7. ORNITHOLOGY

7.1 INTRODUCTION

APEM Ltd was commissioned by Manogate Ltd to examine the potential effects that the proposed project (described in Chapter 2 (Description of Proposed Project)) may have on the ornithological interests present within the study area, including Important Ornithological Features (IOFs). This assessment considers the potential effects with regard to each phase of the project: construction phase, operational phase, and decommissioning phase. Appropriate mitigation measures are described to avoid or reduce potential negative effect(s). The mitigation measures detailed within this chapter should be read in conjunction with mitigation measures contained in Chapter 6 (Biodiversity) and those contained in the Construction Environmental Management Plan (CEMP).

This Chapter of the EIA Report is supported by the following Technical Appendices provided in Volume III - Technical Appendices:

- Appendix 7-1: Baseline Ornithology Report; and
- Appendix 7-2: Collision Risk Modeling Report

The proposed wind farm site is located approximately 4 km north-east of Mullinavat in County Kilkenny.

7.2 STATEMENT OF AUTHORITY

This Chapter was written by Billy Gardener, Senior Ornithology Consultant at APEM and has been technically reviewed by Matthew Rea, Principal Ornithology Consultant at APEM. All contributors are suitably qualified and experienced to undertake the tasks completed in support of the impact assessment.

7.3 RELEVANT LEGISLATION, POLICY AND GUIDANCE

7.3.1 Legislation

The following legislation has been complied with for this chapter:

- Irish Wildlife Acts 1976 to 2021 (as amended).
- The European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) (S.I. No. 477 of 2011) (transposes EU Birds Directive 2009/147/EC and EU Habitats Directive 92/43/EEC).
- Planning and Development Regulations 2001 (as amended)
- Planning and Development Act 2000 (as amended)
- S.I. No. 296/2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018
- Directive 2011/92/EU as amended by Directive 2014/52/EU

7.3.2 Policy

The relevant local planning policies have been extracted from the Kilkenny City and County Development Plan 2021 (Volume 1)[1]. These policies are concerned with the protection and / or enhancement the ecology of County Kilkenny. In broad terms these objectives and policies aim

[1] https://kilkennycoco.ie/eng/services/planning/development-plans/city-and-county-development-plan/vol1-master-ccdp-2-11-2021.pdf

to ensure correct measures are put in place to identify and protect natural heritage and important environmental features within Kilkenny County. In addition, national and international policy relevant to this assessment has been listed below.

This assessment complies with the following policies:

- Project Ireland 2040: National Planning Framework: First Revision.
- Kilkenny County Council (2021) Kilkenny City and County Development Plan: Volume 1 County 2021-2027.
- Kilkenny County Council (2025) Kilkenny's Biodiversity Action Plan 2025-30.
- Department of Housing, Local Government and Heritage (2021) Ireland's 4th National Biodiversity Action Plan.
- The International Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 (the "Ramsar Convention).
- The Convention on the Conservation of Migratory Species of Wild Animals 1979 (the "Bonn Convention").

7.3.3 Guidance

The following guidance documents have been used to inform this chapter:

- Band, W. (2024) Using a collision risk model to assess bird collision risks for onshore wind farms. NatureScot Research Report 909.
- Department of Environment Community and Local Government [DoECLG], (2018). Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.
- Environmental Protection Agency (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports.
- European Commission (2017). Environmental Impact Assessment of Projects.
- European Commission (2011). Wind energy development and Natura 2000. Guidance document.
- Gilbert, G., Stanbury, A., & Lewis, L. (2021). Birds of conservation concern in Ireland 4: 2020–2026. Irish Birds, 43, 1-22.
- Gilbert, G., Gibbons, D.W. & Evans, J. (1998). Bird monitoring methods. RSPB, Sandy.
- Goodship, N.M. and Furness, R.W. (MacArthur Green) (2022) Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283.
- Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. (2013). Raptors: a field guide to survey and monitoring, 3rd edition. The Stationery Office, Edinburgh.
- National Roads Authority (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes (Revision 2).
- NatureScot (2018a). Assessing significance of impacts from onshore wind farms on birds out with designated areas, Version 2.
- NatureScot (2018b). Assessing the cumulative impacts of onshore wind farms on birds. SNH Guidance Note.
- NatureScot (2025) Recommended bird survey methods to inform impact assessment of onshore wind farms, Version 2.
- NatureScot (2016a). Assessing connectivity with Special Protection Areas (SPAs), Version 3.

- NatureScot (2016b). Environmental Statements and Annexes of Environmentally Sensitive Bird Information; Guidance for Developers, Consultants and Consultees, Version 2.
- NatureScot (2000). Windfarms and birds: calculating a theoretical collision risk assuming no avoidance action. SNH Guidance Note.

7.4 METHODS

7.4.1 Zone of Influence and study area

The '*Zone of Influence' (ZoI)* for a project is the area over which ecological features may be subject to significant effects because of the proposed project and associated activities. This is likely to extend beyond the proposed wind farm site, for example where there are ecological or hydrological links beyond site boundaries. The ZoI will vary for different ecological features depending on their sensitivity to an environmental change (CIEEM, 2018).

The ZoI for this project was identified through a review of the nature, size and location of the project, the sensitivities of the ecological features, known impacts and effects likely to arise as a result of the type of proposed development and the potential for in combination effects.

The Ornithology Survey Areas are defined below for each survey method. The study area for the assessment has been determined based on the ZoI, Ornithology Survey Areas and guidance on potential connectivity to designated sites (SNH, 2016a). A study area of 20 km has been used for this assessment based on the core foraging range of pink footed goose, however the study area for ornithological features varies dependent on the species in question and their sensitivity to potential effects.

This assessment considers all parts of the proposed project, other than those identified as scoped out herein.

7.4.2 Consultation

A review of all consultation relating to this project is detailed within Chapter 1 (Introduction).

