territories were identified. Breeding locations are shown in Confidential Appendix 7-5, Figure 7-6.

7.3.7.13 Lapwing

Lapwing were observed in the breeding and winter seasons. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to breeding areas are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Lapwing were observed on 89 occasions during vantage point surveys (see Appendix 7-4, Figure 9-1). Lapwing were observed on average once every 22 hours of vantage point survey. Observations were of up to two birds and the majority were of birds circling or travelling. In 2021, there was one observation of behaviour indicating probable breeding (mobbing). In 2023, there were eight observations of behaviour indicating probable breeding (mobbing and displaying) and one observation confirming breeding (chicks observed). In 2024, there were two observations of behaviour indicating probable breeding (mobbing and displaying). There were three observations of birds landing or roosting on the bog. Birds were observed travelling at potential collision height on 34 occasions. Lapwing were observed on 78 occasions within 500m of the proposed turbine layout.

Winter Walkover Surveys

Lapwing was observed on four occasions during winter walkover surveys (on average, one observation per 48 hours of survey) (see Appendix 7-4, Figure 9-3). The observations were of up to four birds travelling or roosting. There were three observations within 500m of the proposed turbine layout.

Breeding Walkover Surveys

Lapwing was observed on 45 occasions during breeding walkover surveys (on average, one observation per 6 hours of survey) (see Appendix 7-4, Figure 9-2). Observations were of up to eight birds travelling or roosting. There were 43 observations within 500m of the proposed turbine layout. There were several observations of breeding behaviour, all within the Proposed Project site. The was one observation of alarm calling in June 2021, in an area of suitable nesting habitat approximately 380m from the nearest proposed turbine (Ref: L-a). There were numerous observations of adults calling and landing in areas of suitable nesting habitat during breeding seasons 2023 and 2024 indicating probable breeding within these areas (Ref: L-b [2023 & 2024] & L-d [2024]), one approximately 480m from nearest proposed turbine location and one overlapping with a proposed turbine location. The majority of these observations comprised single birds, with observations of five and eight birds in late June and July 2023 respectively, and max counts of two birds in 2024. An adult was observed chasing a ringed plover in June 2024.

Waterbird Distribution and Abundance Surveys

Lapwing were observed on 261 occasions during the waterbird distribution and abundance surveys (on average, one observation every two hours of survey) (see Appendix 7-4, Figure 9-4). Observations were of up to 1,400 birds and were of birds foraging, travelling, displaying or roosting. All observations were outside of the Proposed Project site, ranging from between 4.6km and 10.2km from the nearest proposed turbine.

Incidental Observations

Lapwing were observed on 55 occasions as incidental observations (see Appendix 7-4, Figure 9-5). The majority of observations comprised individual birds travelling. Observations were recorded across most months, but were predominantly concentrated within the breeding season. There were several observations of breeding activity. A juvenile bird was observed with an adult in suitable nesting habitat in June 2023, confirming breeding within this area (Ref: L-b). There were several observations of display and mobbing behaviour in breeding season 2024, indicating probable breeding in this area (Ref: L-d).

Observations were of up to 130 birds calling, travelling, displaying and roosting up to 4.9km from the nearest proposed turbine.

Breeding Summary

- **2021 (Min. one pair)** – Probable breeding recorded in one area within Proposed Project site (Ref: L-a), comprising two birds displaying in June 2021 and a bird mobbing a kestrel in early July 2021. There was no further breeding activity recorded. Estimated breeding of 1-2 pairs.
- **2022** – No breeding activity recorded.
- **2023 (Min. two pairs)** – Breeding activity recorded in two areas within Proposed Project site, one probable and one confirmed with two chicks observed in July 2023 (Refs: L-b & L-c respectively). Five birds were recorded together in late June 2023 and eight birds in late July 2023 in this area. However, by late July lapwing will begin congregating together in flocks which include non-breeding birds or failed breeders. As such, survey results indicate an estimate of 2-3 breeding pairs in 2023.
- **2024 (Min. two pairs)** – Probable breeding recorded in two areas within the Proposed Project site (Refs: L-b & L-d). Up to two birds were recorded displaying and mobbing in April and May 2024 in area previously recorded in 2023 (Ref: L-b). The majority of activity related to a different area in close proximity to this (Ref: L-d), where up to two birds were recorded calling, landing and resting across April to July 2024. Estimated breeding of 2-3 pairs, comprising one pair (Ref: L-b) and two pairs (Ref: L-d) across the two areas respectively.

Over the course of the four breeding seasons surveyed, one to two territories were located. Breeding locations are shown in Confidential Appendix 7-5, Figure 5-4.

7.3.7.14 Snipe

Snipe were observed in the breeding and winter seasons. Raw survey data and maps are provided in Appendix 7-4.

Vantage Point Surveys

Snipe were observed on 165 occasions during vantage point surveys (see Appendix 7-4, Figure 14-1). Observations were of up to 14 birds and the majority were of birds calling or travelling. Observations

were recorded across all months of the year. There were several observations of breeding behaviour within the Proposed Project site. In 2021, there was one observation of behaviour indicating probable breeding (drumming) for at least one breeding pair. In 2023, there were seven observations of behaviour indicating probable breeding (drumming/breeding calls) of likely two breeding pairs. In 2024, there were nine observations of behaviour indicating probable breeding (drumming) for at least one breeding pair. Birds were observed travelling at potential collision height on 15 occasions. Of the total 165 observations, 133 were within 500m of the proposed turbine layout.

Winter Walkover Surveys

Snipe was observed on 97 occasions during winter walkover surveys (on average, one observation per 2 hours of survey) (see Appendix 7-4, Figure 14-3). The majority of observations comprised individual birds flushed or travelling, with a max of four birds observed. There was a single observation of a bird drumming in March 2024, indicating probable breeding in this area within the Proposed Project site. Of the 97 observations, 57 were within 500m of the proposed turbine layout.

Breeding Walkover Surveys

Snipe was observed on 32 occasions during breeding walkover surveys (on average, one observation per 9 hours of survey) (see Appendix 7-4, Figure 14-1). Observations were of up to three birds travelling, drumming or flushed by the surveyor. Of the 32 total observations, 27 were within 500m of the proposed turbine layout.

Waterbird Distribution and Abundance Surveys

Snipe were observed on 16 occasions during the waterbird distribution and abundance surveys (on average, one observation per 34 hours of survey) (see Appendix 7-4, Figure 14-4). Observations were of up to six birds and were of birds foraging, travelling, flushed or calling between 4.4km and 10.1km from the nearest proposed turbine.

Incidental Observations

Snipe were observed on 111 occasions as incidental observations (see Appendix 7-4, Figure 14-5). The majority of observations comprised individual birds flushed or travelling. A max flock of 17 birds was recorded, observed travelling within the Proposed Project site in October 2022. There were several observations of breeding behaviour, indicating probable breeding within suitable habitat within the Proposed Project site.

7.3.7.15 Woodcock

Woodcock were observed in the breeding and winter seasons. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to nest/roosts are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Woodcock were observed on 65 occasions during vantage point surveys (see Appendix 7-4, Figure 15-1). Woodcock were observed on average once every 25 hours of the vantage point survey. Observations were of up to two birds and the majority were of birds calling or travelling. In 2021, there were seven observations of behaviour indicating probable breeding (roding/aggression). In 2023, there was one observation of behaviour indicating probable breeding (roding). In 2024, there was one observation of behaviour indicating probable breeding (roding). Birds were observed travelling at potential collision height on four occasions. Woodcock were recorded on 55 occasions within 500m of the proposed turbine layout.

Breeding Walkover Surveys

Woodcock was observed on four occasions during breeding walkover surveys (on average, one observation per 70 hours of survey) (see Appendix 7-4, Figure 15-2). Observations were of up to two birds travelling and calling. There were three observations within 500m of the proposed turbine layout.

Breeding Woodcock Surveys

Woodcock were observed on 152 occasions during the dedicated breeding woodcock surveys (see Appendix 7-4, Figure 15-3). In 2021, there were 91 observations of woodcock calling, fighting and roding at dusk, indicating probable breeding at these locations. There were eight breeding areas identified in 2021. In 2022, there were six observations of woodcock calling and roding at dusk, indicating probable breeding at these locations. There were three breeding areas identified in 2022. In 2023, there were 23 observations of woodcock calling and roding at dusk, indicating probable breeding at these locations. There were four breeding areas identified in 2023. In 2024, there were 20 observations of woodcock calling and roding at dusk, indicating probable breeding at these locations. There were two breeding areas identified in 2024. Due to the nature of woodcock breeding habits and display, estimating the number of pairs in each breeding area is difficult. For the purposes of this EIAR, it is assumed that there is a minimum of one breeding pair within each breeding area identified.

Incidental Observations

Woodcock were observed on 33 occasions as incidental observations (see Appendix 7-4, Figure 15-4). Observations were of up to two birds calling, travelling and roding up to 3.7km from the nearest proposed turbine.

7.3.7.16 Buzzard

Buzzard were observed in the breeding and winter seasons. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to nest/roosts are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Buzzard were observed on 587 occasions during vantage point surveys (see Appendix 7-4, Figure 16-1). Buzzard were observed on average once every three hours of the vantage point survey. Observations were of up to four birds and the majority were of birds perched, soaring, hunting or travelling. Birds were observed travelling at potential collision height on 333 occasions. Buzzard were observed on 293 occasions within 500m of the proposed turbine layout. In 2021, there were 12 observations of behaviours indicating probable breeding territories (displays, fighting, alarm calling). There was also one observation of a juvenile bird soaring in August 2021, confirming breeding in the wider area. In 2022, there was one observation of buzzards mobbing other birds indicating a probable breeding territory. In 2024, there were four observations of behaviours indicating probable territories (displaying) and two observations indicating confirmed breeding territories (juveniles begging). In early 2025, there were two observations of behaviours indicating probable territories (displaying, mobbing).

Winter Walkover Surveys

Buzzard was observed on 44 occasions during winter walkover surveys (on average, one observation per 4.5 hours of survey) (see Appendix 7-4, Figure 16-4). The observations were of up to three birds travelling, hunting, roosting or soaring. There were 21 observations within 500m of the proposed turbine layout.

Breeding Walkover Surveys

Buzzard was observed on 129 occasions during breeding walkover surveys (on average, 1 observation per 2 hours of survey) (see Appendix 7-4, Figure 16-2). Observations were of up to four birds travelling, soaring or hunting. There were 44 observations within 500m of the proposed turbine layout. There were 27 observations of breeding activity in 2021, but no confirmed nests.

Breeding Raptor Surveys

Buzzard was observed on 189 occasions during breeding raptor surveys (on average, one observation per two hours of survey) (see Appendix 7-4, Figure 16-3). There were 11 observations associated with breeding activity (mobbing, provisioning, juveniles present). In 2021, there were three observations indicating confirmed territories. In 2022, there were eight observations indicating a confirmed breeding territory. In 2024, there were three observations indicating confirmed breeding territories. Observations relating to breeding behaviour are presented in Confidential Appendix 7-5, Figure 10-5. The remaining observations were of up to four birds hunting or travelling.

Incidental Observations

Buzzard were observed on 140 occasions as incidental observations (see Appendix 7-4, Figure 16-5). Observations were of up to four birds calling, travelling and soaring between 0.4km and 3.7km from the nearest proposed turbine.

Breeding Summary

In summary, there were six probable breeding territories and three confirmed territories in 2021, one probable breeding territory and one confirmed territory in 2022, one probable breeding territory and two confirmed territories in 2023, one probable territory and five confirmed territories in 2024 and two probable breeding territories identified in early 2025.

In 2021, the confirmed breeding territories were 317m, 1.4km and 1.5km from the nearest proposed turbine. The confirmed breeding territory in 2022 was approximately 1.6km from the nearest proposed turbine. In 2023, the confirmed breeding territories were 180m and 570m from the nearest proposed turbine. In 2024, the confirmed breeding territories were 220m, 1.2km, 1.3km, 2.8km and 3.3km from the nearest proposed turbine.

The probable breeding territories in 2021 were located adjacent to the Proposed Project site to the east, north and west of the site. The probable breeding territory in 2022 was adjacent to the Proposed Project site, to the west. The probable breeding territory in 2023 was located 2.2km south of the Proposed Project site. The probable breeding territory in 2024 was located 7.5km south of the Proposed Project site. The probable breeding territories in 2025 were located adjacent to the Proposed Project site to the north and west. See Confidential Appendix 7-5, Figure 10-5 for locations of all breeding territory locations.

7.3.7.17 Long-eared Owl

Long-eared owl were observed in the breeding season. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to nest/roosts are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Long-eared owl was observed on one occasion during vantage point surveys (see Appendix 7-4, Figure 17-1). The observation comprised an individual travelling in May 2023 within 500m of the proposed turbine layout.

Incidental Observations

Long-eared owl were observed on two occasions as incidental observations (see Appendix 7-4, Figure 17-2). Observations were of individual birds calling and travelling within the Proposed Project site in June 2023 and February 2024.

7.3.7.18 Sparrowhawk

Sparrowhawk were observed in the breeding and winter seasons. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to nest/roosts are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Sparrowhawk was observed on 86 occasions during vantage point surveys (see Appendix 7-4, Figure 18-1). Sparrowhawk was observed on average once every 23 hours of the vantage point survey. Observations were of up to two birds and the majority were of birds perched, soaring, hunting or travelling. Birds were observed travelling at potential collision height on 22 occasions. Sparrowhawk were observed on 55 occasions within 500m of the proposed turbine layout. In 2023, there was one observation of sparrowhawk carrying prey indicating a confirmed breeding territory. In 2024, there was one observation of behaviour indicating a probable territory (mobbing). In early 2025, there was one observation of behaviours indicating a probable territory (mobbing).

Winter Walkover Surveys

Sparrowhawk was observed on 13 occasions during winter walkover surveys (on average, one observation per 15 hours of survey) (see Appendix 7-4, Figure 18-4). The observations were of individuals travelling or soaring. There were eight observations within 500m of the proposed turbine layout.

Breeding Walkover Surveys

Sparrowhawk was observed on 11 occasions during breeding walkover surveys (on average, one observation per 26 hours of survey) (see Appendix 7-4, Figure 18-2). Observations were of up to two birds travelling, hunting or calling. There were four observations within 500m of the proposed turbine layout. A nest was located 780m from the nearest proposed turbine in 2021. In 2021, there was one observation of behaviour indicating a probable territory (displaying). In 2022, there was one observation of sparrowhawk carrying prey indicating a confirmed breeding territory.

Breeding Raptor Surveys

Sparrowhawk was observed on 15 occasions during breeding raptor surveys (on average, one observation per 24 hours of survey) (see Appendix 7-4, Figure 18-3). There were four observations associated with breeding activity (provisioning, juveniles present). In 2021, there were two confirmed territories (approximately 400m and 700m from the nearest proposed turbine). In 2023, there was one confirmed breeding territory (approximately 1.4km from the nearest proposed turbine). Observations relating to breeding behaviour are presented in Confidential Appendix 7-5, Figure 9-4. The remaining observations were of individuals hunting, perched or travelling.

Incidental Observations

Sparrowhawk were observed on 15 occasions as incidental observations (see Appendix 7-4, Figure 18-5). Observations were of individual birds hunting and travelling between 94m and 7.4km from the nearest proposed turbine.

Breeding Summary

In summary, there was one probable breeding territory and two confirmed territories in 2021, one confirmed territory in 2022, two confirmed territories in 2023, four confirmed territories in 2024 and two probable breeding territories identified in early 2025.

In 2021, the confirmed breeding territories were 520m and 815m from the nearest proposed turbine. The confirmed breeding territory in 2022 was approximately 220m from the nearest proposed turbine. In 2023, the confirmed breeding territories were 600m and 1.4km from the nearest proposed turbine. In 2024, the confirmed breeding territories were 180m, 350m, 360m and 1.2km from the nearest proposed turbine.

The probable breeding territory in 2021 was located adjacent to the Proposed Project site to the southeast of the site. The probable breeding territories in 2025 were located within or adjacent to the Proposed Project site to the north. See Confidential Appendix 7-5, Figure 11-4 for locations of all breeding territory locations.

7.3.7.19 Passerines (Red Listed)

The BoCCI Red listed species grey wagtail, meadow pipit, redwing and swift were recorded within 500m of the Proposed Project site during surveys undertaken between October 2020 to March 2025. Grey wagtail were observed on three occasions, with up to seven birds being recorded. Meadow pipit were observed on 684 occasions, with up to 49 birds being recorded. Redwing were observed on 51 occasions, with up to 100 birds being recorded. Swift were observed on 18 occasions, with up to 15 birds being recorded.

7.4 Receptor Evaluation

7.4.1 Determination of Population Importance

A determination of population importance for birds within the likely ZOI is provided below, following the criteria described in Section 7.2.5. Estimates of national population sizes were obtained from the most recent species-specific national survey, or national surveys by Burke *et al.* (2018), Lewis *et al.* (2019a), Crowe *et al.* (2014) and Lewis *et al.* (2019b), or Ireland's Article 12 Reporting 2013-2018 (EU, 2022), depending on what literature was available. Estimates for mean county population sizes were obtained from species-specific surveys, a review of IWeBS sites within Co. Offaly[15], or derived from national estimates, according to the best available literature.

Following NRA (2009), a population of National Importance is a regularly occurring population that exceeds 1% of the national population. Similarly, a population of County Importance is a regularly occurring population that exceeds 1% of the county population. Locally Important (Higher Value) populations are resident or regularly occurring species of conservation concern of importance at the local level, while Locally Important (Lower Value) populations are resident or regularly occurring species of some local importance.

7.4.1.1 Crane

Crane is a species which was formerly extinct from Ireland but has recently been recorded breeding at a site in midlands in recent years. In addition to this breeding pair, additional summering/non-breeding birds have also been recorded in recent years. Taking a precautionary approach (given the rarity of the

[15] *Please note that these figures are estimates based on the best available information but should be interpreted with a degree of caution.*

species) a regularly occurring population of one bird is required for classification as of National Importance.

An individual was observed travelling within the Proposed Project site in April 2024, and there were two observations of two birds present on the bog within the Proposed Project site in late July 2024. Taking a precautionary approach, this species is considered to be a population of **National Importance**.

7.4.1.2 Golden Plover

The national population of golden plover is estimated to be 82,190 for the Republic of Ireland (ROI) (Burke *et al.* (2025[16])). Therefore, a regularly occurring population of 827 birds is required for classification as National Importance.

To estimate the county population, a review of all County Offaly I-WeBS sites was conducted. It should be noted that the population estimate based on I-WeBS figures below is likely to be an underestimate of the county population[17]. This is due to the foraging ecology of wintering golden plover that will utilise agricultural grasslands and other habitats not typically surveyed during I-WeBS counts. To account (partly) for the birds that occur in terrestrial habitats that would not have been counted by I-WeBS surveyors, the golden plover that occur at terrestrial locations outside of any I-WeBS sites within the 8km survey radius of the Waterbird Distribution and Abundance Survey were added to the county population estimate.

Below are the mean count values recorded for I-WeBS sites over the most recent 5-season period, i.e., for the period 2016/17 – 2020/21 (note that sites with a mean of zero birds were excluded from this list) and the mean peak count from the 8km survey radius of the Waterbird Distribution and Abundance Surveys for the four winter seasons (2020/21 – 2023/24):

- Little Brosna Callows (mean = 2,555)
- Shannon Callows (mean = 252)
- Terrestrial habitats[18] (mean = 2,090)

Based on the above, the mean wintering population from Offaly sites is 4,897 birds. However, as previously stated this likely remains an underestimate. A regularly occurring population of 48 or more birds (>1% of the county population, as per NRA (2009)) is required to be classified as County Importance. This species is wide ranging in the winter months that utilise habitats, such as those present on site (peatlands), that are abundant in the wider landscape.

Golden plover were observed within, or partially within, the Proposed Project site on 62 occasions. Birds of county importance were recorded within the Proposed Project site on 15 occasions over the four winter seasons surveyed. The maximum flock size recorded within the Proposed Project site was 275 birds. Taking a precautionary measure approach, this species is considered to be a population of **County Importance**.

[16] *Burke, B., Kennedy, J., Gadd, R., Fitzgerald, N., Lynch, A., Caffrey, B., Walsh, A., Murray, T. & Kelly, S.B.A. (2025). The status and distribution of wintering waterbirds in Ireland in 2023: results from the Irish Wetland Bird Survey (I-WeBS). Irish Wildlife Manuals, No. 162. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland*

[17] *As per Burke et al., (2018) in relation to the golden plover count, "these estimate must be treated as conservative on the bases that they are widely disturbed in a variety of wetland and non-wetland habitats that are under-sampled during I-WeBS.".*

[18] *From terrestrial areas within the 8km survey radius of the Waterbird Distribution Surveys outside of any I-WeBS sites.*

7.4.1.3 Hen Harrier

Wintering

The estimated national wintering population of hen harrier in Ireland is 311-435 (Ruddock *et al.*, 2016; Article 12 Reporting 2013-2018) therefore 1% of the Republic of Ireland national wintering population is 3-4 birds. A regularly occurring wintering population of 3-4 hen harrier is required for classification as National/International Importance.

Hen harrier were observed on 84 occasions during the winter season from all surveys. The majority of these observations were outside the Proposed Project site and were recorded during hen harrier roost surveys or as incidental records during waterbird distribution and abundance surveys. There was one roost site confirmed situated in an area approximately 750m from the Proposed Project site, with roosting recorded on a total of four occasions (all individual birds) comprising one observation in winter 2020/21 and three in winter 2023/24. Observations throughout the survey period were of male and ringtail birds and no more than a single bird was observed during any one observation. This indicates a minimum of two birds present during the survey period. Taking a precautionary measure approach, this species is considered to be a population of **County Importance**.

Breeding

There was only a single observation of hen harrier during the breeding season within the Proposed Project site over the 4.5 years of surveying, comprising an individual bird travelling in April 2021. There were no observations of breeding activity

The Proposed Project site is of **No Ecological Importance** to this species during the breeding season, given that there was only one observation of this species within the Proposed Project site over the four breeding seasons surveyed. Likely significant effects during the breeding season can be reasonably excluded.

7.4.1.4 Kingfisher

The national population of kingfisher is estimated to be 368-1031 pairs (NPWS Article 12 Reporting 2013-2018) therefore, 1% of the ROI national breeding population is six birds. There are no published figures for the County Offaly population of kingfisher. Using the distribution of kingfisher across Ireland from the breeding bird atlas[19] (2007-2011) the County population of kingfisher is estimated to be 19-54 pairs. Taking a precautionary approach and using the above as a guide; a regularly occurring population of just one bird is required for classification of County Importance.

Kingfisher were observed within, or partially within, the Proposed Project site on 33 occasions with a maximum of two birds recorded. A nest site was confirmed within the Proposed Project site in breeding season 2023. Thus, this species is considered to be a population of **County Importance.**

7.4.1.5 Little Egret

There were only two observations of little egret within the Proposed Project site over the 4.5 years of surveying, both comprising individual birds.

The Proposed Project site is of **No Ecological Importance** to this species, given that there were only two observations of this species within the Proposed Project site over the 4.5 years of surveying.

[19] *Bird Atlas data from the National Biodiversity Data Centre was used to estimate the county population. Presence/absence hectad data was used to estimate the proportion of the national population that occurs in the county. The national population was then multiplied by this percentage to give a county population estimate.*

7.4.1.6 Merlin

As per the latest NPWS Article 12 reporting document, the estimated population of merlin is between 200 – 400 pairs, based on Hardy *et al.* (2013). Therefore, a regularly occurring population of 2-4 birds is required for classification as National Importance. There are no published figures for the County Offaly population of merlin. Using the distribution of merlin across Ireland from the breeding bird atlas[20] (2007-2011) the County population of merlin is estimated to be 4-8 pairs. Taking a precautionary approach and using the above as a guide; a regularly occurring population of just one bird is required for classification of County Importance.

Merlin were observed within, or partially within, the Proposed Project site on 28 occasions over the 4.5 years of surveying. There was no breeding activity recorded. The maximum number of birds recorded within the Proposed Project site was two birds. Thus, this species is considered to be a population of **County Importance.**

7.4.1.7 Peregrine

As per NPWS Article 12 Reporting (2013-2018), the estimated population of peregrine is 425 pairs. Therefore, as per NRA (2009) criteria, a regularly occurring population of four pairs of peregrine is required for classification as Nationally Important. There are no published figures for the County Offaly population of peregrine. Using the distribution of peregrine across Ireland from the breeding bird atlas[21] (2007-2011) the County population of peregrine is estimated to be 25 birds. This population figure only relates to breeding birds, however all populations will include non-breeding individuals. For example, given that peregrine have brood sizes of three to four chicks, and a survival rate of 60% in their first year[22], a non-breeding population of juvenile birds can be estimated at 52 birds, giving a total estimated population of 77 birds. Taking a precautionary approach and using the above as a guide; a regularly occurring population of just one bird is required for classification of County Importance.

Peregrine were observed within, or partially within, the Proposed Project site on 38 occasions over the 4.5 years of surveying. The maximum number of birds recorded within the Proposed Project site was two birds. Survey results indicate the presence of a peregrine breeding pair in the wider area across the breeding seasons surveyed. There is limited to no suitable breeding habitat for peregrine within the Proposed Project site. An analysis of survey results (i.e. behaviour, location and flight direction) and assessment of potential suitable nesting sites in the area identified a suitable structure situated approximately 100m distant from the Proposed Project site within third-party lands as the likely peregrine breeding location. Thus, this species is considered to be a population of **County Importance**.

