Planning and Environmental Consultants

Environmental Impact Assessment Report

Seskin Renewables Wind Farm

Chapter 7 Birds

DOCUMENT DETAILS

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01	Final	13.06.2025	NL	PM/PC

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7. BIRDS

7.1 Introduction

This chapter assesses the likely significant impacts of the Seskin wind farm development (hereafter the "Proposed Development") 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 impacts on avian receptors are identified, mitigation is described, and the residual effects are assessed.

This chapter is supported by Technical Appendices 7-1 to 7-4, which contain data from the surveys undertaken including full details of the survey times, weather conditions, and other relevant information together with the bird records themselves. Confidential Appendix 7-5 contains sensitive records of protected species breeding sites. Appendix 7-6 contains the Collision Risk Assessment (CRA) document which illustrates how the collision risk modelling was undertaken for the Proposed Development. Appendix 7-7 contains the bird monitoring programme. The Site and survey radii are provided in Figures 7.1-7.6 below.

The chapter is structured as follows:

- The Introduction provides a description of the Proposed Development 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 potential impacts of the Proposed Development on birds.
- The Baseline Ornithological Conditions section describes the existing bird population at the 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 Development: 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 Development 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 Development 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 in Chapter 1, for the purposes of this EIAR, the various project components are described and assessed using the following references:

- Where the 'Proposed Development' is referred to this encompasses the entirety of the project for the purposes of this EIA in accordance with the EIA Directive.
- Where the 'Proposed Wind Farm' is referred to, this refers to the wind turbines and associated foundations and hard-standing areas, meteorological mast, access roads, temporary construction compounds, underground cabling, borrow pit, spoil management, site drainage, biodiversity enhancement, turbine delivery accommodation areas and all ancillary works and apparatus.

- Where the 'Proposed Grid Connection' is referred to, this refers to the 38kV onsite substation, Battery Energy Storage System (BESS), associated temporary construction compound and 38kV underground cabling connecting to the existing Ballyragget 110kV substation, and all ancillary works and apparatus.
- Where the 'Site' is referred to, this relates to the primary study area for the EIAR, as delineated by the EIAR Site Boundary in green as shown on Figure 1-1 in Chapter 1 of the EIAR and encompasses an area of approximately 302 hectares.

The following other definitions are used in this chapter:

- The "Zone of Influence" (ZOI) for individual ornithological receptors refers to the area within which potential effects are anticipated. ZOIs differ depending on the sensitivities of particular species and were assigned in accordance with best available guidance (SNH, 2016 and McGuinness *et al.*, 2015), adopting a precautionary approach.
- "Key Ornithological Receptor" (KOR) is defined as a species occurring within the zone of influence of the Proposed Development upon which potential impacts are anticipated and assessed.

7.1.1 Description of the Proposed Development

A full description of the Proposed Development is provided in Chapter 4 of this EIAR. In brief, the applicant is seeking a 35-year planning permission for a project consisting of 8 turbines and the associated works. The turbines will be 100m at hub height, with 3 blades of 150m. The Proposed Development will have an operation 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

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:

- 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.
- Kilkenny City and County Development Plan 2021
- Laois County Development Plan 2021-2027

7.1.3 Statement of Authority and Competence

This ornithology chapter has been prepared by Nessa Lee (B.Sc.), Project Ornithologist of MKO and reviewed by Patrick Manley (B.Sc.), Senior Ornithologist. Both are 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 Principal Ornithologist, Padraig Cregg (M.Sc.) and is fully compliant with recent NatureScot (formerly Scottish Natural Heritage) guidance (SNH, 2017). Field surveys were undertaken by Allan Mee, Andre Robinson, Conor Berney, Donnacha Woods, Geoffrey Hunt, Jamie Quirk, Ken Westman, Neil Bourke, Sean O'Brien, Tony Kenneally, Tomasz Siekaniec. All surveyors are competent experts in ornithology field 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 Site. The assessment included a thorough review of the available ornithological data including:

- Designated sites within the likely ZOI of the Proposed Development.
- Review of Bird Atlases: (Sharrock, 1976; Lack, 1986; Gibbons *et al.*, 1993; Balmer *et al.*, 2013).
- Review of online web-mappers: National Parks and Wildlife Service (NPWS), National Biodiversity Data Centre (NBDC), Irish Wetland Bird Survey I-WeBS. Review of specially requested records from the National Parks and Wildlife Service Rare and Protected Species Database.
- Review of impact assessments associated with nearby developments including wind farms.

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 2.7.1 of Chapter 2 of this EIAR. Table 7-1 Consultation responsesTable 7-1 below provides a list of the organisations consulted with regard to ornithology during the scoping process and notes where scoping responses were received.

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

Table 7-1 Consultation responses

	Consultee	Response	Issues Raised
01	An Taisce	No response	n/a
02	BirdWatch Ireland	No response	n/a
03	Department of Agriculture, Food and the Marine	Response received 10/06/2024	No issues in relation to birds
04	Development Applications Unit (NPWS/NMS)	Response received 24/06/2024	No issues in relation to birds
06	Irish Red Grouse Association	No response	n/a
07	Irish Raptor Study Group	No response	n/a
08	Irish Wildlife Trust	No response	n/a

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 Development was compiled. Bird surveys conducted at the Site were then specifically designed to survey for these target species, in accordance with NatureScot guidance (SNH, 2017). 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).
- Raptors and species that are particularly sensitive to wind farm developments.

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.

7.2.4 Field Surveys

Field surveys were undertaken during the survey period October 2021 – September 2023, consisting of two breeding seasons (April – September) and two non-breeding seasons (October – March). Based on the results of the desk study, consultation and reconnaissance site visits described in the previous sections (Section 7.2.1 to 7.2.3), the assemblage of bird species in the Proposed Wind Farm and the likely importance of the Site for these species was ascertained. Then, adopting a precautionary approach, a site-specific scope for ornithological surveys was devised. The data provided in the field surveys is robust and allows clear, precise and definitive conclusions to be made on the avian receptors identified within the Site.

The survey work that was undertaken between October 2021 and September 2023 forms the core dataset for the assessment of impacts on ornithology. In the absence of specific national bird survey guidelines, the ornithological surveys were designed and undertaken in full accordance with the guidance document 'Recommended bird survey methods to inform impact assessment of onshore wind farms' (SNH, 2017). The various ornithological surveys undertaken at the Site and hinterland are described in detail below. The Proposed Grid Connection was surveyed as part of a multidisciplinary walkover survey (details in Chapter 6 of this EIAR).

7.2.4.1.1 *Vantage Point Surveys*

Vantage point surveys were undertaken in accordance with NatureScot guidance (SNH, 2017) to monitor flight activity within the Site and to a 500m radius of the potential turbine positions. Surveys were conducted from two fixed point vantage points with comprehensive coverage of the Proposed Wind Farm (see Figure 7-1 below). 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.

Viewsheds were calculated using the Visibility Analysis plugin (Version 1.8) over a raster digital elevation model (DEM) in QGIS (Version 3.28) using a notional layer suspended at 25m, is representative of the minimum height considered for the potential collision risk area based on the selected turbine model. Note that while the relevance of being able to view as much of the site to ground level is acknowledged, the NatureScot guidance emphasises the importance of visibility of the 'collision risk volume' when the data is to be used to estimate the risk of collision with turbines by birds. Therefore, the viewshed analysis aims to identify the most suitable locations to site vantage points such that the airspace of the turbine rotor swept area is in view using the fewest possible number of vantage points. The vantage point locations were tested for visibility coverage by creating a point 1.75m in height (to represent the height of the surveyor) on a map using 10m contours terrain data. The relative height of any surrounding landscape features (e.g. trees) and their effects on visibility was also accounted for in the analysis. The software produced a 360° viewshed 25m from ground level up to a 2km radius around the vantage point. This viewshed was then cropped to a 180° arc representing the area visible to the surveyor.

Survey methodology followed SNH (2017). 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 2021 to September 2023 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 watch duration

Survey Season and Number of Vantage Points (VPs)	Effort per Vantage Point (VP)
Winter Season 2021/2022 (2 VPs)	36 hours per VP
Breeding Season 2022 (2 VPs)	36 hours per VP
Winter Season 2022/2023 (2 VPs)	36 hours per VP
Breeding Season 2023 (2 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 a height band 25-200m is considered to be within the Potential Collision Height (PCH) with regard to the turbine swept area (25m-175m). 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.

7.2.4.1.2 Breeding Walkover Surveys

Breeding walkover surveys were undertaken to determine the presence of bird species of high conservation concern and identify probable or confirmed breeding bird activity within the Site and to a 500m radius of this. The methodology was based on O'Brien and Smith (1992) and Gilbert *et al.* (1998), 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[1]. In addition, the presence of any non-target species was recorded to inform the evaluation of supporting habitat.

Breeding walkover surveys were conducted at dawn over four visits during the core breeding season months April to July 2022 and 2023. Survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions for each survey. Figure 7-2 below shows the transect routes.

7.2.4.1.3 Breeding Raptor Surveys

Raptors include all harrier, falcon, buzzard, eagle, hawk, owl, kite and osprey species. Breeding raptor surveys were undertaken within the Site and to a 2km radius to identify occupied territories and monitor their breeding success near or within the Site. Survey methodology followed Hardey *et al.* (2013). Breeding raptor watches of 3 hours (supplemented by transects if necessary) were conducted during daylight at up to eight breeding raptor locations per month. All raptor species observed were recorded and 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. Figure 7-3 below shows the breeding raptor locations.

7.2.4.1.4 Breeding Kingfisher Survey

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

Breeding kingfisher surveys were undertaken along the River Nore, between 250m and 1.4km from the Site. The aim of the survey was to identify breeding kingfisher territories within the survey area by locating kingfishers or signs of nesting along river courses. Survey methodology followed Cummins *et al.* (2010): the surveyor walked along the river course with suitable breeding habitat searching for kingfisher, nest holes or suitable nesting banks during daylight hours. All such observations were recorded and mapped. The river course was surveyed in April and May 2023. An additional kingfisher survey was conducted in May 2025 at the location where the Proposed Grid Connection will cross the River Nore. The survey comprised a search of the riverbanks for existing kingfisher burrows, and an assessment of the habitat suitability of the banks for nesting kingfisher. The survey encompassed the cable crossing location and extended approximately 300m upstream and downstream of this location. Survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions. Figure 7-4 below shows the river courses surveyed.

7.2.4.1.5 Winter Walkover Surveys

Winter walkover surveys were undertaken to record the presence of bird species within the Site and to a 500m radius, including areas between vantage point locations. The methodology was broadly based on methods described in Bibby *et al.* (2000) and SNH (2017). 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 multiple visits between October and March (i.e., four visits in winter 2021/2022 and three visits in winter 2022/2023). Survey effort is presented in Appendix 7-2, including full details of dates, times and weather conditions for each survey. Figure 7-5 below shows the area surveyed.

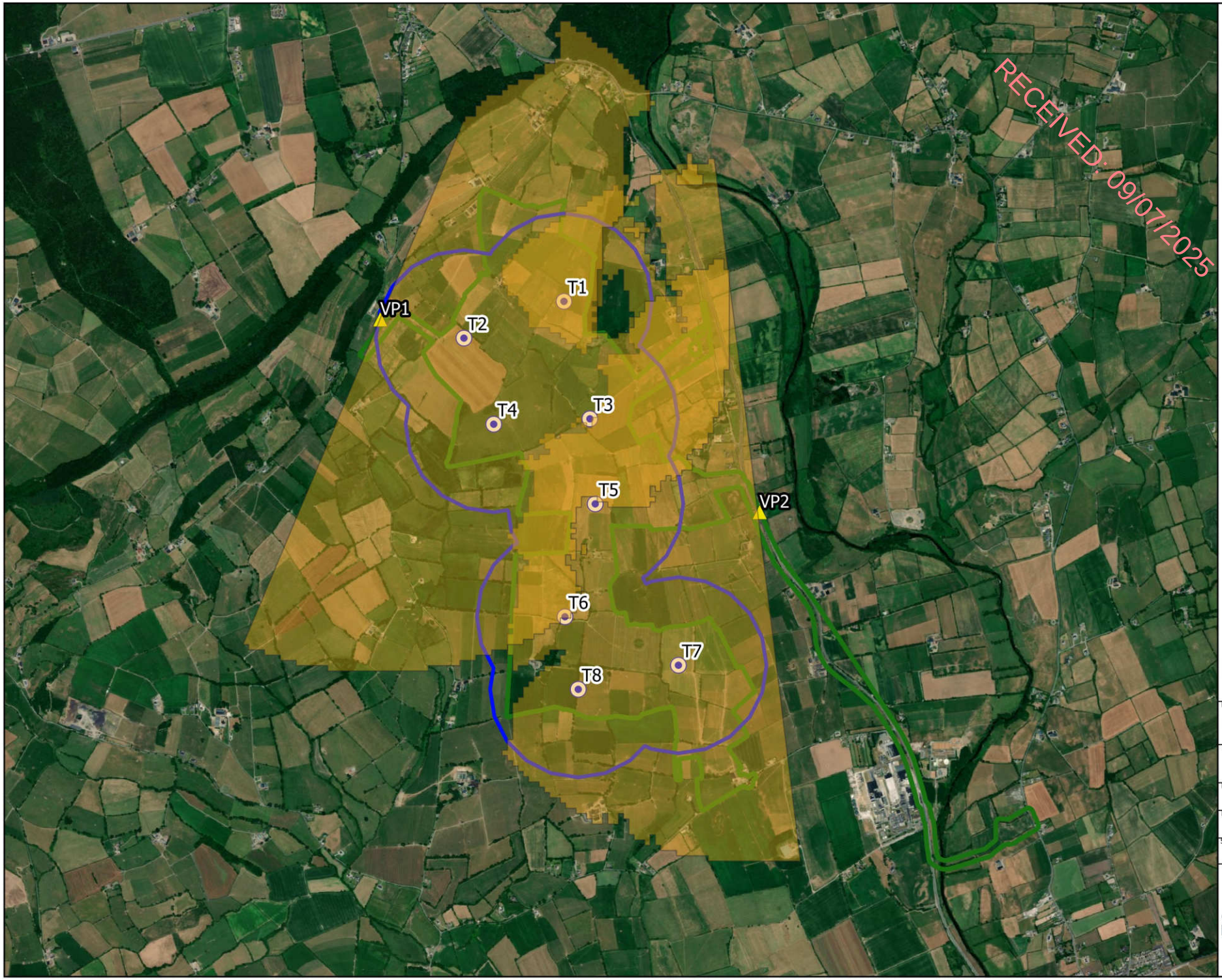
7.2.4.1.6 Waterbird Distribution and Abundance Surveys

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. Significant wetlands and waterbodies within 5km of the Proposed Wind Farm were surveyed for waterbirds during the 2021/2022 and 2022/2023 winter and passage seasons (August to May inclusive) to provide information on their distribution in relation to the Proposed Wind Farm. The area surveyed exceeds the 500m for foraging waterbirds and 1km for roosting waterbirds recommendation of the NatureScot guidance (SNH, 2017) and follows the recommendations of SNH (2016).

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 7-6 below shows the surveyed area.

7.2.4.1.7 Multidisciplinary Walkover Survey

The Proposed Grid Connection was surveyed through a multidisciplinary walkover survey. The site was systematically walked, while the surveyor recorded a range of protected species, including birds. Further details on this survey are available in the Biodiversity Chapter (Chapter 6 of this EIAR).



Map Legend

- Proposed Development
- Proposed Turbine Layout
- 500m Buffer of Proposed Turbine Layout
- Vantage Point Location
- Viewshed at 25m

N

Drawing Title

Vantage Point Survey Locations

Project Title

Seskin Renewables Wind Farm

Drawn By	Checked By
NL	PM
Project No.	Drawing No.
231103	Fig. 7.1
Scale	Date
1:28,000	17/06/2025

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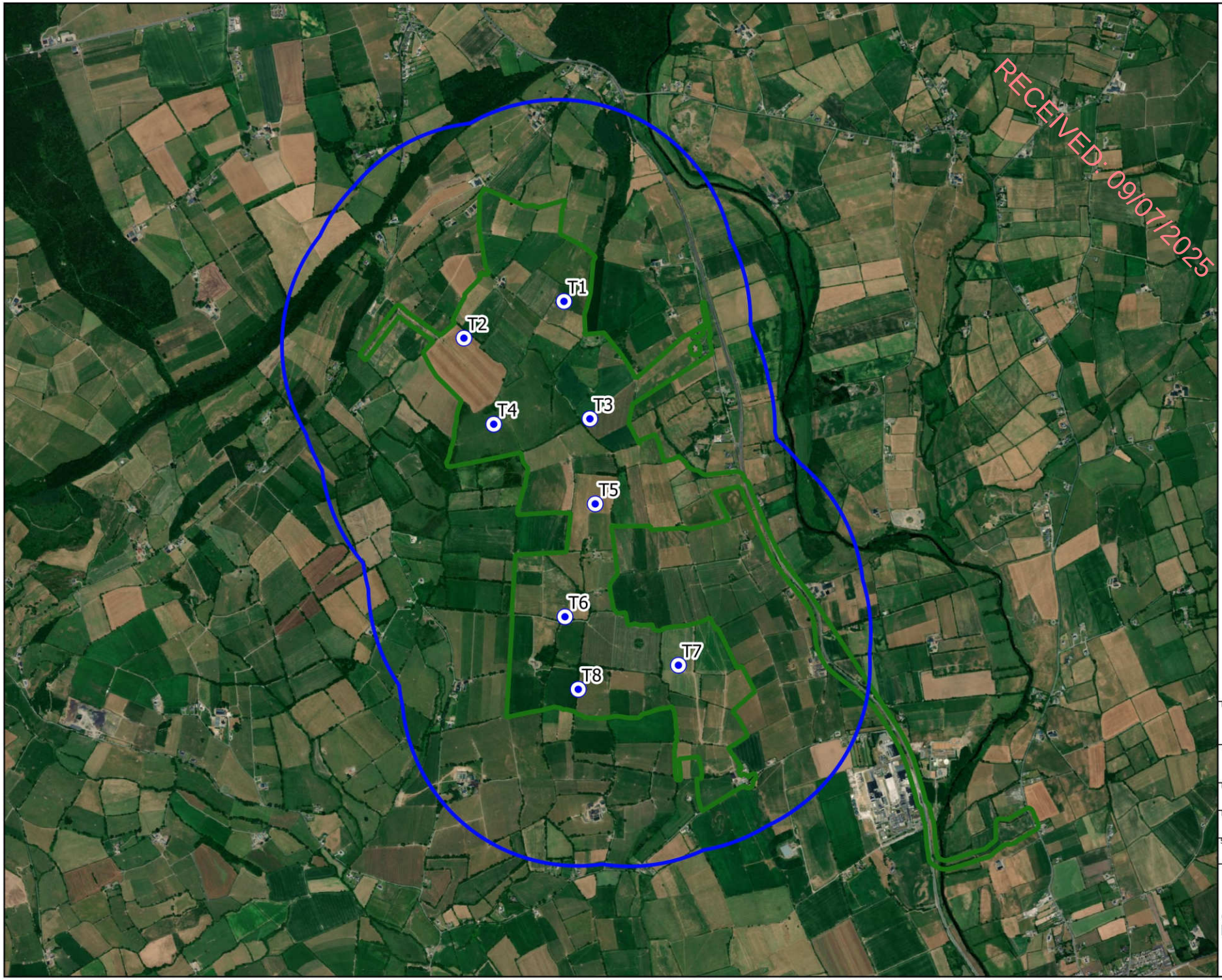