7.4.3 Baseline Data Collection

7.4.3.1 Desk Study

A desk-study has been undertaken to identify statutory designated sites designated for ornithological features with potential connectivity to the Site based on SNH guidance (2016a). The desk-study searched for:

- Internationally important sites - Special Protection Areas (SPAs) and Ramsar sites within 20 km of the proposed project.;
- Internationally important sites - Special Protection Areas (SPAs) and Ramsar sites designated for breeding lesser black-backed gull due to the presence of regular flocks during baseline surveys, in line with NatureScot (2023a, 2023b and 2025) guidance[2]
- Nationally important sites – Natural Heritage Areas (NHAs) within 20 km of the proposed project[3]; and

[2] Connectivity distances for lesser black-backed gull are based on those presented within Woodward *et al.*(2019)
[3] Although not statutory designated sites, proposed NHAs (pNHAs) within 20km of the proposed project have also been considered.

- Nature Reserves within 10 km of the proposed project.

The National Parks and Wildlife Service (NPWS)[4] Designations Viewer was used to search for designated sites.

7.4.3.2 Field Surveys

7.4.3.2.1 Vantage Point Surveys

Vantage Point Surveys (VPS) were carried out between May 2020 and March 2025 (inclusive) from three Vantage Point (VP) locations. No surveys were completed between August 2021 and April 2022 (inclusive). There were initially two VPs (VP1 and VP2). The third (VP3) was added to the survey schedule from January 2023 onwards. The Vantage Points were selected to provide coverage of the proposed turbine locations and a surrounding 500 m buffer (the VP Survey Area) in line with NatureScot (2017) guidance[5].

Table 7-1: Summary of survey effort for VPS

Season	Breeding/non-breeding	Years	Survey hours		
			VP1	VP2	VP3
1	Breeding	2020	32	32	N/A
2	Non-breeding	2020/2021	39	33	N/A
3	Breeding	2021/2022	46	50.5	N/A
4	Non-breeding	2022/2023	36	36	27
5	Breeding	2023	36	39	39
6	Non-breeding	2023/2024	37	37.5	38
7	Breeding	2024	36	36	36
8	Non-breeding	2024/2025	39	36	36.5
Total			301	300	176.5

VPs were selected using viewshed analysis of the proposed wind farm site, turbine locations and a 500 m buffer, undertaken using Geographic Information Systems (GIS) software. This analysis was originally completed for a smaller proposed layout in May 2020. Following this, VP1 and VP2 were selected for the completion of VPS. The proposed layout of the wind farm site was revised in December 2022 with the addition of two turbines to the west of the original eight turbines. A revised viewshed analysis was then completed and the additional VP location (VP3) was selected. A final revision to the turbine layout was completed and this assessment has been conducted with this 10-turbine design.

[4] https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=8f7060450de3485fa1c1085536d477ba (Accessed June 2025)

[5] It should be noted that the NatureScot guidance 'Recommended bird survey methods to inform impact assessment of onshore windfarms' was updated during 2025, however surveys were based upon 2017 guidance which was best practice at the time of survey commencement.

In line with NatureScot (2017) guidance, which is consistent with the updated 2025 guidance, VPS focused on 'target species'. These are species which are afforded a higher level of legislative protection, are of particular conservation concern, or are at particular risk from onshore wind developments. Target species during VPS were as follows:

- All gull species;
- Any species listed on Annex I of the EU Birds Directive;
- Any species listed as Red or Amber of the Birds of Conservation Concern Ireland (BoCCI) 2020-26 (Gilbert *et al.*, 2021), where collision risk presents potential for population level effects; and,
- Species with potential connectivity to nearby designated sites.

Each recorded flight path was numbered and cross-referenced, with the following data recorded:

- Number of birds;
- Behaviour where applicable (e.g. foraging, commuting, display etc);
- Duration of flight within the VP viewshed; and
- Flight height range and flight duration

During the breeding season VPS were completed at varying times during the day, ranging from early morning to late evening, so that patterns of bird activity could be recorded. The height bands used to estimate flight height were:

- 1 - <20m
- 2 – 20m to 40m
- 3 – 40m to 120m
- 4 - >120m

During the non-breeding seasons of 2020/2021 and 2022/2023, VPS were undertaken diurnally. During the 2023/2024 and the 2024/2025 non-breeding seasons, some VPS were undertaken commencing either 30 minutes prior to sunrise or terminating at least 30 minutes after sunset. Surveys during these times facilitated the potential recording of any crepuscular flight activity associated with certain key species, such as commuting flights of wetland birds and hen harrier roost flights.

7.4.3.2.2 Breeding Bird Surveys

Breeding Bird Surveys (BBS) were conducted during the 2020, 2023 and 2024 breeding seasons. Five transects (T1 to T5) were selected to provide coverage of the wind farm site at the commencement of surveys, plus a 500 m buffer (the BBS Survey Area). Surveys were undertaken using an adapted British Trust for Ornithology (BTO) Breeding Bird Survey methodology with all species seen or heard recorded. Habitats present within the BBS Survey Area consisted of open grassland, grassland margins, hedgerows, conifer plantation, and heath.

During the breeding seasons, the transect surveys were completed between April and July inclusive. There were three survey visits during the 2020 breeding season, covering T1 and T2, four visits in 2023, covering T1 to T4, and five visits in 2024, covering T1 to T5. Surveys were undertaken in suitable weather conditions.

Throughout the survey programme, all species seen or heard were recorded. The species and number of individuals were recorded to establish the species assemblage and abundance along each transect. Surveys were undertaken in suitable weather conditions.

7.4.3.2.3 Nocturnal Surveys

To supplement the BBS, additional dusk visits were undertaken to record crepuscular or nocturnal species which are difficult to detect during standard surveys. Target species included all owl species, woodcock and nightjar. Nocturnal surveys were completed along two transects within the BBS Survey Area, with a single visit during the 2023 breeding season and two visits during the 2024 breeding season. Surveys commenced between 21:20 and 21:50 and terminated between 22:20 and 23:15. The location of any target species seen or heard during the transect surveys were recorded using ArcGIS Field Maps.