7.4.1.8 Whooper Swan

As per the latest national wintering estimates provided in Burke *et al.* (2021), the national wintering population of whooper swan in the ROI is 14,467. Therefore, a regularly occurring population of 145 birds is required for classification as of National Importance. The Swan Census 2020 (Burke *et al.*, 2021) was consulted regarding the population data for whooper swan in County Offaly. Based on the 2020 Swan Census data, in January 2020 the county population was 714 individuals. Therefore, a regularly occurring population of seven birds is required for classification of County Importance.

[20] *Bird Atlas data from the National Biodiversity Data Centre was used to estimate the county population. Presence/absence hectad data was used to estimate the proportion of the national population that occurs in the county. The national population was then multiplied by this percentage to give a county population estimate.*
[21] *Bird Atlas data from the National Biodiversity Data Centre was used to estimate the county population. Presence/absence hectad data was used to estimate the proportion of the national population that occurs in the county. The national population was then multiplied by this percentage to give a county population estimate.*
[22] *https://www.bto.org/learn/about-birds/birdfacts/peregrine*

Whooper swan were observed within, or partially within, the 500m radius of proposed turbines on 156 occasions. Roosting was recorded across a total of five areas within the Proposed Project site across the five winter seasons surveyed, with a maximum of four areas being used in any one season. The maximum number of birds recorded roosting within the Proposed Project site was 71 birds. There were regularly occurring flocks of county importance within the Proposed Project site. Thus, this species is considered to be a population of **County Importance**.

7.4.1.9 Black-headed Gull

Wintering

There were only three observations of black-headed gull within the Proposed Project site over the five winter seasons surveyed, comprising between 1-2 birds travelling with no observations of birds utilising habitats within the Proposed Project site.

The Proposed Project site is of **No Ecological Importance** to this species, given that there were only three observations of this species within the Proposed Project site over the five winter seasons surveyed.

Breeding

Black-headed gull were observed within, or partially within, the Proposed Project site on eight occasions over the four breeding seasons surveyed. There were no observations of breeding activity. All observations related to between 1-3 birds travelling with no observations of birds utilising habitats within the Proposed Project site. The Proposed Project site is of **No Ecological Importance** to this species, given the limited observations of this species within the Proposed Project site over the four breeding seasons surveyed.

7.4.1.10 Curlew

There were only three observations of curlew within, or partially within, the Proposed Project site despite undertaking a comprehensive suite of surveys over four and a half years. The observations comprised between 1-5 birds travelling in late July and September, with no observations of birds utilising habitats within the Proposed Project site. There were no observations of breeding activity. The Proposed Project is of **No Ecological Importance** to this species, given how infrequently the species was observed.

7.4.1.11 Barn Owl

As per the latest NPWS Article 12 reporting document, the estimated population of barn owl is 562-702 pairs. Therefore, as per NRA (2009) criteria, a regularly occurring population of five pairs of barn owl is required for classification as Nationally Important. There are no published figures for the County Offaly population of barn owl. Using the distribution of barn owl across Ireland from the breeding bird atlas[23] (2007-2011) the county population of barn owl is estimated to be a minimum of 22 pairs. Therefore, a regularly occurring population of just one bird is required for classification as County Importance.

A confirmed breeding territory was identified within the Proposed Project site in breeding season 2021, although further dedicated surveys undertaken in the 2022 and 2023 breeding season recorded no further barn owl activity. Thus, this species is considered to be a population of **County Importance**.

[23] *Bird Atlas data from the National Biodiversity Data Centre was used to estimate the county population. Presence/absence hectad data was used to estimate the proportion of the national population that occurs in the county. The national population was then multiplied by this percentage to give a county population estimate.*

7.4.1.12 Kestrel

As per NPWS Article 12 Reporting (2013-2018), the national breeding population estimates of kestrel in the ROI is 13,500 birds. Using these latest figures, 1% of the national population of kestrel is 135 birds. Therefore, as per NRA (2009) criteria, a regularly occurring population of 135 birds is required for classification as Nationally Important. There are no published figures for the County Offaly population of kestrel. Using the distribution of kestrel across Ireland from the breeding bird atlas[24] (2007-2011) the county population of kestrel is estimated to be 405 birds. Therefore, a regularly occurring population of four birds is required for classification of County Importance.

There was a maximum of seven breeding territories identified in the vicinity of the Proposed Project site in any one season. This indicates a population of 14 adult birds during the breeding season (using the Proposed Development site at least on occasion). This population would be bolstered by fledglings at the end of the breeding season, which will remain present in the area until the start of the next breeding season, when birds become territorial again. Given that kestrel have brood sizes of four to five chicks, and a survival rate of 30% in their first year[25], it is likely that there would be a population of approximately 14 adults and 10 juvenile birds by the end of each winter season. The population recorded at the Proposed Project was therefore assigned **County Importance** on the basis of a resident/regularly occurring population assessed to be important on a county level.

7.4.1.13 Lapwing

Wintering

The estimated national wintering population of lapwing in Ireland is 67,700 for the Republic of Ireland (ROI) (Burke et al., 2025). Therefore, as per NRA 2009, a regularly occurring population of 67 birds is required for classification as Nationally Important.

To estimate the county population, a review of all County Offaly I-WeBS sites was conducted. It should be noted that, the population estimate based on I-WeBS figures below is likely to be an underestimate of the county population[26]. Similar to golden plover, wintering lapwing will utilise agricultural grasslands and other habitats not typically surveyed during I-WeBS counts. To account (partly) for the birds that occur in terrestrial habitats that would not have been counted by I-WeBS surveyors, the lapwing that occur at terrestrial locations outside of any I-WeBS sites within the 8km survey radius of the Waterbird Distribution Survey were added to the county population estimate.

Below are the mean count values recorded for I-WeBS sites over the most recent 5-season period, i.e. for the period 2016/17 – 2020/21 (note that sites with a mean of zero birds were excluded from this list) and the mean peak count from the 8km survey radius of the Waterbird Distribution Surveys for the four winter seasons (2020/21 – 2023/24):

- Little Brosna Callows (mean =1,629)
- Shannon Callows (mean = 253)
- Terrestrial habitats[27] (mean = 738)

Based on the above, the mean wintering population from Offaly I-WeBS sites is 2,620 birds. However, as previously stated this likely remains an underestimate. Therefore, a regularly occurring population of

[24] *Bird Atlas data from the National Biodiversity Data Centre was used to estimate the county population. Presence/absence hectad data was used to estimate the proportion of the national population that occurs in the county. The national population was then multiplied by this percentage to give a county population estimate.*
[25] https://www.bto.org/learn/about-birds/birdfacts/kestrel
[26] *A relatively large proportion of Lapwing are known to spend winter away from coastal wetlands, often in non-wetland habitats such as agricultural land. Therefore, this species is considered poorly monitored by wetland waterbird monitoring methods and assigning accurate national estimates of wintering populations is difficult (Delaney et al., 2009).*
[27] *From terrestrial areas within the 8km survey radius of the Waterbird Distribution Surveys outside of any I-WeBS sites.*

19 or more birds (>1% of the county population, as per NRA (2009)) is required to be classified as County Importance. This species is wide ranging in the winter months that utilise habitats, such as those present on site (peatlands), that are abundant in the wider landscape.

Lapwing were observed within, or partially within, the Proposed Project site on 19 occasions across the five winter seasons surveyed. The maximum number of birds recorded within the Proposed Project site was 19 birds, observed on a single occasion travelling at the edge of the Proposed Project site. Given the infrequency of observations and low numbers recorded, this species is considered to be a population of no greater than **Local Importance (higher value).**

Breeding

As per the latest NPWS Article 12 reporting document, the national population of breeding lapwing is estimated to be 476 – 620 pairs for the ROI. There are no published figures for the County Offaly population of breeding lapwing. Using the distribution of lapwing across Ireland from the breeding bird atlas[28] (2007-2011) the county population of breeding lapwing is estimated to be a minimum of 33 pairs. Therefore, a regularly occurring population of one bird is required for classification of County Importance.

Lapwing were observed within, or partially within, the 500m radius of proposed turbines on 137 occasions. The maximum number of birds recorded within the Proposed Project site was eight birds. Lapwing breeding activity was identified within the Proposed Project site, with an estimated two pairs breeding present in the most recent breeding seasons surveyed (i.e. 2023 & 2024). As such, this species is considered to be a population of **County Importance.**

7.4.1.14 Snipe

As reported (2013-2018) under Article 12 of the Birds Directive (Directive 2009/147/EC), the national breeding population estimate of snipe in the ROI is 4,275 breeding pairs. Using these latest figures, 1% of the National population of snipe is 43 pairs. Therefore, as per NRA 2009, a regularly occurring population of 43 pairs is required for classification as Nationally Important.

There are no published figures for the County Offaly population of snipe. Using the distribution of snipe across Ireland from the breeding bird atlas[29] (2007-2011) the County population of snipe is estimated to be 128 pairs. Therefore, a regularly occurring population of one pair is required for the classification as County Important.

Snipe were observed within, or partially within, the 500m radius of proposed turbines on 256 occasions Observations were of up to five birds within the Proposed Project site. Breeding activity (i.e. drumming) was recorded across the Proposed Project site within areas of suitable habitat. Taking a precautionary approach, it is assumed that the individuals recorded are associated with a population of **County Importance**.

7.4.1.15 Woodcock

Woodcock is BoCCI Red Listed during the breeding season in Ireland. Thernational estimates of the breeding population of woodcock in Ireland is 27,434 males[30]. The population within the site is

[28] Bird Atlas data from the National Biodiversity Data Centre was used to estimate the county population. Presence/absence hectad data was used to estimate the proportion of the national population that occurs in the county. The national population was then multiplied by this percentage to give a county population estimate.
[29] Bird Atlas data from the National Biodiversity Data Centre was used to estimate the county population. Presence/absence hectad data was used to estimate the proportion of the national population that occurs in the county. The national population was then multiplied by this percentage to give a county population estimate.
[30] O'Neill, J. B. 2024. The spatial ecology and conservation of an important game bird in Ireland: the Eurasian woodcock. PhD Thesis, University College Cork.

significantly below national importance thresholds. There were up to seven breeding areas identified at, or within, the 500m radius of proposed turbines between 2020 and 2024. Taking a precautionary approach (given the species unfavourable conservation status) the population recorded at the Project site was assigned **County Importance**.

7.4.1.16 Buzzard

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

7.4.1.17 Long-eared Owl

Long-eared owl is not listed on Annex I of the Birds Directive and is Green listed in Ireland (BoCCI).. There were three observations of long-eared owl within, or partially within, the Proposed Project site over the four and a half years of surveying. Two of these observations were during the breeding season. Owing to the cryptic nature of this species, likely under-recording during surveys, and the presence of suitable breeding habitat on the margins of the Proposed Project site, the population was assigned **Local Importance (Higher Value)** on the basis of a resident/regularly occurring population assessed to be important at the local level.

7.4.1.18 Sparrowhawk

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

7.4.1.19 Passerines (Red Listed)

Grey wagtail, meadow pipit, redwing and swift are red listed in Ireland. Populations recorded at the Proposed Project site were deemed to be of no greater than **Local Importance (Lower Value)**.

7.4.2 Identification of Key Ornithological Receptors

Table 7-11 outlines the rationale for including or excluding each target species recorded during field surveys as a KOR. The conservation status, population importance evaluation following NRA (2009) and a detailed explanation for inclusion/exclusion as a KOR is provided. The sensitivity of species included as KORs are then evaluated in the following section.

Table 7-11 Receptor evaluation and selection criteria rationale.

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
Crane	Annex I Birds Directive	**Breeding** National Importance	There were two observations of a pair present on the bog within the Proposed Project site in late July 2024. As such, the potential for foraging habitat loss cannot be excluded. **An assessment of direct habitat loss is required.** Birds were recorded within the Proposed Project site and within 500m of the proposed turbine layout. Taking a precautionary approach, **the potential for displacement exists.** This species was not recorded flying over the Proposed Project site within the potential collision risk zone. Thus, significant collision risk is unlikely.	**Yes**
Golden Plover	Annex I Birds Directive & SCI of Middle Shannon Callows SPA & Lough Ree	**Wintering** County Importance	This species was occasionally recorded landing and utilising habitats within the Proposed Project site. The potential for habitat loss cannot be excluded. **An assessment of direct habitat loss is required.** Birds were recorded within the Proposed Project site and within 500m of the proposed turbine layout. Taking a precautionary approach, **the potential for displacement exists.** This species was recorded flying over the Proposed Project site within the potential collision risk zone. **A collision risk assessment is required.**	**Yes**

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
Hen Harrier	Annex I Birds Directive	**Wintering** County Importance	This species was occasionally recorded hunting within the Proposed Project site. As such, the potential for habitat loss cannot be excluded. **An assessment of direct habitat loss is required.** Birds were recorded within the Proposed Project site and within 500m of the proposed turbine layout. Taking a precautionary approach, **the potential for displacement exists.** This species was recorded flying over the Proposed Project site within the potential collision risk zone. **A collision risk assessment is required.**	**Yes**
Kingfisher	Annex I Birds Directive	**All Seasons** County Importance	A confirmed breeding territory was identified within the Proposed Project site during the 2023 breeding season. The potential for habitat loss cannot be excluded. **An assessment of direct habitat loss is required.** Birds were recorded within the Proposed Project site and within 500m of the proposed turbine layout. Taking a precautionary approach, **the potential for displacement exists.** This species was not recorded flying over the Proposed Project site within the potential collision risk zone. As such significantcollision risk effects are unlikely.	**Yes**
Little Egret	Annex I Birds Directive	**All Seasons** No populations of ecological importance recorded	No population of ecological significance was recorded utilising the Proposed Project site during the extensive suite of surveys conducted. As such, the potential for direct habitat loss, disturbance/displacement and collision risk are limited and there is no evidence to suggest that the Proposed Project will have a significant effect on this species.	**No**

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
			No pathways for significant effects were identified.	
Merlin	Annex I Birds Directive	**All Seasons** County Importance	This species was occasionally recorded hunting within the Proposed Project site. The potential for habitat loss cannot be excluded. **An assessment of direct habitat loss is required.** Individuals were recorded within the Proposed Project site and within 500m of the proposed turbine layout. Taking a precautionary approach, **the potential for displacement exists.** This species was recorded flying over the Proposed Project site within the potential collision risk zone. **A collision risk assessment is required.**	**Yes**
Peregrine	Annex I Birds Directive	**All Seasons** County Importance	This species was occasionally recorded hunting within the Proposed Project site. The potential for habitat loss cannot be excluded. **An assessment of direct habitat loss is required.** Birds were recorded within the Proposed Project site and within 500m of the proposed turbine layout. Breeding was confirmed in the vicinity of the Proposed Project site. Taking a precautionary approach, **the potential for displacement exists.** This species was recorded flying over the Proposed Project site within the potential collision risk zone. **A collision risk assessment is required.**	**Yes**
Whooper Swan	Annex I Birds Directive	**Wintering** County Importance	Birds were recorded utilising habitats within the site of the Proposed Project site. Roosting was recorded within the Proposed Project site across five areas. **An assessment of direct habitat loss is required.**	**Yes**

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
			Birds were recorded within the Proposed Project site and within 500m of the proposed turbine layout. **Potential for disturbance/displacement cannot be excluded.** This species was recorded flying over the Proposed Project site within the potential collision risk zone. **A collision risk assessment is required.**	
Black-headed Gull	SCI of Middle Shannon Callows SPA	**Wintering** No populations of ecological importance recorded	No population of ecological significance was recorded utilising the Proposed Project site during the extensive suite of surveys conducted. As such, the potential for direct habitat loss, disturbance/displacement and collision risk are limited and there is no evidence to suggest that the Proposed Project will have a significant effect on this species. **No pathways for significant effects were identified.**	**No**
		Breeding No populations of ecological importance recorded	No population of ecological significance was recorded utilising the Proposed Project site during the extensive suite of surveys conducted. As such, the potential for direct habitat loss, disturbance/displacement and collision risk are limited and there is no evidence to suggest that the Proposed Project will have a significant effect on this species. **No pathways for significant effects were identified.**	**No**
Curlew	BoCCI Red List	**Breeding** No populations of ecological importance recorded	No population of ecological significance was recorded utilising the Proposed Project site during the extensive suite of surveys conducted. As such, the potential for direct habitat loss, disturbance/displacement and collision risk are limited and there is no evidence to suggest that the Proposed Project will have a significant effect on this species. **No pathways for significant effects were identified.**	**No**

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
Barn Owl	BoCCI Red List	**All Seasons** County Importance	Birds were recorded occasionally hunting within the Proposed Project site and a nest site was confirmed within the Proposed Project site in breeding season 2021. **An assessment of direct habitat loss is required.** Birds were recorded within the Proposed Project site and within 500m of the proposed turbine layout. **Potential for disturbance/displacement cannot be excluded.** This species was not recorded flying over the Proposed Project site within the potential collision risk zone. As such significant collision riskeffects are unlikely .	**Yes**
Kestrel	BoCCI Red List	**All Seasons** County Importance	This species was regularly recorded hunting within the Proposed Project site, and up to seven breeding territories were identified in the vicinity of the Proposed Project site. **An assessment of direct habitat loss is required.** Birds were regularly recorded within the Proposed Project site and within 500m of the proposed turbine layout. **Potential for disturbance/displacement cannot be excluded.** This species was recorded flying over the Proposed Project site within the potential collision risk zone. **A collision risk assessment is required.**	**Yes**
Lapwing	BoCCI Red List	**Wintering** Local Importance (higher value)	Birds were recorded occasionally utilising habitats within the site of the Proposed Project site. **An assessment of direct habitat loss is required.** Birds were recorded within the Proposed Project site and within 500m of the proposed turbine layout. Taking a precautionary approach, **the potential for displacement exists.**	**Yes**

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
			This species was recorded flying over the Proposed Project site within the potential collision risk zone. **A collision risk assessment is required.**	
		Breeding County Importance	Birds were recorded utilising habitats within the site of the Proposed Project site, and breeding of an estimated two pairs was identified in breeding seasons 2023 and 2024. **An assessment of direct habitat loss is required.** Birds were recorded within the Proposed Project site and within 500m of the proposed turbine layout. **Potential for disturbance/displacement cannot be excluded.** This species was recorded flying over the Proposed Project site within the potential collision risk zone. **A collision risk assessment is required.**	**Yes**
Snipe	BoCCI Red List	**All Seasons** County Importance	This species was recorded utilising habitats within the Proposed Project site and breeding activity was recorded within the Proposed Project site in areas of suitable habitat. **An assessment of direct habitat loss is required.** Birds were recorded within the Proposed Project site and within 500m of the proposed turbine layout. **Potential for disturbance/displacement cannot be excluded.** This species was recorded flying over the Proposed Project site within the potential collision risk zone. **A collision risk assessment is required.**	**Yes**
Woodcock	BoCCI Red List	**Breeding** County Importance	This species was recorded utilising habitats within the Proposed Project site and breeding activity was recorded within the Proposed Project site in areas of suitable habitat. **An assessment of direct habitat loss is required.**	**Yes**

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
			Birds were recorded within the Proposed Project site and within 500m of the proposed turbine layout. **Potential for disturbance/displacement cannot be excluded.** This species was recorded flying over the Proposed Project site within the potential collision risk zone. **A collision risk assessment is required.**	
Buzzard	BoCCI Green List; a species sensitive to Wind Farm Developments	**All Seasons** Local Importance (Higher Value)	This species was regularly recorded hunting within the Proposed Project site. There were also records of breeding within, and adjacent to, the Proposed Project site. **An assessment of direct habitat loss is required.** Birds were recorded within the Proposed Project site and within 500m of the proposed turbine layout. **Potential for disturbance/displacement cannot be excluded.** This species was recorded flying over the Proposed Project site within the potential collision risk zone. **A collision risk assessment is required.**	**Yes**
Long-eared Owl	BoCCI Green List; a species sensitive to Wind Farm Developments	**All Seasons** Local Importance (Higher Value)	No population of ecological significance was recorded utilising the Proposed Project site during the extensive suite of surveys conducted. As such, the potential for direct habitat loss, disturbance/displacement and collision risk are limited and there is no evidence to suggest that the Proposed Project will have a significant effect on this species. **No pathways for significant effects were identified.**	**No**
Sparrowhawk	BoCCI Green List; a species sensitive to Wind Farm Developments	**All Seasons** Local Importance (Higher Value)	This species was recorded hunting within the Proposed Project site. There were also observations of breeding within, and adjacent to, the Proposed Project site. **An assessment of direct habitat loss is required.**	**Yes**

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
			Birds were recorded within the Proposed Project site and within 500m of the proposed turbine layout. Taking a precautionary approach, **the potential for displacement exists.** This species was recorded flying over the Proposed Project site within the potential collision risk zone. **A collision risk assessment is required.**	
Passerines	BoCCI Red List	**All Seasons** Local Importance (lower value)	Grey wagtail, meadow pipit, redwing and swift were recorded at the Proposed Project site. However, as per NatureScot guidance, it is generally considered that passerine bird species are not significantly impacted by wind farms due to their ecology, reproductive rates and large population sizes. As such, the potential for direct habitat loss, disturbance/displacement and collision risk are limited and there is no evidence to suggest that the Proposed Project will have a significant effect on these species.	**No**

7.4.3 Key Ornithological Receptor Sensitivity Determination

Criteria developed by Percival (2003) for assessing bird sensitivity within the Proposed Project site is presented in Table 7-3 (Section 7.2.5). The sensitivity of the KORs, as per Percival (2003), are listed below, including the rationale for their respective sensitivity classification.

Very High Sensitivity KORs are:

- Golden Plover (Wintering) (Annex I; EU Birds Directive, SCI of Middle Shannon Callows SPA)
- Lapwing (Wintering) (BoCCI Red Listed, SCI of Middle Shannon Callows SPA)

High Sensitivity KORs are:

- Crane (Annex I; EU Birds Directive) (Nationally important population)

Medium Sensitivity KORs are:

- Hen Harrier (Wintering) (Annex I; EU Birds Directive)
- Kingfisher (Annex I; EU Birds Directive)
- Merlin (Annex I; EU Birds Directive)
- Peregrine (Annex I; EU Birds Directive)
- Whooper Swan (Wintering) (Annex I; EU Birds Directive)
- Kestrel (BoCCI Red Listed)
- Lapwing (Breeding) (BoCCI Red Listed)
- Snipe (BoCCI Red Listed)
- Woodcock (BoCCI Red Listed)

Low Sensitivity KORs are:

- Buzzard (lower conservation concern)
- Sparrowhawk (lower conservation concern)

7.5 Potential Impacts

All elements of the Proposed Project have been considered in assessing impacts on KORs. This section is structured as follows:

- Assessment of 'Do nothing' Effect
- Assessment of impacts in relation to KORs during construction of the Proposed Wind Farm, e.g. construction works
- Assessment of impacts in relation to KORs during operation of the Proposed Wind Farm, e.g. disturbance (e.g. foot traffic associated with the amenity track), displacement (e.g. turbine avoidance) and collision risk (e.g. with turbines (there are no guy wires associated with the two masts onsite which limits the potential for a significant effect))
- Assessment of impacts in relation to KORs during decommissioning of the Proposed Wind Farm
- Assessment of impacts associated with the Proposed Grid Connection and proposed turbine delivery route
- Assessment of impacts on designated areas

7.5.1 Do-Nothing Effect

Whether the Proposed Project were to proceed or not, the avian communities of the Lemanaghan bog are likely to evolve with the ongoing revegetation of the bare peat and cutover habitat. A Draft Cutaway Bog Decommissioning and Rehabilitation Plan (Appendix 2-4) (hereafter referred to as the Draft Rehabilitation Plan) will be implemented in accordance with the IPC licence requirements, to environmentally stabilise the site through drain blocking and encouragement of re-vegetation of bare peat areas etc. Please see Section 2.10 of Chapter 2 for further details of the IPC licence requirements.

As outlined in the Draft Rehab Plan, many BnM's bogs cannot be restored to a raised bog, as the majority of peat has been removed and the environmental conditions have been modified. However, other natural habitats will develop, like poor fen and Sphagnum-rich embryonic bog communities (on deeper peat); and wetlands with Reedbeds and Birch woodland on shallower peat. As outlined in Appendix 4-2 (Table 8.1), a minority of the site is comprised of deep peat. In time a naturalised peatland can be developed. It will take some time for vegetation and habitats to fully develop at Lemanaghan, and a peatland ecosystem to be restored. However, it is expected that most of the remaining bare peat will develop pioneer habitats after 5-10 years.

A majority of the site is likely to succeed to a scrub/woodland/reedbed mosaic (shallower peat). The change from a largely open habitat bog to a more enclosed scrub mosaic will favour woodland species (e.g. woodcock) over those that select for open habitats (e.g. lapwing). On average overtime, the site is likely to become less suitable for all key ornithological receptors. The key exceptions to this are woodcock, buzzard, long-eared owl and sparrowhawk as they favour scrub/woodland habitats. Notably, only woodcock of these four is of conservation concern.