Map Legend

- Proposed Development
- Proposed Turbine Layout
- Survey Area

N

Drawing Title

Breeding Walkover Survey Area

Project Title

Seskin Renewables Wind Farm

Drawn By	Checked By
NL	PM
Project No.	Drawing No.
231103	Fig. 7.2
Scale	Date
1:28,000	17/06/2025

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Map Legend

- Proposed Development
- Proposed Turbine Layout
- Survey Area
- Survey Location

N

Drawing Title

Breeding Raptor Survey Locations

Project Title

Seskin Renewables Wind Farm

Drawn By	Checked By
NL	PM
Project No.	Drawing No.
231103	Fig. 7.3
Scale	Date
1:40,000	17/06/2025

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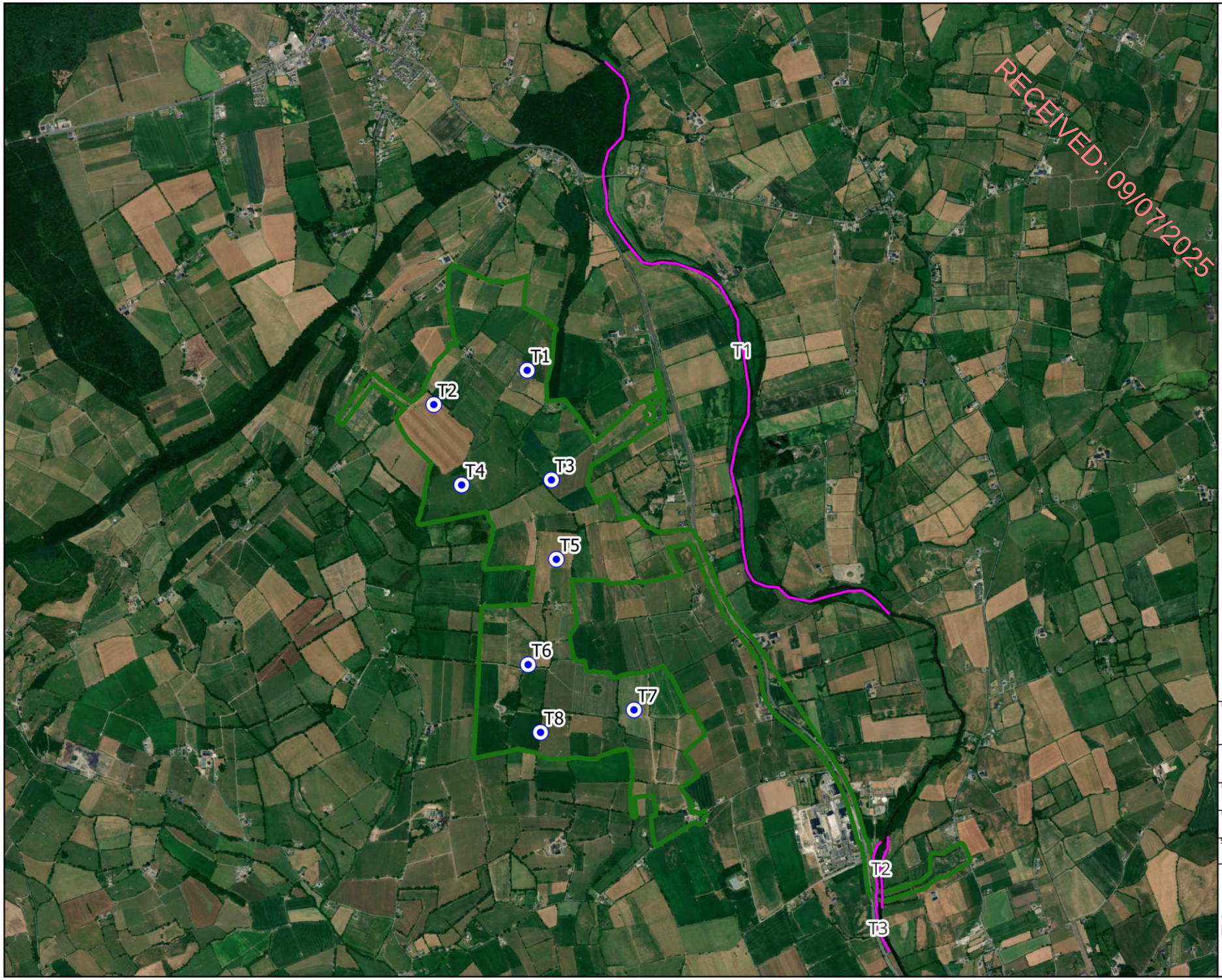

Map Legend

- Proposed Development
- Proposed Turbine Layout
- Transect

N

Drawing Title
Breeding Kingfisher Survey Locations

Project Title
Seskin Renewables Wind Farm

Drawn By	Checked By
NL	PM
Project No.	Drawing No.
231103	Fig. 7.4
Scale	Date
1:30,000	17/06/2025

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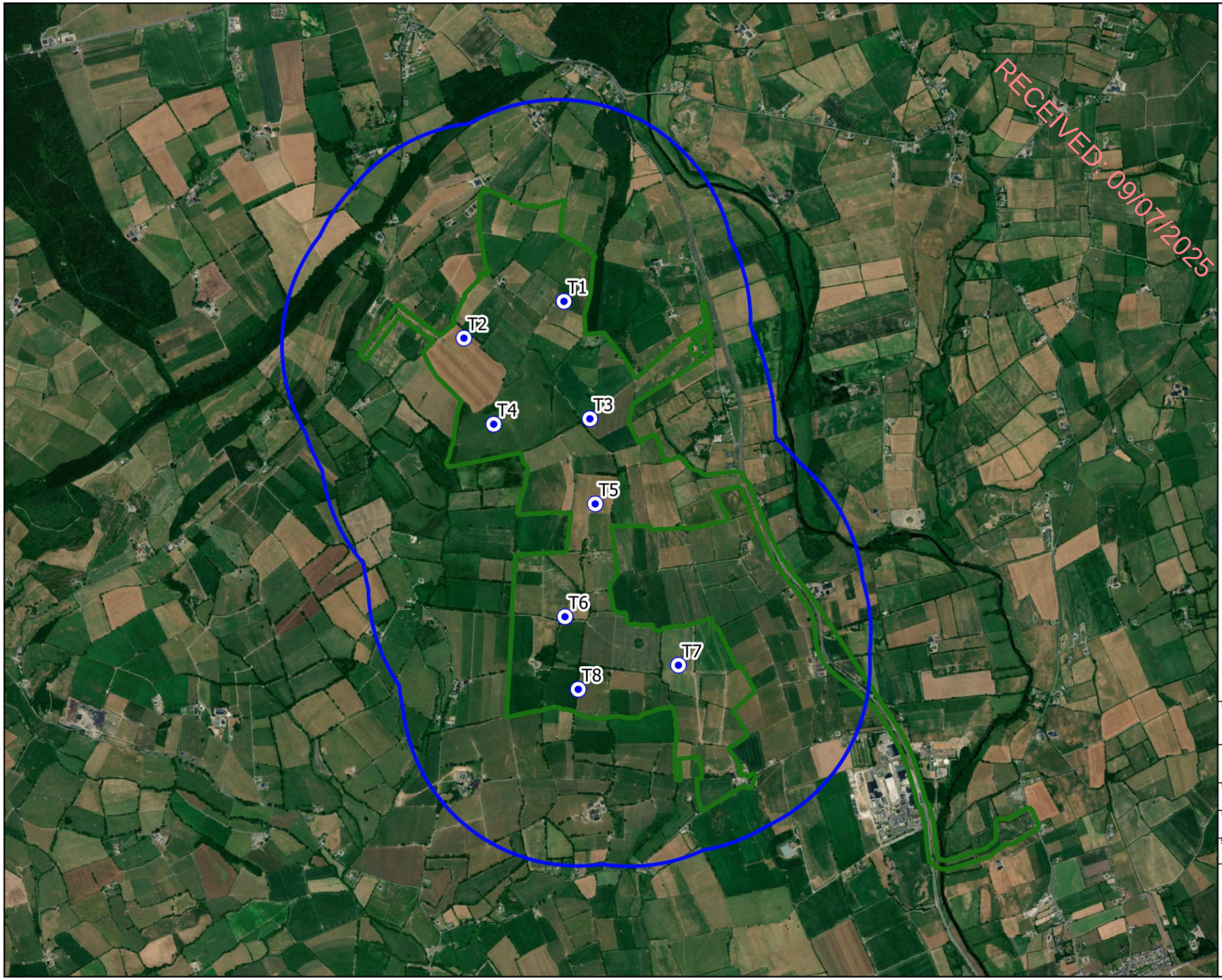

Map Legend

- Proposed Development
- Proposed Turbine Layout
- Survey Area

N

Drawing Title

Winter Walkover Survey Area

Project Title

Seskin Renewables Wind Farm

Drawn By	Checked By
NL	PM
Project No.	Drawing No.
231103	Fig. 7.5
Scale	Date
1:28,000	17/06/2025

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Map Legend

- Proposed Development
- Survey Area
- Proposed Turbine Layout
- Survey Location
- Wetland Survey Area

N

Drawing Title

Waterbird Distribution and Abundance Survey Locations

Project Title

Seskin Renewables Wind Farm

Drawn By	Checked By
NL	PM
Project No.	Drawing No.
231103	Fig. 7.6
Scale	Date
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7.2.5 Receptor Evaluation and Impact Assessment

7.2.5.1 Potential Impacts Associated with Proposed Development

Wind farms present three potential risks to birds (Drewitt and Langston 2006, 2008; *Band et al.*, 2007):

- **Direct habitat loss** due to wind farm infrastructure.
- **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 Development has been used to predict potential impacts of the Proposed Development on birds. 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 (Special Area of Conservation or Special Protection Area) 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 Development 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 and Ornithology chapters of this EIAR, while Percival (2003) has also been followed given its specific focus on birds.

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, Table 7-4 and Table 7-5 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

Significance		Sensitivity			
		Very High	High	Medium	Low
	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. The modelling method used in this collision risk calculation follows the Band Model (Band *et al.,* 2007), as recommended by NatureScot guidance. The Band Model first determines the number of birds transits through the air space swept by the rotor blades of the wind turbines. Then it calculates the collision risk for the birds. The product of the transits multiplied by the collision risk provides a collision rate. An avoidance factor is applied to this to account for birds actively avoiding turbines, providing a final "real world" annual collision rate for each species. See Appendix 7-6 for full details on the collision risk modelling method.

7.2.6 Assessment Justification

7.2.6.1 Survey Data

A comprehensive suite of bird surveys was undertaken at the Site between October 2021 and September 2023. Results derived from a continuous two years of surveying at the Proposed Wind Farm and hinterland, undertaken in line with NatureScot guidance (SNH, 2017), are analysed to inform this assessment. As such, the surveys undertaken provide the information necessary to allow a complete, comprehensive and robust assessment of the potential impacts of the Proposed Development on avian receptors.

7.2.6.2 Mitigation

The Proposed Development 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 Development 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 7.6 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 Development. 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 Development

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 Development 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 and nationally designated sites. 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 of the Proposed Development 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 this case, no potential for direct or indirect impacts for species listed as SCIs of SPAs more than 15km from the Proposed Development was identified.

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 Development 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.

One SPA was located within 15km of the Proposed Development. The SPA is listed and summarised in Table 7-6. Apart than sites which are encompassed by the SPA, no other nationally designated sites of ornithological significance occur within the potential ZOI.

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 Summary
Special Protection Area				
River Nore SPA	360m from the Proposed Wind Farm	› Kingfisher (*Alcedo atthis*) [A229]	Detailed First Order Site-specific conservation objectives for this site, (12/10/2022), were reviewed as part of the assessment and are available at: www.npws.ie	A complete source-pathway-receptor chain was identified and in the absence of mitigation, there is potential for the Proposed Development to result in likely significant effects on this European Site. The SPA is considered to be within the Likely Zone of Influence of the Proposed Development and 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 Site lies within hectad S47. 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 for species of conservation interest for hectad S47.

Species Name	Breeding Atlas 1968-1972	Breeding Atlas 1988-1991	Breeding Atlas 2007-2011
Barn Owl	Probable	-	-
Buzzard	-	-	Probable
Common Tern	-	Breeding	-
Corncrake	Confirmed	Seen	-
Curlew	Confirmed	Seen	-
Golden Plover	-	-	-
Grey Partridge	Confirmed	-	-
Grey Wagtail	Confirmed	Breeding	Confirmed
Hen Harrier	Confirmed	-	-
Kestrel	Probable	Breeding	Possible
Kingfisher	Confirmed	Seen	Confirmed
Lapwing	Possible	Breeding	-
Little Egret	-	-	Possible
Long-eared Owl	Possible	-	Possible
Meadow Pipit	Confirmed	Breeding	Confirmed
Red-breasted Merganser	-	Breeding	-
Redshank	-	Seen	-
Redwing	-	-	-
Snipe	Confirmed	Breeding	Possible
Sparrowhawk	Confirmed	Breeding	Probable
Stock Dove	Confirmed	Breeding	
Swift	Confirmed	Seen	Confirmed
Woodcock	Probable	-	-
Yellowhammer	Confirmed	Breeding	Possible

Table 7-8 Wintering Bird Atlas data for species of conservation interest for hectad S47.

Species Name	Wintering Atlas 1981-1984	Wintering Atlas 2007-2011
Buzzard	-	Present
Curlew	Present	Present
Golden Plover	Present	Present
Grey Wagtail	Present	Present
Kestrel	Present	Present

Species Name	Wintering Atlas 1981-1984	Wintering Atlas 2007-2011
Kingfisher	Present	Present
Lapwing	Present	Present
Meadow Pipit	Present	Present
Redwing	Present	Present
Snipe	Present	Present
Sparrowhawk	-	Present
Stock Dove	Present	-
Woodcock	Present	-
Yellowhammer	Present	Present

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 Wind Farm is located within an area where no data is provided for bird sensitivity to wind energy developments. The Proposed Wind Farm is 25km from the nearest area of high sensitivity.

7.3.4 Irish Wetland Bird Survey Records

The Irish Wetland Bird Survey (I-WeBS), coordinated by BirdWatch Ireland, monitors wintering waterbird populations at their wetland sites across Ireland. I-WeBS site locations are available at https://birdwatchireland.ie/our-work/. Datasets for the I-WeBS sites within 25km of the Proposed Development were sourced from www.birdwatchireland.ie and reviewed. These included:

- Avonmore Ponds, Ballyragget, Co. Kilkenny
- Durrow Curragh (River Erkina), Co. Laois

7.3.5 Rare and Protected Species Dataset

An information request was sent to NPWS requesting records from the Rare and Protected Species Database. The following records were obtained from the NPWS on the 23rd of April 2025. The following species were recorded as present in hectad S47 in which the Site is located:

- Kingfisher
- Grey Wagtail
- Little Egret

7.3.6 Field Survey Results

The target species recorded within the potential ZOI of the Proposed Wind Farm during field surveys are listed in Table 7-9, along with a summary of breeding and winter status. The following sections describe the records of each target species under the individual survey headings.

Table 7-9 Target species recorded in the Potential ZOI of the Proposed Development

Species	Overall breeding status	Overall wintering status
Golden Plover	**Non-breeding.** There was no evidence of breeding at the site during surveys.	**No regularly used roosts identified.** There was no evidence of roosting at the site during surveys
Kingfisher	**Non-breeding.** There was no evidence of breeding at the site during surveys. However, probable breeding sites were identified along the River Nore SPA.	**No regularly used roosts identified.** There was no evidence of roosting at the site during surveys
Little Egret	**Non-breeding.** There was no evidence of breeding at the site during surveys.	**No regularly used roosts identified.** There was no evidence of roosting at the site during surveys
Peregrine	**Confirmed Breeding.** There was a breeding territory identified 2.5km from the nearest proposed turbine in both 2022 and 2023.	**No regularly used roosts identified.** There was no evidence of roosting at the site during surveys
Whooper Swan	**Non-breeding.** There was no evidence of breeding at the site during surveys.	**Confirmed roosting.** In 2022, roosting was observed in three separate grasslands approximately 3km-4km from the nearest proposed turbine.
Curlew	**Non-breeding.** There was no evidence of breeding at the site during surveys.	**No regularly used roosts identified.** There was no evidence of roosting at the site during surveys
Kestrel	**Confirmed Breeding.** There was two probable breeding territories identified in 2022. In 2023, there was one probable and one confirmed territory identified.	**No regularly used roosts identified.** There was no evidence of roosting at the site during surveys
Lapwing	**Non-breeding.** There was no evidence of breeding at the site during surveys.	**No regularly used roosts identified.** There was no evidence of roosting at the site during surveys
Snipe	**Non-breeding.** There was no evidence of breeding at the site during surveys.	**No regularly used roosts identified.** There was no evidence of roosting at the site during surveys
Woodcock	**Non-breeding.** There was no evidence of breeding at the site during surveys.	**No regularly used roosts identified.** There was no evidence of roosting at the site during surveys
Buzzard	**Confirmed Breeding.** In 2022, there was one confirmed breeding territories identified and six probable territories. In 2023, there were five confirmed territories.	**No regularly used roosts identified.** There was no evidence of roosting at the site during surveys
Sparrowhawk	**Non-breeding.** There was no evidence of breeding at the site during surveys.	**No regularly used roosts identified.** There was no evidence of roosting at the site during surveys
Grey Wagtail	**Non-breeding.** There was no evidence of breeding at the site during surveys.	**No regularly used roosts identified.** There was no evidence of roosting at the site during surveys
Meadow Pipit	**Probable Breeding.** In 2022 there was probable breeding observed on habitats within the site.	**No regularly used roosts identified.** There was no evidence of roosting at the site during surveys
Redwing	**Non-breeding.** There was no evidence of breeding at the site during surveys.	**No regularly used roosts identified.** There was no evidence of roosting at the site during surveys

Species	Overall breeding status	Overall wintering status
Stock Dove	**Non-breeding.** There was no evidence of breeding at the site during surveys.	**No regularly used roosts identified.** There was no evidence of roosting at the site during surveys
Yellowhammer	**Non-breeding.** There was no evidence of breeding at the site during surveys.	**No regularly used roosts identified.** There was no evidence of roosting at the site during surveys

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 breeding walkover survey records
- Summary of breeding raptor survey records
- Summary of winter walkover survey records
- Summary of waterbird distribution and abundance survey records
- Summary of non-target species records

7.3.6.1 Golden Plover

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

Vantage Point Surveys

Golden plover were observed on six occasions during vantage point surveys (see Appendix 7-4, Figure 7-4-1). Golden plover were observed on average once every 48 hours of vantage point survey. The majority of observations were of flocks during the winter of between 1 and 130 birds travelling and landing in agricultural fields to feed. There was one observation during the migration period (April) of a flock of 65 birds commuting over the Site. All observations were within 500m of the proposed turbine layout and three observations were within the potential collision height.