7.4.3.2.4 Wintering Bird Surveys

Wintering Bird Surveys were undertaken during the 2020/2021, 2023/2024 and 2024/2025 non-breeding seasons. Surveys were completed over two visits in November and February during each non-breeding season. The Wintering Bird Survey Area, which is consistent with the BBS Survey Area, and transects utilized in these surveys are identical to those employed during the breeding season surveys.

Transect (T)1 and T2 were surveyed in the non-breeding season of 2020-2021, T1 to T4 were surveyed in 2023-24, though T4 was not surveyed in February 2024, and all five transects were surveyed in 2024-2025.

7.4.3.2.5 Hinterland Surveys

Hinterland surveys were completed from three VP locations (HVP1, HVP2 and HVP3) in the wider area surrounding the site. These locations were surveyed to determine the presence of breeding peregrine and roosting hen harrier within a 2 km buffer around the Site (the Wider Survey Area). HVP locations are detailed in Appendix 7-1: Baseline Ornithology Report.

During the breeding season the HVP surveys were completed during daytime hours. During the non-breeding season, these surveys were timed to commence 30 minutes before sunrise or terminate 30 minutes after sunset to survey for roosting hen harriers. All HVP surveys were completed over in one to two hours.

7.4.4 Collision Risk Modelling Methodology

The Collision Risk Modelling (CRM) methods followed those outlined by Band *et al.* (2024). Data collected during the 2021-23 VPS was used to predict the number of individuals per species expected to collide with the turbine rotors. The number of collisions have been predicted during the breeding season and non-breeding season (following NatureScot guidance on breeding season dates [SNH, 2014]) and combined to predict the number of collisions annually for each species.

Turbine parameters were provided to APEM by TOBIN as a range of potential specifications. To facilitate CRM, two theoretical candidate turbine models were selected, representing 'Worst Case' and 'Best Case' scenarios. These models were chosen based on the number of bird transits through their respective Collision Risk Zones (CRZs). The 'Best Case' turbine corresponds to the configuration with the smallest CRZ, thereby presenting the lowest collision risk, while the 'Worst Case' turbine represents the configuration with the largest CRZ and the highest associated risk. The turbine parameter range, along with the ‘Best Case’ and ‘Worst Case’ theoretical models are provided below:

- Provided turbine parameter range:

    - Tip height: 170 -180 m
    - Hub height: 95-105.5 m
    - Rotor diameter: 149-163 m
- Best Case Turbine Model: Rotor diameter 149 m with a rotor swept height of 21-170 m;
- Worst Case Turbine Model: Rotor diameter 163 m with a rotor swept height of 17-180 m.

Within this assessment, a precautionary approach has been taken and the worst-case predicted collisions have been presented which assumes that the Worst Case Turbine Model would be selected.

CRM was completed for the following species:

- Golden plover;
- Lesser black-backed gull; and
- Kestrel

All other target species were scoped out of CRM based on their flight activity, or lack thereof, within the Collision Risk Zone (the CRZ, a 500 m buffer of the turbine layout). The full CRM methodology, including justification for the scoping-out of species is presented within Appendix 7-2: Collision Risk Modelling Report.

7.4.5 Limitations

7.4.5.1 Field Survey(s)

The total VPS effort for VP1 and VP2 during the 2020 breeding season, and for VP2 during the 2020/21 non-breeding season, fell below the recommendation of 36 survey hours (NatureScot, 2025). The reason for this during the 2020 breeding season was the late start of the survey programme in May of that year, as Doherty Environmental were originally contracted to complete one year of surveys from May 2020 to May/June 2021. VP3 was added part-way through the 2022/23 non-breeding season, and as such only 27 hours of survey were completed from this location, for this period. This is acknowledged as a limitation, however the Collision Risk Modelling accounts for the number of hours of survey undertaken when calculating species density within the CRZ. Although the survey effort was reduced, it is considered that the data recorded is representative of the species diversity, and the flight activity within the survey area.

During transect surveys, no spatial information was gathered, therefore a worst-case scenario was assumed for the assessment with any bird recorded during both the breeding season and non-breeding season had to the potential to be disturbed/displaced. Due to the lack of behavioural information collected during BBS, it was not possible to undertake territory analysis. However, it was noted by the surveyor that no breeding non-passerines were recorded during baseline surveys further to this, as no non-passerine species of conservation concern (Gilbert *et al.* 2021) for which suitable breeding habitat was present were recorded during the breeding season, this has not been considered a limitation.

Transects utilised for both BBS, nocturnal and WWO surveys were selected to cover all habitats present within the development site. Parts of each surveys respective survey area were not covered by these transects however, it is considered that all key and dominant habitat present were surveyed. For the nocturnal surveys, likely habitat for woodcock and nightjar were included.

Hinterland Surveys had a limited coverage of the wider 2 km buffer of the proposed project and followed a methodology based on Vantage Point Surveys, rather than following the methods outlined in Hardey *et al.* (2013) in line with NatureScot (2017) guidance. Results of other surveys including VPS have been used to determine the presence of breeding raptors within the survey area, however coverage of the 2 km buffer was limited and therefore breeding raptor species further than 500 m from the proposed wind farm site may have bred undetected. HVPs were selected to provide coverage of areas of potentially suitable habitat for supporting target species, particularly raptors. Focus was given to small areas of wet grassland, conifer plantation and the quarry to the south of the proposed project.

Limitations encountered during field surveys relate to changing weather conditions and the presence of livestock. VP and HVP surveys were scheduled ahead of time following a review of weather forecasting in advance of the survey. Whilst the majority of surveys were completed in conditions suitable for surveys, survey days of poor weather conditions with less than good visibility were encountered. The presence of livestock in fields during breeding season transect surveys resulted in localised deviations along transects. Also, no spatial or behavioural data were recorded during the transect surveys, therefore territory analysis could not be completed.