7.5.2 Effects on Key Ornithological Receptors during Construction and Operation

The following sections describe potential effects on KORs that may occur during the construction and operation of the Proposed Wind Farm[31]. The magnitude and significance of these effects are then defined according to Percival (2003) and EPA (2022) criteria.

7.5.2.1 Crane (Breeding)

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	The crane is potentially re-colonising Ireland after a several-century-long absence. Numbers within the country remain low at present. Crane were observed within, or partially within 500m of the proposed turbine layout on two occasions. A pair were observed landing and foraging within the Proposed Project site on two occasions on consecutive days in late July 2024. These observations likely relate to the same summering but non-breeding birds and were from two different areas within the Proposed Project site. The land lost to the permanent infrastructure footprint is small (i.e. 34.3ha/3%) relative to the total area within the Proposed Project. The species was observed infrequently foraging on the Proposed Project site during the breeding season in July 2024 however no indications of breeding were observed. No nesting habitat and little to no supporting breeding habitat is present. Given the abundance of similar suitable habitats (peatlands) in the wider area as those found within the Proposed Project site and that extensive areas of suitable habitat will remain post construction, no significant impacts are predicted. No significant effects of direct habitat loss are anticipated.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *High* sensitivity species and *Negligible* impact corresponds to a **Very Low** effect significance.	**Likely long-term constant imperceptible negative effect**

[31] *It is noted that, as per Section 6.4, no significant residual effects are predicted on aquatic habitats or species as a result of the Proposed Project. Please see Chapter 6 of the EIAR for further discussion.*

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Disturbance	As previously discussed, crane were very infrequently recorded within the Proposed Project site (only on two occasions over the 4.5 years of surveying), with no breeding activity identified. Therefore, based on the survey data, there is little potential for significant disturbance effects given that crane were not dependent on the habitats located in close proximity to Proposed Wind Farm infrastructure. Significant effects are not predicted.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *High* sensitivity species and *Negligible* impact corresponds to a **Very Low** effect significance.	**Likely short-term constant imperceptible negative effect**
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated, as no additional infrastructure is proposed during the operational phase.	**No Effect**	**No Effect**
Disturbance, Displacement and Barrier Effect	No evidence of breeding or roosting was recorded within the Proposed Project site. As previously discussed, crane were very infrequently recorded within the Proposed Project site (only on two occasions over the 4.5 years of surveying). Although the site is currently sub-optimal for this species, there is the potential for favourable habitat to be created as a consequence of the site's Draft Rehabilitation Plan. Over the lifetime of the wind farm there is therefore the potential for an indirect habitat loss effect. The crane is in the process of potentially re-colonising Ireland after a several-century-long absence. The species could reoccupy the abundant habitat, free of conspecific competition, that exists in the River Shannon catchment and nearby peatlands. The large scale rehabilitation (e.g. PCAS) of surrounding peatland habitats are likely to increase the quality of these habitats for the species and as such, their potential carrying capacity. Owing to this abundance of habitat, significant habitat loss effects are considered unlikely.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *High* sensitivity species and *Negligible* impact corresponds to a **Very Low** effect significance.	**Likely long-term constant imperceptible negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	Furthermore, in the context of the current baseline, the very low rate of occurrence limits the potential for significant levels of disturbance displacement associated with the turbines and/or foot traffic on the amenity tracks. Significant effects are not predicted given the very low numbers recorded and infrequency of these observations.		
Collision Risk	This species was not recorded flying at PCH during the extensive vantage point survey work undertaken. Collision related mortality is not likely to significantly impact this species, based on available data.	**No Effect**	**No Effect**

7.5.2.2 Golden Plover (Wintering)

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	Golden plover were observed within, or partially within, the Proposed Project site on 62 occasions. The majority of these observations related to birds in flight over the Proposed Project site. Birds were observed landing and/or roosting within the Proposed Project site on a total of seven occasions over the 4.5 years of surveying, with flocks recorded ranging from two to 80 birds. The Proposed Project site is therefore not an important foraging or roosting habitat for golden plover and the potential for construction works to result in ecologically significant habitat loss for golden plover is limited. Furthermore, the results of waterbird distribution and abundance surveys in the wider area demonstrate that the Proposed Project site is not a preferred habitat for golden plover, with activity concentrated on peatlands over 5km south of the	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Very High* sensitivity species and *Negligible* impact corresponds to a ***Low*** effect significance.	**Likely long-term constant slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	Proposed Project site including Boora Bog environs and Tumduff Wetlands. Please see Appendix 7-4 for details. The land lost to the permanent infrastructure footprint is small (i.e. 34.3ha/3% of the site area) relative to the total area within the Proposed Project site. Given the abundance of similar suitable habitats (peatlands and improved agricultural grasslands) in the wider area as those found within the Proposed Project site, and that extensive areas of suitable foraging and roosting habitat will remain post construction, no significant impacts are predicted. No significant effects of direct habitat loss are predicted.		
Disturbance	As outlined above, there were only seven records of golden plover utilising habitats within the Proposed Project site over the 4.5 years of surveying. All of these records related to different areas of the Proposed Project site, with no repeat usage of any area recorded. The Proposed Project site is therefore not an important foraging or roosting habitat for golden plover and the potential for construction works to result in ecologically significant habitat loss for golden plover is limited. Significant areas of suitable roosting and foraging habitat for the species occur in the wider landscape and will be retained. In the event of disturbance, there are extensive areas of similar habitat in the wider area. Similar quality habitat is widely available, with good quality habitat abundantly present in the River Shannon catchment. Additionally, the rehabilitation schemes within some of these peatland habitats (on deep peat) are likely to increase the quality of these habitats in the wider surroundings for the species and, relatedly, their potential carrying capacity. This would likely render such an effect inconsequential.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Very High* sensitivity species and *Negligible* impact corresponds to a ***Low*** effect significance.	**Likely short-term slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	Significant effects are not predicted.		
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated, as no additional infrastructure is proposed.	**No Effect**	**No Effect**
Disturbance, Displacement and Barrier Effect	Hötker *et al.* (2006) state that golden plover will approach wind turbines to an average distance of 175m in non-breeding season. Of the 161 no. observations of golden plover throughout the survey period, 24 no. observations were within 175m of the proposed turbine layout. The majority of these related to birds in flight, and with only two observations relating to birds utilising habitats. Of the total seven observations of golden plover utilising habitats across the Proposed Project site, usage was not recorded on more than one occasion in any area. Golden plover are therefore not reliant on any specific area of the Proposed Project site and utilise habitats on an opportunistic basis. As such, in the event of displacement, there are extensive areas of similar habitat in the wider area. Similar quality habitat is widely available, with good quality habitat abundantly present in the River Shannon catchment. Additionally, the rehabilitation schemes within some of these peatland habitats (on deep peat) are likely to increase the quality of these habitats in the wider surroundings for the species and, relatedly, their potential carrying capacity. The low rate of occurrence limits the potential for disturbance displacement associated with the turbines and/or foot traffic on the amenity tracks. These factors likely render displacement effects inconsequential. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, with the succession to scrub mosaic on shallower peat, the site will likely become increasingly less suitable for open habitat species like golden plover.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Very High* sensitivity species and *Negligible* impact corresponds to a ***Low*** effect significance.	**Likely long-term constant slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	There is no evidence to suggest that the Proposed Project site lies on a migratory/ regular commuting route for this species, therefore barrier effect is not anticipated. Significant displacement effects are not anticipated.		
Collision Risk	The species was recorded flying within PCH during vantage point surveys. A collision risk analysis has been undertaken (full details provided in Appendix 7-6). The model used for the analysis assumes that waterbird species are active for 25% of dark hours, in addition to daylight hours. A key factor in calculating the predicted rate of collisions for a given species is the application of an avoidance rate. The avoidance rate accounts for the ability of a bird to take evasive action to avoid a collision with a turbine. Where species-specific avoidance rates are available, these rates are usually very high, e.g. all swan species have been shown to avoid colliding with operating turbines 99.8% of the time. Until recently, a species-specific avoidance rate has not been available for golden plover. A review of golden plover collision avoidance from four UK wind farms has been undertaken. The output of this new research was a golden plover avoidance rate of 99.6 to 99.8%. Following a precautionary approach, the lower of these avoidance rates (i.e. 99.6%) was used in the collision risk analysis. The collision risk has been calculated at a rate of 1.8 collisions per year. Annual mortality of adult golden plover has been calculated at 27% per annum (Sandercock, 2003). If 1.8 collisions were to occur per year, it would mean that the losses at the Proposed Wind Farm would increase the annual mortality of the county population[32] (i.e. 4,897 birds (please see Section 7.4.1 for further	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Very High* sensitivity species and *Negligible* impact corresponds to a ***Low*** effect significance.	**Likely long-term constant slight negative effect**

[32] *The county population was considered a suitable reference population for assessment, based on the following rationale. This is a widespread species (as per the Bird Atlas 2009-11) that utilises a widespread habitat type (agricultural grassland and peatlands), it is, therefore, reasonable to conclude that there is an exchange of individuals in suitable habitat within the county.*

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	details)) by 0.14%. The predicted collision risk is therefore of negligible magnitude as per Percival criteria (2003). No significant effects are predicted.		

7.5.2.3 Hen Harrier (Wintering)

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	Hen harrier was recorded within the Proposed Project site on 20 occasions over the five winter seasons surveyed. No confirmed roosting sites were recorded within the Proposed Project site over the five winter seasons surveyed. There is therefore no potential for impacts on roosting sites in relation to (physical) habitat loss within the Proposed Project site. The Proposed Project site contains some suitable foraging habitat for hen harrier. Of the 20 observations of hen harrier within the Proposed Project site, the majority related to birds observed travelling, with only three observations of birds actively hunting/foraging. While it can be assumed that birds observed travelling may have also been foraging within the Proposed Project site, this is nonetheless a low rate of occurrence of habitat utilisation within the site, in light of the extensive survey effort undertaken over five winter seasons. This demonstrates a lack of dependence on the Proposed Project site for foraging. Furthermore, the results of hen harrier roost surveys and waterbird distribution and abundance surveys in the wider area of the Proposed Project site show significantly higher winter hen harrier activity in other peatland habitats removed from the site (see Appendix 7-4 Figures 4-3 & 4-4).	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely long-term slight constant negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	Significant effects are not predicted particularly given the low levels of activity recorded within the Proposed Project site, that the land lost to the permanent infrastructure footprint is small (i.e. 34.3ha/3%) relative to the total area within the Propose Project site, that extensive areas of suitable foraging habitats will remain post construction and that there is an abundance of similar suitable habitat in the surrounding area. No significant effects of direct habitat loss are predicted.		
Disturbance	As outlined above, hen harrier was recorded within the Proposed Project site on 20 occasions over the five winter seasons surveyed. There were no roost sites recorded within the Proposed Project site. There was one roost site confirmed situated in an area approximately 750m from the Proposed Project site, with roosting recorded on a total of four occasions (all individual birds) comprising one observation in winter 2020/21 and three in winter 2023/24. The literature identifies the potential for disturbance impacts (associated with construction works) to occur between 500m and 1000m (Ruddock and Whitfield (2007), Fernández-Bellon *et al.* (2017) and Wilson *et al.* (2015)). Such disturbance is dependent on factors including topography and lines of sight. The identified roost site is situated approximately 750m distant from the Proposed Project site and beyond 1km from nearest proposed construction works, in an area of open peatland separated from the Proposed Wind Farm by obscuring mature forestry and scrub. Owing to the separation distance and the obscuring vegetation which will remain present during the construction phase, no significant disturbance impacts are predicted on this identified roost site.	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely short-term slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	In the event of temporary disturbance, there are extensive areas of similar open habitat in the wider area. Similar quality habitat is widely available, with good quality habitat abundantly present in the River Shannon catchment. Additionally, the rehabilitation schemes within some of these peatland habitats are likely to increase the quality of these habitats in the wider surroundings for the species and, relatedly, their potential carrying capacity. As outlined above, survey results show a low rate of habitat usage within the Proposed Project site, with only three observations of foraging behaviour over the five winter seasons surveyed. Please see Appendix 7-4 for details. This demonstrates a lack of dependence on the Proposed Project site for foraging or commuting. These factors likely render such an effect inconsequential. Significant effects are not predicted.		
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated, as no additional infrastructure is proposed.	**No Effect**	**No Effect**
Disturbance, Displacement and Barrier Effect	As outlined above, hen harrier was recorded within the Proposed Project site on 20 occasions over the five winter seasons surveyed. There was one roost site confirmed situated in an area approximately 750m from the Proposed Project site, with roosting recorded on a total of four occasions (all individual birds) comprising one observation in winter 2020/21 and three in winter 2023/24. Impacts associated with disturbance (e.g. foot traffic on amenity track) and displacement (e.g. turbine avoidance) on these activities were considered for the operational phase. Key (roosting) habitat:	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely long-term constant slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	As outlined above, the identified roost site is situated approximately 750m from the Proposed Project site and approximately 1.5km from nearest proposed turbine at its closest point. Ruddock and Whitfield (2007) noted disturbance displacement to a distance of 500m-750m for hen harrier breeding and resting locations. Due to the separation distance of over 1km from this identified roost to the nearest proposed turbine and onsite foot traffic no significant displacement impacts are predicted. Foraging habitat As outlined above, survey results show a low rate of habitat usage within the Proposed Project site, with only three observations of foraging behaviour over the five winter seasons surveyed. This demonstrates a lack of dependence on the Proposed Project site for foraging. In the event of temporary disturbance, there are extensive areas of similar open habitat in the wider area. Furthermore, large scale peatland rehabilitation in the wider landscape, is likely to increase the value of many (formerly cutover) habitats for this species[33]. The majority of hen harrier activity recorded within the general vicinity of the Proposed Project site related to an area of peatland over 1km from the nearest proposed turbine locations, and therefore beyond any potential displacement effects. These factors likely render any effect inconsequential. Given the abundance of similar suitable habitats (peatlands in the wider area as those found within the Proposed Project site, and that extensive areas of		

[33] *And particularly so, on areas of deeper peat that are more likely to remain open habitat in the longer term.*

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	suitable foraging and roosting habitat will remain post construction, no significant impacts are predicted. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, a majority of the site will likely develop a scrub mosaic on shallower peat. The site will likely remain suitable initially until the scrub encloses and/or matures to woodland. Significant effects are not predicted.		
Collision Risk	This species was recorded flying the potential collision risk zone during vantage point surveys. A collision risk analysis has been undertaken (full details provided in Appendix 7-6). The collision risk has been calculated at a rate of 0.001 collisions per year, i.e. no collisions predicted over the 35-year life-time of the Proposed Wind Farm. This rate of predicted collisions is so low as to be effectively zero. Significant effects are not predicted.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Medium* sensitivity species and *Negligible* Impact corresponds to a **Very Low** effect significance	**Likely long-term constant imperceptible negative effect**

7.5.2.4 Kingfisher (All Seasons)

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	Kingfisher were observed within, or partially within, the Proposed Project site on 33 occasions with a maximum of two birds recorded. A nest site was confirmed within the Proposed Project site in breeding season 2023. The majority of observations were associated with this nest site.	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely long-term constant slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	The identified nest site is situated away from any proposed infrastructure. As such, there is no potential for direct (physical) habitat loss in relation to the identified nest site. The Proposed Project site contains an extensive network of steep-sided bog drains analogous to the habitat in which the nest site was recorded. The land lost to the permanent infrastructure footprint is small (i.e. 34.3ha/3%) relative to the total area within the Proposed Project site. Given that the identified nest site is removed from any proposed infrastructure, and the extensive network of suitable bog drains that will remain within the Proposed Project site post construction, no significant impacts are predicted. No significant effects of direct habitat loss are predicted.		
Disturbance	As outlined above, a kingfisher nest site was identified within the Proposed Project site in breeding season 2023. No breeding activity was recorded within the Proposed Project site in the most recent breeding season surveyed (2024). A disturbance buffer zone of between 50-100m is recommended for kingfisher (Goodship & Furness, 2022). The only proposed works within a 100m buffer zone of the identified nest site comprise a *c.*125m section of new internal road, situated approximately 75m distant from the nest site at its closest point. However, adopting a precautionary approach, in the absence of mitigation, and assuming that this nest site may be in use by kingfisher in future seasons, these works have the potential to cause short-term disturbance to breeding kingfisher which may be present within 100m of the works areas.	The magnitude of the effect is assessed as *High.* The cross tabularisation of a *Medium* sensitivity species and *High* Impact corresponds to a **Medium** effect significance.	Short-term **Moderate** Negative Effect Please see Section 7.6 for a description of mitigation to avoid/offset impacts.
Operational Phase			

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Direct Habitat Loss	Direct habitat loss effects are not anticipated, as no additional infrastructure is proposed.	**No Effect**	**No Effect**
Disturbance, Displacement and Barrier Effect	A nest was recorded within 270m of the closest turbine; however, the nest was no longer in use during the most recent surveys. There is no published research on displacement/avoidance buffers for kingfisher around operational wind infrastructure. The closest proposed turbine to the identified nest site is over 270m distant. The only permanent infrastructure within 100m of the identified nest site is a *c.*125m section of new internal road. This internal road will be used intermittently during maintenance visits to turbines and by foot traffic. The Proposed Project site contains an extensive network of steep-sided bog drains analogous to the habitat in which the nest site was recorded. Furthermore, a study on the effects of human outdoor recreational activities in the vicinity of kingfisher nest sites found that such activities have a minimal effect on kingfisher, with only fishing and boating activities noted as having any effects over the longer term, although small (Schweizer *et al.*, 2024). Birds were also noted to habituate at sites with high levels of human activity. As such, the operation of the Proposed Wind Farm is unlikely to result in displacement effects on kingfisher. Given that the identified nest site, was not active during the most recent surveys, is removed from any proposed infrastructure, that studies demonstrate kingfisher habituate to human activity, and that the presence of an extensive network of suitable bog drains away from any proposed infrastructure which will remain within the Proposed Project site during operation, no significant impacts are predicted.	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely long-term constant slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, a majority of the site will likely develop a scrub/woodland/reedbed mosaic on shallower peat. The site will likely remain suitable initially until the scrub encloses and/or reedbeds limits access to the underlying wetland habitat. No significant effects are predicted.		
Collision Risk	This species was not recorded flying at PCH during the extensive vantage point survey work undertaken. Collision related mortality is not likely to significantly impact this species, based on available data.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Medium* sensitivity species and *Negligible* impact corresponds to a **Very Low** effect significance.	**Likely long-term constant imperceptible negative effect**

7.5.2.5 Merlin (All Seasons)

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	Merlin were observed within, or partially within, the Proposed Project site on 28 occasions over the 4.5 years of surveying. There were no observations of breeding or roosting activity. The maximum number of birds recorded within the Proposed Project site was two birds. The majority of observations were during the winter season, with no observations recorded within the core breeding season months of May, June or July. Of the total 28 observations of merlin within the Proposed Project site, the majority related to birds observed travelling, with only two observations of	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medum* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely long-term constant slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	birds actively hunting. While it can be assumed that birds observed travelling may have also been hunting within the Proposed Project site, this is nonetheless a low rate of occurrence of habitat utilisation within the site, in light of the extensive survey effort undertaken over 4.5 years. This demonstrates a lack of dependence on the Proposed Project site for foraging. Significant effects are not predicted particularly given the low levels of activity recorded within the Proposed Project site, that the land lost to the permanent infrastructure footprint is small (i.e. 34.3ha/3%) relative to the total area within the Propose Project site, that extensive areas of suitable foraging habitats will remain post construction and that there is an abundance of suitable habitat in the surrounding area. No significant effects of direct habitat loss are predicted.		
Disturbance	As outlined above, merlin were observed within, or partially within, the Proposed Project site on 28 occasions over the 4.5 years of surveying. There were no observations of breeding or roosting activity. The majority of observations were during the winter season, with no observations recorded within the core breeding season months of May, June or July. A disturbance buffer zone of <200m is recommended for merlin during the non-breeding season (Goodship & Furness, 2022). The majority of merlin observations were away from proposed infrastructure and greater than 200m distant from the proposed turbine locations. On a precautionary basis it is assumed that temporary disturbance will occur around the Proposed Project site during construction works. As outlined above, survey results show a low rate of habitat usage within the Proposed Project site, with only two observations of confirmed foraging behaviour over the 4.5 years of surveying. This demonstrates a lack of	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely short-term slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	dependence on the Proposed Project site for foraging. In the event of temporary disturbance, there are extensive areas of similar open habitat in the wider area. Similar quality habitat is widely available, with good quality habitat abundantly present in the River Shannon catchment. Additionally, the rehabilitation schemes within some of these peatland habitats (on deep peat) are likely to increase the quality of these habitats in the wider surroundings for the species and, relatedly, their potential carrying capacity. These factors likely render any effect inconsequential. Significant effects are not predicted.		
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated, as no additional infrastructure is proposed.	**No Effect**	**No Effect**
Disturbance, Displacement and Barrier Effect	Merlin were infrequently observed within a 500m radius of proposed turbines and the majority of observations were of birds travelling over the area. Moreover, significant effects are not anticipated, given that extensive areas of suitable foraging habitat exist and will remain in the wider area. Large-scale peatland rehabilitation in the wider landscape, is likely to increase the value of these (formerly cutover) habitats for this species. And particularly so, on areas of deeper peat that are more likely to remain open habitat in the longer term. Onsite habitats are not considered unique to the Proposed Project site. As outlined in Section 7.5.1, over the lifetime of the Wind Farm, with the succession to scrub mosaic on shallower peat, the site will likely become increasingly less suitable for open habitat species like merlin. Significant effects are not predicted.	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely long-term constant slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Collision Risk	This species was recorded flying the potential collision risk zone during vantage point surveys. A collision risk analysis has been undertaken (full details provided in Appendix 7-6). The collision risk has been calculated at a rate of 0.0002 collisions per year, i.e. no collisions predicted over the 35-year life-time of the Proposed Wind Farm. This collision risk is so low as to be effectively zero. Significant effects are not predicted.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Medium* sensitivity species and *Negligible* Impact corresponds to a **Very Low** effect significance	**Likely long-term constant imperceptible negative effect**

7.5.2.6 Peregrine (All Seasons)

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	Peregrine were observed within, or partially within, the Proposed Project site on 38 occasions over the 4.5 years of surveying. Survey results indicate the presence of a peregrine breeding pair in the wider area across the breeding seasons surveyed, deemed likely to be at a structure situated approximately 100m distant from the Proposed Project site. This nest site is situated outside of the Proposed Project site and there is little to no suitable nesting habitat for peregrine within the Proposed Project site. This limits the potential for ecologically significant effects to result. Peregrine were recorded hunting within the Proposed Project site. However, the land lost to the permanent infrastructure footprint is small (i.e. 34.3ha/3% of the site area) relative to the total area within the Proposed Project site. Given the abundance of similar suitable habitats (peatlands and improved agricultural grasslands) supporting similar prey species in the wider area as those found	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely long-term constant slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	within the Proposed Project site, and that extensive areas of suitable foraging habitat will remain post construction, no significant impacts are predicted. No significant effects of direct habitat loss are predicted.		
Disturbance	As outlined above, peregrine were observed within, or partially within, the Proposed Project site on 38 occasions over the 4.5 years of surveying. Survey results indicate the presence of a peregrine breeding pair in the wider area across the breeding seasons surveyed, deemed likely to be at a structure situated approximately 100m distant from the Proposed Project site. The closest proposed infrastructure to this nest site is situated over 1km away, and therefore beyond the potential for disturbance effects. Construction works are unlikely to discourage flight activity or foraging in the vicinity of the Proposed Project site, particularly given peregrine has been documented to become accustomed to various sources of human disturbance (Ruddock *et al.*, 2007). It is therefore reasonable to conclude that following a period of habituation, the population will become accustomed to the construction activity during the construction phase. Significant disturbance effects are not anticipated.	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely short-term slight negative effect**
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated, as no additional infrastructure is proposed.	**No Effect**	**No Effect**
Disturbance, Displacement and Barrier Effect	In total, this species was recorded on 26 occasions within, or partially within, 500m of the proposed turbine layout during the survey period. The identified nest site (see above) is situated over 1km from the nearest proposed turbine.	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low*	**Likely long-term constant slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	The availability of alternative suitable habitat in the surroundings, limit the potential for significant displacement effects. Furthermore, peregrine has been documented to become accustomed to various sources of human disturbance (Ruddock *et al.*, 2007). It is, therefore, reasonable to conclude that following a period of habituation, the population will become accustomed to the Proposed Wind Farm in the landscape. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, with the succession to scrub mosaic on shallower peat, the site will likely become increasingly less suitable for open habitat species like peregrine. Significant effects are not predicted.	impact corresponds to a **Low** effect significance.	
Collision Risk	The species was recorded flying within PCH during vantage point surveys. A collision risk analysis has been undertaken (full details provided in Appendix 7-6). The collision risk has been calculated at a rate of 0.01 collisions per year, i.e. no collisions predicted over the 35-year life-time of the Proposed Wind Farm. This collision risk is so low as to be effectively zero. No significant effects are predicted.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Medium* sensitivity species and *Negligible* Impact corresponds to a **Very Low** effect significance	**Likely long-term constant imperceptible negative effect**

7.5.2.7 Whooper Swan (Winter)

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	Whooper swan were observed within, or partially within, the 500m radius of proposed turbines on 156 occasions. Regular roosting was recorded across a total of five areas within the Proposed Project site across the five winter seasons surveyed, with a maximum of four areas being used in any one season. The majority of observations of birds landing/roosting related to two areas (Refs: WS-a & WS-b), with a total of 63 individual observations (37 and 26 respectively). The maximum number of birds recorded roosting within the Proposed Project site was 71 birds (WS-a). Interchange of birds moving between these two areas was also recorded. The other three areas (Refs: WS-c, WS-d & WS-e) were used infrequently, with a total of eight individual observations across the three areas over the five winter seasons surveyed, with an overall average count of six birds. A section of new internal road is proposed that would dissect the roosting area WS-a, in addition to a proposed turbine location directly adjacent to this area. This will likely result in the effective loss of this area as roosting habitat for whooper swan. There is no infrastructure proposed within roosting areas WS-b and WS-e. A section of new internal road is proposed to dissect area WS-c, and a minor section of new internal road is proposed at the margins of area WS-d. Without intervention, the loss of roosting habitat from direct habitat loss is assessed as significant at the county level.	The magnitude of the effect is assessed as *High*. The cross tabularisation of a *Medium* sensitivity species and *High* impact corresponds to a **Medium** effect significance.	**Likely long-term constant moderate negative effect** Please see Section 7.7 for a description of enhancement measures to offset impacts.
Disturbance	As outlined above, whooper swan were regularly recorded within the Proposed Project site, with regular roosting recorded across a total of five areas within the same broad area of the bog.	The magnitude of the effect is assessed as *High*. The cross tabularisation of a *Medium*	**Likely short-term moderate negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	A disturbance buffer zone of 200-600m is recommended for whooper during the non-breeding season (Goodship & Furness, 2022). As detailed above, infrastructure is proposed within some of these areas, and construction works would be required within 600m of all five roosting areas. Adopting a precautionary approach, there is potential for these construction works to result in disturbance to roosting whooper swan. Without intervention, the potential disturbance to roosting areas during construction works is assessed as significant at the county level.	sensitivity species and *High* impact corresponds to a **Medium** effect significance.	Please see Section 7.7 for a description of enhancement measures to offset impacts.
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated, as no additional infrastructure is proposed.	**No Effect**	**No Effect**
Disturbance, Displacement and Barrier Effect	As outlined above, whooper swan were regularly recorded within the Proposed Project site, with regular roosting recorded across a total of five areas within the same broad area of the bog. A study of swan non-breeding activity from eight European wind farms showed displacement effects from within a mean minimum distance of 150m from the base of wind turbines. Exclusion from habitat around turbines has also been identified up to 300m in some cases (Percival, 2003). Turbines are proposed within 150m of the identified roosting areas WS-a and WS-c, and within 300m of roosting areas WS-a, WS-b, WS-c and WS-d. As such, there is potential for the presence of the proposed turbines to displace whooper swan from these areas of roosting habitat. Without intervention, the potential displacement of swans from roosting areas is assessed as significant at the county level.	The magnitude of the effect is assessed as *High*. The cross tabularisation of a *Medium* sensitivity species and *High* impact corresponds to a **Medium** effect significance.	**Likely long-term constant moderate negative effect** Please see Section 7.7 for a description of mitigation to avoid/offset impacts.