Waterbird Distribution and Abundance Surveys

Golden plover were observed on 11 occasions during waterbird distribution and abundance surveys, and on approximately 22% of survey dates (see Appendix 7-4, Figure 7-4-2). The average number of birds per observation was 144, with a peak of 450 birds. Golden plover was recorded between approximately 3.7km and 6.7km from the nearest proposed turbine, with the majority of observations occurring in fields along the River Nore. Observations were of flocks commuting, landed within fields and roosting.

7.3.6.2 Kingfisher

Kingfisher were observed in the breeding season. Raw survey data and maps are provided in Appendix 7-4. Survey data and maps relating to nests are provided in Confidential Appendix 7-5.

Breeding Kingfisher Surveys

Kingfisher were observed on five occasions during breeding kingfisher surveys in 2023 and 2025 (see Appendix 7-4, Figure 7-4-3). Surveys were carried out along the River Nore, adjacent to the Proposed Wind Farm in 2023 and where the Proposed Grid Connection crossed the River Nore in 2025. Suitable nesting habitat was identified within the survey area in several areas during the 2023 surveys, the closest of which was 950m from the proposed turbine layout. Suitable nesting habitat is provided in Appendix

7-5, Figure 7-5-1. Most observations were of individuals calling or travelling. There was one observation of two kingfisher, with a male perched and a second bird calling from the riverbank below. This observation indicates a probable nest in this location.

During the breeding kingfisher survey at the crossing point of the Proposed Grid Connection and the River Nore no nesting burrows were recorded within the survey area. The majority of bank habitat within the survey area was assessed as unsuitable nesting habitat for kingfisher (i.e. shallow sloping banks; densely overgrown with no exposed substrate or steep/vertical faces present). A minor section (c.10m) of sub-optimal nesting habitat was identified on the western bank within the cable crossing area (where there has been erosion of a section of bank leaving an exposed sloping soil face extending approximately 1m above water level at time of survey). An additional section of suitable nesting habitat was recorded approximately 130m upstream of the cable crossing location. No burrows were recorded at these locations.

Waterbird Distribution and Abundance Surveys

Kingfisher were observed on two occasions during waterbird distribution and abundance surveys (see Appendix 7-4, Figure 7-4-4). The observations were of individuals travelling on the River Nore, approximately 2.8km from the nearest proposed turbine. Both observations were in April 2022.

7.3.6.3 Little Egret

Little egret were observed in the breeding and winter season. Raw survey data and maps are provided in Appendix 7-4.

Vantage Point Surveys

Little egret were observed on three occasions during vantage point surveys (see Appendix 7-4, Figure 7-4-5). Little egret were observed on average once every 96 hours of vantage point surveys. Observations were of one or two birds travelling or soaring. There was only one observation within 500m of the proposed turbine layout and two observations were within the potential collision height.

Winter Walkover Surveys

Little egret were observed on two occasions during winter walkover surveys, both of which were on the same survey date (see Appendix 7-4, Figure 7-4-6). Observations were of between one and six birds foraging in wet grassland along the banks of the River Nore, approximately 980m from the nearest proposed turbine

Waterbird Distribution and Abundance Surveys

Little egret were observed on 54 occasions during the waterbird distribution and abundance surveys. Little egret were observed on 23 of the 36 survey dates. The majority of observations were recorded during the surveys from October to March. Two observations were observed in April 2023 and there was one observation in September 2022 (see Appendix 7-4, Figure 7-4-7). Observations ranged from one to ten birds, with an average of three birds per observation. Little egret was observed travelling, roosting and foraging between 1km and 6.4km from the nearest proposed turbine. The majority of observations were along the River Nore, or adjacent fields.

7.3.6.4 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 identified breeding territories are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Peregrine were observed on four occasions during the vantage point surveys, or on average once every 72 hours of vantage point surveys (see Appendix 7-4, Figure 7-4-8). Observations were of individuals hunting or travelling. Three observations were within 500m of the proposed turbine layout and three observations were within potential collision height.

Breeding Walkover Surveys

Peregrine were observed on only one occasion during the breeding walkover surveys (see Appendix 7-4, Figure 7-4-9). This observation was of an individual hunting adjacent to the Site, approximately 300m from the nearest proposed turbine.

Breeding Raptor Surveys

Peregrine were observed on 14 occasions during breeding raptor surveys (see Appendix 7-4, Figure 7-4-10). Thirteen of these observations were at Aharney, with the remaining observation being near Durrow. The majority of observations were associated with a confirmed nest in a quarry, 2.5km from the nearest proposed turbine. Breeding was confirmed at this location in 2022 with two adult birds carrying food for young and a third displaying agitated behaviour and mobbing other birds. In May 2023 a fledgling was observed flying within the quarry, confirming successful breeding again in 2023. Observations relating to breeding behaviour are presented in Confidential Appendix 7-5, Figure 7-5-2 and the breeding territory location is presented in Confidential Appendix 7-5, Figure 7-5-3. The remaining observations were of individuals hunting, travelling or flying around the breeding territory.

7.3.6.5 Merlin

Merlin were observed in the winter season. Raw survey data and maps are provided in Appendix 7-4.

Incidental Observations

There was one incidental observation of a merlin during the waterbird distribution and abundance surveys (see Appendix 7-4, Figure 7-4-11). This observation was of an individual male hunting near the Erkina River, approximately 4.8km from the nearest proposed turbine.

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

7.3.6.6 Whooper Swan

Whooper swans were observed in the winter season. Raw survey data and maps are provided in Appendix 7-4.

Vantage Point Surveys

Whooper swan were observed on four occasions (on average once every 72 hours of vantage point surveys) (see Appendix 7-4, Figure 7-4-12). Observations were of between 5 and 16 birds travelling through the site from north to south, roughly following the direction of the River Nore. All observations were within 500m of the proposed turbine layout, however, only one observation was within the potential collision height.

Winter Walkover Surveys

Whooper swan were observed on only one occasion during the seven winter walkover surveys (see Appendix 7-4, Figure 7-4-13). This observation was of six birds foraging in arable fields south of the Site, approximately 1.4km from the nearest proposed turbine.

Waterbird Distribution and Abundance Surveys

Whooper swan were observed on 56 occasions during the of waterbird distribution and abundance surveys (see Appendix 7-4, Figure 7-4-14). Whooper swan were observed on 22 of the 36 survey dates, and only within the core winter months of October to March. November had the highest number of observations. The average number of birds per observation was 35, with a peak of 160 birds. Whooper swans were recorded travelling, roosting and foraging between 1.2km and 6.5km from the nearest proposed turbine. The majority of observations were at Black Island and the Durrow Curragh, along the Erkina River. In 2022, roosting was observed in agricultural grassland south of the Site, between 3km and 4km from the nearest proposed turbine, with flock of between 6 and 28 birds being observed.

Incidental Observations

Whooper swan were observed on two occasions as incidental observations. Two flocks of 25 and 55 were observed foraging on improved agricultural grassland 1.4km and 5.4km from the nearest proposed turbine (see Appendix 7-4, Figure 7-4-15).

7.3.6.7 Curlew

Curlew were observed in the winter season. Raw survey data is provided in Appendix 7-4.

Waterbird Distribution and Abundance Surveys

Curlew were observed on five occasions during waterbird distribution and abundance surveys, on 4 of the 36 survey days. The average number of birds per observation was 21, with a peak of 40 birds. Observations were of birds flying and foraging. Curlew were observed between 4.7km and 6.5km from the nearest proposed turbine. Observations were at Durrow Curragh and Newtown.

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

7.3.6.8 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 identified breeding territories are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Kestrel were observed on 64 occasions during vantage point surveys (see Appendix 7-4, Figure 7-4-16). Kestrel were observed on average once every 22 hours of vantage point survey. Most observations were of individual birds travelling, perched or hunting. There was one observation of a female carrying prey in March 2023, however given the time of the year it is unlikely to be associated with provisioning a nest and the bird was likely carrying prey to a nearby plucking post. There were 43 observations within 500m of the proposed turbine layout and there were 17 observations within the potential collision height.

Breeding Walkover Surveys

Kestrel were observed on 12 occasions during breeding walkover surveys (kestrel were observed on 50% of survey days) (see Appendix 7-4, Figure 7-4-17). Ten of the 12 observations were within 500m of the proposed turbine layout. The majority of observations were of one or two birds hunting or travelling. In July 2022 there was one observation of two birds hunting together in improved agricultural grassland, given the time of year this could potentially be an adult teaching a juvenile to hunt as kestrel do not usually hunt together. These birds likely originated form a nest in the wider area surrounding the Site, however the exact location cannot be confirmed.

Breeding Raptor Surveys

Kestrel were observed on 43 occasions during breeding raptor surveys (see Appendix 7-4, Figure 7-4-18). Kestrel were observed on average twice per survey conducted and were observed at most survey locations. The majority of observations were of one or two birds and were of birds hunting or travelling. There were five observations of kestrel within 500m of the proposed turbine layout. There were six observations relating to breeding behaviour, three in 2022 and three in 2023. In 2022, a pair were observed displaying twice during a survey approximately 600m from the nearest turbine, indicating probable breeding (Ref: K.-a). Additionally, in 2022, there was an observation of agitated behaviour with a kestrel mobbing a buzzard approximately 3.8km from the nearest proposed turbine, indicating a probable breeding territory (Ref: K.-b). In June and July 2023 an individual was observed alarm calling on two occasions, once while in pursuit of a buzzard, indicating probable breeding at this location, approximately 2km from the nearest turbine (Ref: K-c). In July 2023 there was one observation of a male provisioning a nest within the Site, approximately100m from the proposed entrance road and 700m from the nearest turbine (Ref: K-d). Observations relating to breeding behaviour are presented in the Confidential Appendix 7-5, Figure 7-5-4.

Winter Walkover Surveys

Kestrel were observed on five occasions during the winter walkover surveys (on four of the seven survey dates) (see Appendix 7-4, Figure 7-4-19). These observations were of one or two birds travelling or perched. Of the observations that were mapped, two were within 500m of the proposed turbine layout.

Incidental Observations

Kestrel were observed on six occasions as incidental observations (see Appendix 7-4, Figure 7-4-20). Observations were of individuals hunting, travelling or perched and were between approximately 1km and 5.2km from the proposed turbine layout.

Breeding Summary

Breeding territories are mapped in Appendix 7-5, Figure 7-5-5. The identified territories in each breeding season are summarised below.

- **2022 (Two territories) –** Two probable breeding territories (Refs: K.-a and K.-b) approximately 600m and 3.8km from the nearest proposed turbine.
- **2023 (Two territories) –** One probable breeding territory (Ref: K.-c) approximately 2.2km from the nearest proposed turbine and one confirmed breeding territory (Refs: K.-d) approximately 700m from the nearest proposed turbine.

7.3.6.9 Lapwing

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

Waterbird Distribution and Abundance Surveys

Lapwing were observed on 35 occasions during waterbird distribution and abundance surveys, on 17 of the 36 survey days (see Appendix 7-4, Figure 7-4-21). The average number of birds per observation was 67, with a peak of 320 birds. Observations were of birds flying, foraging and roosting. Lapwing were observed between 1.7km and 6.4km from the nearest proposed turbine. The majority of observations occurring along the River Nore and Erkina River, or within fields adjacent to these rivers.

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

7.3.6.10 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 six occasions during vantage point surveys (see Appendix 7-4, Figure 7-4-22). Snipe were observed on average once every 48 hours of vantage point survey. All observations were between October 2021 and January 2022. Observations were of individuals flying or calling. All observations were within 500m of the proposed turbine layout and only two observations were within the potential collision height.

Breeding Walkover Surveys

Snipe were observed on three occasions during breeding walkover surveys, on only 2 of the 16 survey days (see Appendix 7-4, Figure 7-4-23). The observations were of individual birds flying, calling and landing between 400m and 800m from the nearest proposed turbine. There were no observations within areas where infrastructure is proposed.

Winter Walkover Surveys

Snipe were observed on 20 occasions during winter walkover surveys, on five of the seven survey days (see Appendix 7-4, Figure 7-4-24). observations ranged from 1 to 24 birds, with the majority of observations being of between one and three birds. There were 11 observations within the Site, with the remaining observations being up to 600m from the Site.

Waterbird Distribution and Abundance Surveys

Snipe were observed on 19 occasions during waterbird distribution and abundance surveys, on 28% of survey days (see Appendix 7-4, Figure 7-4-25). Observations ranged from 1 to 26 birds, with an average flock size of five birds. Snipe was observed between 950m and 5.8km from the nearest proposed turbine. The majority of observations occurring along the River Nore, or in adjacent fields. Observations were of birds being flushed by the surveyor or flying.

7.3.6.11 Woodcock

Woodcock were observed in the winter season. Raw survey data and maps are provided in Appendix 7-4.

Winter Walkover Surveys

Woodcock were observed on two occasions during the winter walkover survey (on only one survey day) (see Appendix 7-4, Figure 7-4-26). These observations were of individuals flushed by the surveyor 750m and 1km from the nearest proposed turbines.

7.3.6.12 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 identified breeding territories are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Buzzard were observed on 175 occasions during vantage point surveys (see Appendix 7-4, Figure 7-4-27). Buzzard were regularly observed (on average once every 1.6 hours of survey). The majority of observations were of between one and three birds travelling, perched, calling or hunting. There were 127 observations within 500m of the proposed turbine layout and 53 observations were within the potential collision height. There were three observations relating to breeding activity with an additional 11 observations of juveniles in 2022 and 13 observations in 2023.

In 2022, there was one probable territory, and one confirmed territory identified. In February 2022 a pair were observed circling before chasing a third buzzard away from a probable breeding territory (Ref: BZ-a, 1.1km from the nearest proposed turbine). Furthermore, in March in the same area (Ref: BZ-a) a pair of buzzard were observed soaring and calling. In July 2022, a chick was observed in a nest (Ref: BZ-b, 150m from the nearest proposed turbine), confirming breeding at this location. Additionally, in August a juvenile was heard calling on two occasions close to this nest. In July an adult buzzard was observed catching and carrying off prey approximately 800m south of this nest (Ref: BZ-b), it is assumed that this bird was provisioning this nest given the separation distance although the bird was lost from view and was not seen entering the nest. Throughout August, September and October there were observations of juvenile birds flying, calling and foraging during vantage point surveys throughout the site. Given that these birds were highly mobile at this stage, the origins of these birds are unknown, however it indicates successful breeding in the wider area, likely from one of the two identified territories discussed above.

In 2023, there was two confirmed and one probable breeding territories identified during vantage point surveys. In May 2023, an individual was observed flying and circling over a probable nest site, 180m from the nearest proposed turbine (Ref: BZ-c). In July, there were two observations of provisioning adults carrying rats, confirming a nest within trees along the banks of the River Nore (Ref: BZ-d, 1.4km from the nearest proposed turbine). Chicks were observed calling frequently throughout the survey at this location. In August and September there were observations of adults modelling short flights to encourage fledgelings to fly. Fledgelings were also observed calling for food, hunting and flying. Given that these birds were mobile at this stage, the origins of these birds is unknown, however it indicates successful breeding in the wider area, likely from one of the three identified territories discussed above (Ref: BZ-c, BZ-d).

Observations relating to breeding behaviour are presented in Appendix 7-5, Figure 7-5-6.

Breeding Walkover Surveys

Buzzard were observed on 23 occasions during breeding walkover surveys (on 13 of 16 survey days) (see Appendix 7-4, Figure 7-4-28). Observations were of between one and four birds, with the majority of observations being were of birds travelling or hunting. There was no breeding evidence observed in 2022. There were four observations indicative of breeding activity in 2023.

In 2023 there were four observations relating to breeding activity in an area previously discussed for vantage point surveys above (Ref: BZ-c, adjacent to the Site), these observations confirm breeding at this location. In May, there were two observations of a bird showing agitated behaviour at this location. In June, in the same area two fledged young were observed calling along with two adults in a nest in a hedgerow. In July these juveniles were observed flying and calling. Additionally in July, there was one observation of a juvenile buzzard calling and flying to the north of the Site. Given that these birds were mobile at this stage, the origins of these birds is unknown, however it indicates successful breeding in the wider area, likely from one of the identified territories discussed above. Observations relating to breeding behaviour are presented in Appendix 7-5, Figure 7-5-7.

Breeding Raptor Surveys

Buzzard were observed on 151 occasions during breeding raptor surveys (buzzards were observed at all survey locations and on average, six birds per survey) (see Appendix 7-4, Figure 7-4-29). Observations were of one or two individuals and the majority were of birds travelling, calling or hunting.