The majority of field surveys were completed in optimal weather conditions; however, a small number of surveys were undertaken in sub-optimal conditions. Although some surveys were completed in sub-optimal weather conditions, including increased wind speeds, precipitation and reduced visibility, is it considered that this is a minor limitation and that surveying in a range of weather conditions is more representative of typical bird behaviour within the proposed wind farm site. Therefore, it is considered that data collected during sub-optimal weather conditions is representative of an accurate baseline, scientifically robust and suitable to inform an impact assessment.

7.4.5.2 Collision Risk Modelling

The height bands used during VPS were established prior to the start of surveys and before turbine parameters were confirmed. The uppermost height band surveyed was >120 m, which is substantially lower than the maximum tip height of both the worst-case and best-case turbine models. As a result, all flights recorded above 120 m have been included in the Collision Risk Modelling (CRM), even though many of these are expected to be above the collision risk zone.

Similarly, the lowest height band surveyed was <20 m. For the worst-case turbine model, which has a minimum rotor tip height of 17 m, all flights recorded below 20 m have also been included in the CRM, despite many of these likely occurring below the height at which collision risk exists.

7.4.6 Assessment Approach

The ecological evaluation and impact assessment approach used in this report complies with Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland ("CIEEM guidelines") (CIEEM, 2019).

The key issues for the assessment of potential ornithological effects relating to the proposed project are:

- Direct loss of breeding, foraging and/or roosting habitat through construction;
- Displacement of birds as a result of disturbance during all phases of the development. This includes barrier effects to commuting or migrating birds due to the presence of wind turbines or other infrastructure;

- Death or injury through collision with turbine blades or other types of infrastructure; and
- Cumulative effects on species and / or designated sites, resulting from construction, operation and decommissioning of the proposed Development in conjunction with other developments that may also impact on the same populations.

7.4.7 Important Ornithological Features

Ecological features can be important for a variety of reasons and the rationale used to identify them is explained in the text below. Importance may relate, for example, to the quality or extent of the designated site or habitats therein; habitat and/ or species rarity; the extent to which such habitats and/ or species are threatened throughout their range, or to their rate of decline.

7.4.8 Determining Importance

The importance of an ecological feature should be considered within a defined geographical context. CIEEM guidance provide a framework for determining the importance of an ornithological feature at the following geographic scales:

- International importance – important in a European or wider international context;
- National importance – important in an Irish context;
- County importance – important within the context of County Kilkenny;
- Local importance - locally important populations/assemblages of bird species and/or protected and/or priority species/habitats

The evaluation criteria for these scales of importance are provided in Table 7-2 below. It should be noted that professional judgement has been used when defining importance, based on the level of species activity recorded during surveys. For example, where a species has been recorded very rarely, or not recorded within or close to the proposed development, its importance has been decreased.

Table 7-2: Evaluation criteria for determining the importance of ornithological features

Importance	Evaluation Criteria
International	• Statutory sites of international ornithological importance (SPAs and Ramsar sites) with potential connectivity to the Wind Farm Site. • The regular presence within or around the Site of a qualifying species of an existing or proposed statutory site of international importance (i.e. an SPA or Ramsar site) with potential connectivity to the Wind Farm Site. Numbers of birds making use of the Wind Farm Site are also taken into account. • The regular presence within or around the Wind Farm Site of other bird species that contribute to the integrity of an existing or proposed statutory site of international importance (such as a species which is part of an assemblage feature) with potential connectivity to the Wind Farm Site. Numbers of birds making use of the Wind Farm Site are also taken into account.

Importance	Evaluation Criteria
National (Ireland)	• Statutory sites of national ornithological importance (NHAs) with potential connectivity to the Wind Farm Site. • The regular presence within or around the Wind Farm Site of a qualifying species of an existing or proposed statutory site of national importance (i.e. an NHA) with potential connectivity to the Wind Farm Site. Numbers of birds making use of the Wind Farm Site are also taken into account. • The regular presence within or around the Wind Farm Site of a species listed on Annex I of the Birds' Directive, where the species is not a cited interest of a statutory site but is present in nationally important numbers. • The regular presence within or around the Wind Farm Site of nationally important numbers of a species of conservation concern, where this is identified in NS guidance (NS, 2018a) as a priority for assessment. • The regular presence within or around the Wind Farm Site of nationally importance numbers of a migratory species which is rare or vulnerable or warrant consideration on account of the proximity of migration routes, or breeding, moulting, wintering or staging areas to a proposed development, and which is identified in guidance as a priority for assessment.
County (Co. Kilkenny)	• A cited interest of an existing or proposed statutory site i.e. SPA, Ramsar or NHA) with potential connectivity to the Wind Farm Site but is only present within the Wind Farm Site infrequently or in low numbers. • Other species which contribute to the integrity of an existing or proposed statutory site (for example as part of an assemblage) with potential connectivity to the Wind Farm Site but is only present within the Wind Farm Site infrequently or in low numbers. • A species listed on Annex I of the Birds' Directive, where the species is not a cited interest of a statutory site and is regularly present in numbers of county importance. • The regular presence within or around the Wind Farm Site of important numbers in the county context of a species of conservation concern, where this is identified in guidance as a priority for assessment.
Local	• Locally important populations of priority species identified in the Local Biodiversity Action Plan. • Regularly occurring populations (assessed to be important at the local level) of Annex I species or species of conservation concern.
Less than Local	• A species or site which is covered by the categories above, for which there is no pathway for significant effects.

Importance	Evaluation Criteria
	• All other species which are widespread, common and not listed as a species of conservation concern. • A species for which there will be no likely impacts (for example passerine species, which are stated in NS guidance (2018a) as unlikely to be impacted by onshore wind developments).

Features assessed as being of less than Local importance have been considered to be of negligible importance and have scoped out of the detailed assessment of effects, as any effects on these receptors would be considered not significant.

The importance of an ornithological feature (using the geographical scale of importance defined above) has been determined based on the following criteria:

- Conservation status:
  - Whether a species is listed on Annex I of the Birds' Directive; and,
  - BoCCI Red and Amber listed species (Gilbert et al. 2021).
- Species abundance at a relevant geographic scale.