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	As outlined in Section 7.5.1, over the lifetime of the Wind Farm, a majority of the site will likely develop a scrub mosaic on shallower peat. The site will likely remain suitable initially until the scrub encloses and/or matures to woodland. This encroachment of woody vegetation is likely to discourage whooper swan use. Survey results indicate that the Proposed Project site does not lie on an important migratory corridor for whooper swan, and no regular or patterned flight was identified over the site. Therefore, no barrier effect is predicted.		
Collision Risk	The species was recorded flying within PCH during vantage point surveys. A collision risk analysis has been undertaken (full details provided in Appendix 7-6). The model used for the analysis assumes that waterbird species are active for 25% of dark hours, in addition to daylight hours. The collision risk has been calculated at a rate of 0.1 collisions per year. Annual mortality of adult whooper swan has been calculated at 20% per annum (Brazil, 2003). If 0.1 collisions were to occur per year, it would mean that the losses at the Proposed Wind Farm would increase the annual mortality of the county population[34] (i.e. 714 birds (please see Section 7.4.1 for further details)) by 0.07%. The predicted collision risk is therefore of negligible magnitude as per Percival criteria (2003). In addition, the proposed enhancement plan is likely to further reduce collision risk by attracting swans to a low-risk area away from turbines. No significant effects are predicted.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Medium* sensitivity species and *Negligible* Impact corresponds to a **Very Low** effect significance	**Likely long-term constant imperceptible negative effect**

[34] *The county population was considered a suitable reference population for assessment, based on the following rationale. This is a widespread species (as per the Bird Atlas 2009-11) that utilises a widespread habitat type (agricultural grassland and peatlands), it is, therefore, reasonable to conclude that there is an exchange of individuals in suitable habitat within the county.*

7.5.2.8 Barn Owl (All Seasons)

Potential effects during the construction and operational phases of the Proposed Project		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	A confirmed breeding territory was identified within the Proposed Project site in breeding season 2021. Further dedicated surveys undertaken in the 2022 and 2023 breeding seasons recorded no further barn owl activity at this location, likely due to this structure was subsequently boarded up following the 2021 breeding season and therefore likely rendered unsuitable for barn owl. This previously identified nest site is situated outside the footprint of proposed infrastructure, and there is limited to no suitable additional breeding habitat for barn owl within the Proposed Project site outside of this location. As such, there is no potential for habitat loss associated with the Proposed Wind Farm to result in a reduction of suitable barn owl breeding habitat. Direct loss of foraging habitat relative to its availability onsite, will be minimal. The land lost to the permanent infrastructure footprint is small (i.e. 34.3ha/3%) relative to the total area of the site. Furthermore, substantial areas of undisturbed suitable breeding and foraging habitat will remain both within the Proposed Project site and the wider surroundings post-construction. No significant effects of direct habitat loss are predicted.	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely long-term constant slight negative effect**
Disturbance	As outlined above, a confirmed breeding territory was identified within the Proposed Project site in breeding season 2021. The site now no longer appears suitable for barn owls. A second potential previously used breeding location was identified on third-party lands approximately 100m outside the Proposed Project site. This nest site was active in 2021 and 2022, as per a public information post from Offaly	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely short-term slight negative effect**

Potential effects during the construction and operational phases of the Proposed Project		Significance (Percival, 2003)	Significance (EPA, 2022)
	County Council regarding conservation works undertaken at the structure[35]. It is unclear whether this nest site remains suitable for barn owl following conservation works undertaken. As per Ruddock & Whitfield (2007), barn owl have a limit of disturbance at 50-100m, with many nest sites not being disturbed until a human was within 10m during the study. However, the Forestry Commission of Scotland (2006) recommends a 250m disturbance buffer around a known nest site where operations should be limited. The infrastructure proposed within a 250m radius of the 2021 nest site comprises the upgrade of a *c.*400m length of existing access track to a new internal road. However, as outlined above, modifications to this structure have likely rendered this building as now unsuitable for barn owl. The potential for construction works to result in disturbance to breeding barn owl are therefore limited. The additional potential nest location on third-party lands is situated over 1km from the nearest proposed construction works and therefore beyond any potential for disturbance effects. Significant effects are not predicted.		
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated, as no additional infrastructure is proposed.	**No Effect**	**No Effect**
Disturbance, Displacement and Barrier Effect	There is no published research on displacement/avoidance buffers for barn owl around operational wind infrastructure. One of the nest site is situated approximately 680m from the nearest proposed turbine location and adjacent	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium*	**Likely long-term constant slight negative effect**

[35] https://www.offaly.ie/conservation-of-medieval-buildings/

Potential effects during the construction and operational phases of the Proposed Project		Significance (Percival, 2003)	Significance (EPA, 2022)
	to a track with potential foot traffic but is no longer suitable for nesting. The additional potential nest location (see above) is situated over 1km from the nearest proposed turbine location and/or amenity track/internal road. Therefore, no significant impacts are predicted to breeding locations given the considerable separation distance involved. Furthermore, the Proposed Project site is dominated by formerly milled cutover bog, this habitat is sub-optimal for foraging barn owl. The more suitable habitat in the vicinity of the breeding locations (i.e. agricultural land) is situated away from the Proposed Project site. This limits the potential for any displacement effects. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, with the succession to scrub mosaic on shallower peat, the site will likely become increasingly less suitable for open habitat species like barn owl. Significant effects are not predicted.	sensitivity species and *Low* impact corresponds to a **Low** effect significance.	
Collision Risk	This species was not recorded flying at PCH during the extensive vantage point survey work undertaken. Collision related mortality is not likely to significantly impact this species, particularly given barn owl flies at low elevation when foraging (Barn Owl Trust, 2021[36]), which contrasts with the considerable height (70m) of the lowest swept height of the proposed turbine. Significant effects are not predicted.	**No Effect**	**No Effect**

[36] https://www.barnowltrust.org.uk/hazards-solutions/barn-owls-wind-turbines/

7.5.2.9 Kestrel (All Seasons)

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	There were up to seven breeding kestrel territories (confirmed and probable) identified for kestrel in the vicinity of the Proposed Project site in any one season over the four breeding seasons surveyed. The majority of the breeding locations recorded over the four seasons were situated on the margins of the Proposed Project site and beyond, with only two of the total 13 breeding territories recorded occurring entirely within the Proposed Project site. As such, the majority of the breeding locations recorded are sited away from proposed infrastructure. There will be minimal loss of suitable breeding habitat, given the majority of suitable woodland habitat occurs on the margins of the bog and away from proposed infrastructure. Direct loss of foraging habitat relative to its availability onsite, will be minimal. The land lost to the permanent infrastructure footprint is small (i.e. 34.3ha/3%) relative to the total area within the Proposed Project site. Substantial areas of undisturbed suitable breeding and foraging habitat will remain both within the Proposed Project site and the wider surroundings post-construction. No significant effects of direct habitat loss are predicted.	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely long-term constant slight negative effect**
Disturbance	The Proposed Project site does not contain habitats that are unique to the local area. Therefore, were disturbance to occur it would not result in the loss of a scarce resource for the local kestrel population. As previously discussed, there were up to seven kestrel territories identified at the Proposed Project site in any one breeding season.	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely short-term slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	The majority of the breeding locations recorded over the four seasons were situated on the margins of the Proposed Project site and beyond, with only two of the total 13 breeding territories recorded occurring entirely within the Proposed Project site. As such, the majority of the breeding locations recorded are sited away from proposed construction works. While the disturbance associated with construction works may result in a measurable reduction in the breeding density of kestrel onsite and a reduction in the amount of available foraging habitat around the margins of the Proposed Project site, these lands (e.g., treeline, scrub, adjacent woodland and farmland) are not considered unique to the Proposed Project site or rare in the wider surroundings. Significant effects are not anticipated, given that extensive areas of suitable foraging habitat exist and will remain in the wider area. Onsite habitats are not considered unique to the Proposed Project site. Furthermore, large scale peatland rehabilitation in the wider landscape is likely to increase the value of these (formerly cutover) habitats for this species. And particularly so, on areas of deeper peat that are more likely to remain open habitat in the longer term. Significant effects are not predicted.		
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated, as no additional infrastructure is proposed.	**No Effect**	**No Effect**
Disturbance, Displacement and Barrier Effect	Raptor studies have generally found only low levels of turbine avoidance (Hötker *et al.*, 2006; Madders and Whitfield, 2006), with some species, such as kestrels, known to continue foraging activity close to turbines (Pearce-Higgins *et al.,* 2009). Moreover, significant effects are not anticipated, given that	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low*	**Likely long-term constant slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	extensive areas of suitable foraging habitat exist and will remain in the wider area. For example, large scale peatland rehabilitation in the wider landscape is likely to increase the value of these (formerly cutover) habitats for this species. And particularly so, on areas of deeper peat that are more likely to remain open habitat in the longer term. Onsite habitats are not considered unique to the Proposed Project site. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, with the succession to scrub mosaic on shallower peat, the site will likely become increasingly less suitable for open habitat species like kestrel. Significant effects are not predicted.	impact corresponds to a **Low** effect significance.	
Collision Risk	The species was recorded flying within PCH during vantage point surveys. A collision risk analysis has been undertaken (full details provided in Appendix 7-6). The collision risk has been calculated at a rate of 0.55 collisions per year. Annual mortality of adult kestrel has been calculated at 31% per annum (Village, 1990). If 0.55 collisions were to occur per year, it would mean that the losses at the proposed wind farm would increase the annual mortality of the county population[37] (i.e. 405 birds (please see Section 7.4.1 for further details)) by 0.44%. The predicted collision risk is therefore of negligible magnitude as per Percival criteria (2003). No significant effects are predicted.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Medium* sensitivity species and *Negligible* impact corresponds to a **Very Low** effect significance.	**Likely long-term constant imperceptible negative effect**

[37] *The county population was considered a suitable reference population for assessment, based on the following rationale. This is a widespread species (as per the Bird Atlas 2009-11) that utilises a widespread habitat type (agricultural grassland and peatlands), it is, therefore, reasonable to conclude that there is an exchange of individuals in suitable habitat within the county.*

7.5.2.10 Lapwing (Wintering)

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	Lapwing were observed within, or partially within, the Proposed Project site on 19 occasions across the five winter seasons surveyed. The majority of these observations related to birds in flight over the Proposed Project site. Birds were observed landing / on ground within the Proposed Project site on only a total of three occasions over the five winter seasons surveyed, with flocks recorded ranging from 1-4 birds. This is a very low rate of occurrence. The Proposed Project site is therefore not an important foraging or roosting habitat for wintering lapwing and the potential for construction works to result in ecologically significant habitat loss for wintering lapwing is limited. Furthermore, the results of waterbird distribution and abundance surveys in the wider area demonstrate that the Proposed Project site is not a preferred habitat for lapwing, with activity concentrated on peatlands over 5km south of the Proposed Project site (i.e. Boora Bogs, Tumduff Wetlands and Turraun Wetlands). The land lost to the permanent infrastructure footprint is small (i.e. 34.3ha/3%) relative to the total area within the Proposed Project site. Given the abundance of similar suitable habitats (peatlands and improved agricultural grasslands) in the wider area as those found within the Proposed Project site, and that extensive areas of suitable foraging and roosting habitat will remain post construction, no significant impacts are predicted. No significant effects of direct habitat loss are predicted.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Very High* sensitivity species and *Negligible* impact corresponds to a ***Low*** effect significance.	**Likely long-term constant slight negative effect**
Disturbance	As outlined above, there were only three records of lapwing utilising habitats within the Proposed Project site over the five winter seasons surveyed. This is a very low rate of occurrence. The Proposed Project site is therefore not an	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Very*	**Likely short-term slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	important foraging or roosting habitat for wintering lapwing and the potential for construction works to result in ecologically significant habitat loss for lapwing is limited. Significant areas of suitable roosting and foraging habitat for the species occur in the wider landscape and will be retained. In the event of disturbance, there are extensive areas of similar or alternative habitat in the wider area. Similar quality habitat is widely available, with good quality habitat abundantly present in the River Shannon catchment. These factors likely render such an effect inconsequential. Significant effects are not predicted.	*High* sensitivity species and *Negligible* impact corresponds to a ***Low*** effect significance.	
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated, as no additional infrastructure is proposed.	**No Effect**	**No Effect**
Disturbance, Displacement and Barrier Effect	As outlined above, there were only three records of lapwing utilising habitats within the Proposed Project site over the five winter seasons surveyed This species was not observed to regularly utilise any areas of the Proposed Project site during winter months but was primarily recorded travelling over the Proposed Project site. There are extensive areas of suitable habitat in the wider area as identified during the Waterbird Distribution and Abundance Surveys (Appendix 7-4), including Lough Boora Parklands and Tumduff, outside any potential displacement buffer. Similar quality habitat is widely available, with good quality habitat abundantly present in the River Shannon catchment.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Very High* sensitivity species and *Negligible* impact corresponds to a ***Low*** effect significance.	**Likely long-term constant slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, with the succession to scrub mosaic on shallower peat, the site will likely become increasingly less suitable for open habitat species like lapwing. Survey results indicate that the Proposed Project site does not lie on a migratory corridor for lapwing, and no regular or patterned flight was identified over the site. Significant effects are not predicted.		
Collision Risk	The species was recorded flying within PCH during vantage point surveys. A collision risk analysis has been undertaken (full details provided in Appendix 7-6). The model used for the analysis assumes that the species are active for 50% of dark hours, in addition to daylight hours. The collision risk has been calculated at a rate of 0.07 collisions per year. Annual mortality of adult lapwing has been calculated at 29.5% per annum (Peach et al, 1994). If 0.07 collisions were to occur per year, it would mean that the losses at the Proposed Wind Farm would increase the annual mortality of the county population[38] (i.e. 2,620 birds (please see Section 7.4.1 for further details)) by 0.009%. The predicted collision risk is therefore of negligible magnitude as per Percival criteria (2003). No significant effects are predicted.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Very High* sensitivity species and *Negligible* impact corresponds to a ***Low*** effect significance.	**Likely long-term constant imperceptible negative effect**

[38] *The county population was considered a suitable reference population for assessment, based on the following rationale. This is a widespread species (as per the Bird Atlas 2009-11) that utilises a widespread habitat type (agricultural grassland and peatlands), it is, therefore, reasonable to conclude that there is an exchange of individuals in suitable habitat within the county.*

7.5.2.11 Lapwing (Breeding)

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	Lapwing breeding activity was identified within the Proposed Project site in three of the four seasons surveyed, with an estimated two breeding pairs present in the most recent breeding seasons surveyed (i.e. 2023 & 2024). Breeding activity was recorded at four locations across the three relevant breeding seasons, all within the same general area of the Proposed Project site. Breeding activity was recorded in more than one season at only one of these locations (Ref: L-b). There is no infrastructure proposed within this location. Activity was recorded in a single season at the other three locations (Refs: L-a, L-c & L-d). Infrastructure is proposed within areas L-a and L-d, comprising a turbine and a new internal road. This will likely result in the effective loss of this area as breeding habitat for lapwing. There is no infrastructure proposed within area L-c. Without intervention, the loss of breeding habitat from direct habitat loss is assessed as significant at the county level.	The magnitude of the effect is assessed as *High*. The cross tabularisation of a *Medium* sensitivity species and *High* impact corresponds to a **Medium** effect significance.	**Likely long-term constant moderate negative effect** Please see Section 7.7 for a description of enhancement measures to offset impacts.
Disturbance	As outlined above, lapwing breeding activity was recorded at four locations across the three relevant breeding seasons, all within the same general area of the Proposed Project site, with an estimated two breeding pairs present in the most recent breeding seasons surveyed (i.e. 2023 & 2024). Pearce-Higgins et al. (2012) did not find any significant negative effect of construction works on breeding lapwing populations, although the number of sites studied was low. Hotker *et al.* (2006) undertook a meta-analysis of existing literature on disturbance distances. This review reported from the 13 studies examined the mean disturbance distance for breeding lapwing was 108m.	The magnitude of the effect is assessed as *High*. The cross tabularisation of a *Medium* sensitivity species and *High* impact corresponds to a **Medium** effect significance.	**Likely short-term moderate negative effect** Please see Section 7.7 for a description of enhancement measures to offset impacts.

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	Of the four locations, breeding activity was only recorded in more than one season at one of these locations (Ref: L-b). There is no infrastructure proposed within 108m of this location. Breeding activity was recorded in a single season at the other three locations (Refs: L-a, L-c & L-d). Infrastructure is proposed within 108m of these locations. As such, there is potential that these construction works to result in disturbance to breeding lapwing. Without intervention, the potential disturbance to breeding areas during construction works is assessed as significant at the county level.		
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated, as no additional infrastructure is proposed.	**No Effect**	**No Effect**
Disturbance, Displacement and Barrier Effect	Several studies of wind energy infrastructure and its impact on bird populations have found no discernible impact on populations of breeding lapwings, either through collision, disturbance displacement or avoidance (Winkelman 1992; Ketzenberg et al. 2002; Pearce-Higgins et al. 2009). 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. Intermittent foot traffic onsite also has the potential to cause disturbance. Hotker et al. (2006) undertook a meta-analysis of existing literature on disturbance distances. This review reported from the 13 studies examined the mean disturbance distance for breeding lapwing was 108m. As outlined above, lapwing breeding activity was recorded at four locations, all within the same general area of the Proposed Project site. There are turbines proposed within 108m of three of these locations. As such, there is potential for	The magnitude of the effect is assessed as *High*. The cross tabularisation of a *Medium* sensitivity species and *High* impact corresponds to a **Medium** effect significance.	**Likely long-term constant moderate negative effect** Please see Section 7.7 for a description of enhancement measures to offset impacts.

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	the presence of the proposed turbines to displace breeding lapwing from these areas. Without intervention, the potential displacement of breeding lapwing is assessed as significant at the county level. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, with the succession to scrub mosaic on shallower peat, the site will likely become increasingly less suitable for open habitat species like lapwing. Notwithstanding this, enhancement measures are proposed to offset shorter term effects.		
Collision Risk	The species was recorded flying within PCH during vantage point surveys. A collision risk analysis has been undertaken (full details provided in Appendix 7-6). The model used for the analysis assumes that the species are active for 50% of dark hours, in addition to daylight hours. The collision risk has been calculated at a rate of 0.04 collisions per year. Annual mortality of adult lapwing has been calculated at 29.5% per annum (Peach et al, 1994). If 0.04 collisions were to occur per year, it would mean that the losses at the Proposed Wind Farm would increase the annual mortality of the county population[39] (i.e. 33 pairs (please see Section 7.4.1 for further details)) by 0.2%. The predicted collision risk is therefore of negligible magnitude as per Percival criteria (2003). No significant effects are predicted.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Medium* sensitivity species and *Negligible* Impact corresponds to a **Very Low** effect significance	**Likely long-term constant imperceptible negative effect**

[39] *The county population was considered a suitable reference population for assessment, based on the following rationale. This is a widespread species (as per the Bird Atlas 2009-11) that utilises a widespread habitat type (agricultural grassland and peatlands), it is, therefore, reasonable to conclude that there is an exchange of individuals in suitable habitat within the county.*

7.5.2.12 Snipe (All Seasons)

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	Snipe were regularly recorded during surveys, with observations of drumming or calling snipe during the breeding season frequently recorded. There were several probable breeding territories identified within the Proposed Project site; one in 2021, four in 2023 and five in 2024. The (physical) loss of breeding habitat will be minimal as the infrastructure is confined to a narrow corridor (i.e. 34.3ha/3% of the Proposed Project site). Significant areas of suitable nesting and foraging habitat will continue to remain post construction and there is an abundance of suitable habitat in the surrounding area. Significant habitat loss effects are not predicted. No significant effects of direct habitat loss are anticipated at the county, national or international level.	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely long-term constant slight negative effect**
Disturbance	Pearce-Higgins *et al.* (2009), found that breeding snipe showed significant avoidance of turbines extending to a distance of 400m, and there is also evidence of avoidance of access tracks. Throughout the survey period, there were several probable breeding territories identified within the Proposed Project site; one in 2021, four in 2023 and five in 2024. Disturbance associated with construction works could result in a measurable reduction in the breeding density of snipe onsite/around the margins of the Proposed Project site. Given the abundance of similar habitats (improved agricultural grasslands and peatlands) in the wider surroundings, substantial areas of undisturbed suitable breeding and foraging habitat will remain both within the Proposed Project site and the wider surroundings during construction. For example, large scale peatland rehabilitation in the wider landscape, is likely to increase the value of these (formerly cutover) habitats for	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely short-term slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	this species. And particularly so, on areas of deeper peat that are more likely to remain open habitat in the longer term. No significant effects of disturbance are anticipated at the county, national or international level.		
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated, as no additional infrastructure is proposed.	**No Effect**	**No Effect**
Disturbance, Displacement and Barrier Effect	Pearce-Higgins et. al (2009), found that breeding snipe showed significant avoidance of turbines extending to a distance of 400m, with breeding density reduced by up to 50% within this area (Pearce-Higgins et. al 2009). There is also evidence of avoidance of access tracks. Disturbance displacement associated with operational turbines could result in a measurable reduction in the breeding density of snipe onsite/around the margins of the Proposed Project site. Substantial areas of undisturbed suitable breeding and foraging habitat will remain both within the Proposed Project site and the wider surroundings. Similar quality habitat is widely available, with good quality habitat abundantly present in the River Shannon catchment. Additionally, the rehabilitation schemes within some of these peatland habitats (on deep peat) are likely to increase the quality of these habitats in the wider surroundings for the species and, relatedly, their potential carrying capacity. As outlined in Section 7.5.1, over the lifetime of the Wind Farm, with the succession to scrub mosaic on shallower peat, the site will likely become increasingly less suitable for open habitat species like snipe.	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Medium* sensitivity species and *Low* impact corresponds to a **Low** effect significance.	**Likely long-term constant slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	No significant effects of displacement are anticipated at the county, national or international level.		
Collision Risk	The species was recorded flying within the potential collision risk zone during VP surveys. A collision risk analysis has been undertaken, and full details are provided in Appendix 7.6. It is acknowledged that the predicted number of transits, and hence the predicted rate of collision for snipe may be underestimated, as flight activity for this species is predominantly crepuscular in nature while the VP surveys are largely diurnal (Table 1.4, SNH (2017)). However, in order to account for this, the model used for the analysis assumes that waterbird species are active for 100% of dark hours, in addition to daylight hours. The collision risk has been calculated at a rate of 0.01 collisions per year, i.e. no collisions predicted over the 35-year life-time of the Proposed Wind Farm. This collision risk is so low as to be effectively zero. No significant effects are predicted.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Medium* sensitivity species and *Negligible* Impact corresponds to a **Very Low** effect significance	**Likely long-term constant imperceptible negative effect**