In 2022, there were five observations relating to breeding activity. There were five probable territories identified (Ref: BZ-e, BZ-f, BZ-g, BZ-h and BZ-i). In May, a pair of buzzards were observed displaying approximately 1.7km from the nearest proposed turbine, indicating probable breeding at this location (Ref: BZ-e). In July, there were three observations of buzzard visiting probable nests in three separate locations (BZ-f, BZ-g and BZ-h; 2km, 2.3km and 2.6km from the nearest proposed turbine respectively). The remaining observation was of an individual showing agitated behaviour and calling, indicating probable breeding in the area (Ref: BZ-i; 1km from the nearest proposed turbine).

In 2023, there were 14 observations of breeding behaviour. There were three territories confirmed during breeding raptor surveys (Ref: BZ-i, BZ-j, BZ-k). At territory BZ-i, 1km from the proposed turbine layout, there was one observation of a territorial male chasing another buzzard, three observations of adults provisioning the nest and one observation of a bird calling from the nest. This confirms breeding at this location. At territory BZ-j, there were three observations, the first of which was of a pair displaying to the north of the nest location. Later in the season, there was observations of the female leaving the nest and a male provisioning the nest, confirming breeding at this location, 1.7km from the nearest proposed turbine. In May, there was one observation of a bird provisioning a nest in a line of sitka spruce (Ref: BZ-k; 2km from the nearest proposed turbine), confirming breeding at this location. The remaining observations were related to confirmed breeding territory BZ-d, discussed previously, with birds observed showing territorial behaviour and provisioning a nest.

Observations relating to breeding behaviour are presented in Appendix 7-5, Figure 7-5-8.

Winter Walkover Surveys

Buzzard were observed on 14 occasions during winter walkover surveys (on average, 2 birds per survey) (see Appendix 7-4, Figure 7-4-30). All observations were of one or two birds calling, travelling, perched or hunting.

Incidental Observations

Buzzard were observed on 20 occasions as incidental observations (see Appendix 7-4, Figure 7-4-31). Observations were of between one and three birds travelling, soaring or calling. Observations were between 750m and 6km from the nearest proposed turbine.

Breeding Summary

Breeding territories are mapped in Appendix 7-5, Figure 7-5-9. The identified territories in each breeding season are summarised below.

2022

- **BZ-a** – Probable breeding territory identified during the 2022 breeding season. Located on the far side of the River Nore from the Site, approximately 1.1km from the nearest proposed turbine.
- **BZ-b** – Confirmed breeding territory during the 2022 breeding season. Located within the Site, approximately 150m from the nearest proposed turbine.
- **BZ-e** - Probable breeding territory located 1.7km from the nearest proposed turbine.
- **BZ-f** – Probable breeding territory located 2km from the nearest proposed turbine.
- **BZ-g** – Probable breeding territory located 2.3km from the nearest proposed turbine.
- **BZ-h** – Probable breeding territory located 2.6km from the nearest proposed turbine.

2023

- **BZ-c** – Confirmed breeding territory during located adjacent to the site and180m from the nearest proposed turbine.
- **BZ-d** – Confirmed breeding territory during the 2023 breeding season. Located adjacent to the River Nore, approximately 1.4km from the nearest proposed turbine and 80m from the Proposed Grid Connection.
- **BZ-j** –Confirmed breeding territory located 1.7km from the nearest proposed turbine.
- **BZ-k** –Confirmed breeding territory located 2km from the nearest proposed turbine.

2022/2023

- **BZ-i –** Probable breeding territory in 2022 and Confirmed breeding territory during the 2023 breeding season. Located 1km from the nearest proposed turbine.

7.3.6.13 Sparrowhawk

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

Vantage Point Surveys

Sparrowhawk were observed on 12 occasions during the vantage point surveys, or on average once every 24 hours of vantage point survey (see Appendix 7-4, Figure 7-4-32). Observations were of individuals hunting, flying or perched. There were nine observations within 500m of the proposed turbine layout and seven observations were within the potential collision height.

Breeding Walkover Surveys

Sparrowhawk were observed on three occasions during breeding walkover surveys, or on average 19% of surveys (see Appendix 7-4, Figure 7-4-33). All observations were of individuals hunting or travelling

over improved agricultural grassland and hedgerows, between 200m and 850m from the nearest proposed turbine. There were no observations of breeding behaviour during these surveys.

Breeding Raptor Surveys

Sparrowhawk was observed on eight occasions during breeding raptor surveys at three of the eight survey locations and on average, on 35% of surveys (see Appendix 7-4, Figure 7-4-34). All observations were of individual birds hunting or travelling between 180m and 1.6km from the nearest proposed turbine. There were no observations of breeding behaviour during these surveys.

Winter Walkover Surveys

Sparrowhawk was observed on three occasions during winter walkover surveys, with all observations occurring on the same date (see Appendix 7-4, Figure 7-4-35). The observations were of individuals hunting over improved agricultural grassland and two observations were within 500m of the proposed turbine layout.

Incidental Observations

Sparrowhawk was observed on one occasion as an incidental observation. An individual was observed travelling 4.7km from the nearest turbine (see Appendix 7-4, Figure 7-4-36).

7.3.6.14 Grey Wagtail

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

Vantage Point Surveys

Grey wagtail were observed on three occasions during vantage point surveys (see Appendix 7-4, Figure 7-4-37). Grey wagtail were observed on average once every 96 hours of vantage point surveys. All observations were of individual birds travelling, with two observations being within 500m of the proposed turbine layout. No observations were recorded within the potential collision height.

Breeding Walkover Surveys

Grey wagtail were observed on four occasions during breeding walkover surveys (on 4 of the 16 survey dates) (see Appendix 7-4, Figure 7-4-38). All observations were of one or two birds foraging, calling or landed. There were no observations within 500m of the proposed turbine layout.

Winter Walkover Surveys

Grey wagtail were observed on only one occasion during winter walkover surveys (see Appendix 7-4, Figure 7-4-39). This observation was of an individual perched in wet grassland approximately 950m from the nearest proposed turbine.

Waterbird Distribution and Abundance Surveys

Grey wagtail were observed on 31 occasions during waterbird distribution and abundance surveys, on 58% of survey dates (see Appendix 7-4, Figure 7-4-40). Observations ranged from one to five birds, with an average of two birds. Grey wagtail observed between 1km and 6.5km from the nearest proposed turbine with the majority of observations occurring along the River Nore and Erkina River.

Incidental Observations

Grey wagtail were observed on three occasions as incidental observations. Observations were individual birds foraging, calling or flying. All observations were between 1.5km and 2km from the proposed turbine layout (see Appendix 7-4, Figure 7-4-41).

7.3.6.15 Meadow Pipit

Meadow pipit 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 identified breeding territories are provided in Confidential Appendix 7-5.

Vantage Point Surveys

Meadow pipit were observed on three occasions during vantage point surveys (see Appendix 7-4, Figure 7-4-42). Meadow pipit were observed on average once every 96 hours of vantage point survey. All observations were of between one and six birds flying. Two of these observations were within 500m of the proposed turbine layout. No observations were recorded within the potential collision height.

Breeding Walkover Surveys

Meadow pipit were observed on 15 occasions during breeding walkover surveys (on 9 of the 16 survey dates) (see Appendix 7-4, Figure 7-4-43). Observations ranged from one to nine birds, with an average flock size of two. All observations were of birds flushed, travelling, calling or perched in improved agricultural grassland or scrub, with the majority of observations being within 500m from the proposed turbine layout. In 2022, there was four observations of pairs within the proposed turbine layout indicating probable breeding in the area (see Confidential Appendix 7-5, Figure 7-5-10).

Winter Walkover Surveys

Meadow pipit were observed on four occasions during winter walkover surveys (57% of surveys) (see Appendix 7-4, Figure 7-4-44). Observations were of between one and six birds. All observations were of birds travelling or calling in improved agricultural grassland with only one observation being within 500m of the proposed turbine layout.

Incidental Observations

Meadow pipit were observed on three occasions as incidental observations. Observations were of one and four birds perched, calling or displaying. Displaying birds indicate a probable breeding territory in this area, approximately 2.7km from the nearest proposed turbine. The remaining observations were 1.2km and 1.7km from the nearest proposed turbine (see Appendix 7-4, Figure 7-4-45).

7.3.6.16 Redwing

Redwing were observed in the winter season. Raw survey data and maps are provided in Appendix 7-4.

Vantage Point Surveys

Redwing were observed on 17 occasions during vantage point surveys, or not average once every 8 hours of surveying during the winter season, when this species is resident in Ireland. (see Appendix 7-4, Figure 7-4-46). Observations were of between 1 and 25 birds, with an average flock size of 8 birds. All

but one observation were of birds flying or foraging within 500m from the nearest proposed turbine. No observations were recorded within the potential collision height.

Winter Walkover Surveys

Redwing were observed on 11 occasions during winter walkover surveys (on four of the seven survey dates) (see Appendix 7-4, Figure 7-4-47). Observations were of between 1 and 20 birds, with an average flock size of 10 birds. Five of the eleven observations were of birds flying, foraging or perched within 500m from the proposed turbine layout. The remaining observations were of birds travelling greater than 500m from the proposed turbine layout.

7.3.6.17 Stock dove

Stock dove were observed in the winter season. Raw survey data and maps are provided in Appendix 7-4.

Vantage Point Surveys

Stock dove were observed on only three occasions during vantage point surveys (see Appendix 7-4, Figure 7-4-48). Observations were of one to two birds flying over improved agricultural grassland.

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

7.3.6.18 Yellowhammer

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

Incidental Observations

Yellowhammer were observed on two occasions as incidental observations (see Appendix 7-4, Figure 7-4-49). Observations were of one and three birds perched and flying. Observations were between 3.1km and 4.3km from the nearest proposed turbine.

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

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 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) and Lewis *et al.* (2019), or Ireland's Article 12 Reporting 2013-2018 (EU, 2022), depending on what literature was available for each species. Estimates for mean county population sizes were obtained from species-specific surveys, a review of I-WeBS sites within 25km of the Site[2], or derived from national estimates, according to what literature was available.

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 Golden Plover

7.4.1.1.1 *Wintering*

The estimated national wintering population of golden plover in Ireland is 80,707 for the Republic of Ireland (ROI) (Burke *et al.* (2018)). 1% of the ROI National wintering population of golden plover is 807 birds. As per NRA 2009, a regularly occurring population of 807 golden plover is required for classification as Nationally Important. The maximum number of birds recorded within 500m of the Proposed Wind Farm from the winter seasons surveyed was 130 birds. A regularly occurring Nationally Important population was not therefore observed at the Proposed Wind Farm.

To estimate the county population, a review of all I-WeBS sites within 25kms of the site (approximate to the average size of the county) was conducted. It should be noted that wintering golden plover will utilise agricultural grasslands and other habitats not typically surveyed during I-WeBS counts. Therefore, the population estimate provided based on I-WeBS figures below is likely to be an underestimate of the county population. The following mean count values have been recorded for I-WeBS sites over the most recently available 5-season period, i.e. for the period 2015/16 – 2020/21

To account (partly) for the birds that occur in other wetland sites and terrestrial habitats that would not have been counted by I-WeBS surveyors, the golden plover that occurred at other non-I-WeBS sites, as well as some I-WeBS sites where no data was available, were included in the county population estimate. The mean of the peak counts from the two winters surveyed were used to estimate the number of birds using each site.

I-WeBS Sites

The following mean count values have been recorded for I-WeBS sites over the most recent 5-season period, i.e., for the period 2015/16 – 2020/21 (note that sites with a mean of zero birds were excluded from this list):

- Durrow Curragh (River Erkina), Co. Laois (552)

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

Surveyed Sites

- Black Island (130)
- Erkina Flood land (46)
- River Nore (178)

Based on the above, the mean wintering population from the I-WeBS sites is 906. Therefore, taking a precautionary approach, a regularly occurring population of 9 birds (1% of population) is considered of county importance in the context of the Proposed Wind Farm.

Flocks of 9 birds or more (county importance) were recorded over the Proposed Wind Farm on two occasions during the extensive suite of surveys undertaken, however these flocks were not observed with any regularity. Notwithstanding this, on a precautionary bases the population recorded at the Proposed Wind Farm could be associated with a population of **County Importance** give the proximity of the site to the River Nore and the Durrow Curragh/Erkina River floodplain where larger flocks were recorded more regularly.

7.4.1.1.2 *Breeding*

Golden plover was observed on one occasion in April 2023. April is within the migration season for golden plover. This species was not observed at the Proposed Wind Farm during the core breeding season. The Proposed Wind Farm is therefore considered to be of **No Ecological Importance** to breeding golden plover.

7.4.1.2 Kingfisher

As reported (2013-2018) under Article 12 of the Birds Directive (Directive 2009/147/EC), the estimated national population of kingfisher is between 368 – 1,031 breeding pairs.

Kingfisher is an SCI of the River Nore SPA. This SPA is located c. 1km east of the nearest proposed turbine. However, this SPA cites breeding populations of kingfisher only. The wintering population of kingfisher is not cited as an interest of the SPA.

There are no county population estimates available for kingfisher. I-WeBS does include kingfisher in its survey methodology but given that this species uses rivers and streams that are not typically covered by these surveys, they cannot accurately estimate the county population. Furthermore, these surveys are only conducted in winter, while kingfisher are resident in this area all year round. Given the proximity of the River Nore SPA, the presence of any kingfisher at the Site is considered to be of county importance.

Kingfisher were not observed within 500m of the Proposed Wind Farm during the extensive suite of surveys undertaken. Given the lack of suitable habitat for kingfisher within the Proposed Wind Farm, it is therefore reasonable to conclude that the Site is of **No Ecological Importance** to Kingfisher.

However, the Proposed Grid Connection crosses the River Nore SPA and therefore, the construction of the Proposed Grid Connection could impact the kingfisher population that is resident within the River Nore SPA. This population is considered to be of **County Importance**.

7.4.1.3 Little Egret

Little Egret is an Annex I species. The national population of little egret is estimated to be 1,274 for the Republic of Ireland (ROI) (Burke *et al.* (2018)). Therefore, a regularly occurring population of 12 birds is required for classification as National Importance.

Little egret were observed on, or within 500m of, the Proposed Wind Farm on only one occasion despite undertaking a comprehensive suite of surveys over two years. Furthermore, there are no watercourse habitats which would be suitable for this species for roosting or foraging within the Site. The Proposed Wind Farm is therefore considered to be of **No Ecological Importance** to this species, given how infrequently the species was observed and the lack of suitable habitat.

7.4.1.4 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.

The site is on the county boundary of Kilkenny and Laois. There are no published figures for the County population of peregrine. Using the distribution of peregrine across Ireland from the breeding bird atlas[3] (2007-2011) the Kilkenny population is 12 birds, and the Laois population is 14 birds. Therefore, a resident population of one bird is required to qualify as being of county importance. Peregrine were observed on 19 occasions, of which four observations were within 500m of the proposed turbines. In 2022 and 2023 breeding was confirmed with an identified nest in a quarry, 2.5km from the nearest proposed turbine.

Taking a precautionary approach, the peregrine observed at the Site are likely associated with a breeding territory/resident pair which is of **County Importance**.

7.4.1.5 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.

Merlin were not recorded within 4.8km of the Site despite undertaking a comprehensive suite of surveys over two years. The Site is of **No Ecological Importance** to this species given that they were not observed on, or adjacent to, the Proposed Wind Farm.

7.4.1.6 Whooper Swan

7.4.1.6.1 *Wintering*

As per the latest national wintering estimates provided in Burke *et al.* (2021), the national wintering population of whooper swan in the Republic of Ireland is 14,467. Therefore, a regularly occurring population of 145 birds is required for classification as National Importance.

To estimate the county population, a review of all I-WeBS sites within 25kms of the site (approximate to the average size of the county) was conducted. It should be noted that wintering whooper swan will utilise agricultural grasslands and other habitats not typically surveyed during I-WeBS counts. Therefore, the population estimate provided based on I-WeBS figures below is likely to be an underestimate of the county population. The following mean count values have been recorded for I-WeBS sites over the most recent 5-season period, i.e. for the period 2015/16 – 2020/21

To account (partly) for the birds that occur in other wetland sites and terrestrial habitats that would not have been counted by I-WeBS surveyors, the whooper swan that occurred at other non-I-WeBS sites, as well as some I-WeBS sites where no data was available, were included in the county population

[3] *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.*

estimate. The mean of the peak counts from the two winters surveyed were used to estimate the number of birds using each site.

I-WeBS Sites

The following mean count values have been recorded for I-WeBS sites over the most recent 5-season period, i.e., for the period 2015/16 – 2020/21 (note that sites with a mean of zero birds were excluded from this list):

- Durrow Curragh (River Erkina), Co. Laois (119)

Surveyed Sites

- Black Island (37)
- Castle Durrow Demesne (40)
- Erkina flood land (37)
- Knockanoran (30)
- Newtown (43)
- O'Sullivan's Island (6)
- River Goul Flood land (1)
- River Nore (12)
- Seskin South (15)

Based on the above, the mean wintering population is 340. Therefore, taking a precautionary approach, a regularly occurring population of 3 birds (1% of population) is considered of county importance in the context of the Proposed Wind Farm.

Birds of three or more (county importance) were recorded on only four occasions within 500m of the Site during the extensive suite of surveys undertaken. Taking a precautionary approach, given that the Site is in close proximity to the River Nore and the Durrow Curragh, the flocks observed at the Site have the potential to be associated with a population of **County Importance**.

7.4.1.6.2 *Breeding*

This species does not ordinarily breed in Ireland; therefore, the Site is of **No Ecological Importance** for breeding to this species.

7.4.1.7 Curlew

As reported (2013-2018) under Article 12 of the Birds Directive (Directive 2009/147/EC), the national wintering population estimate of curlew in the Republic of Ireland is 28,300. Using these latest figures, 1% of the National population of curlew is 283. Therefore, as per NRA 2009, a regularly occurring population of 283 curlew is required for classification as Nationally Important. The maximum number of birds recorded from the winter season was 40 birds. This maximum number does not correspond with the classification criteria for National or International Importance.

Curlew were not recorded within 4.7km of the Site despite undertaking a comprehensive suite of surveys over two years. The Site is of **No Ecological Importance** to this species given that they were not observed on, or adjacent to, the Proposed Wind Farm.