7.4.9 Impact Assessment

The impact assessment process involves the following steps:

- Identifying and characterising potential impacts;
- Incorporating measures to avoid and mitigate (reduce) these impacts;
- Assessing the significance of any residual effects after mitigation;
- Identifying appropriate compensation measures to offset significant residual effects (if required);
- Identifying opportunities for ecological enhancement: and
- Assessing the potential for cumulative effects with other permitted or proposed projects

The assessment of potential effects from the proposed Development on ornithological features has taken consideration of the following factors in line with CIEEM guidance (2018):

- **Nature of effect**: whether it is positive (beneficial) to ornithological features, e.g. by increasing species diversity or extending habitat, or negative (detrimental), e.g. by loss of, or displacement from, suitable habitat;
- **Extent**: the spatial or geographical area over which the effect may occur;
- **Magnitude**: the size, amount, intensity, and volume of the effect;
- **Duration**: the duration of an effect as defined in relation to ornithological characteristics (such as a species' life cycle) as well as human timeframes. It should also be noted that the duration of an activity may differ from the duration of the resulting effect; e.g. if short-term construction activities cause disturbance to breeding birds, there may be long-term implications from failure to reproduce that season;
- **Frequency**: the number of times an activity occurs may influence the resulting effect; and

- **Timing**: this may result in an impact on an ecological feature if it coincides with critical life stages or seasons (e.g. the breeding season).
- **Reversibility**: an irreversible effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it.

7.4.10 Significant Effects

The concept of ecological significance is addressed in paragraphs 5.24 through to 5.28 of CIEEM (2018) guidelines. Significance is a concept related to the weight that should be attached to effects when decisions are made. For the purpose of EIA, a '*significant effect*' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general.

Following the classification of an effect based on the factors described above, it is necessary to state whether an effect is "significant" or "not significant". CIEEM (2018) guidance states the significance of an effect on an ornithological feature has been determined based on analysis of the factors listed above, with CIEEM (2018) guidance stating that a "'significant effect' is an effect that either supports or undermines biodiversity conservation objectives".

7.4.11 Cumulative Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. When considered in-combination with impacts of other proposed or permitted plans and projects, these can result in significant effects. Potential cumulative effects can include direct habitat loss, disturbance, barrier effects and collision risk. The potential for the proposed project to make a material contribution to cumulative effects on IOFs is assessed following NatureScot guidance (SNH, 2018b).

7.4.12 Avoidance, Mitigation, Compensation and Enhancement

When seeking mitigation or compensation solutions, efforts should be consistent with the geographical scale at which an effect is significant. For example, mitigation and compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved.

Where potentially significant effects have been identified, the mitigation hierarchy has been applied, as recommended in the CIEEM (2018) Guidelines. The mitigation hierarchy sets out a sequential approach beginning with the avoidance of impacts where possible, the application of mitigation measures to minimise unavoidable impacts and then compensation for any remaining impacts. Once avoidance and mitigation measures have been applied residual effects are then identified along with any necessary compensation measures, and incorporation of opportunities for enhancement.

It is important for the EIA to clearly differentiate between avoidance mitigation, compensation and enhancement and these terms are defined here as follows:

- Avoidance is used where an impact has been avoided, e.g. through changes in scheme design;

- Mitigation is used to refer to measures to reduce or remedy a specific negative impact *in situ*;
- Compensation describes measures taken to offset residual effects, i.e. where mitigation *in situ* is not possible; and
- Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

7.5 EXISTING ENVIRONMENT

7.5.1 Sites Designated for Nature Conservation

A single designated site was identified within 20 km of the proposed wind farm site whilst a further site, designated for breeding seabirds has also been considered due to the presence of lesser black-backed gull flocks recorded during baseline surveys. The nearest site designated for lesser black-backed gull has been included. Designated sites are presented in Table 7-3.

Table 7-3: Statutory designated sites with ornithological features considered to have potential connectivity to the proposed project

Name	Designation	Species of Conservation Interest	Distance & Direction from Sites
River Nore*	SPA	Kingfisher (*Alcedo atthis*)	9.1 km north/north-east of the proposed project
Saltee Islands**	SPA	Fulmar (*Fulmarus glacialis*) Gannet (*Morus bassanus*) Cormorant (*Phalacrocorax carbo*) Shag (*Gulosus aristotelis*) Lesser Black-backed Gull (*Larus fuscus*) Herring Gull (*Larus argentatus*) Kittiwake (*Rissa tridactyla*) Guillemot (*Uria aalge*) Razorbill (*Alca torda*) Puffin (*Fratercula arctica*)	41.6 km south-east of the proposed project
* River Nore SPA Site Synopsis https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004233.pdf ** Saltee Islands SPA Site Synopsis https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004002.pdf			

A further 29 pNHAs were also identified within 20 km of the wind farm site. However, Site Synopses[6] were not available for all of these. Of those with Site Synopses, only two described nationally/regionally important numbers of bird species however, both these were outside the max foraging range for the species described. Therefore, no pNHAs are further considered as part of the assessment.

[6] https://www.npws.ie/protected-sites/nha

7.5.2 Ornithological Baseline

7.5.2.1 Vantage Point Surveys

A total of 267 flights by nine identified target species were recorded during the most recent two years of surveys between April 2023 and March 2025, as shown in Table 7-4. The species recorded most frequently was lesser black-backed gull with a total of 190 flights, followed by kestrel (31 flights) and golden plover (14 flights).

Flight activity was low for all species other than lesser black-backed gull. Peak flight activity occurred in the 2024 breeding season, with 110 flights by target species, whereas the lowest flight activity was recorded in the 2023 breeding season, with 49 flights. Lesser black-backed gull was recorded regularly in flight (flocks of 1 to 250 individuals), with birds landing to forage within open areas of the proposed wind farm site, with flight activity concentrated towards the north-east of the VP Survey Area. Kestrel was regularly recorded hunting within the survey area. This species appeared to favour the eastern, northern and central parts of the survey area. Eight kestrel flights were also recorded in the south-west during the 2023 breeding season.