7.5.2.13 Woodcock (Breeding)

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	This species was regularly recorded during breeding woodcock surveys across the four breeding seasons surveyed. Numerous roding male woodcock were recorded. These observations indicate that woodcock bred within the Proposed Project site. There were seven breeding territories identified at, or within 500m of, the Proposed Project site in 2021, three in 2022, five in 2023 and four in 2024. The majority of the breeding areas recorded over the four seasons were situated on the margins of the Proposed Project site and within the central island, with only seven of the total 19 breeding territories overlapping with the development footprint. The construction of the development footprint will result in a measurable reduction in the breeding habitat onsite/around the margins of the Proposed Project site. However, this will not result in the loss of a scarce resource given these habitats are not unique to the Proposed Project site nor are they rare locally, e.g. areas of shallower peat on surrounding rehabilitated peatlands is likely to develop into the scrub/woodland habitat favoured by this species. In addition, extensive areas of suitable foraging and nesting habitat will remain post construction. Furthermore, as outlined in Chapter 6: Biodiversity there is extensive planting of woody vegetation proposed. No significant effects of direct habitat loss are predicted.	The magnitude of the effect is assessed as *Medium*. The cross tabularisation of *Medium* sensitivity species and *Medium* Impact corresponds to a **Low** effect significance.	**Likely long-term constant slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Disturbance	There were up to seven breeding territories identified at, or within 500m of, the Proposed Project site in 2021, three in 2022, five in 2023 and four in 2024. Sections of the site are dominated by scrub, immature birch woodland and commercial forestry which provide suitable breeding habitat for woodcock. Some of these areas with identified breeding territories overlap with the development footprint and therefore, construction works. The construction works could result in a measurable reduction in the suitability of breeding habitat onsite/around the margins of the Proposed Project site. However, this will not result in the loss of a scarce resource given these habitats are not unique to the Proposed Project site and are found abundantly in the local area. No significant effects of disturbance are anticipated at the county, national or international level.	The magnitude of the effect is assessed as *Medium*. The cross tabularisation of *Medium* sensitivity species and *Medium* Impact corresponds to a **Low** effect significance.	**Likely short-term slight negative effect**
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated, as no additional infrastructure is proposed.	**No Effect**	**No Effect**
Disturbance, Displacement and Barrier Effect	A study by Dorka et al. (2014) found that there was a reduction of breeding woodcock densities from 10 males/100ha to 1.2 males/100ha at 15 wind farms in Germany. These declines were attributed to the barrier effect of turbines and the effects of turbine noise on displaying woodcock. LAG VSW (2014) outline a displacement distance of 500m around operational turbines for breeding woodcock. This impact and the potential disturbance of foot traffic on site is considered. Habitat loss effects are only likely to be significant if there is the loss of a scare resource.	The magnitude of the effect is assessed as *Medium*. The cross tabularisation of *Medium* sensitivity species and *Medium* Impact corresponds to a **Low** effect significance.	**Likely long-term constant slight negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	The breeding habitats on-site (i.e. scrub, immature birch woodland and commercial forestry) are not unique to the Proposed Project site nor are they rare locally. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, a majority of the site will likely develop a scrub mosaic on shallower peat. With the encroachment of woody vegetation, the site is likely to become increasingly suitable for this species. Extensive areas of suitable foraging and nesting habitat exist and is likely to develop beyond 500m from the proposed turbine layout. Furthermore, as outlined in Chapter 6: Biodiversity there is planting of woody vegetation proposed. Considering the above, no significant displacement effects are predicted.		
Collision Risk	The species was recorded flying within the potential collision risk zone during VP surveys. A collision risk analysis has been undertaken, and full details are provided in Appendix 7.6. It is acknowledged that the predicted number of transits, and hence the predicted rate of collision for woodcock may be underestimated, as flight activity for this species is predominantly crepuscular in nature while the VP surveys are largely diurnal (Table 1.4, SNH (2017)). However, in order to account for this, the model used for the analysis assumes that waterbird species are active for 100% of dark hours, in addition to daylight hours. The collision risk has been calculated at a rate of 0.007 collisions per year, i.e. no potential collision predicted over the 35-year life-time of the Proposed Wind Farm. Significant effects are not predicted.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Medium* sensitivity species and *Negligible* Impact corresponds to a **Very Low** effect significance	**Likely long-term constant imperceptible negative effect**

7.5.2.14 Buzzard (All Seasons)

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	This species was frequently recorded within the Proposed Project site during the breeding and winter seasons. There were six probable breeding territories and three confirmed territories in 2021, one probable breeding territory and one confirmed territory in 2022, one probable breeding territory and two confirmed territories in 2023, one probable territory and five confirmed territories in 2024 and two probable breeding territories identified in early 2025. The majority of the breeding locations recorded over the four seasons were situated on the margins of the Proposed Project site and beyond, with only three of the total 22 breeding territories recorded occurring entirely within the Proposed Project site. As such, the majority of the breeding locations recorded are sited away from proposed infrastructure. While there is potential for the loss of some nesting habitat within the Proposed Project site, this will be insignificant in the wider context, given the majority of suitable woodland habitat occurs on the margins of the bog and away from proposed infrastructure. Direct loss of foraging habitat relative to its availability onsite, will be minimal. The land lost to the permanent infrastructure footprint is small (i.e. 34.3ha/3% of the site area) relative to the total area within the Proposed Project site. Substantial areas of undisturbed suitable breeding and foraging habitat will remain both within the Proposed Project site and the wider surroundings post-construction. No significant effects of direct habitat loss are predicted.	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Low* sensitivity species and *Low* impact corresponds to a **Very Low** effect significance.	**Likely long-term constant not significant negative effect**
Disturbance	This species is resident at the Proposed Project site. The majority of the breeding locations recorded over the four seasons were situated on the margins of the Proposed Project site and beyond, with only three of the total	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Low*	**Likely short-term not significant negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	22 breeding territories recorded occurring entirely within the Proposed Project site. As such, the majority of the breeding locations recorded are sited away from proposed construction works. While the disturbance associated with construction works may result in a measurable reduction in the breeding density of buzzard onsite and a reduction in the amount of available foraging habitat around the margins of the Proposed Project site, these lands (e.g., treeline, scrub, adjacent woodland and farmland) are not considered unique to the Proposed Project site or rare in the wider surroundings. Significant effects are not anticipated, given that extensive areas of suitable foraging habitat exist and will remain in the wider area. Onsite habitats are not considered unique to the Proposed Project site. Furthermore, large scale peatland rehabilitation in the wider landscape, is likely to increase the value of these (formerly cutover) habitats for this species. No significant effects of disturbance are anticipated.	sensitivity species and *Low* impact corresponds to a **Very Low** effect significance.	
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated, as no additional infrastructure is proposed.	**No Effect**	**No Effect**
Disturbance, Displacement and Barrier Effect	This species was frequently recorded within the Proposed Project site during the breeding and winter seasons. As outlined above, there were six probable breeding territories and three confirmed territories in 2021, one probable breeding territory and one confirmed territory in 2022, one probable breeding territory and two confirmed territories in 2023, one probable territory and five confirmed territories in 2024 and two probable breeding territories identified in early 2025. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, a majority of the site will likely develop a scrub mosaic on shallower peat. With the encroachment of woody vegetation, the site is likely to	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Low* sensitivity species and *Low* impact corresponds to a **Very Low** effect significance.	**Likely long-term constant not significant negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	become increasingly suitable for this species. Extensive areas of suitable foraging and nesting habitat exist and is likely to develop beyond 500m from the proposed turbine layout. Pearce-Higgins *et al.* (2009) describes that buzzard has been found to show significant turbine avoidance extending to at least 500m. There was one confirmed and two probable breeding territories identified within 500m of the proposed turbine layout. Extensive areas of suitable foraging and breeding habitat exist and will remain in the wider area (i.e., outside 500m from the proposed turbine layout). Additionally, there were 405 observations of buzzard within 500m of the proposed turbine layout. There will be a measurable reduction in the frequency of commuting and foraging buzzard within 500m of the proposed turbine layout. However, onsite habitats are not considered unique to the Proposed Project site and there is an abundance of suitable habitat for this species greater than 500m from the proposed turbine layout within the Proposed Project site and its surroundings. Furthermore, large scale peatland rehabilitation in the wider landscape, is likely to increase the value of these (formerly cutover) habitats for this species. No significant effects of displacement are anticipated.		
Collision Risk	The species was recorded flying within the potential collision risk zone during VP surveys. A collision risk analysis has been undertaken, and full details are provided in Appendix 7.6. The collision risk has been calculated at a rate of 0.31 collisions per year. Buzzard are at favourable conservation status (i.e. Green-listed as per BoCCI) and the breeding population is increasing (Gilbert *et al*, 2021). The loss of	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Low* sensitivity species and *Low* impact corresponds to a **Very Low** effect significance.	**Likely long-term constant not significant negative effect**

Potential effects during the construction and operational phases of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
	0.31 birds per year from the local population of a Green-listed (BoCCI) species is considered of low significance.		

7.5.2.15 Sparrowhawk (All Seasons)

Potential effects during the construction and operational phases of the Proposed Project		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	This species was frequently recorded within the Proposed Project site during the breeding and winter seasons. There was one probable breeding territory and two confirmed territories in 2021, one confirmed territory in 2022, two confirmed territories in 2023, four confirmed territories in 2024 and two probable breeding territories identified in early 2025. The majority of the breeding locations recorded over the four seasons were situated on the margins of the Proposed Project site, with only three of the total 12 breeding territories recorded occurring entirely within the Proposed Project site. As such, the majority of the breeding locations recorded are sited away from proposed infrastructure. While there is potential for the loss of some nesting habitat within the Proposed Project site, this will be insignificant in the wider context, given the majority of suitable woodland habitat occurs on the margins of the bog and away from proposed infrastructure. Direct loss of foraging habitat relative to its availability onsite, will be minimal. The land lost to the permanent infrastructure footprint is small (i.e. 34.3ha/3% of the site area) relative to the total area within the Proposed Project site. Substantial areas of undisturbed suitable breeding and foraging habitat will remain both within the Proposed Project site and the wider surroundings postconstruction.	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Low* sensitivity species and *Low* impact corresponds to a **Very Low** effect significance.	**Likely long-term constant not significant negative effect**

Potential effects during the construction and operational phases of the Proposed Project		Significance (Percival, 2003)	Significance (EPA, 2022)
	No significant effects of direct habitat loss are predicted.		
Disturbance	Breeding sparrowhawk were recorded in each of the four breeding seasons surveyed. The majority of the breeding locations recorded over the four seasons were situated on the margins of the Proposed Project site, with only three of the total 12 breeding territories recorded occurring entirely within the Proposed Project site. As such, the majority of the breeding locations recorded are sited away from proposed construction works. While the disturbance associated with construction works may result in a measurable reduction in the breeding density of sparrowhawk and a reduction in the amount of available foraging habitat within the Proposed Project site, these lands (e.g., farmland, adjacent woodland and treelines) are not considered unique to the Proposed Project site or rare in the wider surroundings. No significant effects of disturbance are anticipated at the county, national or international level.	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Low* sensitivity species and *Low* impact corresponds to a **Very Low** effect significance.	**Likely short-term not significant negative effect**
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated, as no additional infrastructure is proposed.	**No Effect**	**No Effect**
Disturbance, Displacement and Barrier Effect	As previously discussed, the Proposed Project site hosts breeding and foraging sparrowhawk. Displacement from proposed turbines is not reported for sparrowhawk, however, it is assumed for the purposes of this assessment that sparrowhawk show avoidance to a distance of 500m from turbines as with other raptors (Pearce-Higgins *et al.*, 2009). As outlined in Section 7.5.1, over	The magnitude of the effect is assessed as *Low*. The cross tabularisation of a *Low* sensitivity species and *Low*	**Likely long-term constant not significant negative effect**

Potential effects during the construction and operational phases of the Proposed Project		Significance (Percival, 2003)	Significance (EPA, 2022)
	the lifetime of the Proposed Wind Farm, a majority of the site will likely develop a scrub mosaic on shallower peat. With the encroachment of woody vegetation, the site is likely to become increasingly suitable for this species. Extensive areas of suitable foraging and nesting habitat exist and is likely to develop beyond 500m from the proposed turbine layout. There was one confirmed territory within 500m of the proposed turbine layout in 2022, and three in 2024. The disturbance associated with operational turbines will result in a measurable reduction in the breeding density of sparrowhawk and a reduction in the amount of available foraging habitat within the Proposed Project site. Notwithstanding this, extensive areas of suitable foraging habitat exist and will remain in the wider area (i.e., outside 500m from the proposed turbine layout). Moreover, onsite habitats are not considered unique to the Proposed Project site with significant areas of similar habitats available outside the Proposed Project site. No significant effects of direct habitat loss are anticipated.	impact corresponds to a **Very Low** effect significance.	
Collision Risk	The species was recorded flying within the potential collision risk zone during VP surveys. A collision risk analysis has been undertaken and full details are provided in Appendix 7.6. The collision risk has been calculated at a rate of 0.01 collisions per year, i.e. no collisions predicted over the 35-year life-time of the Proposed Wind Farm. This collision risk is so low as to be effectively zero. No significant effects are predicted.	The magnitude of the effect is assessed as *Negligible*. The cross tabularisation of a *Low* sensitivity species and *Negligible* impact corresponds to a **Very Low** effect significance.	**Likely long-term constant not significant negative effect**

7.5.3 Effects on Key Ornithological Receptors during Decommissioning

Potential effects on KORs that may occur during the decommissioning of the Proposed Wind Farm are described below. The magnitude and significance of these effects are then defined according to Percival (2003) and EPA (2022).

Potential impacts during the decommissioning phase of the Proposed Wind Farm		Significance (Percival, 2003)	Significance (EPA, 2022)
Direct Habitat Loss	Direct or indirect effects are not anticipated.	**No Effect**	**No Effect**
Disturbance	Disturbance impacts can be similarly characterised, as above for the construction phase for each species in Section 7.5.2. A majority of the site is likely to succeed to a scrub/woodland/reedbed mosaic (shallower peat). The change from a largely open habitat bog to a more enclosed scrub mosaic will favour woodland species (e.g. woodcock) over those that select for open habitats (e.g. lapwing). On average overtime, the site is likely to become less suitable for all key ornithological receptors. The key exceptions to this are woodcock, buzzard, long-eared owl and sparrowhawk as they favour scrub/woodland habitats. Notably, only woodcock of these four is of conservation concern. Of the KORs, only woodcock, buzzard, long-eared owl and sparrowhawk have the potential to be significantly impacted, owing to the likely absence/very low rate of occurrence of species that favour open habitats. On a precautionary basis, it is assumed that some temporary disturbance may occur during works.	No effect significance greater than Low, as per Percival (2003) criteria, is identified for any KOR and no effect significance greater than Slight, as per EPA (2022) criteria, is identified for any KOR. Significant effects on the KORs with regard to direct disturbance/displacement are not predicted.	

7.5.4 Effect Associated with the Proposed Grid Connection and Turbine Delivery Route

Proposed Grid Connection

It is proposed to construct an onsite 220kV substation within the northernmost section of the Proposed Project site and to connect this to the existing Shannonbridge-Maynooth 220kV over-head line (OHL) via an OHL connection in the townland of Cooldorragh, Co. Offaly. The Proposed Grid Connection will consist of approximately 0.8km of overhead line (comprising 0.4km of OHL from the proposed steel masts for the double loop-in/loop-out from the proposed onsite 220kV substation to the existing OHL) (following best practice, the 0.8km of OHL will include line markers to increase their visibility to birds in flight), telecommunications tower, temporary access track, 4 no. new steel masts, 2 no. new gantry structures, and the removal of 1 no. existing steel mast. The construction works and have been assessed as part of the overall construction and operational phases within Section 7.5.2 above.

As detailed in Section 7.2.4, the location of the Proposed Grid Connection infrastructure was thoroughly covered during ornithological surveys, comprising four breeding seasons and five winter seasons. Across all surveys over these 4.5 years of surveying, there were no regular flight paths recorded in the vicinity of the proposed new 0.4km sections of OHL. Furthermore, there were no flights of overwintering waterbirds species identified as KORs recorded crossing the location of the Proposed Grid Connection OHL cabling (i.e. golden plover, whooper swan, lapwing) over the 4.5 years of surveying.

Following best practice, the 0.8km of OHL will include line markers to increase their visibility to birds in flight. The Proposed Grid Connection OHL cabling is insignificant in the context of the existing Shannonbridge-Maynooth 220kV OHL to which it connects, and which passes through the north of the Proposed Project site. As such, based on the low levels of activity recorded at the location of the Proposed Grid Connection infrastructure over the 4.5 years of surveying and the scale of the OHL in the context of the existing Shannonbridge-Maynooth 220kV OHL, the line marker, the effect significance for all KORs is classed as no greater than ***Low*** (Percival, 2003) or a **likely long-term slight negative effect** (EPA, 2022).

Proposed Turbine Delivery Route

To facilitate the delivery of large turbine components and other abnormal loads during the construction of the wind farm, a temporary access road will be required at Kennedy's Cross, located in the townland of Ballindown, Co. Offaly (junction of the N52 and N62 National Secondary Roads). These works will comprise the re-establishment of a temporary junction bypass road to facilitate the delivery of turbine components and other abnormal loads that was previously used for the successful delivery of turbine components to the Derrinlough Wind Farm (Pl Ref. PA19.306706). The proposed temporary road will measure approximately 160 metres in length and have a 6-metre running width. Upon completion of the turbine delivery phase the temporary turbine delivery access road will be closed, covered with a layer of topsoil and reseeded. Full details are provided in Section 4.6.4 of Chapter 4 of this EIAR).

The majority of habitats at the locations of the Proposed Grid Connection and proposed turbine delivery accommodation works are of low ecological value (i.e. cutover bog and 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 disturbance may occur during works. However, given the small footprint and the extent of suitable habitat in the wider area, significant disturbance effects are not predicted. The effect significance for all KORs is classed as no greater than ***Low*** (Percival, 2003) or a **likely short-term slight negative effect** (EPA, 2022).

7.5.5 Effects on Designated Areas

Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction, operation and decommissioning of the Proposed Project will not have an adverse effect on the integrity of any European sites in light of their conservation objectives.

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

7.6 Mitigation and Best Practice Measures

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

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

7.6.1 Mitigation by Design

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

- Hard standing areas have been designed to the minimum size necessary to accommodate the turbine model that is selected.
- Following best practice, the 0.8km of OHL will include line markers to increase their visibility to birds in flight.

7.6.2 Management of the Proposed Project Phases

The following section describes the mitigation and best practice measures to be implemented during each phase of the Proposed Project.

7.6.2.1 Construction Phase

The following measures are proposed for the construction phase:

- A Construction and Environmental Management Plan (CEMP) has been prepared (Appendix 4-4) and will be in place prior to the start of the construction phase. Best practice measures which form part of the design of the project are included in Chapter 4 of the EIAR. Note that these measures are proposed as industry best practice rather than to mitigate any identified significant effect and will be updated as required to address any conditions of a permission or findings of any pre-construction survey results.
- Works will commence outside the bird nesting season (1st of March to 31st of August inclusive). Any requirement for construction works to run into the subsequent breeding season following commencement will be informed by pre-construction bird surveys. Please see Appendix 7-7 for details.

- Where sections of woody vegetation are removed for the purposes of the junction and road upgrades, these will be replaced with suitable hedge/tree species which are common in the local context.
- During the construction phase, noise limits, noise control measures, hours of operation (i.e. dusk and dawn is high faunal activity time) and selection of plant items will be considered in relation to disturbance of birds. All plant and equipment for use will comply with the European Communities (Noise Emission By Equipment For Use Outdoors) Regulations, 2001, as amended (SI 632/2001). Plant machinery will also be turned off when not in use.
- Silt fences will be installed as an additional water protection measure around existing watercourses.
- If winter roosting or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and no works shall be undertaken within a species-specific disturbance buffer in line with industry best practice (e.g. Goodship and Furness, 2022). No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.
- An Ecological Clerk of Works and Project Ecologist will be appointed. Duties will include:
    - Organise the undertaking of a pre-construction walkover bird survey to ensure that significant effects on birds will be avoided.
    - Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Proposed Project site.
    - Oversee management of ornithological issues during the construction period and advise on ornithological issues as they arise.
    - Provide guidance to contractors to ensure legal compliance with respect to protected species onsite.
    - Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress as necessary.

7.6.2.1.1 *Kingfisher*

As outlined in Section 7.5.2, there is the potential for short-term moderate negative effect (EPA, 2022) on breeding kingfisher as a result of potential disturbance during the works within 100m of the previously identified nest site during the construction phase. Specific mitigation measures are therefore required, the implementation of these measures is described below.

- Any works within 100m of the previously identified nest site during the period March – June will be preceded by a pre-commencement survey to investigate whether the previously identified nest site is occupied;
- Should breeding activity be recorded, then these works will be restricted to outside the main breeding season for kingfisher, i.e. March – July.

7.6.2.1.2 *Whooper Swan*

As outlined in Section 7.5.2, there is the potential for a short-term moderate negative effect (EPA, 2022) on whooper swan due to habitat loss and disturbance effects during the construction phase, and long-term moderate negative effect (EPA, 2022) due to displacement during the operational phase, in relation to the identified regularly used roost sites within the Proposed Project site. Measures have been designed to offset these potential impacts and are outlined in Section 7.7.1 below.

7.6.2.1.3 *Lapwing*

As outlined in Section 7.5.2, there is the potential for a short-term moderate negative effect (EPA, 2022) on breeding lapwing due to habitat loss and disturbance effects during the construction phase, and long-term moderate negative effect (EPA, 2022) due to displacement during the operational phase, in

relation to the identified breeding locations within the Proposed Project site. Measures have been designed to offset these potential impacts and are outlined in Section 7.7.1 below.

7.6.2.2 Operational Phase

No significant operational phase impacts requiring mitigation were identified. The only exception to this is the ornithological mitigation proposed for whooper swan and lapwing. Please see Section 7.7 for details.

7.6.2.3 Decommissioning Phase

During the decommissioning phase, disturbance limitation measures will be as per the construction phase described in Section 7.6.2.1.

7.7 Ornithological Mitigation and Enhancement Measures

Enhancement measures are proposed to offset the potential impacts identified to whooper swan and lapwing (please see Section 7.5.2 above for further detail). An overview of these measures is given below. Full details are provided in Appendix 6-5 Biodiversity Management and Enhancement Plan.

7.7.1 Whooper Swan

An enhancement area is proposed for whooper swan in order to replace the roosting habitat lost to the footprint of the Proposed Wind Farm. As detailed in Section 7.3.7, roosting was recorded across a total of five areas within the Proposed Wind Farm across the five winter seasons surveyed, with a maximum of four areas being used in any one season.

The 10ha enhancement area is proposed in the northwest of the Proposed Wind Farm, near Site Entrance 1 (see Figure 3-1 in Appendix 6-5 for location details) in an area of bare cutover peat, located approx. 1.5km west of the nearest proposed turbine (T01). The measures proposed includes the controlled flooding of an area of approximately 10ha to a depth of approximately 1.5m. This will be achieved by blocking drains and creation of berms as required to contain water. The controlled flooding will be such that water will be present during the winter months when whooper swan are present. Freshwater plants will be planted around the perimeter of the ephemeral wetland area. Visual screening from the internal road and car park will be created via planting of native scrub of *c.*3m width in the intervening area.

7.7.2 Lapwing

An enhancement area is proposed for lapwing in order to replace the breeding habitat lost to the footprint of the Proposed Wind Farm. As detailed in Section 7.3.7.13, lapwing breeding activity was identified within the Proposed Wind Farm, with an estimated two pairs breeding present in the most recent breeding seasons surveyed (i.e. 2023 & 2024).

Lapwing require open habitat in which to breed, and birds avoid fields of less than 5ha (Cramp & Simmons, 1983). While the minimum area of breeding habitat required by one pair of lapwing is 5ha, lapwing regularly breed in loose colonies. Group nesting lapwing nests are typically separated by 10-150m. Therefore, a 5ha plot could host more than a single pair. To calculate the quantum of habitat required by the two potentially impacted breeding pairs from 2023, the area occupied by an average territory was multiplied by two. Therefore, the estimated quantum of habitat required by two breeding pairs of lapwing is 10ha.