7.4.1.8 Kestrel

As per NPWS Article 12 Reporting (2013-2018), the national breeding population estimates of kestrel in the Republic of Ireland 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 population of kestrel. The site is on the county boundary of Kilkenny and Laois. There are no published figures for the County population of kestrel. Using the distribution of kestrel across Ireland from the breeding bird atlas[4] (2007-2011) the Kilkenny population is 285 birds, and the Laois population is 252 birds. Therefore, a regularly occurring population of two birds is required for classification of County Importance.

Kestrel was observed within the Proposed Wind Farm on 61 occasions. There was a maximum of four breeding territories identified (three probable territories), two of which are within close proximity of the Site. This indicates a resident population of four adult birds during the breeding season which have the potential to utilise the Site. This population would be bolstered by fledglings at the end of the breeding season, which will remain present at the Proposed Wind Farm 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[5], it is likely that there would be a population of approximately four adults and three juvenile birds by the end of each winter season.

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

7.4.1.9 Lapwing

The estimated national wintering population of lapwing in Ireland is 69,823 for the Republic of Ireland (ROI) (Burke *et al.* (2018)). 1% of the ROI National wintering population of lapwing is 698 birds. As per NRA 2009, a regularly occurring population of 698 lapwing is required for classification as Nationally Important. The maximum number of birds recorded from the winter season was 320 birds. This maximum number does not correspond with the classification criteria for National or International Importance.

Lapwing were not recorded within 1.7km of the Site despite undertaking a comprehensive suite of surveys over two years. The Site is of **No Ecological Importance** to this species given that they were not observed on, or adjacent to, the Proposed Wind Farm.

7.4.1.10 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 Republic of Ireland 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 population of snipe. The site is on the county boundary of Kilkenny and Laois. There are no published figures for the County population of snipe. Using the distribution of snipe across Ireland from the breeding bird atlas[6] (2007-2011) the Kilkenny population is 263 birds, and the Laois population is 188 birds. Therefore, a regularly occurring population of one bird is required for classification of County Importance.

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[4] 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.
[5] https://app.bto.org/birdfacts/results/bob3040.htm
[6] 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.

Snipe were observed on 27 occasions on, or within 500m of, the Site. The majority of observations were of individuals, however flocks of up to 24 birds were observed during the winter season when the resident population of snipe is bolstered migrants from Europe. Snipe are an abundant species in Ireland, however this species can be cryptic and under recorded. On a precautionary basis, it is considered that the population at the Proposed Wind Farm is of **County Importance**, given that there is a resident population within the Site and it is likely that the number of individuals at the Site is of county importance.

7.4.1.11 Woodcock

Woodcock is a BoCCI Red Listed species for the breeding season only in Ireland. Woodcock were only observed during the winter season, when the Irish population of birds is bolstered by migrants from Eastern Europe and Russia. Given that there were no observations during the breeding season, it is unlikely that these birds are resident in Ireland and therefore, the site is of **No Ecological Importance** to the resident Irish population of woodcock.

7.4.1.12 Buzzard

The national population of buzzard is estimated to be 1,938 breeding pairs (NPWS Article 12 Reporting). Buzzard is not listed on Annex I of the Birds Directive. The species is Green listed in Ireland (BoCCI).

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

7.4.1.13 Sparrowhawk

The national population of sparrowhawk is estimated to be 11,859 birds (Lewis *et al.,* 2019). Sparrowhawk is not listed on Annex I of the Birds Directive. The species is Green listed in Ireland (BoCCI).

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

7.4.1.14 Passerines (Red Listed)

Grey wagtail, meadow pipit, redwing, stock dove and yellowhammer are BoCCI Red Listed in Ireland. Populations recorded at the Site were deemed to be of no greater than **Local Importance (Lower Value).**

7.4.2 Identification of Key Ornithological Receptors

Table 7-10 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 7-10 Receptor evaluation and selection criteria rational

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
Golden Plover	Annex I Birds Directive & Red List	**Wintering** County Importance	This species was occasionally recorded within on, or within 500m of, the Site. **Potential for direct habitat loss cannot be excluded.** Birds were recorded flying over the Site and within 500m of the proposed turbine layout. **Potential for disturbance/displacement cannot be excluded.** This species was recorded flying over the Site within the potential collision risk zone. **Potential for collision risk cannot be excluded.** As such, an assessment of direct habitat loss, disturbance/displacement and collision risk has been completed for wintering golden plover (see Section 7.5.2.1).	**Yes**
		Breeding No population of ecological significance recorded	No population of ecological significance was recorded utilising the Site during the extensive suite of surveys conducted in the breeding season. As such, the potential for direct habitat loss, disturbance/displacement and collision risk are limited and there is no evidence to suggest that the Site is of significance to this species. **No pathways for significant effects were identified**.	**No**

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
Kingfisher	Annex I Birds Directive & SCI of the River Nore SPA	**Proposed Wind Farm** No population of ecological significance recorded. **Proposed Grid Connection** County Importance	No population of ecological significance was recorded utilising the 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 Site is of significance to this species. **No pathways for significant effects were identified** with regard to the Proposed Wind Farm. Notwithstanding this, due to the proximity of the River Nore SPA in which kingfisher is an SCI and given that the Proposed Grid Connection goes through the SPA, **an assessment of direct habitat loss and disturbance** has been completed for kingfisher with regard to the Proposed Grid Connection. (see Section 7.5.4).	**Yes**
Little Egret	Annex I Birds Directive	**All Seasons** No population of ecological significance recorded	No population of ecological significance was recorded utilising the 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 Site is of significance to this species. **No pathways for significant effects were identified**.	**No**
Peregrine	Annex I Birds Directive	**All Seasons** Country Importance	This species was recorded hunting within the Site. **Potential for direct habitat loss cannot be excluded.** Birds were recorded flying over the Site and within 500m of the proposed turbine layout. **Potential for disturbance/displacement cannot be excluded.** This species was recorded flying over the Site within the potential collision risk zone. **Potential for collision risk cannot be excluded.** As such, an assessment of direct habitat loss, disturbance/displacement and collision risk has been completed for Peregrine (see Section 7.5.2.2).	**Yes**

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
Merlin	Annex I Birds Directive	**All Seasons** No population of ecological significance recorded	No population of ecological significance was recorded utilising the 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 Site is of significance to this species. **No pathways for significant effects were identified**.	**No**
Whooper Swan	Annex I Birds Directive	**Wintering** Country Importance	This species was recorded within the Site and there is suitable habitat present for this species. **Potential for direct habitat loss cannot be excluded.** Birds were recorded flying over the Site and within 500m of the proposed turbine layout. **Potential for disturbance/displacement cannot be excluded.** This species was recorded flying over the Site within the potential collision risk zone. **Potential for collision risk cannot be excluded.** As such, an assessment of direct habitat loss, disturbance/displacement and collision risk has been completed for whooper swan (Section 7.5.2.3).	**Yes**
		Breeding No population of ecological significance recorded	This species does not breed in Ireland. No population of ecological significance was recorded utilising the Site during the extensive suite of surveys conducted. As such, the potential for direct habitat loss, disturbance/displacement and collision risk are limited during the breeding season and there is no evidence to suggest that the Site is of significance to this species. **No pathways for significant effects were identified**.	**No**
Curlew	Red List	**Wintering** No population of ecological significance recorded	No population of ecological significance was recorded utilising the 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 Site is of significance to this species. **No pathways for significant effects were identified**.	**No**

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
Kestrel	Red List & Raptor	**All Seasons** Country Importance	This species was recorded hunting and breeding within the Site. **Potential for direct habitat loss cannot be excluded.** Birds were recorded flying over the Site and within 500m of the proposed turbine layout. **Potential for disturbance/displacement cannot be excluded.** This species was recorded flying over the Site within the potential collision risk zone. **Potential for collision risk cannot be excluded.** As such, an assessment of direct habitat loss, disturbance/displacement and collision risk has been completed for kestrel (Section 7.5.2.4).	**Yes**
Lapwing	Red List	**Wintering** No population of ecological significance recorded	No population of ecological significance was recorded utilising the 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 Site is of significance to this species. **No pathways for significant effects were identified**.	**No**
Snipe	Red List	**All Seasons** County Importance	This species was occasionally recorded utilising habitats within the Site. **Potential for direct habitat loss cannot be excluded.** Birds were recorded flying over the Site and within 500m of the proposed turbine layout. **Potential for disturbance/displacement cannot be excluded.** This species was recorded flying over the Site within the potential collision risk zone. **Potential for collision risk cannot be excluded.** As such, an assessment of direct habitat loss, disturbance/displacement and collision risk has been completed for snipe (Section 7.5.2.5).	**Yes**

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
Woodcock	Red List	**All Seasons** No population of ecological significance recorded	No population of ecological significance was recorded utilising the 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 Site is of significance to this species. **No pathways for significant effects were identified**.	**No**
Buzzard	Raptor	**All Seasons** Local Importance (higher value)	This species was occasionally recorded hunting and breeding within the Site. **Potential for direct habitat loss cannot be excluded.** Birds were recorded flying over the Site and within 500m of the proposed turbine layout. **Potential for disturbance/displacement cannot be excluded.** This species was recorded flying over the Site within the potential collision risk zone. **Potential for collision risk cannot be excluded.** As such, an assessment of direct habitat loss, disturbance/displacement and collision risk has been completed for buzzard (Section 7.5.2.6)	**Yes**
Sparrowhawk	Raptor	**All Seasons** Local Importance (higher value)	This species was occasionally recorded hunting within the Site. **Potential for direct habitat loss cannot be excluded.** Birds were recorded flying over the Site and within 500m of the proposed turbine layout. **Potential for disturbance/displacement cannot be excluded.** This species was recorded flying over the Site within the potential collision risk zone. **Potential for collision risk cannot be excluded.** As such, an assessment of direct habitat loss, disturbance/displacement and collision risk has been completed for sparrowhawk (Section 7.5.2.7).	**Yes**

Species	Conservation Status	NRA Evaluation	Rationale for inclusion/exclusion as KOR	KOR
Passerines	Red List	**All Seasons** Local Importance (lower value)	Grey wagtail, meadow pipit, redwing and stock dove were recorded within the Site. However, as per NatureScot guidance (SNH, 2017), it is generally considered that passerine bird species are not significantly impacted by wind farms due to their ecology and large populations. 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 Development will have a significant effect on these species. **No pathways for significant effects were identified**.	**No**

7.4.3 Key Ornithological Receptor Sensitivity Determination

Criteria developed by Percival (2003) for assessing bird sensitivity 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:

- Kingfisher (Proposed Grid Connection only) (SCI of the River Nore SPA)

Medium Sensitivity KORs are:

- Golden Plover (Annex I; EU Birds Directive)
- Peregrine (Annex I; EU Birds Directive)
- Whooper Swan (Annex I; EU Birds Directive)
- Kestrel (BoCCI Red Listed)
- Snipe (BoCCI Red Listed)

Low Sensitivity KORs are:

- Buzzard (resident population of local importance identified)
- Sparrowhawk (resident population of local importance identified)

7.5 Potential Impacts

All elements of the Proposed Development 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 and operation
- Assessment of impacts in relation to KORs during decommissioning
- Assessment of impacts associated with the Proposed Grid Connection
- Assessment of impacts on designated areas

7.5.1 Do-Nothing Effect

If the Proposed Development were not to proceed, it is unlikely that any changes would be made to the current land use practice. The majority of the lands within the Proposed Development area would continue to be managed as they are now either as improved agricultural grassland and associated grazing. The other habitats identified within the Proposed Wind Farm site and Grid Connection Route, including treelines, hedgerows, woodland, watercourses etc. would likely remain in a similar condition.

In some areas where scrub succession is establishing, this scrub may develop if not managed by the landowners and in time, this may undergo succession to small areas of woodland. The avian community on the Proposed Wind Farm site and Grid Connection Route, as described in this chapter, would likely remain similar to its current state as activity levels and land use would not change

7.5.2 Effects on Key Ornithological Receptors during Construction and Operation

The boxes in the following sections describe potential effects on KORs that may occur during the construction and operation of the wind farm. The magnitude and significance of these effects are then defined according to Percival (2003) and EPA (2022) criteria.

7.5.2.1 Golden Plover (Winter)

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	This species was recorded on five occasions within, or partially within, 500m of the proposed infrastructure during the winter seasons. The majority of observations were of golden plover flying over the Site. There was only one observation of golden plover utilizing habitats within the Site. The construction of the Proposed Wind Farm will not result in the loss of a significant amount of suitable habitat for golden plover given the development footprint is small (i.e. 7.6 ha or 2.5% of the Site) relative to the total area within the Site. This species was not dependent on the Site for foraging or roosting during the wintering period, given how infrequently the site was utilized by birds. Furthermore, these lands (e.g. agricultural grassland) are not considered unique to the Site or rare in the wider surroundings. Extensive areas of suitable foraging and roosting habitat will remain post construction, and no significant impacts are 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 tablature of a *Medium* sensitivity species and *Low* impact corresponds to a ***Low*** effect significance.	**Long-term slight negative effect**
Disturbance	Research indicates that this species is susceptible to disturbance impacts during the construction works (Pearce-Higgins *et al.*, 2012). Additionally, Goodship and Furness (2022) reported mean disturbance distances of 143m for golden plover during the winter season. This species was not regularly recorded	The magnitude of the effect is assessed as ***Low***. The cross tablature of a *Medium* sensitivity species and *Low*	**Short-term slight negative effect**

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
	utilising habitats within the Site for roosting or foraging. During the two winter seasons surveyed, there were only one observation of birds landing on, or adjacent to, the Site. There was no evidence to suggest that golden plover were utilising the Site for foraging. Significant areas of more suitable roosting and foraging habitat for the species occur in the wider landscape and will be retained, e.g. along the River Nore. In the event of displacement, there are extensive areas of suitable habitat in the wider area including abundant improved agricultural grassland suitable for this species. Significant displacement effects are not anticipated.	impact corresponds to a ***Low*** effect significance.	
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated.	**No Effect**	**No Effect**
Displacement and Barrier Effect	A review of 29 other studies suggests golden plover will approach wind turbines to an average distance of 175 m in non-breeding season (Hötker *et al.,* 2006). Only two of the six observations of golden plover were within 175m of the proposed turbine layout during surveys. In the event of displacement, there are extensive areas of suitable habitat in the wider area. This would likely render such an effect inconsequential. Furthermore, there is no evidence to suggest that the Site lies on a migratory/ regular commuting route for the species therefore barrier effect is not anticipated. Observations during the vantage point survey were of birds flying. However, no regularly used commuting routes were identified, and flight activity appeared random. No significant effects of displacement are anticipated at the county, national or international level.	The magnitude of the effect is assessed as ***Low***. The cross tablature of a *Medium* sensitivity species and *Low* impact corresponds to a ***Low*** effect significance.	**Long-term slight negative effect**

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
Collision Risk	The species was recorded flying within PCH during vantage point surveys. A "Random" collision risk analysis has been undertaken (full details provided in Appendix 7-6). The collision risk assessment has followed a precautionary approach and utilises flight observations recorded across the winter season and the spring migration period in April. Therefore, the assessment provided below is highly conservative. To account for the crepuscular flight activity of golden plover, the collision risk analysis for this species has assumed nocturnal flight activity occurred for 25% of the night. Please see Appendix 7-6 for further discussion. A key factor in calculating the predicted rate of collisions for a given species is the application of an avoidance rate. A review of golden plover collision avoidance from four UK wind farms has been undertaken and is outlined in Appendix 7-6. The output of this new research was a golden plover avoidance rate of between 99.6% and 99.8%. The lower avoidance rate from this study (99.6%) was used in the collision risk analysis. The collision risk has been calculated at a rate of 0.29 collisions per year. Annual mortality of adult golden plover has been calculated at 27% per annum (Sandercock, 2003). If 0.29 collisions were to occur per year, it would mean that the losses at the proposed wind farm would increase the annual mortality of the county population (c. 906) by 0.12%. The predicted collision risk is negligible. No significant effects are anticipated.	The magnitude of the effect is assessed as **Negligible**. The cross tablature of a *Medium* sensitivity species and *Negligible* impact corresponds to a ***Very Low*** effect significance.	**Long-term imperceptible negative effect**

7.5.2.2 Peregrine (All Seasons)

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	Peregrine were recorded on four occasions within, or partially within, 500m of the Site during surveys. Most observations were of birds flying, calling or hunting within the Site. The construction of the Proposed Wind Farm will not result in the loss of a significant amount of foraging habitat given the development footprint is small (i.e. 7.6 ha or 2.5% of the Site) relative to the total area within the Site. Extensive areas of suitable foraging habitat will remain post construction and there is an abundance of suitable habitat in the surrounding area. Furthermore, this species is unlikely to be dependent on the onsite habitats, given the wide-ranging nature of the species and the availability of similar suitable habitats in the surroundings (e.g. agricultural grassland). 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 tablature of a *Medium* sensitivity species and *Low* impact corresponds to a ***Low*** effect significance.	**Long-term slight negative effect**
Disturbance	This species was recorded on four occasions within, or partially within, 500m of the proposed turbine layout during the breeding and winter seasons. There was no evidence of breeding within the Site, and the nearest breeding territory was 2.5km from the Site. Disturbance during construction is unlikely to discourage flight activity or foraging in the vicinity of the Site, particularly given peregrine has been documented to become accustomed to various sources of human disturbance (Ruddock *et al.*, 2007). 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 tablature of a M*edium* sensitivity species and *Low* impact corresponds to a ***Low*** effect significance.	**Short-term slight negative effect**
Operational Phase			

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
Direct Habitat Loss	Direct habitat loss effects are not anticipated.	**No Effect**	**No Effect**
Displacement and Barrier Effect	In total, this species was recorded on four occasions within, or partially within, 500m of the proposed turbine layout during the survey period. 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 wind farm in the landscape. No significant effects of displacement are anticipated at the county, national or international level.	The magnitude of the effect is assessed as **Low**. The cross tablature of a *Medium* sensitivity species and *Low* impact corresponds to a ***Low*** effect significance.	**Long-term slight negative effect**
Collision Risk	The species was recorded flying within PCH during vantage point surveys. A "Random" collision risk analysis has been undertaken (full details provided in Appendix 7-6). The collision risk has been calculated at a rate of 0.003 collisions per year, or one bird every 302 years. The predicted collision risk is insignificant over the 35-year life-time of the Proposed Development.	The magnitude of the effect is assessed as **Negligible**. The cross tablature of a *Medium* sensitivity species and *Negligible* impact corresponds to a ***Very Low*** effect significance.	**Long-term imperceptible negative effect**