A total of 14 golden plover flights were recorded all near the centre of the survey area in the 2024-2025 non-breeding season. Most were recorded on 28th October 2024, in flocks of two to 26 individuals. Some of these were commuting flights and others involved birds circling and landing. As the other species were recorded in very low numbers, there was limited evidence of areas favoured by these species. Hen harrier was recorded seven times throughout the survey programme, with one observed hunting in the centre of the survey area in October 2023. Merlin was recorded five times, with no observations of hunting behaviour.

During the previous seasons of VPS between the 2020 breeding season and the 2022-2023 non-breeding season, a total of 72 flights by five target species were recorded. The most frequently recorded species was buzzard, with 51 flights, followed by lesser black-backed gull, with 11 flights.

7.5.2.2 Breeding Bird Surveys

A total of 48 species were recorded during the programme of transect surveys. However, the majority of these species were passerines and in line with NatureScot (2017) guidance which states that passerines are not readily impacted by wind farms, these records have been omitted from the results.

Only three non-passerine were recorded during the survey programme: mallard, lesser black-backed gull and buzzard. It should be noted that no spatial data was collected during Breeding Bird Surveys and behavioural information was very limited. However, these species are not considered to breed on site.

Lesser black-backed gull was recorded on four survey transects during 2023, with the largest record on a single transect being 16 birds. During 2024 surveys lesser black-backed gull was recorded during five survey transects, with 28 birds the largest record from a single transect.

Further lesser black-backed gulls were recorded incidentally during breeding season VPS, foraging in fields within the proposed wind farm site. Aggregations of up to 250 birds were recorded.

Table 7-4: Summary of target species flights recorded during 2023-2025 VPS

Species*	Conservation Status BoCCI (Ireland)	Season				Total Flights	No. of birds per flight
		2023 breeding	2023/2024 non-breeding	2024 breeding	2024/2025 non-breeding		
Golden plover	Ann1, Red	0	0	0	14	14	2 to 26
Curlew	Red	0	0	1	0	1	1
Snipe	Red	0	0	1	0	1	2
Black-headed gull	Amber	0	0	6	0	6	1 to 6
Great black-backed gull	Green	1	0	0	0	1	1 to 3
Lesser black-backed gull	Amber	21	41	90	28	180	1 to 250
Hen harrier	Ann 1, Amber	0	3	1	3	7	1 to 2
Kestrel	Red	21	6	7	7	41	1
Merlin	Ann 1, Amber	0	0	1	4	5	1
Total		**49**	**51**	**110**	**57**	**267**	

* Species names and order follow the List of Ireland's Birds maintained by BirdWatch Ireland.
**Ann 1 = listed on Annex 1 of the Bird's Directive; Green= BoCCI Green-listed species; Amber = BoCCI Amber-listed species; Red = BoCCI Red-listed species

7.5.2.3 Wintering Bird Surveys

A total of 39 species were recorded during Wintering Bird Surveys. However, the majority of these species were passerines and in line with NatureScot (2017) guidance, which states that passerines are not readily impacted by wind farms, these records have been omitted from the results.

Only two non-passerine species were recorded during the survey programme: lesser black-backed gull and buzzard. Lesser black-backed gull was recorded in small numbers during 2023/24 surveys, with a single record of six birds noted, while there were three records of birds recorded during 2024/25 surveys, again with a peak count of six birds.

It should be noted that no spatial data was collected during Wintering Bird Surveys and behavioural information was very limited. Therefore, all species recorded were assumed to be foraging or utilising land within the survey area.

Further lesser black-backed gulls were recorded, incidentally during winter season VPS, foraging in fields, within the Wind Farm Site. Aggregations of up to 80 birds were recorded.

7.5.2.4 Hinterland Surveys

As stated in the limitations, surveys were undertaking following a Vantage Point Methodology rather than following guidance outlined in Hardey *et al.* (2013), and only covered a small area within 2 km of the proposed wind farm site.

Kestrel was the only target species recorded during surveys. A total of four kestrel flights were recorded, however there was no evidence of breeding activity. Flights by four non-target species were recorded during hinterland surveys: mallard, black-headed gull, lesser black-backed gull and buzzard.

It should be caveated that limited behavioural information was noted during Hinterland Surveys and there was limited coverage of the wider survey area from the HVPs used. It should be noted that kestrel was the only target raptor species that was recorded with more than one flight during the 2023 and 2024 breeding season VPS, and it is considered unlikely that any raptor species other than kestrel bred successfully and went undetected within 1 km of the proposed wind farm site given the lack of flight records. However, it is possible that birds could have bred further from the proposed wind farm site and were not recorded due to a lack of survey coverage.

7.5.2.5 Nocturnal Surveys

There were no records of any target species during the three nocturnal survey visits and no nocturnal species were recorded during dawn and dusk VPS.

7.5.2.6 Collision Risk Modelling Results

For each species for which CRM was completed, the predicted collisions in each breeding and non-breeding season (as applicable), as well as annually, are outlined in the tables below. As stated above, a worst-case scenario has been used within the assessment, assuming that the that the 'highest risk' turbine would be selected. If the other turbine models were to be used, then the collision risk would be reduced. For context, predicted collisions for each candidate turbine model have been presented.

CRM took into account species-specific avoidance rates as recommended by NatureScot (2018 and 2019) guidance when determining predicted collisions. For golden plover, a higher avoidance rate was used as suggested by Gittings (2020a), where it was estimated a 99.8% avoidance rate for golden plover using data

from three post-construction winter surveys and collision fatality rates. He argued this figure is a robust and precautionary estimate, particularly as it is based on stronger evidence than the avoidance rate used for whooper swan by SNH (2018), which relied on a single study. Gittings also suggested the absence of golden plover from SNH (2018) guidance may reflect a focus on breeding populations rather than wintering ones.