The 10ha enhancement area is proposed in the northwest of the Proposed Wind Farm, near Site Entrance 1 (see Figure 3-1 in Appendix 6-5 for location details) in an area of bare cutover peat, significantly removed from turbine infrastructure. This proposed 10ha area will be managed by regular mowing to keep the land open for breeding waders and free of predator posts (e.g. through birch scrub encroachment). Drains would be re-profiled and in-filled to allow unfledged chicks to move between dry and damp areas within the enhancement area. Wader scrapes will be excavated to a maximum depth of 30-45cm, with gentle sloping edges to provide foraging areas for breeding waders and their chicks. Visual screening from the internal road and car park will be provided via planting of native scrub in the intervening area, although sufficiently removed so as not to provide effective predator perches. Predator-proof fencing will be installed around the perimeter of the 10ha enhancement area. The NPWS, as part of recent conservation measures within the Termoncarragh Lake and Annagh Marsh SPA, have provided detailed specifications for permanent predator exclusion fencing for this specific purpose[40]. The proposed permanent predator exclusion fencing within the offsetting lands has therefore been designed based on these specifications.

Lapwing show high levels of natal philopatry (i.e. returning to breed in the site where a bird fledged). The enhancement area is considered sufficiently close to act as replacement breeding habitat for any lapwing potentially impacted by the Proposed Wind Farm. The furthest potentially impacted lapwing territories are situated approximately 2.5km from the proposed enhancement area. The majority of lapwing (61%) from a British ringing study returned to breed within 10km from where they were ringed as chicks (Thomson *et al.*, 2008).

The existing breeding habitat within 108m of the Proposed Project footprint is fragmented among three area of 5ha or less. Breeding activity was only recorded during a single breeding season at each of these three areas. The successful implementation of the BMP will produce more favourable breeding habitat for local lapwing than is currently available within 108m of the Proposed Project footprint.

Furthermore, as outlined above, the approximate 10ha area for whooper swan will be managed through controlled flooding such that water will be present during the winter months and not during the breeding season. This adjacent area will likely provide additional suitable breeding and foraging habitat for lapwing not accounted for above. Adaptive management will be applied to the design of the enhancement areas as part of implementation.

7.7.3 Best Practice Measures

The following measures are proposed for the benefit of local biodiversity and are not proposed to mitigate or compensate for any identified significant effects.

7.7.3.1 Barn Owl

A confirmed breeding barn owl nest site was identified within the Proposed Project site in breeding season 2021, with a second potential previously used nest site present approximately 100m outside the Proposed Project site (please see Section 7.5.2 for further information). The availability of suitable nest sites has the potential to limit local population growth. It is proposed to install ten barn owl nest boxes. The design for the nest boxes will follow the recently published, '*Guidance Document for the Barn Owl Nest Box Action*'. Full details are provided in that document[41]. It is proposed to site five number nest boxes (suitable location to be chosen by Ecological Clerk of Works and/or Project Ecologist). This area should be near to the 2021 nest site (Please see Confidential Appendix 7-5 for details) which makes them more likely to be encountered by barn owls and sufficiently distant from the Proposed Project site

[40] *NPWS (2023). Screening for Appropriate Assessment. Adoption of necessary conservation measures within Termoncarragh Lake and Annagh Marsh Special Protection Area in accordance with Regulation 42A EC (Birds and Natural) Habitats Regulations 2011-2021. Available at https://assets.gov.ie/static/documents/2023-11-07-eau-adoption-of-ncm-termoncarragh-lake-23-134.pdf*

[41] *Lusby and McCarthy, BirdWatch Ireland (2022) Guidance Document for the Barn Owl Nest Box Action.*

to avoid impacts. The location of the nest boxes will be registered with BirdWatch Ireland, through their request for barn owl nests information portal: https://survey123.arcgis.com/share/f0cac6f49de44d9c9fd60ca1195b4096.

7.7.3.1.1 *Implementation and Installation*

As per the RSPB recommendations[42], the following are prerequisites for the programme of barn owl nest box installation:

- The nest boxes will be built of an exterior grade plywood or other robust timber. Preservative can extend the life of the box but will only be applied to the outside of the box. Only use selected water-based preservatives, which are known to be safe for animals, such as Sadolin. CCA pressure-treated timber will not be used.
- The nest boxes must be in place the winter before the first breeding season of the construction phase.
- The nest box should be located with clear flight paths on a pole specifically erected for the purpose away from woodland edges to avoid predation of nests by pine martens, with the entrance facing away from the prevailing wind direction.
- The nest boxes should be securely attached and sited a minimum of 5m high.
- Angle the box so that the floor slopes slightly away from the entrance. To ensures that the eggs remain in the sheltered end of the box should they roll.
- The floor panel of the nest box should be replaced if it shows signs of rotting.
- Annual monitoring will be scheduled to record information on occupancy, to inform the installation of additional nest boxes and to clean out a build-up of debris as required.

7.7.3.2 Sharing Ecological Data

As a measure to support conservation research and policy, it is proposed to submit the pre-planning survey data and information to the National Biodiversity Data Centre (NBDC) and to BirdWatch Ireland to contribute to the upcoming bird atlas (2027) on relevant ecological records, for example, information on the location of breeding territories and nest sites of bird species of conservation concern. The submission of the data will follow relevant standards and will be provided in the preferred NBDC excel template. This measure will be fulfilled within the first year of the construction phase in the event of a successful application. This commitment ensures the project is contributing to the aims of Objective Four, Outcome 4B of Ireland's 4th National Biodiversity Action Plan: Data relevant to biodiversity and ecosystems, including conservation needs, is widely accessible and standardised.

7.8 Monitoring

The below provides a summary, with Appendix 7-7 acting as the primary source text upon which monitoring will be implemented.

7.8.1 Commencement and Construction

Taking a precautionary approach, it is proposed that construction works will commence outside the bird nesting season (1st of March to 31st of August inclusive). Pre-commencement surveys will be undertaken prior to the initiation of works at the site. Any requirement for construction works to run into the subsequent breeding season following commencement will be subject to a repeat of the pre-commencement bird surveys to confirm the absence of breeding birds of conservation concern. The survey will aim to identify sensitive sites e.g. nests or roosts depending on the season in question.

[42] https://www.rspb.org.uk/birds-and-wildlife/advice/how-you-can-help-birds/nestboxes/nestboxes-for-owls-and-kestrels/providing-nest-sites-for-bigger-birds/

Monitoring will be undertaken by a suitably qualified ornithologist. The survey will include a thorough walkover survey within a 500m radius of the Proposed Project footprint and/or all works areas, where access allows. If winter roosts or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter or breeding season of the construction phase. If the roost/nest is found to be active during the construction phase survey no works shall be undertaken within a species-specific buffer (as per Goodship, N.M. and Furness, R.W. 2022) in line with best practice. No works within the buffer zone shall be permitted until it can be demonstrated that birds of conservation concern are no longer reliant on the roost/nest site.

7.8.2 Post-Construction

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

- Monthly flight activity surveys: vantage point surveys.
- Breeding Bird surveys: Adapted Brown & Shepard
- Winter walkover surveys: winter transects/waterfowl surveys (with an emphasis on wintering waterfowl, e.g. whooper swan).
- Targeted bird collision surveys (corpse searches) will be undertaken with trained dogs. The surveys will include detection and scavenger trials, to correct for these two biases and ensure the resulting data is robust. It is noted that these surveys can be combined with bat carcass searches.

The proposed programme of monitoring was not proposed in response to any identified significant effect but rather as a best practice measure (SNH, 2009). The monitoring is comprehensive and considered entirely adequate in this regard. The results of this monitoring will be reported to the Planning Authority following each monitoring year and will include recommendations that may inform additional mitigation or adaptation if required.

Enhancement Area Monitoring

- Annual monitoring is proposed for the lifetime of the wind farm. However, a review of the requirement to continue with annual monitoring should be undertaken after the fifth operational year. Any change to the annual monitoring requirement will require NPWS and An Coimisiún Pleanála (ACP) sign-off.
- The areas proposed for enhancement will be the subject of ongoing monitoring during the operational phase of the Proposed Wind Farm to ensure it is offering supporting habitat for breeding lapwing and roosting whooper swans. The ongoing monitoring will take place during the breeding bird season (March to August) for lapwing and winter (October to March) for whooper swans. The monitoring will seek to identify whether these species are utilising the areas under active management and will be conducted by way of vantage point surveys. These surveys will be undertaken once a month March to August and October to March inclusive, each year. This is discussed in detail in Appendix 7-7.
- The existing vantage point location VP6 is situated adjacent to, and overlooks, the proposed enhancement lands. Similarly, the existing breeding transects overlap with this area. As such, these surveys will provide information on the usage of the proposed enhancement lands by whooper swan and lapwing. The enhancement areas should be accurately mapped and should be monitored annually to check that the areas have not altered in size and that the mowing regime that is in place is maintaining the suitability of these habitats (i.e. neither poaching nor overgrowth of

open areas is occurring). As well as mapping, this monitoring will be recorded by means of fixed-point photography.

7.8.3 Decommissioning

Taking a precautionary approach, it is proposed that decommissioning works will commence outside the bird nesting season (1st of March to 31st of August inclusive). Decommissioning monitoring surveys will be undertaken prior to works associated with decommissioning at the Proposed Wind Farm. The surveys will include a thorough walkover survey to a 500m radius of the development footprint and all works areas, where access allows. Any requirement for decommissioning works to run into the subsequent breeding season following commencement will be subject to a repeat of the decommissioning bird surveys to confirm the absence of breeding birds of conservation concern. If winter roosting or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter or breeding season of the decommissioning phase. If it is found to be active during the decommissioning phase survey, no works shall be undertaken within a species-specific buffer (as per Goodship, N.M. and Furness, R.W. 2022), in line with industry best practise. No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.

The decommissioning of the Proposed Wind Farm will be completed in compliance with the requirements of the Rehabilitation Plan for Lemanaghan Bog as appropriate. All site staff and subcontractors will be made aware of any restrictions to be imposed by means of a toolbox talk and a map of the 'no-work zone' will be made available to all construction staff. The restricted area will also be marked to alert all personnel on site to the suspension of works within that area.

7.9 Residual Effects

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

- Golden Plover
- Whooper Swan
- Crane
- Hen Harrier
- Kingfisher
- Merlin
- Peregrine
- Barn Owl
- Kestrel
- Lapwing
- Snipe
- Woodcock
- Buzzard
- Sparrowhawk

Following the measures described in Sections 0 and 7.7, no residual effect significance greater than ***Low,*** as per Percival (2003) criteria, is identified for any KOR and no effect significance greater than ***Slight,*** as per EPA (2022) criteria, is identified for any KOR. Significant residual effects on the KORs with regard to direct habitat loss, disturbance/displacement, barrier effect or collision mortality are not anticipated.

7.10 Cumulative Effects

As per NatureScot guidance on assessing the cumulative impacts of onshore wind energy developments (SNH, 2012, NatureScot, 2025), cumulative effects arising from two or more developments may be:

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

This section first identifies other plans and projects in the vicinity of the Proposed Project site and then assesses the potential for additive, antagonistic or synergistic impacts to occur.

7.10.1 Other Plans and Projects

Assessment material was compiled for relevant developments within the vicinity of the Proposed Project site. The material was gathered through a search of relevant online Planning Registers, reviews of relevant EIS/EIAR documents, planning application details and planning drawings. It served to identify past and future plans and projects, their activities and their environmental impacts. These are then considered for in-combination or cumulative effects with the Proposed Project. All plans and projects reviewed are outlined below.

7.10.1.1 Plans Considered in the Cumulative Impact Assessment

The following plans were considered in the cumulative impact assessment:

- Offaly County Development Plan 2021-2027
- 4th National Biodiversity Action Plan 2023-2030
- Lemanaghan Bog Decommissioning and Rehabilitation Plan will be implemented in accordance with the IPC licence requirements. Please see Chapter 2 and 4 for details.
- EU Nature Restoration Law: this obliges Ireland to produce a national Nature Recovery Plan and statutory targets for ecosystem restoration.
- Bord na Móna Peatlands Climate Action Scheme

7.10.1.2 Projects Considered in the Cumulative Impact Assessment

NatureScot guidance (SNH, 2012; 2018; 2025) was consulted while undertaking the cumulative assessment. NatureScot guidance emphasises that its priority is to 'maintain the conservation status of the species population at the national level.' However, it is acknowledged that consideration should also be allowed for impacts at the regional level 'where regional impacts have national implications (for example where a specific region holds the majority of the national population)'. Following the guidance of SNH (2012), the cumulative impact assessment has been carried out at the scale of the importance rating of the receptor. Please note that a 25km radius of the proposed turbine locations was considered a reasonable approximation of the size of a county and a 5km radius of the proposed turbine locations was considered a reasonable approximation for the local level.

To conduct the cumulative impact assessment, local authority and An Coimisiún Pleanála online planning registers, relevant EIAR (or EIS) documents, planning application details and planning drawings in the vicinity of the Proposed Wind Farm and all associated works were reviewed to identify past and future projects, their activities and their environmental impacts. The findings of this review are outlined in the following sections.

7.10.1.2.1 *Developments/Land-uses*

Forestry, Agricultural Practices and Amenity

Some areas within the surrounding area are planted with commercial forestry. The forestry works (felling/planting) associated with the forestry in the wider surroundings of the Proposed Project site will be subject to relevant licensing and guidance from the Forestry Service.

The remaining land use in the surrounding area is predominantly agriculture in the form of livestock grazing and recently granted walking trails (Offaly West Midlands Trail Network). These applications and land uses have also been taken into account in this cumulative assessment.

Other Developments

The review of the Offaly County Council planning registers document relevant general development planning applications in the vicinity of the Proposed Project site and all its associated works, most of which relate to the provision and/or alteration of housing, agriculture-related structures and community facilities. More detail on the nature of these developments can be found in Chapter 2. Owing to the scale and nature of these development significant cumulative impacts are not anticipated.

Bord na Móna Peatland Climate Action Scheme (PCAS)

The Peatland Climate Action Scheme (PCAS) scheme is supported by Government through the Climate Action Fund and Ireland's National Recovery and Resilience Plan administered by the Department of Environment, Climate and Communications (DECC). Please see https://www.bnmpcas.ie/ for details. The National Parks and Wildlife Service (NPWS) acts as the Scheme regulator and there is ongoing engagement with the EPA. This scheme is in addition to the IPC licence requirements. Peatlands in the wider vicinity of the Proposed Project site are included in the scheme. For example, at the offsite but nearby Pollagh bog where these works have been completed. These measures aim to optimise climate action benefits of rewetting the former industrial peat production areas by creating soggy peatland conditions that will allow compatible peatland habitats to redevelop.

The measures undertaken will set sites on an accelerated trajectory towards the development of a variety of compatible habitats including developing natural peatland, wetland and woodland. This will provide habitat for a range of species that depend on these habitats, including some species that are rare and protected. In relation to birds, it is anticipated that the rehabilitated peatlands will be of particular benefit to waders and raptors (e.g. snipe, woodcock, lapwing and kestrel). The newly restored habitat is likely to provide breeding and resting locations for these species.

This scheme and nearby bogs undergoing or are planned to be rehabilitated as part of PCAS have been considered in this cumulative assessment.

7.10.1.2.2 *Other Wind Farm Developments*

Existing, permitted and proposed wind farm projects within 25km of the proposed turbine locations are provided in Table 7-12, including details of their planning status. For further detail see Section 2.10 in Chapter 2 of this EIAR.

7-12 Existing, permitted and proposed wind farm projects within 25km of the proposed turbine locations.

Wind Farm	Planning Status	Number of Turbines	Separation Distance (turbine to turbine)	County
Leabeg Wind Farm	Existing	2	6.25km	Co. Offaly
Lea Mor Single Turbine	Permitted	1	6.75km	Co. Offaly
Derrinlough Wind Farm	Existing	21	10.68km	Co. Offaly
Cloghan Wind Farm	Existing	9	10.79km	Co. Offaly
Meenwaun Wind Farm	Existing	5	16.3km	Co. Offaly
Kilbeggan Turbine	Permitted	1	17.08km	Co. Westmeath
Cush Wind Farm	Permitted	8	17.43km	Co. Offaly
James Nally Single Turbine	Existing	1	18.84km	Co. Westmeath
Bellair Wind Farm	*Proposed*	*n/a*	*2.73km*	*Co. Offaly*
Umma More Wind Farm	*Proposed*	*9*	*16.28km*	*Co. Westmeath*

Existing Leabeg Wind Farm

The potential for the Proposed Project to result in significant cumulative or in-combination effects when assessed alongside the existing Leabeg Wind Farm was considered. The 'Environmental Impact Report' is available on the planning file[43] for the existing Leabeg Wind Farm and was consulted. Chapter 10 of this report ('Avian Impact Assessment') does not identify KORs. However, the following species were recorded during surveys, which are also KORs of the Proposed Project: golden plover, hen harrier, merlin, peregrine, whooper swan, kestrel, lapwing, snipe and buzzard. The Environmental Impact Report assessed collision risk and displacement for the operational phase of the existing Leabeg Wind Farm. A collision risk model was included for hen harrier and whooper swan as part of this assessment (predicted collisions are shown in Table 7-13 further below). No significant effects were predicted and a low probability of collisions was concluded. No significant displacement effects were identified.

Existing Derrinlough Wind Farm

The potential for the Proposed Project to result in significant cumulative or in-combination effects when assessed alongside the existing Derrinlough Wind Farm was considered. The EIAR is available on the planning file[44] for the existing Derrinlough Wind Farm and was consulted. The EIAR for the existing Derrinlough Wind Farm assessed the following species which are shared as KORs with the Proposed Project: golden plover, hen harrier, merlin, peregrine, whooper swan, kestrel, lapwing (breeding & wintering), snipe, woodcock and buzzard. The EIAR assessed collision risk and displacement for the operational phase of the existing Derrinlough Wind Farm. Displacement was assessed as *Low* significance as per Percival (2003) for golden plover, hen harrier, peregrine, whooper swan, lapwing (breeding), lapwing (wintering) and woodcock, and *Very Low* for merlin, kestrel, snipe, buzzard and sparrowhawk. Collision risk was assessed as *Very Low* as per Percival (2003) for golden plover, hen

[43] https://www.eplanning.ie/OffalyCC/AppFileRefDetails/10130/0
[44] https://www.pleanala.ie/en-ie/case/306706

harrier, peregrine, whooper swan, lapwing (breeding), lapwing (wintering), kestrel, snipe, buzzard and sparrowhawk, and *No Effect* for merlin and woodcock. A collision risk model was included for the above species, the predicted collisions of which are shown in Table 7-13 further below. As stated in the EIAR "*on a precautionary basis*" a Short-term Moderate Negative Effect. as per EPA (2021), was identified in relation to displacement for breeding lapwing. A "Lapwing, Waterfowl and Wader Habitat Enhancement Plan" was included as mitigation for this identified effect.

Existing Cloghan Wind Farm

The potential for the Proposed Project to result in significant cumulative or in-combination effects when assessed alongside the existing Cloghan Wind Farm was considered. The EIS (and appended Ecological Impact Assessment Report) submitted with the original planning application[45], and the updated Ecological Impact Assessment Report submitted with an amendment application[46] for alterations to turbine siting and dimensions and were consulted. The EIS for the original application and the updated EcIA for the amendment application do not identify any KORs. However, the following species were recorded during surveys which are also KORs of the Proposed Project: golden plover, kingfisher, whooper swan, kestrel, lapwing, snipe and sparrowhawk. The EIS assessed collision risk and displacement for the operational phase of the existing Cloghan Wind Farm. No significant effects were identified. A collision risk model was not included for the above species.

Existing Meenwaun Wind Farm

The potential for the Proposed Project to result in significant cumulative or in-combination effects when assessed alongside the permitted Meenwaun Wind Farm was considered. The EIAR is available on the planning file[47] for the existing Meenwaun Wind Farm and was consulted. The EIAR shared the following KOR species with the Proposed Project: whooper swan, golden plover, snipe, kestrel, buzzard, woodcock. The EIS assessed disturbance, avoidance, barrier effect and collision risk for the operational phase of the permitted Meenwaun Wind Farm, for which no significant effects were identified. No predicted collision rates were reported. The habitats onsite are mainly agricultural and forestry in nature.

Permitted Cush Wind Farm

The potential for the Proposed Project to result in significant cumulative or in-combination effects when assessed alongside the permitted Cush Wind Farm was considered. The EIAR is available on the planning file[48] for the permitted Cush Wind Farm and was consulted. The EIAR shared the following KOR species with the Proposed Project: golden plover, hen harrier, kingfisher, merlin, peregrine, whooper swan, barn owl, kestrel, lapwing (breeding & wintering), snipe and woodcock. The EIAR assessed collision risk and displacement for the operational phase of the permitted Cush Wind Farm. No significant displacement effects were identified. Collision risk was assessed as "*unlikely to have a significant effect at the county/regional scale*" for each of the identified KORs. A collision risk model was included for the above species, the predicted collisions of which are shown in Table 7-13 further below.

Proposed Bellair Wind Farm

The potential for the Proposed Project to result in significant cumulative or in-combination effects when assessed alongside the proposed Bellair Wind Farm has been considered. As the project is at an early design phase (no publicly available information available on location of turbines etc.) and has not yet

[45] https://www.eplanning.ie/OffalyCC/AppFileRefDetails/14188/0
[46] https://www.eplanning.ie/OffalyCC/AppFileRefDetails/19404/0
[47] https://offalycoco.eplanning.ie/idocsweb/ViewFiles.aspx?docid=102679&format=djvu
[48] https://www.pleanala.ie/en-ie/case/318816

been submitted for planning, no information regarding potential effects on birds is available. The proposed Bellair Wind Farm is situated within regenerating formerly cutover peatland. As such, there is potential for KOR species of the Proposed Wind Farm to occur at the proposed Bellair Wind Farm, i.e. crane, golden plover, hen harrier, kingfisher, merlin, peregrine, whooper swan, barn owl, kestrel, lapwing (breeding & wintering), snipe, woodcock, buzzard and sparrowhawk. The potential cumulative or in-combination effects of the Proposed Project when assessed alongside the proposed Bellair Wind Farm have been considered in so far as possible at the time of writing.

Proposed Umma More Wind Farm

The potential for the Proposed Project to result in significant cumulative or in-combination effects when assessed alongside the proposed Umma More Wind Farm was considered. The EIAR, and EIAR Addendum, is available on the planning file[49] for the proposed Umma More Wind Farm and were consulted. The EIAR and EIAR Addendum for the proposed Umma More Wind Farm assessed the following species which are shared as KORs with the Proposed Project: golden plover, merlin, peregrine, kestrel, lapwing (breeding & wintering), snipe, woodcock and buzzard. The EIAR and EIAR Addendum assessed collision risk and displacement for the operational phase of the proposed Umma More Wind Farm. Displacement was assessed as *Low* significance as per Percival (2003) for golden plover, peregrine, lapwing, snipe and kestrel, and *Very Low* for merlin, buzzard and sparrowhawk. Collision risk was assessed as *Low* as per Percival (2003) for golden plover, peregrine, lapwing (wintering), kestrel and buzzard; *Very Low* for snipe and sparrowhawk, and *No Effect* for merlin. A collision risk model was included for the above species, the predicted collisions of which are shown in Table 7-13 further below.

Single Turbines

Permitted Lea More Turbine

The potential for the Proposed Project to result in significant cumulative or in-combination effects when assessed alongside the permitted Lea More single turbine was considered. The Ecological Impact Assessment (EcIA) Report undertaken for this permitted single turbine available on the planning file[50] was consulted. The EcIA for the permitted Lea Beg Turbine did not identify specific KORs. A collision risk assessment was undertaken as part of the application, which assessed the following species which are shared as KORs with the Proposed Project: crane, golden plover, hen harrier, whooper swan, kestrel, lapwing (wintering), snipe, buzzard and sparrowhawk. Collision risk was assessed as *Medium* as per Percival (2003) for buzzard, *Low* as per Percival (2003) for golden plover, kestrel and lapwing (wintering), and negligible for crane, hen harrier, whooper swan, snipe and sparrowhawk. A collision risk model was included for the above species, the predicted collisions of which are shown in Table 7-13 further below.

Permitted Kilbeggan Turbine

The potential for the Proposed Project to result in significant cumulative or in-combination effects when assessed alongside the permitted Kilbeggan single turbine was considered. The Ecological Impact Assessment (EcIA) Report undertaken for this permitted single turbine is available on the planning file[51] and was consulted. The EcIA for the permitted Kilbeggan Turbine did not identify specific KORs. No significant effects to birds were identified in the EcIA.

[49] https://www.pleanala.ie/en-ie/case/321595
[50] https://www.eplanning.ie/OffalyCC/AppFileRefDetails/2460326/0
[51] https://www.eplanning.ie/WestmeathCC/AppFileRefDetails/22537/0

Existing James Nally Turbine

The potential for the Proposed Project to result in significant cumulative or in-combination effects when assessed alongside the existing James Nally single turbine was considered. There is no information pertaining to birds available on the planning file[52]. The turbine is located in an agricultural farm situated over 18km from the Proposed Project. The potential for this domestic single turbine of a height of less than 40m to result in significant cumulative effects on birds is negligible.

[52] https://www.eplanning.ie/WestmeathCC/AppFileRefDetails/114099/0

Table 7-13. Available predicted collisions per annum from wind farms within 25km of the Proposed Project site.