7.5.2.3 Whooper Swan (Winter)

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	This species was not recorded utilising habitats within the Site. All observations of this species within 500m of the proposed turbine layout were of birds commuting. The majority of observations of this species were during waterbird distribution and abundance surveys, up to 6.5km from the proposed turbine layout. The species was not recorded utilising habitats within the Site for foraging or roosting during the wintering period. There are some areas within the Site that are potentially suitable for foraging and roosting whooper swan. However, the land lost to the development footprint is small (i.e. 7.6 ha or 2.5% of the Site) relative to the total area within the Site. Direct loss of suitable habitat for this species will be minimal. No significant effects are predicted.	The magnitude of the effect is assessed as **Negligible**. The cross tablature of a *Medium* sensitivity species and *Negligible* impact corresponds to a ***Very Low*** effect significance.	**Long-term imperceptible negative effect**
Disturbance	As per McGuinness *et al.* (2015) the zone of sensitivity for the species is 600m. Whooper swan were recorded in flight within 600m of the proposed turbine layout on only four occasions. Numbers recorded ranged from five to eleven birds. Additionally, there were no observations of whooper swan foraging or roosting within 600m of the Site. The nearest foraging/roosting flock was observed 3km from the Site. A study undertaken by Rees *et al.* (2005) in relation to whooper swan behavioural responses to human activity suggests that swans become less sensitive to disturbance if the frequency of daily disturbance is high. Rees *et al.* (2005) conducted a study at Black Cart Special SPA near Glasgow in relation to whooper swan behavioural and disturbance responses to different types of human activity. The study found that activities relating to cars,	The magnitude of the effect is assessed as **Negligible**. The cross tablature of a *Medium* sensitivity species and *Negligible* impact corresponds to a ***Very Low*** effect significance.	**Short-term imperceptible negative effect**

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
	tractors, bicycles, farm workers on foot and cattle (livestock) exhibited the least disturbance to whooper swan flocks (within 100m disturbance distance bands). Significant disturbance to whooper swan is therefore not anticipated as the populations are expected to become habituated to the levels of disturbance. Significant displacement effects are not anticipated at any geographical scale given the infrequency of observations. Furthermore, flocks of county importance were observed at Black Island and the Durrow Curragh, along the Erkina River approximately 2km north of the site. However, given the separation distance, significant disturbance effects are not anticipated on these birds. No significant effects are predicted.		
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated.	**No Effect**	**No Effect**
Displacement and Barrier Effect	There were no observations of whooper swan utilising habitats within the Site during surveys. This demonstrates a lack of dependence of whooper swan on the habitats of the Proposed Wind Farm. Observations of whooper swan non-breeding activity from 8 European studies have given a mean minimum avoidance distance of 150 m from the base of wind turbines (Hötker *et al.,* 2006). Only two of the observed flights of whooper swan were recorded within 150m of the proposed turbine layout across the two winters surveyed. This amount of flight activity is very low relative to the survey effort undertaken. There is no evidence to suggest that the Site lies on a migratory/ regular commuting route for the species therefore barrier effect is not anticipated. There were only infrequent observations of birds commuting over the Site	The magnitude of the effect is assessed as **Low**. The cross tablature of a *Medium* sensitivity species and *Low* impact corresponds to a ***Low*** effect significance.	Long-term **slight** negative effect

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
	during surveys, and all observations were of low numbers of birds. However, no regularly used commuting routes were identified No significant effects of displacement or barrier effects are anticipated at the county, national or international level.		
Collision Risk	The species was recorded flying within PCH during vantage point surveys. A "Regular" collision risk analysis has been undertaken. To account for the crepuscular flight activity of golden plover, the collision risk analysis for this species has assumed nocturnal flight activity occurred for 25% of the night. Please see Appendix 7-6 for further discussion. The collision risk has been calculated at a rate of 0.02 collisions per year, or one bird every 41 years. The predicted collision risk is insignificant over the 35-year life-time of the Proposed Development.	The magnitude of the effect is assessed as **Negligible**. The cross tablature of a *Medium* sensitivity species and *Negligible* impact corresponds to a ***Low*** effect significance.	Long-term **imperceptible** negative effect

7.5.2.4 Kestrel (All Seasons)

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	This species was frequently recorded within the Site during the breeding and winter seasons. The construction of the Proposed Wind Farm will not result in the loss of a significant amount of foraging or breeding habitat given the development footprint is small (i.e. 7.6 ha or 2.5% of the Site) relative to the total area within the Site. There was one confirmed breeding territories identified partially within the Site in an area of treelines during the 2023 breeding season (see Confidential Appendix 7-5, Figure 7-5-4). However, this habitat is not unique to the Site and is not a rare resource in the wider area. Significant loss of potential breeding habitat is not anticipated. Additionally, direct loss of potential foraging habitat to the footprint of the Proposed Wind Farm will be minimal. 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 tablature of a *Medium* sensitivity species and *Low* impact corresponds to a ***Low*** effect significance.	**Long-term slight negative effect**
Disturbance	The construction of the Proposed Development has the potential to give rise to disturbance impacts; however, significant impacts are not predicted based on the following rationale. While this species was frequently recorded within the Site during the breeding and winter seasons, the 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 was one kestrel territory identified at the Proposed Wind Farm. Given that kestrel have brood sizes of four to five	The magnitude of the effect is assessed as **Low**. The cross tablature of a *Medium* sensitivity species and *Low* impact corresponds to a ***Low*** effect significance.	**Short-term slight negative effect**

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
	chicks, and a survival rate of 30% in their first year[7], it is likely that there would be a population of approximately two adults and four to five juvenile birds by the end of the winter season. Therefore, only 0.03% of the county population (i.e., 6 of c.270 birds (please see Section 7.4.1.12 for further details)) could be impacted. Significant effects are not anticipated, given that extensive areas of suitable foraging and breeding habitat exist and will remain in the wider area. Onsite habitats are not considered unique to the Proposed Wind Farm. 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.	**No Effect**	**No Effect**
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 extensive areas of suitable foraging and breeding habitat exist and will remain in the wider area. Onsite habitats are not considered unique to the Proposed Wind Farm. No significant effects of displacement or barrier effect are anticipated.	The magnitude of the effect is assessed as **Low**. The cross tablature of a *Medium* sensitivity species and *Low* impact corresponds to a ***Low*** effect significance.	**Long-term slight negative effect**

[7] https://app.bto.org/birdfacts/results/bob3040.html

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
Collision Risk	The species was recorded flying within PCH during vantage point surveys. A "Random" collision risk analysis has been undertaken (full details provided in Appendix 7-6). The collision risk has been calculated at a rate of 0.49 collisions per year, or one bird every 2 years. Annual mortality of adult Kestrel has been calculated at 35% per annum (Orta *et al.,* 2020). If 0.49 collisions were to occur per year, it would mean that the losses at the Proposed Wind Farm would increase the annual mortality of the county population (c.252) by 0.56%. The predicted collision risk is negligible. No significant effects are anticipated.	The magnitude of the effect is assessed as **Negligible**. The cross tablature of a *Medium* sensitivity species and *Negligible* impact corresponds to a ***Very Low*** effect significance.	**Long-term imperceptible negative effect**

7.5.2.5 Snipe (All Seasons)

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	Snipe was recorded utilising habitats within the Site on 17 occasions. The majority of observations were of snipe flying, calling or landing on the site. The construction of the Proposed Wind Farm will not result in the loss of a significant amount of habitat given the development footprint is small (i.e. 7.6 ha or 2.5% of the Site) relative to the total area within the 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.	The magnitude of the effect is assessed as **Low**. The cross tablature of a *Medium* sensitivity species and *Low* impact corresponds to a ***Low*** effect significance.	**Long-term slight negative effect**
Disturbance	This species was recorded on 21 occasions within, or partially within, 500m of the proposed turbine layout during the winter seasons. These observations were within agricultural grassland habitat. Disturbance associated with construction works has the potential to result in a measurable reduction in the local density of snipe (i.e. onsite). However, these onsite habitats are abundant	The magnitude of the effect is assessed as **Low**. The cross tablature of a *Medium* sensitivity species and *Low*	**Short-term slight negative effect**

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
	in the wider area and are not unique to the Site. Therefore, were disturbance to occur it would not result in the loss of a scarce resource for the local snipe population. No significant effects of disturbance are anticipated.	impact corresponds to a ***Low*** effect significance.	
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated.	**No Effect**	**No Effect**
Displacement and Barrier Effect	As outlined above, snipe was recorded utilising habitats within the Site on 17 occasions over the two years of surveying, with an additional nine records of birds utilising habitats within 500m of the Site. 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. There is also evidence of avoidance of access tracks. The above study relates to breeding snipe. Breeding activity was not recorded for snipe within the Site or within 500m of the Site. Wintering non-breeding birds are assumed to be at less risk of disturbance effects, as they are not tied to a fixed location (i.e. nest site) and are therefore less restricted in their selection of habitats. The habitats within the Site and a 500m radius comprise agricultural grassland. This is an abundant habitat type in the surrounding landscape and are not unique to the Site. No significant effects of displacement or barrier effect are anticipated.	The magnitude of the effect is assessed as **Low**. The cross tablature of a *Medium* sensitivity species and *Low* impact corresponds to a ***Low*** effect significance.	**Long-term slight negative effect**
Collision Risk	The species was recorded flying within PCH during vantage point surveys. A "Random" collision risk analysis has been undertaken. To account for the crepuscular flight activity of golden plover, the collision risk analysis for this	The magnitude of the effect is assessed as **Negligible**. The cross tablature of a *Medium*	**Long-term imperceptible negative effect**

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
	species has assumed nocturnal flight activity occurred for 25% of the night. Please see Appendix 7-6 for further discussion. The collision risk has been calculated at a rate of 0.006 collisions per year, or one bird every 158 years. The predicted collision risk is insignificant over the 35-year life-time of the Proposed Development.	sensitivity species and *Negligible* impact corresponds to a ***Very Low*** effect significance.	

7.5.2.6 Buzzard (All Seasons)

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	This species was frequently recorded within the Site during the breeding and winter seasons. The construction of the Proposed Wind Farm will not result in the loss of a significant amount of suitable habitat given the development footprint is small (i.e. 7.6 ha or 2.5% of the Site) relative to the total area within the Site. There were two confirmed breeding territories identified within or adjacent to the Site during the 2022 and 2023 breeding seasons (see Confidential Appendix 7-5, Figure 7-5-9). There is evidence of breeding within the Site in areas of treelines. However, this habitat type is not unique to the Proposed Wind Farm and is not a rare resource in the wider area. Significant loss of potential breeding habitat is not anticipated. Direct loss of potential foraging habitat to the footprint of the Proposed Wind Farm will be minimal. 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 tablature of *Low* sensitivity species and *Low* Impact corresponds to a ***Very Low*** effect significance	**Long-term slight negative effect**
Disturbance	Onsite areas and to a 500m radius of the Site has hosted breeding pairs of buzzard during both breeding seasons surveyed, 2022 and 2023 (see Confidential Appendix 7-5, Figure 7-5-9). As previously discussed, this species is resident at the Site. The disturbance associated with construction works will 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 Wind Farm. However, these lands (e.g., treeline, scrub, adjacent woodland and farmland) are not considered unique to the Site or rare in the wider surroundings.	The magnitude of the effect is assessed as ***Medium***. The cross tablature of a *Low* sensitivity species and *Medium* impact corresponds to a ***Very Low*** effect significance.	**Short-term slight negative effect**

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
	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.	**No Effect**	**No Effect**
Displacement and Barrier Effect	This species was frequently recorded within the Site during the breeding and winter seasons. As previously discussed, there were two confirmed breeding territories identified within or adjacent to the Proposed Wind Farm during the 2022 and 2023 breeding seasons. Pearce-Higgins *et al.* (2009) describes that buzzard has been found to show significant turbine avoidance extending to at least 500m. There was a maximum of one breeding territory 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 176 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 Wind Farm and there is an abundance of suitable habitat for this species greater than 500m from the proposed turbine layout within the Site and its surroundings. No significant effects of displacement or barrier effect are anticipated at the county, national or international level.	The magnitude of the effect is assessed as ***Medium***. The cross tablature of a *Low* sensitivity species and *Medium* impact corresponds to a ***Very Low*** effect significance.	**Long-term slight negative effect**

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
Collision Risk	The species was recorded flying within PCH during vantage point surveys. A "Random" collision risk analysis has been undertaken (full details provided in Appendix 7-6). The collision risk has been calculated at a rate of 1.2 collisions per year. The favourable conservation status of this species (Green-listed BoCCI) limits the potential for ecologically significant effects to result. The loss one bird per year from the local population of a Green-listed (BoCCI) species is considered of low significance. No significant effects are anticipated.	The magnitude of the effect is assessed as **Low**. The cross tablature of a *Low* sensitivity species and *Low* impact corresponds to a ***Very Low*** effect significance.	**Long-term slight negative effect**

7.5.2.7 Sparrowhawk (All Seasons)

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
Construction Phase			
Direct Habitat Loss	This species was recorded on 14 occasions within, or partially within, 500m of the proposed turbine layout during the breeding and winter seasons. The construction of the Proposed Wind Farm will not result in the loss of a significant amount of foraging habitat given the development footprint is small (i.e. 7.6 ha or 2.5% of the Site) relative to the total area within the Site. There is the potential for the loss of foraging habitat within the Site. However, these lands (e.g. agricultural land and treelines) are not considered unique to the Proposed Wind Farm or rare in the wider surroundings. 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 tablature of a *Low* sensitivity species and *Low* impact corresponds to a ***Very Low*** effect significance.	**Long-term slight negative effect**
Disturbance	This species was recorded on 14 occasions within, or partially within, 500m of the proposed turbine layout during the breeding and winter seasons. There was no evidence of breeding sparrowhawk at, or adjacent to, the Site.	The magnitude of the effect is assessed as **Low**. The cross tablature of a *Low* sensitivity	**Short-term slight negative effect**

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
	Therefore, construction activity is unlikely to cause disturbance to nesting sparrowhawk. There may be some disturbance to foraging and commuting sparrowhawk within the Site, however if disturbance were to occur, there are extensive areas of suitable habitat in the wider area and it will not result in the loss of a scarce resource for the local sparrowhawk population. No significant effects of disturbance are anticipated at the county, national or international level.	species and *Low* impact corresponds to a ***Very Low*** effect significance.	
Operational Phase			
Direct Habitat Loss	Direct habitat loss effects are not anticipated.	**No Effect**	**No Effect**
Displacement and Barrier Effect	As previously discussed, the Site hosts foraging and commuting sparrowhawk. Displacement from turbines is not reported for sparrowhawk, however, it is assumed for the purposes of the assessment that sparrowhawk show avoidance to a distance of 500m from turbines as with other raptors (Pearce-Higgins *et al.*, 2009). The availability of alternative suitable habitat in the surroundings, limit the potential for significant displacement effects. No significant effects of displacement or barrier effect are anticipated at the county, national or international level.	The magnitude of the effect is assessed as **Low**. The cross tablature of a *Low* sensitivity species and *Low* impact corresponds to a ***Very Low*** effect significance.	**Long-term slight negative effect**
Collision Risk	The species was recorded flying within PCH during vantage point surveys. A "Random" collision risk analysis has been undertaken (full details provided in Appendix 7-6). The collision risk has been calculated at a ratio of 0.05 collisions per year, or one bird every 22 years. The favourable conservation status of this species (Green-listed BoCCI) limits the potential for ecologically significant effects to result. The loss one bird per year from the local population of a Green-listed	The magnitude of the effect is assessed as **Negligible**. The cross tablature of a *Low* sensitivity species and *Negligible* impact corresponds to a ***Very Low*** effect significance.	**long-term imperceptible negative effect**

Potential effects during the construction and operational phases of the Proposed Development		Significance (Percival, 2003)	Significance (EPA, 2022)
	(BoCCI) species is considered of low significance. No significant effects are anticipated.		

7.5.3 Effects on Key Ornithological Receptors during Decommissioning

Potential effects on KORs that may occur during the decommissioning of the 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 Development		Significance (Percival, 2003)	Significance (EPA, 2022)
Direct Habitat Loss	Direct or indirect effects are not anticipated.	**No Effect**	**No Effect**
Disturbance	As above for the construction phase for each species in Section 7.5.2.	As above for the construction phase for each species in Section 7.5.2.	As above for the construction phase for each species in Section 7.5.2.

7.5.4 Effect Associated with the Grid Connection and Turbine Delivery Route

The Proposed Grid Connection cable route will commence from the proposed onsite substation and will run along existing roads, cross the River Nore underground and continue within agricultural grassland to Ballyragget 110kV substation. Required works are minor and are all located within the existing road corridor and within agricultural grassland. The underground cabling will cross beneath the River Nore via horizontal direction drilling (full details in Chapter 4 of this EIAR). The proposed turbine delivery route will require temporary junction accommodation for abnormal loads, therefore required works are also minor and are located within the existing road corridor (full details in Chapter 4 of this EIAR). Upon completion of the turbine delivery phase, the route delivery temporary accommodation works location will revert back to its existing condition.

For both the grid connection and turbine delivery route, the existing habitats (i.e. existing roads and agricultural grassland) do not have the potential to support other species of conservation interest in the area, excluding the River Nore which supports a resident population of kingfisher and is discussed below. On a precautionary basis, it is assumed that some temporary disturbance may occur during works. However, given the extent of suitable habitat in the wider area, significant disturbance effects are not predicted. The effect significance for all KORs (excluding kingfisher) is classed as no greater than ***Low*** (Percival, 2003) or a **likely short-term slight negative effect (**EPA, 2022).