Table 7-5: Predicted collisions for Worst-Case Turbine Model

Species	Predicted collisions per non-breeding season*	Predicted collisions per breeding season	Predicted annual collisions**	Predicted years per collision	Predicted collisions during proposed Development operational lifespan
Lesser black-backed gull	7.27	1.18	8.45	0.70	295.64
Golden plover	3.19	0.00	3.19	0.03	11.15
Kestrel	1.00	0.82	1.82	0.15	63.80

*Seasonal collision risk was calculated based on the breeding season dates stated in NatureScot (SNH, 2014) guidance

**Sum of non-breeding and breeding season predicted collisions. Note that all figures have been rounded to two decimal places.

Table 7-6: Predicted collisions for Best-Case Turbine Model

Species	Predicted collisions per non-breeding season*	Predicted collisions per breeding season	Predicted annual collisions**	Predicted years per collision	Predicted collisions during proposed Development operational lifespan
Lesser black-backed gull	5.23	0.54	5.77	0.48	201.87
Golden plover	2.42	0.00	2.42	0.02	8.46
Kestrel	0.74	0.56	1.30	0.11	45.46

*Seasonal collision risk was calculated based on the breeding season dates stated in NatureScot (SNH, 2014) guidance

**Sum of non-breeding and breeding season predicted collisions. Note that all figures have been rounded to two decimal places.

7.5.3 Summary of Important Ornithological Features

Table 7-7 provides rationale for the determination of whether a receptor should be considered an IOF. This considers the importance of the receptor and its presence (of a single species or qualifying species of designated sites) within and around the turbine layout. When determining whether a designated site is an IOF, the connectivity of designated sites to the proposed Development has been considered. When determining whether a designated site has connectivity to the proposed Development, this has considered the core foraging range of species using the following guidance and literature:

- Woodward, I., Thaxter, C.B., Owen, E., Cook, A.S.C.P. (2019). Desk-based revision of seabird foraging ranges used for HRA screening. BTO Research Report 724.
- SNH (2016a) Assessing connectivity with Special Protection Areas (SPAs) Guidance. Version 2.
- NatureScot (2023) Guidance Note 4: Guidance to Support Offshore Wind Applications: Ornithology - Determining Connectivity of Marine Birds with Marine Special Protection Areas and Breeding Seabirds from Colony SPAs in the Non-Breeding Season.
- Using professional judgement, it is considered that the core foraging of waders during the non-breeding season is 15 km.

Table 7-7: Summary of Important Ornithological Features Subject to Detailed Assessment

Ecological Feature	Importance	Rationale
Saltee Islands SPA	International	*Site Information* Saltee Islands SPA is designated under the Birds Directive as it is of special conservation interest for the following breeding species: fulmar, gannet, cormorant, shag. lesser black-backed gull, herring gull, kittiwake, guillemot, razorbill and puffin. The designated site is located approximately 41.6km south-east from the Wind Farm Site and therefore there is potential for connectivity and impacts upon lesser black-backed gull and herring gull. *Baseline Results* Lesser black-backed gull was recorded frequently during VPS with a total of 180 flights, the majority of which were recorded during the breeding season. The peak number of birds recorded in a single flight was 187. During VPS, lesser black-backed gull was recorded incidentally, foraging and loafing, within the Wind Farm Site during both breeding and non-breeding seasons. The peak count recorded during breeding season VPS was a flock of 250 birds, which were recorded foraging in a freshly cut field. However, the next highest count during breeding season VPS

Ecological Feature	Importance	Rationale
		was of 37 birds, with an average of 8.36 birds per flight (from 73 breeding season flights). Lesser black-backed gull was noted commuting through the VP Survey Area, as well as landing in fields within the VP Survey Area to loaf and forage. The species was also recorded regularly during Breeding Bird Surveys (98 records). During wider Hinterland Surveys, lesser black-backed gull was recorded incidentally on eight occasions, five of which were within the breeding season. Two of these flights were within 500 m of the Wind Farm Site.
Golden plover	National	*Conservation Status* Golden plover is a BoCCI red-listed wader species of conservation concern primarily due to significant population declines to the breeding population, but also to non-breeding birds (Gilbert *et al*., 2021). Golden plover is also listed on Annex I with an all-Irish population of 92,060 birds and Ireland specific population of 80,707, based on estimates from 2022/12-2015/16 (Burke *et al*., 2018). However, it is likely that this is an underestimate as golden plover is widely distributed in grassland habitat during the non-breeding season, much of which is not covered by I-WeBS surveys. Golden plover are considered to be in a "large decline" within Ireland with a 17.5% decrease recorded between 2014/25-2019/2020 (Kennedy *et al*., 2023). No population for county Kilkenny could be found. *Baseline Results* Golden plover was recorded occasionally during VPS, with a total of 14 flights across both survey years, all of which were within 500 m of the turbine locations and therefore golden plover was scoped in for CRM. The majority (eight) of golden plover flights were recorded during a single survey on the 28/10/25. There was no evidence of golden plover utilising the Wind Farm Site during breeding or non-breeding seasons during either survey years of Transect Surveys.
Lesser black-backed gull	Regional	*Conservation Status* Lesser black-backed gull is a large BoCCI amber listed gull species of conservation concern due to breeding populations considered to be localised (Gilbert *et al*., 2021). Lesser blacked-back gull is both a breeding and wintering species in Ireland, with an estimated breeding population of 21,552[7]. The majority of breeding colonies are located

[7] National population is gathered from Cummins *et al*.,(2019) and then adjusted by a factor of 1/0.66 which is to account for the occurrence of intermittent breeding in lesser black-backed gull populations (Calladine and Harris, 1997; APEM, 2013)