KOR	Proposed Project	Existing Leabeg Wind Farm	Existing Derrinlough Wind Farm	Permitted Cush Wind Farm	Proposed Umma More Wind Farm	Permitted Lea More Single Turbine	Cumulative Predicted Collisions
Golden plover[53]	1.8	-	2.84*	1.55*	10.842	0.377	**17.409**
Hen harrier	0.001	0.42	0.005	0.009	-	0.0003	**0.4353**
Merlin	0.0002	-	0	0	-	-	**0.0002**
Peregrine	0.01	-	0.07	0.039	0.152	-	**0.271**
Whooper Swan	0.112	1.19	0.21	0.097	-	0.009	**1.618**
Kestrel	0.553	-	1.62	0.67	2.512	0.883	**6.238**
Lapwing (breeding)	0.039	-	0.20	-	0.207	-	**0.446**
Lapwing (wintering)	0.07	-	3.55	4.98	19.562	7.641	**35.803**
Snipe	0.01	-	0.06	0.45	0.471	0.008	**0.999**
Woodcock	0.035	-	0	0	0	-	**0.035**
Buzzard	0.306	-	3.98	-	5.342	1.161	**10.789**
Sparrowhawk	0.005	-	0.16	-	0.123	0.010	**0.298**

[53] *Predicted collisions for golden plover have been adjusted where relevant to reflect the more accurate avoidance rate of 99.6% emanating from new research (see Section 7.5.2.2 further above and Appendix 7-5 for more details). Collision rates adjusted are denoted with '*'.*

7.10.2 Assessment of Cumulative Effects

There were 15 KORs identified at the Proposed Project site: crane, golden plover, hen harrier, kingfisher, merlin, peregrine, whooper swan, barn owl, kestrel, lapwing (breeding & wintering), snipe, woodcock, buzzard and sparrowhawk. A key consideration in the assessment of the potential for cumulative impacts to result in significant effects on KORs is proximity. For the purposes of this cumulative assessment, the local scale is considered to be a 5km radius of the Proposed Project site and the county scale is considered to be a 25km radius of the Proposed Project site. There is only one wind farm within 5km of the Proposed Project site (proposed Bellair Wind Farm).

Following SNH (2012) guidance, the cumulative impact assessment has been carried out at the scale of the importance rating of the receptor: National Importance (crane); County Importance (golden plover, hen harrier, kingfisher, merlin, peregrine, whooper swan, barn owl, kestrel, lapwing (breeding), snipe and woodcock); and Local Importance Higher Value (lapwing (wintering), buzzard and sparrowhawk). The assessment of cumulative effects on KORs is provided below. In particular, cumulative habitat loss, displacement and collision risk associated with operational turbines is assessed. Along associated site activity and amenity disturbance Short-term impacts (e.g. construction disturbance) , including from grid connection and turbine delivery and construction are highly unlikely to give rise to significant cumulative impacts, and no significant effects are predicted. For this reason, they are not considered further.

7.10.2.1 Crane (Breeding)

The extremely low rate of occurrence within the proposed, permitted or existing wind farms limits the potential for significant effects to result. Crane were observed within, or partially within 500m of the proposed turbine layout on two occasions. Two birds were observed landing and foraging within the Proposed Project site on two occasions on consecutive days in late July 2024. These observations likely relate to the same birds and were from two different areas within the Proposed Project site. Although the Proposed Wind Farm is currently sub-optimal for this species, there is the potential for favourable habitat to be created as part of the site Draft Rehab Plan. Over the lifetime of the wind farm there is therefore the potential for an indirect habitat loss. Notwithstanding this, the impacts of displacement and barrier effects as a result of the Proposed Project were assessed to be of *Very Low* effect significance. The potential for developments at the county scale (25km) to result in significant cumulative or in-combination effects when assessed alongside the Proposed Project were considered. No significant effects were reported for crane in the data available from any of the wind farms located within 25km of the Proposed Project site.

The crane is in the process of potentially re-colonising Ireland after a several-century-long absence. The species could reoccupy the abundant habitat, free of conspecific competition, that exists in the River Shannon catchment and nearby peatlands. The large scale rehabilitation of surrounding peatland habitats are likely to increase the quality of these habitats for the species and as such, their potential carrying capacity. Owing to this abundance of habitat, significant cumulative habitat loss effects are considered unlikely. The habitats within the Proposed Project site broadly comprise regenerating formerly cutover peatland and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape. The existing Leabeg Wind Farm and existing Cloghan Wind Farm are situated within agricultural grassland. The existing Derrinlough Wind Farm and proposed Bellair Wind Farm are situated within regenerating formerly cutover peatland. The existing Meenwaun Wind Farm includes agricultural and forestry habitats. The permitted Cush Wind Farm is situated within predominantly commercial forestry with some areas of agricultural grassland and peatland. The proposed Umma More Wind Farm is situated within predominantly agricultural grassland with some commercial forestry. There is only a single confirmed breeding pair of crane in Ireland, although some summering non-breeding birds have also been recorded, as is the case within the Proposed Project site. As such, the breeding population is confined to one known site. Of the above wind farms, the areas of regenerating/re-wetted formerly

cutover peatland areas could comprise potential future suitable breeding habitat for crane, should the population expand from the single breeding pair. However, as outlined, suitable habitat free of conspecific competition is not rare locally or unique to the Proposed Project site or other wind farms. Extensive areas of suitable foraging and breeding habitat will remain in the surrounding area. Significant cumulative impacts are not anticipated.

The extremely low rate of occurrence within the proposed, permitted or existing wind farms limits the potential for significant collision risk effects to result. Crane was not recorded flying at PCH during the extensive vantage point survey work undertaken at the Proposed Project site. Similarly, crane was not recorded at PCH and subsequently not included in collision risk models undertaken for wind farms within 25km of the Proposed Project. As such, there is no potential for significant cumulative collision risk effects.

No significant effects were reported for crane for any of the wind farms located within a 25km radius of the Proposed Project site. Taking into consideration the above reported effects and the predicted effects with the Proposed Project, no residual additive, antagonistic or synergistic effects have been identified concerning habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.10.2.2 Golden Plover (Wintering)

Golden plover were observed within, or partially within, the Proposed Project site on 62 occasions. The majority of these observations related to birds in flight over the Proposed Project site. Birds were observed landing and/or roosting within the Proposed Project site on a total of seven occasions over the 4.5 years of surveying, with flocks recorded ranging from two to 80 birds. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, with the succession to scrub mosaic on shallower peat, the site will likely become increasingly less suitable for open habitat species like golden plover.

The impacts of displacement and barrier effects as a result of the Proposed Project were assessed to be of *Low* effect significance. The potential for developments at the county scale (25km) to result in significant cumulative or in-combination effects when assessed alongside the Proposed Project were considered. No significant effects were reported for golden plover in the data available from any of the wind farms located within 25km of the Proposed Project site.

The habitats within the Proposed Project site broadly comprise regenerating formerly cutover peatland and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape. The existing Leabeg Wind Farm and existing Cloghan Wind Farm are situated within agricultural grassland. The existing Derrinlough Wind Farm and proposed Bellair Wind Farm are situated within regenerating formerly cutover peatland. The existing Meenwaun Wind Farm includes agricultural and forestry habitats. The permitted Cush Wind Farm is situated within predominantly commercial forestry with some areas of agricultural grassland and peatland. The proposed Umma More Wind Farm is situated within predominantly agricultural grassland with some commercial forestry. The areas of agricultural grassland, bare cutover peat and wetland areas at these wind farm sites comprise potentially suitable foraging and roosting habitat for golden plover. However, they are not of particularly high quality, e.g. the bare cutover peat of the Proposed Project. Similar quality habitat is widely available in the county, with good quality habitat abundantly present in the River Shannon catchment. Additionally, the rehabilitation schemes within some of these peatland habitats (on deep peat) are likely to increase the quality of these habitats in the wider surroundings for the species and, relatedly, their potential carrying capacity. In summary, extensive areas of suitable foraging and roosting habitat will remain in the surrounding area. Significant cumulative habitat loss impacts are not anticipated.

The cumulative collision risk when including wind farms within 25km of the Proposed Wind Farm is a combined total of 17.4 birds per year (see Table 7-13 above). It is noted that c. 10 of the predicted collisions are associated with Umma More, which is a proposed development that may not be built.

The cumulative impact of the low number of likely collisions at these wind farms is insignificant for both the county and national populations. Notwithstanding this, the result of the operational phase bird monitoring will be reported to the Planning Authority following each monitoring year and will include recommendations that may inform additional mitigation or adaptation if required.

Considering the above reported effects and the predicted effects with the Proposed Project, no significant residual additive, antagonistic or synergistic cumulative effects have been identified concerning habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.10.2.3 Hen Harrier (Wintering)

Hen harrier were recorded within the Proposed Project site on 20 occasions over the five winter seasons surveyed and there was one roost site confirmed situated in an area approximately 750m from the Proposed Project site. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, a majority of the site will likely develop a scrub mosaic on shallower peat. The site will likely remain suitable initially until the scrub encloses and/or matures to woodland.

The impacts of displacement and barrier effects as a result of the Proposed Project were assessed to be of *Low* effect significance. The potential for developments at the county scale (25km) to result in significant cumulative or in-combination effects when assessed alongside the Proposed Project were considered. No significant effects were reported for hen harrier in the data available from any of the wind farms located within 25km of the Proposed Project site.

The habitats within the Proposed Project site broadly comprise regenerating formerly cutover peatland and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape. The existing Leabeg Wind Farm and existing Cloghan Wind Farm are situated within agricultural grassland. The existing Derrinlough Wind Farm and proposed Bellair Wind Farm are situated within regenerating formerly cutover peatland. The existing Meenwaun Wind Farm includes agricultural and forestry habitats. The permitted Cush Wind Farm is situated within predominantly commercial forestry with some areas of agricultural grassland and peatland. The proposed Umma More Wind Farm is situated within predominantly agricultural grassland with some commercial forestry. The areas of regenerating peatland, and to a lesser extent agricultural grassland, comprise suitable foraging and roosting habitat for hen harrier. However, these habitats are not of particularly high quality, e.g. the bare cutover peat of the Proposed Project. Similar quality habitat is widely available in the county, with good quality habitat abundantly present in the River Shannon catchment. Additionally, the rehabilitation schemes within some of these peatland habitats (in deep peat areas) are likely to increase the quality of these habitats in the wider surroundings for the species and their corresponding potential carrying capacity. In summary, extensive areas of suitable foraging and roosting habitat will remain in the surrounding area. Significant cumulative habitat loss impacts are not anticipated.

The predicted collisions at the Proposed Project site are so low as to be effectively zero (i.e. no predicted collisions during the lifetime of the Proposed Wind Farm). The cumulative collision risk is a combined total of 0.43 birds per year (see Table 7-13 above), the vast majority of which is associated with the existing Leabeg Wind Farm. This is an insignificant rate of predicted cumulative collisions. Notwithstanding this, the result of operational phase bird monitoring will be reported to the Planning Authority following each monitoring year and will include recommendations that may inform additional mitigation or adaptation if required.

Considering the above reported effects and the predicted effects with the Proposed Project, no significant residual additive, antagonistic or synergistic cumulative effects have been identified concerning habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.10.2.4 Kingfisher (All Seasons)

Kingfisher were observed within, or partially within, the Proposed Project site on 33 occasions with a maximum of two birds recorded. A nest site was confirmed within the Proposed Project site in breeding season 2023 but not subsequently. The majority of observations were associated with this nest site in 2023.As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, a majority of the site will likely develop a scrub/woodland/reedbed mosaic on shallower peat. The site will likely remain suitable initially until the scrub encloses and/or reedbed limits access to the underlying habitat.

The impacts of displacement and barrier effects as a result of the Proposed Project were assessed to be of *Low* effect significance. The potential for developments at the county scale (25km) to result in significant cumulative or in-combination effects when assessed alongside the Proposed Project were considered. No significant effects were reported for kingfisher in the data available from any of the wind farms located within 25km of the Proposed Project site.

The habitats within the Proposed Project site broadly comprise regenerating formerly cutover peatland and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape. The existing Leabeg Wind Farm and existing Cloghan Wind Farm are situated within agricultural grassland. The existing Derrinlough Wind Farm and proposed Bellair Wind Farm are situated within regenerating formerly cutover peatland. The existing Meenwaun Wind Farm includes agricultural and forestry habitats. The permitted Cush Wind Farm is situated within predominantly commercial forestry with some areas of agricultural grassland and peatland. The proposed Umma More Wind Farm is situated within predominantly agricultural grassland with some commercial forestry. The areas of regenerating peatland contain extensive drainage channels similar to the nest site location at the Proposed Project site. However, this habitat feature would not be considered of particularly high-quality habitat, rare locally or unique to the Proposed Project site or above wind farms. Extensive networks of drainage channels will remain post construction, particularly so, the more optimal habitat in the River Shannon catchment. Significant cumulative impacts are not anticipated.

Kingfisher was not recorded flying at PCH during the extensive vantage point survey work undertaken at the Proposed Project site. Similarly, kingfisher was not recorded at PCH and subsequently not included in collision risk models undertaken for wind farms within 25km of the Proposed Project. As such, there is no potential for significant cumulative effects in relation to collision risk.

Considering the above reported effects and the predicted effects with the Proposed Project, no significant residual additive, antagonistic or synergistic cumulative effects have been identified concerning habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.10.2.5 Merlin (All Seasons)

Merlin were observed within, or partially within, the Proposed Project site on 28 occasions over the 4.5 years of surveying. There were no observations of breeding or roosting activity. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, with the succession to scrub mosaic on shallower peat, the site will likely become increasingly less suitable for open habitat species like merlin.

The impacts of displacement and barrier effects as a result of the Proposed Project were assessed to be of *Low* effect significance. The potential for developments at the county scale (25km) to result in significant cumulative or in-combination effects when assessed alongside the Proposed Project were considered. No significant effects were reported for merlin in the data available from any of the wind farms located within 25km of the Proposed Project site.

The habitats within the Proposed Project site broadly comprise regenerating formerly cutover peatland and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape. The existing Leabeg Wind Farm and existing Cloghan Wind Farm are situated within agricultural grassland. The existing Derrinlough Wind Farm and proposed Bellair Wind Farm are situated within regenerating formerly cutover peatland. The existing Meenwaun Wind Farm includes agricultural and forestry habitats. The permitted Cush Wind Farm is situated within predominantly commercial forestry with some areas of agricultural grassland and peatland. The proposed Umma More Wind Farm is situated within predominantly agricultural grassland with some commercial forestry. The areas of regenerating peatland, and to a lesser extent agricultural grassland, comprise suitable foraging and roosting habitat for merlin. However, these habitats are not of particularly high quality, e.g. the bare cutover peat of the Proposed Project. Similar quality habitat is widely available in the county, with good quality habitat abundantly present in the River Shannon catchment. Additionally, the rehabilitation schemes within some of these peatland habitats (in deep peat areas) are likely to increase the quality of these habitats in the wider surroundings for the species and their corresponding potential carrying capacity. In summary, extensive areas of suitable foraging and roosting habitat will remain in the surrounding area. Significant cumulative habitat loss impacts are not anticipated.

The predicted collisions at the Proposed Project site are so low as to be effectively zero (0.0002 birds/year, i.e. no predicted collisions during the lifetime of the wind farm). The combined collision risk of wind farms within 25km of the Proposed Wind Farm is zero (see Table 7-13 above). As such, there is no potential for cumulative effects in relation to collision risk.

Considering the above reported effects and the predicted effects with the Proposed Project, no significant residual additive, antagonistic or synergistic cumulative effects have been identified concerning habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.10.2.6 Peregrine (All Seasons)

Peregrine were observed within, or partially within, the Proposed Project site on 38 occasions over the 4.5 years of surveying. Survey results indicate the presence of a peregrine breeding pair in the wider area across the breeding seasons surveyed, deemed likely to be at a structure situated approximately 100m distant from the Proposed Project site. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, with the succession to scrub mosaic on shallower peat, the site will likely become increasingly less suitable for open habitat species like peregrine.

The impacts of displacement and barrier effects as a result of the Proposed Project were assessed to be of *Low* effect significance. The potential for developments at the county scale (25km) to result in significant cumulative or in-combination effects when assessed alongside the Proposed Project were considered. No significant effects were reported for peregrine in the data available from any of the wind farms located within 25km of the Proposed Project site.

The habitats within the Proposed Project site broadly comprise regenerating formerly cutover peatland and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape. The existing Leabeg Wind Farm and existing Cloghan Wind Farm are situated within agricultural grassland. The existing Derrinlough Wind Farm and proposed Bellair Wind Farm are situated within regenerating formerly cutover peatland. The existing Meenwaun Wind Farm includes agricultural and forestry habitats. The permitted Cush Wind Farm is situated within predominantly commercial forestry with some areas of agricultural grassland and peatland. The proposed Umma More Wind Farm is situated within predominantly agricultural grassland with some commercial forestry. The areas of regenerating peatland, and to a lesser extent agricultural grassland, comprise suitable foraging habitat for peregrine. However, these habitats are not of particularly high quality, e.g. the bare cutover peat of the Proposed Project. Similar quality habitat is widely available in the county, with good quality habitat abundantly present in the

River Shannon catchment. Additionally, the rehabilitation schemes within some of these peatland habitats (in deep peat areas) are likely to increase the quality of these habitats in the wider surroundings for the species and their corresponding potential carrying capacity. In summary, extensive areas of suitable foraging and roosting habitat will remain in the surrounding area. Significant cumulative habitat loss impacts are not anticipated.

The cumulative collision risk when including wind farms within 25km of the Proposed Wind Farm is a combined total of 0.27 birds per year (see Table 7-13 above). It is noted that a significant portion of the predicted collisions are associated with Umma More, which is a proposed development that may not be built. The cumulatively low rate of predicted likely collisions at these wind farms is insignificant. Notwithstanding this, the result of the operational phase bird monitoring will be reported to the Planning Authority following each monitoring year and will include recommendations that may inform additional mitigation or adaptation if required.

Considering the above reported effects and the predicted effects with the Proposed Project, no significant residual additive, antagonistic or synergistic cumulative effects have been identified concerning habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.10.2.7 Whooper Swan (Wintering)

Whooper swan were observed within, or partially within, the 500m radius of proposed turbines on 156 occasions over the 4.5 years of surveying. Regular roosting was recorded across a total of five areas within the Proposed Project site across the five winter seasons surveyed, with a maximum of four areas being used in any one season. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, a majority of the site will likely develop a scrub mosaic on shallower peat. The site will likely remain suitable initially until the scrub encloses and/or matures to woodland. This encroachment of woody vegetation is likely to discourage whooper swan use.

The impacts of displacement and barrier effects as a result of the Proposed Project were assessed to be of *Medium* effect significance. An enhancement plan has been incorporated into the Proposed Project which will (following the successful implementation) offset this identified potential effect. The potential for developments at the county scale (25km) to result in significant cumulative or in-combination effects when assessed alongside the Proposed Project were considered. No significant effects were reported for whooper swan in the data available from any of the wind farms located within 25km of the Proposed Project site.

The habitats within the Proposed Project site broadly comprise regenerating formerly cutover peatland and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape. The existing Leabeg Wind Farm and existing Cloghan Wind Farm are situated within agricultural grassland. The existing Derrinlough Wind Farm and proposed Bellair Wind Farm are situated within regenerating formerly cutover peatland. The existing Meenwaun Wind Farm includes agricultural and forestry habitats. The permitted Cush Wind Farm is situated within predominantly commercial forestry with some areas of agricultural grassland and peatland. The proposed Umma More Wind Farm is situated within predominantly agricultural grassland with some commercial forestry. Areas of regenerating peatland which flood during the winter comprise suitable roosting habitat, and the areas agricultural grassland comprise suitable foraging habitat for whooper swan. However, these habitats are not of particularly high quality, e.g. the bare cutover peat of the Proposed Project. Similar quality habitat is widely available in the county, with good quality habitat abundantly present in the River Shannon catchment. Additionally, the rehabilitation schemes within some of these peatland habitats are likely to increase the quality of these habitats in the wider surroundings for the species and their corresponding potential carrying capacity. In summary, extensive areas of suitable foraging and roosting habitat will remain in the surrounding area. Significant cumulative habitat loss impacts are not anticipated.

The cumulative collision risk when including wind farms within 25km of the Proposed Wind Farm is a combined total of 1.6 birds per year (see Table 7-13 above). It is noted that the proposed enhancement plan is likely to further reduce the predicted rate of collisions at the Proposed Wind Farm, as swans will be attracted away from turbines. The cumulatively low rate of predicted likely collisions at these wind farms is insignificant. Notwithstanding this, the result of operational phase bird monitoring will be reported to the Planning Authority following each monitoring year and will include recommendations that may inform additional mitigation or adaptation if required.

Considering the above reported effects and the predicted effects with the Proposed Project, no significant residual additive, antagonistic or synergistic cumulative effects have been identified concerning habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.10.2.8 Barn Owl (All Seasons)

A confirmed breeding barn owl nest site was identified within the Proposed Project site in breeding season 2021. A second potential previously used breeding location was identified on third-party lands approximately 100m outside the Proposed Project site, which was last observed to be active in 2021 and 2022. Breeding was not confirmed since. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, with the succession to scrub mosaic on shallower peat, the site will likely become increasingly less suitable for open habitat species like barn owl.The impacts of displacement and barrier effects as a result of the Proposed Project were assessed to be of *Low* effect significance. The potential for developments at the county scale (25km) to result in significant cumulative or in-combination effects when assessed alongside the Proposed Project were considered. No significant effects were reported for barn owl in the data available from any of the wind farms located within 25km of the Proposed Project site.

The habitats within the Proposed Project site broadly comprise regenerating formerly cutover peatland and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape. The existing Leabeg Wind Farm and existing Cloghan Wind Farm are situated within agricultural grassland. The existing Derrinlough Wind Farm and proposed Bellair Wind Farm are situated within regenerating formerly cutover peatland. The existing Meenwaun Wind Farm includes agricultural and forestry habitats. The permitted Cush Wind Farm is situated within predominantly commercial forestry with some areas of agricultural grassland and peatland. The proposed Umma More Wind Farm is situated within predominantly agricultural grassland with some commercial forestry. The areas of bare peat and regenerating peatland, which made up the majority of the Proposed Wind Farm would not typically be considered good quality barn owl habitat. This limits the potential for the Proposed Project to contribute to a significant cumulative habitat loss effect. Significant cumulative habitat loss effects are not anticipated.

Collision related mortality is not likely to significantly impact this species, particularly given barn owl flies at low elevation when foraging (Barn Owl Trust, 2021[54]), which contrasts with the considerable height (70m) of the lowest swept height of the proposed turbine. Barn owl was not recorded flying at PCH during the extensive vantage point survey work undertaken at the Proposed Project site. Similarly, the species was not recorded at PCH and subsequently not included in collision risk models undertaken for wind farms within 25km of the Proposed Project. As such, there is no potential for cumulative effects in relation to collision risk.

Considering the above reported effects and the predicted effects with the Proposed Project, no significant residual additive, antagonistic or synergistic cumulative effects have been identified concerning habitat loss, displacement or collision mortality.

[54] https://www.barnowltrust.org.uk/hazards-solutions/barn-owls-wind-turbines/

Significant cumulative impacts are not predicted.

7.10.2.9 Kestrel (All Seasons)

There were up to seven breeding kestrel territories (confirmed and probable) identified for kestrel in the vicinity of the Proposed Project site in any one season over the four breeding seasons surveyed. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, with the succession to scrub mosaic on shallower peat, the site will likely become increasingly less suitable for open habitat species like kestrel. As the majority of these territories were located in the wider surroundings/around the margins of the site, the impacts of displacement and barrier effects as a result of the Proposed Project were assessed to be of *Low* effect significance. The potential for developments at the county scale (25km) to result in significant cumulative or in-combination effects when assessed alongside the Proposed Project were considered. No significant effects were reported for kestrel in the data available from any of the wind farms located within 25km of the Proposed Project site.

The habitats within the Proposed Project site broadly comprise regenerating formerly cutover peatland and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape. The existing Leabeg Wind Farm and existing Cloghan Wind Farm are situated within agricultural grassland. The existing Derrinlough Wind Farm and proposed Bellair Wind Farm are situated within regenerating formerly cutover peatland. The existing Meenwaun Wind Farm includes agricultural and forestry habitats. The permitted Cush Wind Farm is situated within predominantly commercial forestry with some areas of agricultural grassland and peatland. The proposed Umma More Wind Farm is situated within predominantly agricultural grassland with some commercial forestry. The areas of regenerating peatland and agricultural grassland comprise suitable foraging habitat for kestrel. However, these habitats are not of particularly high quality, e.g. the bare cutover peat of the Proposed Project. Similar quality habitat is widely available in the county, with good quality habitat abundantly present in the River Shannon catchment. Additionally, the rehabilitation schemes within some of these peatland habitats are likely to increase the quality of these habitats in the wider surroundings for the species and their corresponding potential carrying capacity. In summary, extensive areas of suitable habitat will remain in the surrounding area. Significant cumulative habitat loss impacts are not anticipated.