Kingfisher

The grid connection will cross beneath the River Nore SPA, which is designated for kingfisher, via horizontal direction drilling. This crossing point was surveyed for the presence of kingfisher and suitable nesting habitat. There was no breeding burrows observed in this area, however a small section of suitable breeding habitat was identified 130m from the crossing point. Given that the works would involve drilling under the river, there is no potential for habitat loss to kingfisher and therefore no direct habitat loss effect is anticipated. However, there is the potential for disturbance of kingfisher during the construction works. Given the short-term nature of the works, and that works will be limited to the winter period (see Section 7.6.2.1), if disturbance were to occur it would not be significant as wintering kingfisher are mobile and will utilise other sections of the river during the short period that construction works will be undertaken. The effect significance for kingfisher 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

The Proposed Wind Farm is not located within the boundaries of any European Sites (see Section 7.3.1). An Appropriate Assessment screening was prepared to provide the information necessary to complete an Appropriate Assessment for the Proposed Development. The screening identified and assessed a potential pathway for indirect effects on the River Nore SPA.

Following the screening, a Natura Impact Statement was prepared which concluded that:

"Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction and operation of the Proposed Development does not adversely affect the integrity of European sites. Therefore, it can be objectively concluded that the Proposed Development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site".

As such, it can be concluded that the Proposed Development will not have an adverse impact on any European Sites designated for birds, either alone or in combination with other plans or projects.

No proposed National Heritage Area or National Heritage Area within the ZOI were considered as ornithological ecological receptors in their own right due to the separation distance from the Proposed Development and the absence of connectivity.

7.6 Mitigation and Best Practice Measures

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

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

7.6.1 Design of the Proposed Development

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

- The Proposed Development avoids wildlife refuge sites (e.g., waterbodies)
- Hard standing areas have been designed to the minimum size necessary to accommodate the turbine model that is selected.
- The turbine delivery route has been selected to utilise built infrastructure i.e., public roads.
- The proposed grid connection route have been selected to utilise built infrastructure where possible (i.e. cables to be laid within public roads). Cables will be laid underground to avoid effects on roadside hedgerows and disturbance to nesting birds.

7.6.2 Management of the Proposed Development Phases

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

7.6.2.1 Construction Phase

A Construction and Environmental Management Plan (CEMP) has been prepared and will be in place prior to the start of the construction phase. Full details of the CEMP are available in Appendix 4-2, Chapter 4, while details pertinent to birds are summarised below. 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.
- The horizontal direction drilling for the grid connection cables under the River Nore will be undertaken outside the breeding season (1st March to 31st August inclusive) to avoid impacts on breeding kingfisher.
- The removal of woody vegetation will be undertaken in full compliance with Section 40 of the Wildlife Act 1976 – 2022. 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 Environmental Clerk of Works and Project Ecologist will be appointed. Duties will include:
    - Organise the undertaking of a pre-construction and construction phase 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 Development.
    - 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.

7.6.2.2 Operational Phase

No significant operational phase impacts requiring mitigation were identified.

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 Monitoring

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

7.7.1 Pre-Construction and Construction Surveys

It is proposed that construction works will commence outside the bird nesting season (1st of March to 31st of August inclusive) to avoid the most sensitive time of the year for most bird species with the potential to use the site and its environs. Pre-commencement confirmatory surveys will be undertaken within one month prior to the initiation of works at the Proposed Development to identify sensitive sites (e.g. roosts). Any requirement for construction works to run into the subsequent breeding and winter seasons following commencement will be subject to a repeat of the pre-commencement bird surveys to confirm the absence of breeding birds of conservation concern once per month during the breeding season (April to July) and once during the winter season (October). The survey will aim to identify sensitive sites e.g., nests or roosts depending on the season in question.

The survey will be undertaken by a suitably qualified ornithologist. The survey will comprise a thorough walkover survey of the development footprint and/or all works areas to a 500m radius, where access allows. If winter roosts or nests of birds of high conservation concern are identified, the roost/nest will be earmarked for continued monitoring during works. If the roost/nest is found to be active during works, works will cease within a species-specific buffer of its location in line with best practice guidance (e.g. Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007) to avoid disturbance. No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.

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.

7.7.2 Operational Phase Surveys

In line with best practice measures, a detailed post-construction Bird Monitoring Programme has been prepared for the operational phase of the proposed development, please 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 & 15 of the lifetime of the wind farm. Monitoring measures are broadly based on guidelines issued by the NatureScot (SNH, 2009). The following individual components are proposed:

- Flight activity surveys: vantage point surveys.
- Breeding bird surveys: O'Brien & Smith
- 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.

The proposed programme of monitoring was not proposed in response to any identified significant effect but rather as a best practice measure (as per guidance outlined in NatureScot, 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.

7.7.3 Decommissioning

It is proposed that decommissioning works will commence outside the bird nesting season (1st of March to 31st of August inclusive) to avoid the most sensitive time of the year for most bird species with the potential to use the site and its environs. Pre-commencement confirmatory surveys will be undertaken within one month prior to the initiation of works at the Proposed Development to identify sensitive sites (e.g. roosts). Any requirement for construction works to run into the subsequent breeding and winter seasons following commencement will be subject to a repeat of the pre-commencement bird surveys to confirm the absence of breeding birds of conservation concern once per month during the breeding season (April to July) and once during the winter season (October). The survey will aim to identify sensitive sites e.g., nests or roosts depending on the season in question.

The surveys will be undertaken by a suitably qualified ornithologist. The surveys will comprise a thorough walkover survey of the development footprint and/or all works areas to a 500m radius, where access allows. If winter roosts or nests of birds of high conservation concern are identified, the roost/nest will be earmarked for continued monitoring during works. If the roost/nest is found to be active during works, works will cease within a species-specific buffer of its location in line with best practice guidance (e.g. Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007). No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.

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.

7.8 Residual Effects

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

- Golden Plover (winter)
- Kingfisher (all seasons)
- Peregrine (all seasons)
- Whooper Swan (winter)
- Kestrel (all seasons)
- Snipe (all seasons)
- Buzzard (all seasons)
- Sparrowhawk (all seasons)

Following the measures described in Section 7.6, no effect significance greater than ***Low,*** as per Percival (2003) criteria, or ***Slight,*** as per EPA (2022) criteria, was identified for any KOR. Taking into consideration the effect significance levels identified and the proposed best practice and mitigation, significant residual effects on the KORs with regard to direct habitat loss, disturbance/displacement or collision mortality are not anticipated.

The site is characterised by improved agricultural grassland utilised for livestock grazing. Improved agricultural grassland is typically considered to be of low ecological value. Improved agricultural grassland habitat is among the most abundant in Ireland and are neither rare locally or uniquely occur within the Site. As outlined in Section 7.2.5.1, wind farms have the potential to impact birds. The Proposed Wind Farm will likely give rise to a measurable reduction in the distribution and abundance of birds locally within the site. However, no significant effects are predicted at the county, national or international level.

7.9 Cumulative Effects

As per NatureScot guidance "Assessing the Cumulative Impacts of onshore Wind Energy Developments" (SNH, 2012), 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 Wind Farm and then assesses the potential for additive, antagonistic or synergistic impacts to occur.

7.9.1 Other Plans and Projects

Assessment material was compiled for relevant developments within the vicinity of the Proposed Wind Farm. 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 Development. All plans and projects reviewed are outlined below.

7.9.1.1 Plans Considered in the Cumulative Impact Assessment

The following plans were considered in the cumulative impact assessment:

- Kilkenny City and County Development Plan 2021-2027
- Laois County Development Plan 2021-2027
- National Biodiversity Action Plan 2023-2030

7.9.1.2 Projects Considered in the Cumulative Impact Assessment

NatureScot guidance (SNH, 2018b) was consulted while undertaking the cumulative assessment. NatureScot 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)'. As the Proposed Development is located on the county boundary, to consider impacts at the county scale an approximation was required. A 25km radius of the proposed development was considered a reasonable approximation of the size of a county and a 5km radius of the Proposed Development was considered a reasonable approximation for the local level.

To conduct the cumulative impact assessment, County Council 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.

7.9.1.2.1 *Developments and Land Uses*

The review of the County Council planning register identified relevant general development planning applications in the vicinity of the Proposed Development. Most of these relate to the provision and/or alteration of one-off rural housing and agriculture-related structures, as described in Chapter 2 of the EIAR. Owing to the scale and nature of these developments, significant cumulative impacts are not anticipated.

7.9.1.3 Forestry and Agricultural Practices

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 development will be subject to relevant licencing and guidance from the Forestry Service.

The remaining land use in the surrounding area is predominantly agriculture in the form of livestock grazing. These applications and land uses have also been taken into account in this cumulative assessment.

7.9.1.3.1 *Other Wind Farm Developments*

Wind farm projects within 25km of the Proposed Development are provided in Table 7-11, including details of their planning status. A total of 96 existing turbines and 100 permitted/proposed turbines were identified for consideration. The environmental impacts of each existing or permitted/proposed wind farm are outlined in detail in this section.

Table 7-11 Wind energy applications within 25km of the Proposed Wind Farm

County	Wind Farm	Planning Status	Number of Turbines	Separation Distance (turbine to turbine)
Kilkenny	Lisdowney Wind Farm	Existing	4	c.4.2km
Kilkenny	Single Turbine at Acragar	Existing	1	c.4.7km
Kilkenny	Ballynalacken Wind Farm	Proposed	12	c.5.7km
Kilkenny & Laois	Pinewoods Wind Farm	Permitted	11	c.10km
Laois	Cullenagh Wind Farm	Permitted	18	c.14.4km
Kilkenny & Laois	Lisheen III Wind Farm	Existing	8	c.17.1km
Laois	Coolglass Wind Farm	Proposed	13	c.17.4km
Kilkenny	Briskalagh Wind Farm	Proposed	7	c.18km
Kilkenny	Ballybay Wind Farm	Existing	6	c.18.2km
Kilkenny, Laois & Tipperary	Brukana Wind Farm	Existing	14	c.18.9km
Kilkenny	Foyle Wind Farm Extension	Permitted	3	c.19km
Kilkenny	Foyle Wind Farm	Existing	4	c.19.3km
Carlow & Kilkenny	White Hill Wind Farm	Proposed	7	c.19.3km
Tipperary	An Cnoc Wind Farm	Existing	5	c.20km
Kilkenny	Freneystown Wind Farm	Proposed	8	c.20.2km
Laois	Gortahile Wind Farm	Existing	8	c.20.6km
Tipperary	Lisheen I & II Wind Farm	Existing	30	c.20.6km
Carlow	Seskin Wind Farm	Proposed	7	c.21.3km
Carlow	Bilbao Wind Farm	Permitted	5	c.21.7km
Tipperary	Farranroy Wind Farm	Permitted	9	c.22.9km
Tipperary	Gurteen Lower Turbine	Existing	1	c.24.2km
Tipperary	Monaincha Wind Farm	Existing	15	c.24.7km

Lisdowney Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the existing Lisdowney Wind Farm, which is 4km from the nearest proposed

turbine, was considered. The EIS[8] for the existing Lisdowney Wind Farm was consulted. The EIS assessed the following species which are shared as key ornithological receptors with the Proposed Wind Farm: peregrine, kestrel, snipe, buzzard and sparrowhawk. The EIS concluded no significant effects on these species due to habitat loss, collisions or disturbance.

Single Turbine at Acragar

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the existing single turbine located at Acragar, which is 4.7km from the nearest proposed turbine, was considered. The is no planning file on record for this turbine. The turbine is located within agricultural grassland. As such, there is potential for KOR species of the Proposed Wind Farm to occur at the site.

Ballynalacken Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside proposed Ballynalacken Wind Farm, which is 5.7km from the nearest proposed turbine, was considered. The EIAR[9] for the Ballynalacken Wind Farm was consulted. The EIAR assessed the following species which are shared as key ornithological receptors with the Proposed Wind Farm: kingfisher, peregrine, kestrel, snipe, buzzard and sparrowhawk. No significant impacts on birds were anticipated with regard to collision risk and disturbance/displacement, with any potential impacts being no greater than slight/moderate.

The cumulative assessment for the Ballynalacken Wind Farm considers wind farms within 4km of the wind farm for the assessment. It was concluded that the cumulative impact of collision risk and displacement effects on birds unlikely to be significant, with any potential impacts being no greater than slight.

The EIAR concluded that "*Overall, it is evaluated that the residual impact on the Environmental Factor, Biodiversity, will be Neutral*".

Pinewoods Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the permitted Pinewoods Wind Farm, which is 10km from the nearest proposed turbine, was considered. The EIS[10] for the Pinewoods Wind Farm was consulted. The EIS assessed the following species which are shared as key ornithological receptors with the Proposed Wind Farm: kestrel and sparrowhawk. No significant impacts on birds were anticipated with regard to collision risk and disturbance, with any potential impacts being slight negative.

Cullenagh Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the permitted Cullenagh Wind Farm, which is 14.4km from the nearest proposed turbine, was considered. The EIS[11] for the Cullenagh Wind Farm was reviewed. The EIS assessed the following species which are shared as key ornithological receptors with the Proposed Wind Farm: sparrowhawk. No significant impacts on birds were anticipated with regard to collision risk or habitat loss.

[8] *https://www.eplanning.ie/KilkennyCC/AppFileRefDetails/12172/0*
[9] *https://ballynalackenwindfarmplanning.ie/environmental/*
[10] *https://www.eplanning.ie/LaoisCC/AppFileRefDetails/16260/0*
[11] *https://www.eplanning.ie/LaoisCC/AppFileRefDetails/13268/0*

Lisheen III Wind Farm

The potential for the Proposed Wind Farm to result in significant cumulative or in-combination effects when assessed alongside the existing Lisheen III Wind Farm, which is 17.1km from the nearest proposed turbine, was considered. The original EIS[12] and updated Environmental Considerations Report included in latest amendment application[13] was consulted. The species which are key ornithological receptors of the Proposed Wind Farm and were recorded at Lisheen Wind Farm III were snipe and sparrowhawk, however these were not considered key ornithological receptors of Lisheen III Wind Farm. The EIS and Environmental Considerations Reports concluded no potential for significant negative effects on birds.

Coolglass Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the proposed Coolglass Wind Farm, which is 17.4km from the nearest proposed turbine, was considered. The EIAR[14] for the proposed Coolglass Wind Farm was reviewed. The EIAR assessed the following species which are shared as key ornithological receptors with the Proposed Wind Farm: golden plover, peregrine and snipe. No significant impacts on birds were anticipated with regard to collision risk, disturbance/displacement and barrier effect, with any potential impacts being slight negative.

The cumulative assessment for the Coolglass Wind Farm considers wind farms within 20km of the wind farm for the assessment. It was concluded that the cumulative impact of habitat loss, collision risk, barrier effect and indirect disturbance effects on birds unlikely to be significant.

The EIAR concluded that "*there are not likely to be any residual significant effects on important ecological features*".

Briskalagh Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the proposed Briskalagh Wind Farm, which is 18km from the nearest proposed turbine, was considered. The EIAR[15] for the proposed Briskalagh Wind Farm was reviewed. Briskalagh Wind Farm shared the following key ornithological receptors within the Proposed Wind Farm: kestrel, snipe, buzzard and sparrowhawk. This EIAR assessed collision risk and displacement for the operational phase of this development. The collision risk was assessed to be Very Low (as per Percival, 2003) for these species. Displacement/barrier effect was assessed to be Low (as per Percival, 2003) for kestrel and snipe, and Very Low (as per Percival, 2003) for buzzard and sparrowhawk.

The cumulative assessment for the Briskalagh Wind Farm assessed the cumulative construction and operational impacts on birds of the wind farm when wind farms within 25km were taken into consideration. It was concluded that there would be no significant cumulative displacement/barrier effects or collision risk anticipated.

The EIAR concluded that "*following consideration of the residual effects, it is concluded that the Proposed Project will not result in any significant effects on any of the identified KORs*".

[12] *https://planning.kilkennycoco.ie/AppFileRefDetails/14202/0*
[13] *https://planning.kilkennycoco.ie/AppFileRefDetails/20459/0*
[14] *https://www.pleanala.ie/en-ie/case/317809*
[15] *https://www.pleanala.ie/en-ie/case/322154*

Ballybay Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the existing Ballybay Wind Farm, which is 18.2km from the nearest proposed turbine, was considered. There was no information available on the environmental impacts of the Ballybay Wind Farm on the planning file[16]. The existing Ballybay Wind Farm is situated within agricultural grassland with minor watercourses present. As such, there is potential for KOR species of the Proposed Development to occur at the existing Ballybay Wind Farm.

Brukana Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the existing Brukana Wind Farm, which is 18.9km from the nearest proposed turbine, was considered. There was no information available on the environmental impacts of the Brukana Wind Farm on the planning file[17]. The existing Buckrana Wind Farm is situated within cutover bog and scrub. As such, there is potential for KOR species of the Proposed Wind Farm to occur at the existing Brukana Wind Farm.

Foyle Wind Farm & Foyle Wind Farm Extension

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the existing Foyle Wind Farm and permitted Foyle Wind Farm Extension, which is 19km from the nearest proposed turbine, was considered. There was no information available on environmental impacts of the existing Foyle Wind Farm on the planning file[18], however the EIS for the permitted extension was reviewed[19]. No KOR species of the Proposed Wind Farm were listed as being recorded during surveys at the Foyle Wind Farm. The Foyle Wind Farm and Foyle Wind Farm Extension is situated within agricultural grassland and commercial forestry.

White Hill Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the permitted White Hill Wind Farm was considered. The EIAR[20] for White Hill Wind Farm was reviewed. The EIAR for the permitted White Hill Wind Farm assessed the following species which are shared as key ornithological receptors with the Proposed Wind Farm: kestrel, snipe, buzzard and sparrowhawk. The EIAR for the permitted White Hill Wind Farm assessed collision risk and displacement for the operational phase of this development. The collision risk was assessed to be not significant for all species. Disturbance/displacement and barrier effect were assessed to be not significant for all species.

The cumulative assessment in the EIAR for the permitted White Hill Wind Farm assessed the in-combination collision risk and the in-combination barrier effect of the wind farm with other wind farms within 15km were taken into consideration and concluded no likelihood for cumulative collision risk or cumulative barrier effect on birds.

An Cnoc Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the existing An Cnoc Wind Farm, which is 20km from the nearest proposed

[16] *https://planning.kilkennycoco.ie/AppFileRefDetails/12533/0*
[17] *https://planning.kilkennycoco.ie/AppFileRefDetails/10145/0*
[18] *https://planning.kilkennycoco.ie/AppFileRefDetails/12378/0*
[19] *https://planning.kilkennycoco.ie/AppFileRefDetails/1617/0*
[20] *https://www.pleanala.ie/en-ie/case/315365*

turbine, was considered. The EIS[21] for the existing An Cnoc Wind Farm was reviewed. The EIS assesses commonly occurring passerines present at the site. There were no KORs of the Proposed Development assessed. The existing An Cnoc Wind Farm is situated within agricultural grassland with some watercourses present.

Freneystown Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the proposed Freneystown Wind Farm, which is 20.2km from the nearest proposed turbine, was considered. Freneystown Wind Farm is at the preplanning stage and therefore no planning application has been lodged, and no impact assessment has been completed. Freneystown Wind Farm is situated within agricultural grassland with some commercial forestry and watercourses. As such, there is potential for KOR species of the Proposed Development to occur at the proposed Freneystown Wind Farm.

Gortahile Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the existing Gortahile Wind Farm, which is 20.6km from the nearest proposed turbine, was considered. The EIS[22] for the Gortahile Wind Farm was reviewed. The EIS assessed the following species which are shared as key ornithological receptors with the Proposed Wind Farm: kestrel and snipe. No impacts on birds were anticipated from the wind farm.

Lisheen I Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the existing Lisheen I Wind Farm, which is 20.6km from the nearest proposed turbine, was considered. The EIS[23] for the existing Lisheen I Wind Farm was consulted. The following species which are key ornithological receptors with the Proposed Wind Farm were recorded at Lisheen I Wind Farm: kestrel and snipe. The EIS concluded no potential for significant negative effects on birds.

Lisheen II Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the existing Lisheen II Wind Farm was considered. The EIS and Avian Assessment Appendix for the existing Lisheen II Wind Farm was reviewed. The following species which are key ornithological receptors of the Proposed Wind Farm were recorded at Lisheen II Wind Farm: kestrel, snipe and sparrowhawk. The EIS assessed collision risk and displacement for the operational phase of the wind farm. The EIS concluded no potential for significant negative effects on birds.

Seskin Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the proposed Seskin Wind Farm, which is 21.3km from the nearest proposed turbine was considered. The EIAR[24] for the proposed Seskin Wind Farm was assessed the following species which are shared as key ornithological receptors with the Proposed Wind Farm: kestrel, golden plover, snipe, buzzard and sparrowhawk. The EIAR assessed direct habitat loss and disturbance for the

[21] *https://www.eplanning.ie/TipperaryCC/AppFileRefDetails/09781/0*
[22] *https://www.eplanning.ie/LaoisCC/AppFileRefDetails/04935/0*
[23] *https://www.eplanning.ie/TipperaryCC/AppFileRefDetails/06510773/0*
[24] *https://www.eplanning.ie/CarlowCC/AppFileRefDetails/2460122/0*

construction phase. For the operational phase direct habitat loss, displacement, barrier effect and collision risk were assessed. The collision risk was assessed to be low significance for all species. Habitat loss was assessed to be low significance for all species.

Bilbao Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the permitted Bilbao Wind Farm, which is 21.7km from the nearest proposed turbine, was considered. The EIAR[25] for the permitted Bilbao Wind Farm was reviewed. The EIAR assessed the following species which are shared as key ornithological receptors with the Proposed Wind Farm: kestrel, peregrine, golden plover, snipe, buzzard and sparrowhawk. The EIAR for the permitted Bilbao Wind Farm assessed collision risk, disturbance and displacement, and habitat loss for the construction, operation and decommissioning of this development. The collision risk was assessed to be not significant for all species. Disturbance/displacement and barrier effect were assessed to be not significant for all species. The habitat loss was assessed to be not significant for all species. The cumulative assessment in the EIAR for the permitted Bilbao Wind Farm assessed the in-combination collision risk and the in-combination barrier effect of the Bilbao Wind Farm when wind farms within 20km were taken into consideration and concluded no likelihood for cumulative collision risk or cumulative barrier effect on birds.

Farranroy Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the permitted Farranroy Wind Farm, which is 22.9km from the nearest proposed turbine, was considered. The EAIR[26] and Environmental Considerations Report[27] for the Farranroy Wind Farm was reviewed. The EIAR assessed the following species which are shared as key ornithological receptors with the Proposed Wind Farm: kestrel and buzzard. The EIAR for the permitted Farranroy Wind Farm assessed habitat loss, displacement and collision risk of the development. Habitat loss was assessed to be a negligible impact. Displacement was assessed to be of low significance for all species. The habitat loss was assessed to be not significant for all species. The collision risk was assessed to be of very low significance for all species. The cumulative assessment in the EIAR assessed impacts of the Farranroy Wind Farm when wind farms within 20km were taken into consideration and concluded there was no potential for negative cumulative impacts to biodiversity.

Gurteen Lower Wind Turbine

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the existing Gurteen Lower wind turbine, which is 23.2km from the nearest proposed turbine, was considered. The planning file for the existing Gurteen Lower Wind Turbine was consulted[28], however no information specific to birds was available. The existing Gurteen Lower Wind Turbine is situated within agricultural grassland. As such, there is potential for KOR species of the Proposed Wind Farm to occur in the vicinity of the existing Gurteen Lower Wind Turbine.

Monaincha Wind Farm

The potential for the Proposed Development to result in significant cumulative or in-combination effects when assessed alongside the existing Monaincha Wind Farm, which is 24.7km from the nearest proposed turbine, was considered. There was no information available on the environmental impacts of

[25] *https://www.eplanning.ie/CarlowCC/AppFileRefDetails/22340/0*
[26] *https://www.eplanning.ie/TipperaryCC/AppFileRefDetails/20972/0*
[27] *https://www.eplanning.ie/TipperaryCC/AppFileRefDetails/2360803/0*
[28] *https://www.eplanning.ie/TipperaryCC/AppFileRefDetails/09801/0*

the Monaincha Wind Farm on the planning file[29]. The existing Monaincha Wind Farm is situated within commercial forestry, agricultural grassland and bog habitats. As such, there is potential for KOR species of the Proposed Wind Farm to occur at the existing Monaincha Wind Farm.

[29] *https://www.eplanning.ie/TipperaryCC/AppFileRefDetails/09510084/0*

7.9.2 Assessment of Cumulative Effects

There were eight KORs identified at the Proposed Development: golden plover, kingfisher, peregrine, whooper swan, kestrel, snipe, 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 Wind Farm. There are only two wind farms within 5km of proposed Seskin Wind Farm (Lisdowney and a single turbine at Acragar); there were a further three wind farms between 5-15km (Ballynalacken, Pinewoods and Cullennagh), the remaining were within 15-25km.

Following SNH (2012) guidance, the cumulative impact assessment has been carried out at the scale of the importance rating of the receptor: County Importance (golden plover, kingfisher, peregrine, whooper swan, kestrel and snipe); and Local Importance Higher Value (buzzard and sparrowhawk). The assessment of cumulative effects on KORs is provided below. In particular, cumulative habitat loss and displacement associated with operational turbines is assessed. Short-term impacts (e.g. construction disturbance) are highly unlikely to give rise to significant cumulative impacts. For this reason, no significant cumulative effects are predicted, and it is not considered further. Kingfisher are only assessed in relation to the Proposed Grid Connection and therefore highly unlikely to give rise to significant cumulative impacts when considered with other wind farm developments. For this reason, no significant cumulative effects are predicted, and kingfisher is not considered further.

7.9.2.1 Golden Plover (County Importance)

The potential for developments at a county scale (within 25km) to result in significant cumulative or in combination effects when assessed alongside the Proposed Development were considered. Lisdowney, the single turbine at Acragar, Ballynalacken, Pinewoods, Lisheen III, Coolglass, Briskalagh, Ballybay, Foyle, Foyle Extension, White Hall, An Cnoc, Freneystown, Gortahile, Lisheen I & II, Seskin, Farronroy, Gurteen Lower and Monaincha are all location within, or partially within agricultural grassland habitats. Brukana and Monaincha are located within, or partially within bog habitats. Both of these habitat types are suitable for foraging and roosting golden plover. While there will be a measurable reduction in the available habitat within the Site, these habitats are not considered to be a scarce resource in the area and in particular agricultural grassland (which is favoured by foraging golden plover) is abundant locally and within 25km of the site. Furthermore, there is an abundance of suitable habitat within 25km of the Site which is not in proximity to a wind farm and therefore no significant cumulative impact is anticipated.

Four wind energy developments are located within the maximum foraging range of 12km for wintering golden plover (Gillings and Fuller, 1999). The closest wind farm to the proposed development is the Lisdowney Wind Farm, which is 4.2km of the Proposed Wind Farm. Furthermore, the single turbine at Acragar, Ballynalacken and Pinewoods are within the wintering foraging range of the Proposed Wind Farm. However, given the location of the wind farm, the abundance of suitable habitat in the wider area and the lack of significant residual impacts on this species, no significant impacts on this species were identified.

No significant impacts on this species were identified at the local scale (5km), given the low density of turbines located within 5km of the Proposed Wind Farm and the abundance of suitable habitat. Furthermore, no significant effects were reported for any of the wind farms located within a 25km radius (county scale) of the Proposed Wind Farm.

Taking into consideration the above and the predicted effects with the Proposed Development, no residual additive, antagonistic or synergistic effects have been identified with regard to habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.9.2.2 Peregrine (County Importance)

The potential for developments at a county scale (within 25km) to result in significant cumulative or in combination effects when assessed alongside the Proposed Project were considered Lisdowney, the single turbine at Acragar, Ballynalacken, Pinewoods, Lisheen III, Coolglass, Briskalagh, Ballybay, Foyle, Foyle Extension, White Hall, An Cnoc, Freneystown, Gortahile, Lisheen I & II, Seskin, Farronroy, Gurteen Lower and Monaincha are all location within, or partially within agricultural grassland habitats. Brukana and Monaincha are located within, or partially within bog habitats. These habitat types are suitable for foraging peregrine. However, these habitats are not considered to be a scarce resource in the area. While there will be a measurable reduction in the available habitat within the Site, extensive areas of suitable foraging and breeding habitat will remain post construction. Furthermore, there is an abundance of suitable habitat within 25km of the Site which is not in proximity to a wind farm and therefore no significant cumulative impact is anticipated.

The maximum foraging range of peregrine is 18km (NatureScot, 2016). There are seven wind energy developments located within the maximum foraging range of peregrine: Lisdowney, the single turbine at Acragar, Ballynalacken, Pinewoods, Cullenagh, Lisheen III and Coolglass. No significant impacts on peregrine were anticipated from any of these developments. The majority of turbines at Pinewoods, Cullenagh and Coolglass are located within commercial forestry, a habitat of very limited ecological value for peregrine. The remaining turbines within the wind farms within 18km of the Site are within agricultural grassland. These habitats are abundant within 18km of the Site.

No significant impacts on this species were identified at the local scale (5km), given the low density of turbines located within 5km of the Proposed Wind Farm and the abundance of similar habitat found within the wind farms in the wider area. Furthermore, no significant effects were reported for any of the wind farms located within a 25km radius (county scale) of the Proposed Wind Farm.

Taking into consideration the above reported effects and the predicted effects with the Proposed Development, no residual additive, antagonistic or synergistic effects have been identified with regard to habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.9.2.3 Whooper Swan (County Importance)

The potential for developments at a county scale (within 25km) to result in significant cumulative or in combination effects when assessed alongside the Proposed Project were considered. Lisdowney, the single turbine at Acragar, Ballynalacken, Pinewoods, Lisheen III, Coolglass, Briskalagh, Ballybay, Foyle, Foyle Extension, White Hall, An Cnoc, Freneystown, Gortahile, Lisheen I & II, Seskin, Farronroy, Gurteen Lower and Monaincha are all location within, or partially within agricultural grassland habitats. Brukana and Monaincha are located within, or partially within bog habitats. Both of these habitat types are suitable for foraging and roosting whooper swan, particularly where winter flooding occurs. However, these habitats are not considered to be a scarce resource in the area. Extensive areas of suitable foraging habitat will remain post construction (e.g. the abundant local grassland), and there is an abundance of suitable roosting habitat in the surrounding area (e.g. along the River Nore and Erkina River floodplains).

There are two wind energy developments located within the foraging range of 5km for whooper swan (NautreScot, 2016). The Lisdowney Wind Farm and the single turbine at Acragar are within the wintering foraging range of the Proposed Wind Farm. Furthermore, there are no other wind farms within the foraging range (5km) of the identified foraging grounds at Black Island and the Durrow Curragh. Therefore, given the low density of turbines, the abundance of suitable habitat in the wider area and the lack of significant residual impacts on this species, no significant impacts on this species were identified.

No significant impacts on this species were identified at the local scale (5km), given the low density of turbines located within 5km of the Proposed Wind Farm and the abundance of similar habitat found within the wider area. Furthermore, no significant effects were reported for any of the wind farms located within a 25km radius (county scale) of the Proposed Wind Farm.

Taking into consideration the above reported effects and the predicted effects with the Proposed Development, no residual additive, antagonistic or synergistic effects have been identified with regard to habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.9.2.4 Kestrel (County Importance)

The potential for developments at a county scale (within 25km) to result in significant cumulative or in combination effects when assessed alongside the Proposed Development were considered. Lisdowney, Ballynalacken, Pinewoods, Cullenagh, Lisheen III, Coolglass, Briskalagh, Ballybay, Brukana, Foyle & Foyle Extension, White Hill, Freneystown, Gortahile, Lisheen I & II, Seskin, Bilbao, Farranroy and Monaincha are all within, or adjacent to forestry or woodland which is suitable for nesting kestrel. Lisdowney, the single turbine at Acragar, Ballynalacken, Pinewoods, Lisheen III, Coolglass, Briskalagh, Ballybay, Foyle, Foyle Extension, White Hall, An Cnoc, Freneystown, Gortahile, Lisheen I & II, Seskin, Farronroy, Gurteen Lower and Monaincha are all location within, or partially within agricultural grassland habitats. Brukana and Monaincha are located within, or partially within bog habitats. Both of these habitat types are suitable for hunting kestrel. However, these habitats are not considered to be a scarce resource in the area. While there will be a measurable reduction in the available habitat within the Site, extensive areas of suitable foraging and breeding habitat will remain post construction. Furthermore, there is an abundance of suitable habitat within 25km of the Site which is not in proximity to a wind farm and therefore no significant cumulative impact is anticipated.

There were no wind energy developments located within the foraging range of 1.8km for kestrel (based off a maximum home range of 10km^2 (Village, 1990)). Furthermore, the Site is predominantly agricultural grassland throughout, a habitat that is predominantly utilized for hunting. However, the habitat types within the Site are not rare locally. Therefore, significant cumulative impacts are not predicted.

No significant impacts on this species were identified at the local scale (5km), given the low density of turbines located within 5km of the Proposed Wind Farm and the abundance of similar habitat found within the wind farms in the wider area. Furthermore, no significant effects were reported for any of the wind farms located within a 25km radius (county scale) of the Proposed Wind Farm.

Taking into consideration the above reported effects and the predicted effects with the Proposed Development, no residual additive, antagonistic or synergistic effects have been identified with regard to habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.9.2.5 Snipe (County Importance)

The potential for developments at a county scale (within 25km) to result in significant cumulative or in combination effects when assessed alongside the Proposed Development were considered. Lisdowney, the single turbine at Acragar, Ballynalacken, Pinewoods, Lisheen III, Coolglass, Briskalagh, Ballybay, Foyle, Foyle Extension, White Hall, An Cnoc, Freneystown, Gortahile, Lisheen I & II, Seskin, Farronroy, Gurteen Lower and Monaincha are all location within, or partially within agricultural grassland habitats. Brukana and Monaincha are located within, or partially within bog habitats. Both of

these habitat types are suitable for foraging snipe. However, these habitats are not considered to be a scarce resource in the area. While there will be a measurable reduction in the available habitat within the Site, extensive areas of suitable foraging and breeding habitat will remain post construction. Furthermore, there is an abundance of suitable habitat within 25km of the Site which is not in proximity to a wind farm and therefore no significant cumulative impact is anticipated.

No significant impacts on this species were identified at the local scale (5km), given the low density of turbines located within 5km of the Proposed Wind Farm and the abundance of suitable habitat. Furthermore, no significant effects were reported for any of the wind farms located within a 25km radius (county scale) of the Proposed Wind Farm.

Taking into consideration the above reported effects and the predicted effects with the Proposed Development, no residual additive, antagonistic or synergistic effects have been identified with regard to habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.9.2.6 Buzzard (Local Importance)

The potential for local developments to have resulted in significant cumulative or in combination effects when assessed alongside the Proposed Development was considered.

There are no wind energy developments located within the foraging range of 1km for buzzard (based off a maximum home range of 3km^2 (Walls & Kenward, 2001)). The Site is predominantly agricultural grassland throughout, a habitat type that is predominantly utilized for hunting. However, these habitat types are not rare locally. Furthermore, this species is numerous and widespread with a favorable conservation status. Therefore, significant cumulative impacts are not predicted.

No significant impacts on this species were identified at the local scale (5km), given the low density of turbines located within 5km of the Proposed Wind Farm and the abundance of suitable habitat. Furthermore, no significant effects were reported for any of the wind farms located within a 25km radius (county scale) of the Proposed Wind Farm.

Taking into consideration the above reported effects and the predicted effects with the Proposed Development, no residual additive, antagonistic or synergistic effects have been identified with regard to habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.9.2.7 Sparrowhawk (Local Importance)

The potential for other developments to have resulted in significant cumulative or in combination effects when assessed alongside the Proposed Development was considered.

There are no wind energy developments located within the foraging range of 3.3km for sparrowhawk (based on a maximum home range of 3,528ha (Marquiss and Newton, 1982)). The Site is predominantly agricultural grassland throughout, a habitat type that are predominantly utilized for hunting. However, these habitat types are not rare locally. Furthermore, this species is numerous and widespread with a favorable conservation status. Therefore, significant cumulative impacts are not predicted.

No significant impacts on this species were identified at the local scale (5km), given the low density of turbines located within 5km of the Proposed Wind Farm and the abundance of suitable habitat.

Furthermore, no significant effects were reported for any of the wind farms located within a 25km radius (county scale) of the Proposed Wind Farm.

Taking into consideration the above reported effects and the predicted effects with the Proposed Development, no residual additive, antagonistic or synergistic effects have been identified with regard to habitat loss, displacement or collision mortality.

Significant cumulative impacts are not predicted.

7.10 Conclusion

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