The cumulative collision risk when including wind farms within 25km of the Proposed Wind Farm is a combined total of 6.2 birds per year (see Table 7-13 above). The cumulative rate of predicted likely collisions at these wind farms is unlikely to significantly impact the county or national population. Notwithstanding this, the result of operational phase bird monitoring will be reported to the Planning Authority following each monitoring year and will include recommendations that may inform additional mitigation or adaptation if required.

Considering the above reported effects and the predicted effects with the Proposed Project, no significant residual additive, antagonistic or synergistic cumulative effects have been identified concerning habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.10.2.10 Lapwing (Wintering)

Lapwing were observed within, or partially within, the Proposed Project site on 19 occasions across the five winter seasons surveyed. The majority of these observations related to birds in flight over the Proposed Project site. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, with the succession to scrub mosaic on shallower peat, the site will likely become increasingly less suitable for open habitat species like lapwing. The impacts of displacement and barrier effects as a result of the Proposed Project were assessed to be of *Low* effect significance. The potential for developments at the county scale (25km) to result in significant cumulative or in-combination effects when assessed alongside

the Proposed Project were considered. No significant effects were reported for wintering lapwing in the data available from any of the wind farms located within 25km of the Proposed Project site.

The habitats within the Proposed Project site broadly comprise regenerating formerly cutover peatland and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape. The existing Leabeg Wind Farm and existing Cloghan Wind Farm are situated within agricultural grassland. The existing Derrinlough Wind Farm and proposed Bellair Wind Farm are situated within regenerating formerly cutover peatland. The existing Meenwaun Wind Farm includes agricultural and forestry habitats. The permitted Cush Wind Farm is situated within predominantly commercial forestry with some areas of agricultural grassland and peatland. The proposed Umma More Wind Farm is situated within predominantly agricultural grassland with some commercial forestry. The areas of agricultural grassland, bare cutover peat and wetland areas at these wind farm sites comprise suitable foraging and roosting habitat for lapwing. However, these habitats are not of particularly high quality, e.g. the bare cutover peat of the Proposed Project. Similar quality habitat is widely available in the county, with good quality habitat abundantly present in the River Shannon catchment. Additionally, the rehabilitation schemes within some of these peatland habitats (in deep peat areas) are likely to increase the quality of these habitats in the wider surroundings for the species and their corresponding potential carrying capacity. In summary, extensive areas of suitable habitat will remain in the surrounding area. Significant cumulative habitat loss impacts are not anticipated.

The cumulative collision risk when including wind farms within 25km of the Proposed Wind Farm is a combined total of 35.8 birds per year (see Table 7-13 above). It is noted that a large majority of the predicted collisions are associated with Umma More, which is a proposed development that may not be built. The cumulative rate of predicted likely collisions at these wind farms is unlikely to significantly impact the county or national population. Notwithstanding this, the result of operational phase bird monitoring will be reported to the Planning Authority following each monitoring year and will include recommendations that may inform additional mitigation or adaptation if required.

Considering the above reported effects and the predicted effects with the Proposed Project, no significant residual additive, antagonistic or synergistic cumulative effects have been identified concerning habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.10.2.11 Lapwing (Breeding)

Lapwing breeding activity was identified within the Proposed Project site in three of the four seasons surveyed, with an estimated two breeding pairs present in the most recent breeding seasons surveyed (i.e. 2023 & 2024). As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, with the succession to scrub mosaic on shallower peat, the site will likely become increasingly less suitable for open habitat species like lapwing. The impacts of displacement and barrier effects as a result of the Proposed Project were assessed to be of *Medium* effect significance. An enhancement plan has been incorporated into the Proposed Project in order to offset this identified potential effect, comprising the creation of a c.10ha area of suitable breeding habitat. The potential for developments at the county scale (25km) to result in significant cumulative or in-combination effects when assessed alongside the Proposed Project were considered.

The existing Derrinlough Wind Farm identified as stated in the EIAR "*on a precautionary basis*" a Short-term Moderate Negative Effect, as per EPA (2022). Seven breeding pairs were identified within the existing Derrinlough Wind Farm site during pre-planning surveys. However, a "*Lapwing, Waterfowl and Wader Habitat Enhancement Plan*" was included in the project design as mitigation for this identified effect. No significant effects were reported for breeding lapwing in the data available from any of the other wind farms located within 25km of the Proposed Project site.

The habitats within the Proposed Project site broadly comprise regenerating formerly cutover peatland and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape. The existing Leabeg Wind Farm and existing Cloghan Wind Farm are situated within agricultural grassland. The existing Derrinlough Wind Farm and proposed Bellair Wind Farm are situated within regenerating formerly cutover peatland. The existing Meenwaun Wind Farm includes agricultural and forestry habitats. The permitted Cush Wind Farm is situated within predominantly commercial forestry with some areas of agricultural grassland and peatland. The proposed Umma More Wind Farm is situated within predominantly agricultural grassland with some commercial forestry. The areas of regenerating peatland and agricultural grassland comprise suitable nesting and foraging habitat for breeding lapwing. Significant cumulative habitat loss impacts are not anticipated, based on the following rationale.

The Proposed Project includes the creation of 10ha of lapwing breeding habitat, which limits the potential for a significant contribution to cumulative habitat loss effects. Additionally, the rehabilitation schemes within some of these peatland habitats (in deep peat areas) are likely to increase the quality of these habitats in the wider surroundings for the species and their corresponding potential carrying capacity.

The cumulative collision risk when including wind farms within 25km of the Proposed Wind Farm is a combined total of 0.0.45 birds per year (see Table 7-13 above). It is noted that the proposed enhancement plan is likely to further reduce the predicted rate of collisions at the Proposed Wind Farm, as lapwing will be attracted away from the turbines. The cumulative rate of predicted likely collisions at these wind farms is unlikely to significantly impact the county or national population. Notwithstanding this, the result of operational phase bird monitoring will be reported to the Planning Authority following each monitoring year and will include recommendations that may inform additional mitigation or adaptation if required.

Considering the above reported effects and the predicted effects with the Proposed Project, no significant residual additive, antagonistic or synergistic cumulative effects have been identified concerning habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.10.2.12 Snipe (All Seasons)

Snipe were regularly recorded during surveys, with observations of drumming or calling snipe during the breeding season frequently recorded. There were several probable breeding territories identified within the Proposed Project site; one in 2021, four in 2023 and five in 2024. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, with the succession to scrub mosaic on shallower peat, the site will likely become increasingly less suitable for open habitat species like snipe. The impacts of displacement and barrier effects as a result of the Proposed Project were assessed to be of *Low* effect significance. Please see Section 7.5.2.12 for details. It is noted that the enhancement plan proposed for the benefit of lapwing is likely to also benefit breeding snipe. The potential for developments at the county scale (25km) to result in significant cumulative or in-combination effects when assessed alongside the Proposed Project were considered. No significant effects were reported for snipe in the data available from any of the wind farms located within 25km of the Proposed Project site.

The habitats within the Proposed Project site broadly comprise regenerating formerly cutover peatland and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape. The existing Leabeg Wind Farm and existing Cloghan Wind Farm are situated within agricultural grassland. The existing Derrinlough Wind Farm and proposed Bellair Wind Farm are situated within regenerating formerly cutover peatland. The existing Meenwaun Wind Farm includes agricultural and forestry habitats. The permitted Cush Wind Farm is situated within predominantly commercial forestry with some areas of agricultural grassland and peatland. The proposed Umma More Wind Farm is situated within predominantly agricultural grassland with some commercial forestry. The areas of regenerating formerly cutover

peatland and agricultural grassland at these wind farm sites comprise suitable breeding, roosting and foraging habitat for snipe. Significant cumulative habitat loss impacts are not anticipated, based on the following rationale.

The Proposed Project includes the creation of 10ha of lapwing breeding habitat that will likely benefit snipe also, which limits the potential for a significant contribution to cumulative habitat loss effects. Additionally, the rehabilitation schemes within some of these peatland habitats (in deep peat areas) in the wider surroundings are likely to increase the quality of these habitats for the species and their corresponding potential carrying capacity.

The cumulative collision risk when including wind farms within 25km of the Proposed Wind Farm is a combined total of 1 bird per year (see Table 7-13 above). The cumulative low rate of predicted likely collisions at these wind farms is unlikely to significantly impact the county or national population. Notwithstanding this, the result of operational phase bird monitoring will be reported to the Planning Authority following each monitoring year and will include recommendations that may inform additional mitigation or adaptation if required.

Considering the above reported effects and the predicted effects with the Proposed Project, no significant residual additive, antagonistic or synergistic cumulative effects have been identified concerning habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.10.2.13 Woodcock (Breeding)

Woodcock was regularly recorded during dedicated breeding woodcock surveys across the four breeding seasons surveyed. There were seven breeding territories identified at, or within 500m of, the Proposed Project site in 2021, three in 2022, five in 2023 and four in 2024. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, a majority of the site will likely develop a scrub mosaic on shallower peat. With the encroachment of woody vegetation, the site is likely to become increasingly suitable for this species. Extensive areas of suitable foraging and nesting habitat exist and is likely to develop beyond 500m from the proposed turbine layout. The impacts of displacement and barrier effects as a result of the Proposed Project were assessed to be of *Low* effect significance. The potential for developments at the county scale (25km) to result in significant cumulative or in-combination effects when assessed alongside the Proposed Project were considered. No significant effects were reported for woodcock in the data available from any of the wind farms located within 25km of the Proposed Project site.

The habitats within the Proposed Project site broadly comprise regenerating formerly cutover peatland and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape. The existing Leabeg Wind Farm and existing Cloghan Wind Farm are situated within agricultural grassland. The existing Derrinlough Wind Farm and proposed Bellair Wind Farm are situated within regenerating formerly cutover peatland. The existing Meenwaun Wind Farm includes agricultural and forestry habitats. The permitted Cush Wind Farm is situated within predominantly commercial forestry with some areas of agricultural grassland and peatland. The proposed Umma More Wind Farm is situated within predominantly agricultural grassland with some commercial forestry. The areas of regenerating formerly cutover peatland (i.e. areas of establishing woodland) and commercial forestry at these wind farm sites comprise suitable breeding habitat for woodcock. However, as outlined, these two habitats are the abundant habitat types in the wider area, and not a rare resource locally or unique to the Proposed Project site or above wind farms. Extensive areas of suitable foraging and roosting habitat will remain post construction and suitable habitat is abundant in the surrounding area. Significant cumulative impacts are not anticipated.

The predicted collisions at the Proposed Project site are so low as to be effectively zero (0.035 birds/year). The combined collision risk of wind farms within 25km of the Proposed Wind Farm is zero (see Table 7-13 above). As such, there is no potential for cumulative effects in relation to collision risk.

Considering the above reported effects and the predicted effects with the Proposed Project, no significant residual additive, antagonistic or synergistic cumulative effects have been identified concerning habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.10.2.14 Buzzard (All Seasons)

This species was frequently recorded within the Proposed Project site during the breeding and winter seasons. There were six probable breeding territories and three confirmed territories in 2021, one probable breeding territory and one confirmed territory in 2022, one probable breeding territory and two confirmed territories in 2023, one probable territory and five confirmed territories in 2024 and two probable breeding territories identified in early 2025. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, a majority of the site will likely develop a scrub mosaic on shallower peat. With the encroachment of woody vegetation, the site is likely to become increasingly suitable for this species. Extensive areas of suitable foraging and nesting habitat exist and is likely to develop beyond 500m from the proposed turbine layout. The impacts of displacement and barrier effects as a result of the Proposed Project were assessed to be of *Low* effect significance. The potential for developments at the county scale (25km) to result in significant cumulative or in-combination effects when assessed alongside the Proposed Project were considered. No significant effects were reported for buzzard in the data available from any of the wind farms located within 25km of the Proposed Project site.

The habitats within the Proposed Project site broadly comprise regenerating formerly cutover peatland and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape. The existing Leabeg Wind Farm and existing Cloghan Wind Farm are situated within agricultural grassland. The existing Derrinlough Wind Farm and proposed Bellair Wind Farm are situated within regenerating formerly cutover peatland. The existing Meenwaun Wind Farm includes agricultural and forestry habitats. The permitted Cush Wind Farm is situated within predominantly commercial forestry with some areas of agricultural grassland and peatland. The proposed Umma More Wind Farm is situated within predominantly agricultural grassland with some commercial forestry. The areas of regenerating peatland and agricultural grassland comprise suitable nesting and foraging habitat for buzzard. However, as outlined, these two habitats are the abundant habitat types in the wider area, and not a rare resource locally or unique to the Proposed Project site or above wind farms. Extensive areas of suitable foraging and roosting habitat will remain post construction and suitable habitat is abundant in the surrounding area. Significant cumulative impacts are not anticipated.

The cumulative collision risk when including wind farms within 25km of the Proposed Wind Farm is a combined total of 12.258 birds per year (see Table 7-13 above). The addition of the low number of collisions at these wind farms is insignificant for such an abundant species. Notwithstanding this, the result of operational phase bird monitoring will be reported to the Planning Authority following each monitoring year and will include recommendations that may inform additional mitigation or adaptation if required.

Considering the above reported effects and the predicted effects with the Proposed Project, no significant residual additive, antagonistic or synergistic cumulative effects have been identified concerning habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.10.2.15 Sparrowhawk (All Seasons)

This species was frequently recorded within the Proposed Project site during the breeding and winter seasons. There was one probable breeding territory and two confirmed territories in 2021, one confirmed territory in 2022, two confirmed territories in 2023, four confirmed territories in 2024 and two probable breeding territories identified in early 2025. As outlined in Section 7.5.1, over the lifetime of the Proposed Wind Farm, a majority of the site will likely develop a scrub mosaic on shallower peat. With the encroachment of woody vegetation, the site is likely to become increasingly suitable for this species. Extensive areas of suitable foraging and nesting habitat exist and is likely to develop beyond 500m from the proposed turbine layout. The impacts of displacement and barrier effects as a result of the Proposed Project were assessed to be of *Low* effect significance. The potential for developments at the county scale (25km) to result in significant cumulative or in-combination effects when assessed alongside the Proposed Project were considered. No significant effects were reported for sparrowhawk in the data available from any of the wind farms located within 25km of the Proposed Project site.

The habitats within the Proposed Project site broadly comprise regenerating formerly cutover peatland and agricultural grassland. These are the dominant habitats within the wider landscape, and a mix of these habitats are found at all wind farms within the wider landscape. The existing Leabeg Wind Farm and existing Cloghan Wind Farm are situated within agricultural grassland. The existing Derrinlough Wind Farm and proposed Bellair Wind Farm are situated within regenerating formerly cutover peatland. The existing Meenwaun Wind Farm includes agricultural and forestry habitats. The permitted Cush Wind Farm is situated within predominantly commercial forestry with some areas of agricultural grassland and peatland. The proposed Umma More Wind Farm is situated within predominantly agricultural grassland with some commercial forestry. The areas of regenerating peatland (i.e. areas of establishing woodland) and agricultural grassland comprise suitable breeding and foraging habitat for sparrowhawk. However, as outlined, these two habitats are the abundant habitat types in the wider area, and not a rare resource locally or unique to the Proposed Project site or above wind farms. Extensive areas of suitable foraging and roosting habitat will remain post construction and suitable habitat is abundant in the surrounding area. Significant cumulative impacts are not anticipated.

The cumulative collision risk when including wind farms within 25km of the Proposed Wind Farm is a combined total of 0.327 birds per year (see Table 7-13 above). The addition of the low number of collisions at these wind farms is insignificant for such an abundant species. Notwithstanding this, the result of operational phase bird monitoring will be reported to the Planning Authority following each monitoring year and will include recommendations that may inform additional mitigation or adaptation if required.

Considering the above reported effects and the predicted effects with the Proposed Project, no significant residual additive, antagonistic or synergistic cumulative effects have been identified concerning habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.11 Conclusion

Following consideration of the residual effects (post-mitigation), it is concluded that the Proposed Project will not result in any significant effects on any of the identified KORs. No significant effects on receptors of International, National or County Importance were identified. Provided that the Proposed Project is constructed, operated and decommissioned in accordance with the design, best practice mitigation and enhancement measures that are described within this application, significant individual or cumulative effects on the identified KORs are not anticipated.

7.12 EIA Classification Summary

Please see the below table for a summary of all identified impacts for the Proposed Project relating to ornithology.

Table 7-14 Impact Assessment Classification Summary

Topic	Pre-Mitigation Effect	Mitigation Section Reference	Residual Effect	Significance
Construction Phase				
Crane (Breeding)	**Direct Habitat Loss**: Long-Term, Imperceptible, Negative **Disturbance**: Short-Term, Imperceptible, Negative	Section 7.6.1 Section 7.6.2.1 Section 7.8.1	No Effect greater than Imperceptible	Not Significant
Golden Plover (Wintering)	**Direct Habitat Loss**: Long-Term, Slight, Negative **Disturbance**: Short-Term, Slight, Negative	Section 7.6.1 Section 7.6.2.1 Section 7.8.1	No Effect greater than Slight	Not Significant
Hen Harrier (Wintering)	**Direct Habitat Loss**: Long-Term, Slight, Negative **Disturbance**: Short-Term, Slight, Negative	Section 7.6.1 Section 7.6.2.1 Section 7.8.1	No Effect greater than Slight	Not Significant

Kingfisher (All Seasons)	**Direct Habitat Loss**: Long-Term, Slight, Negative **Disturbance**: Short-Term, Moderate, Negative	Section 7.6.1 Section 7.6.2.1 Section 7.8.1	No Effect greater than Slight	Not Significant
Merlin (All Seasons)	**Direct Habitat Loss**: Long-Term, Slight, Negative **Disturbance**: Short-Term, Slight, Negative	Section 7.6.1 Section 7.6.2.1 Section 7.8.1	No Effect greater than Slight	Not Significant
Peregrine (All Seasons)	**Direct Habitat Loss**: Long-Term, Slight, Negative **Disturbance**: Short-Term, Slight, Negative	Section 7.6.1 Section 7.6.2.1 Section 7.8.1	No Effect greater than Slight	Not Significant
Whooper Swan (Winter)	**Direct Habitat Loss**: Long-Term, Moderate, Negative **Disturbance**: Short-Term, Moderate, Negative	Section 7.6.1 Section 7.6.2.1 Section 7.7.1 Section 7.8.1	No Effect greater than Slight	Not Significant
Barn Owl (All Seasons)	**Direct Habitat Loss**: Long-Term, Slight, Negative **Disturbance**: Short-Term, Slight, Negative	Section 7.6.1 Section 7.6.2.1 Section 7.8.1	No Effect greater than Slight	Not Significant
Kestrel (All Seasons)	**Direct Habitat Loss**:	Section 7.6.1 Section 7.6.2.1	No Effect greater than Slight	Not Significant

	Long-Term, Slight, Negative **Disturbance**: Short-Term, Slight, Negative	Section 7.8.1		
Lapwing (Wintering)	**Direct Habitat Loss**: Long-Term, Slight, Negative **Disturbance**: Short-Term, Slight, Negative	Section 7.6.1 Section 7.6.2.1 Section 7.8.1	No Effect greater than Slight	Not Significant
Lapwing (Breeding)	**Direct Habitat Loss**: Long-Term, Moderate, Negative **Disturbance**: Short-Term, Moderate, Negative	Section 7.6.1 Section 7.6.2.1 Section 7.7.2 Section 7.8.1	No Effect greater than Slight	Not Significant
Snipe (All Seasons)	**Direct Habitat Loss**: Long-Term, Slight, Negative **Disturbance**: Short-Term, Slight, Negative	Section 7.6.1 Section 7.6.2.1 Section 7.8.1	No Effect greater than Slight	Not Significant
Woodcock (Breeding)	**Direct Habitat Loss**: Long-Term, Slight, Negative **Disturbance**: Short-Term, Slight, Negative	Section 7.6.1 Section 7.6.2.1 Section 7.8.1	No Effect greater than Slight	Not Significant
Buzzard (All Seasons)	**Direct Habitat Loss**: Long-Term, Not-Significant, Negative	Section 7.6.1 Section 7.6.2.1 Section 7.8.1	No Effect greater than Slight	Not Significant

	Disturbance: Short-Term, Not-Significant, Negative			
Sparrowhawk (All Seasons)	**Direct Habitat Loss**: Long-Term, Not-Significant, Negative **Disturbance**: Short-Term, Not-Significant, Negative	Section 7.6.1 Section 7.6.2.1 Section 7.8.1	No Effect greater than Slight	Not Significant
Operational Phase				
Crane (Breeding)	**Direct Habitat Loss**: Long-Term, Imperceptible, Negative **Disturbance, Displacement and Barrier Effect**: Long-Term, Imperceptible, Negative **Collision Risk**: No Effect	Section 7.6.1 Section 7.8.2	No Effect greater than Imperceptible	Not Significant
Golden Plover (Wintering)	**Direct Habitat Loss:** No Effect **Disturbance, Displacement and Barrier Effect**: Long-Term, Slight, Negative **Collision Risk**: Long-Term, Slight, Negative	Section 7.6.1 Section 7.8.2	No Effect greater than Slight	Not Significant
Hen Harrier (Wintering)	**Direct Habitat Loss:** No Effect	Section 7.6.1 Section 7.8.2	No Effect greater than Slight	Not Significant

	Disturbance, Displacement and Barrier Effect: Long-Term, Slight, Negative **Collision Risk**: Long-Term, Imperceptible, Negative			
Kingfisher (All Seasons)	**Direct Habitat Loss:** No Effect **Disturbance, Displacement and Barrier Effect**: Long-Term, Slight, Negative **Collision Risk**: Long-Term, Imperceptible, Negative	Section 7.6.1 Section 7.8.2	No Effect greater than Slight	Not Significant
Merlin (All Seasons)	**Direct Habitat Loss:** No Effect **Disturbance, Displacement and Barrier Effect**: Long-Term, Slight, Negative **Collision Risk**: Long-Term Imperceptible, Negative	Section 7.6.1 Section 7.8.2	No Effect greater than Slight	Not Significant
Peregrine (All Seasons)	**Direct Habitat Loss:** No Effect **Disturbance, Displacement and Barrier Effect**:	Section 7.6.1 Section 7.8.2	No Effect greater than Slight	Not Significant

	Long-Term, Slight, Negative **Collision Risk**: Long-Term Imperceptible, Negative			
Whooper Swan (Winter)	**Direct Habitat Loss:** No Effect **Disturbance, Displacement and Barrier Effect**: Long-Term, Moderate, Negative **Collision Risk**: Long-Term, Imperceptible, Negative	Section 7.6.1 Section 7.7.1 Section 7.8.2	No Effect greater than Slight	Not Significant
Barn Owl (All Seasons)	**Direct Habitat Loss:** No Effect **Disturbance, Displacement and Barrier Effect**: Long-Term, Slight, Negative **Collision Risk**: No Effect	Section 7.6.1 Section 7.8.2	No Effect greater than Slight	Not Significant
Kestrel (All Seasons)	**Direct Habitat Loss:** No Effect **Disturbance, Displacement and Barrier Effect**: Long-Term, Slight, Negative **Collision Risk**:	Section 7.6.1 Section 7.8.2	No Effect greater than Slight	Not Significant

	Long-Term Imperceptible, Negative			
Lapwing (Wintering)	**Direct Habitat Loss:** No Effect **Disturbance, Displacement and Barrier Effect**: Long-Term, Slight, Negative **Collision Risk**: Long-Term, Imperceptible, Negative	Section 7.6.1 Section 7.8.2	No Effect greater than Slight	Not Significant
Lapwing (Breeding)	**Direct Habitat Loss:** No Effect **Disturbance, Displacement and Barrier Effect**: Long-Term, Moderate, Negative **Collision Risk**: Long-term, Imperceptible, Negative	Section 7.6.1 Section 7.7.2 Section 7.8.2	No Effect greater than Slight	Not Significant
Snip (All Seasons)	**Direct Habitat Loss:** No Effect **Disturbance, Displacement and Barrier Effect**: Long-Term, Slight, Negative **Collision Risk**: Long-term, Imperceptible, Negative	Section 7.6.1 Section 7.8.2	No Effect greater than Slight	Not Significant

Woodcock (Breeding)	**Direct Habitat Loss:** No Effect **Disturbance, Displacement and Barrier Effect**: Long-Term, Slight, Negative **Collision Risk**: Long-term, Imperceptible, Negative	Section 7.6.1 Section 7.8.2	No Effect greater than Slight	Not Significant
Buzzard (All Seasons)	**Direct Habitat Loss:** No Effect **Disturbance, Displacement and Barrier Effect**: Long-Term, Not-Significant, Negative **Collision Risk**: Long-term, Not-Significant, Negative	Section 7.6.1 Section 7.8.2	No Effect greater than Not-Significant	Not Significant
Sparrowhawk (All Seasons)	**Direct Habitat Loss:** No Effect **Disturbance, Displacement and Barrier Effect**: Long-Term, Not-Significant, Negative **Collision Risk**: Long-term, Not-Significant, Negative	Section 7.6.1 Section 7.8.2	No Effect greater than Not-Significant	Not Significant
Decommissioning Phase				
Ornithological Receptors	**Direct Habitat Loss:**	7.8.3	No Effect greater than Slight	Not Significant

	No Effect **Disturbance:** No Effect greater than Slight			