Ecological Feature	Importance	Rationale
		along the western and southern coasts, with a small number of breeding colonies present on the east coast. This species is also known to breed at urban colonies, however a recent survey found no urban breeding pairs in Co. Kilkenny (Keogh and Lauder, 2021. No population for county Kilkenny could be found, however given the very large foraging range for this species, it is considered more suitable to assess effects on the national population. *Baseline Results* Lesser black-backed gull was recorded frequently during VPS with a total of 180 flights, the majority of which were recorded during the breeding season however, more individual birds were recorded during the non-breeding season. The peak number of birds recorded in a single flight was 187. There was no evidence of lesser black-backed gulls breeding within the Breeding Bird Survey Area. During VPS, lesser black-backed gull were recorded incidentally, foraging and loafing, within the Wind Farm Site during both breeding and non-breeding seasons. The peak count recorded during breeding season VPS was a flock of 250 birds, which were recorded foraging in a freshly cut field. However, the next highest count during breeding season VPS was of 37 birds, with an average of 8.36 birds per flight (from73 breeding season flights). During the non-breeding season, although the peak count recorded (187 birds) was lower than in the breeding season, the average number of birds per flight was higher at 13.92 birds (from 117 non-breeding season flights) Lesser black-backed gull was noted commuting through the VP Survey Area, as well as landing in fields within the VP Survey Area to loaf and forage. The species was also recorded regularly during Breeding Bird Surveys (98 records) and rarely during Wintering Bird Surveys (18 records). During wider Hinterland Surveys, lesser black-backed gull were recorded incidentally on eight occasions, five of which were within the breeding season. Two of these flights were within 500 m of the Wind Farm Site.
Kestrel	Regional	*Conservation Status*

Ecological Feature	Importance	Rationale
		Kestrel is a BoCCI red-listed species of conservation concern, due to severe breeding population decline (Gilbert *et al*., 2021), with an estimated population of 13,500 individuals in the Republic of Ireland (Lewis *et al*., 2019). No population for county Kilkenny could be found. *Baseline Results* Kestrel was recorded on 41 occasions during VPS, with numbers consistent across the breeding and non-breeding seasons. Kestrel was not recorded during Breeding Bird Surveys was therefore not considered breeding on the Wind Farm Site or BBS Survey Area. Kestrel was recorded on four occasions during Hinterland Surveys, twice in each breeding season. Again, there was no evidence that kestrel was breeding within the wider survey area.

Table 7-8: Summary of Avifauna Key Receptors Scoped out of the Assessment

Ecological Feature	Rationale
River Nore SPA	*Site Information* River Nore SPA is designated under the Birds Directive as it is of special conservation interest for kingfisher, of which the SPA supports a nationally important population. The designated site is located approximately 9.1 km from the Wind Farm Site it is considered that there is no potential connectivity to the Wind Farm Site. There is no stated core foraging range for kingfisher in guidance, however Musseau *et al.* (2021) state that based on GPS tracking that kingfisher home ranges are limited, with an average home range of 2.5 ha ±0.55ha. Although there is potential for hydrological connectivity, it is considered that implementation of standard good working practice will avoid potential for pollution impacts (see mitigation measures in Chapter 9 (Hydrology and Hydrogeology)). Based on this, and the distance from the SPA to the Wind Farm Site, it is considered that there is no potential for connectivity to the SPA. . *Baseline Results* Kingfisher was not recorded during any baseline survey, therefore there if considered to be no connectivity between the proposed project and the qualifying species population, and hence no pathway for effects.

Ecological Feature	Rationale
Mallard	*Conservation Status* Mallard is a BoCCI amber-listed duck species of conservation concern due to a decline in the Irish wintering population (Gilbert *et al.*, 2021), with an Irish population of 18,810 individuals and an all-Ireland population of 28,230 individuals (Burke et al, 2018). Mallard is not listed as a priority bird species for assessment in NatureScot (2025) guidance. *Baseline Results* Mallard was not recorded during VPS and therefore scoped out of CRM. Mallard was recorded on a single occasion during Breeding Bird Surveys and a single occasion, incidentally, during Hinterland Surveys. Mallard has not been considered an IOF due to its very low activity within and adjacent to the Wind Farm Site, which suggests that mallard is rarely present. Therefore the potential for significant effects is negligible.
Swift	*Conservation Status* Swift is a BoCCI red-listed migratory species of conservation concern due to severe breeding population declines (Gilbert *et al.*, 2021), with a 2011-2016 Irish population estimate of 51,728 (Lewis *et al.*, 2019). Swift is not listed as a priority bird species for assessment in NatureScot (2025) guidance. *Baseline Results* Swift was recorded on two occasions during the VPS, both within the CRZ. Due to the low number of flights, the species has been scoped out of CRM. Swift was not recorded during any other survey methodology. Swift has not been considered an IOF due to its very low activity within and adjacent to the Wind Farm Site and therefore the potential for significant effects is negligible.
Stock dove	*Conservation Status*

Ecological Feature	Rationale
	Stock dove is a BoCCI red-listed species of conservation concern due to severe breeding population declines (Gilbert *et al*., 2021), with a 2011-2016 population estimate of 27,486 individuals (Lewis *et al*., 2019). Stock dove is not listed as a priority bird species for assessment in NatureScot (2025) guidance. *Baseline Results* Stock dove was recorded on a single occasion during VPS and therefore has been scoped out of CRM due to the low number of flights. The species was not recorded during any other survey methodology. Stock dove has not been considered an IOF due to its very low activity within and adjacent to the Wind Farm Site and therefore the potential for significant effects is negligible.
Curlew	*Conservation Status* Curlew is a BoCCI red listed wader species of conservation concern due to significant population declines of both breeding and non-breeding populations (Gilbert *et al*., 2021) with an Irish population of 28,300 individuals and an all-Ireland population of 35,240 individuals (Burke *et al*., 2018) . *Baseline Results* Curlew was recorded on a single occasion during VPS and therefore has been scoped out of CRM due to the low number of flights. Curlew was not recorded during any other survey methodology. Curlew has not been considered an IOF due to its very low activity within and adjacent to the Wind Farm Site and therefore the potential for significant effects is negligible.
Snipe	*Conservation Status*

Ecological Feature	Rationale
	Snipe is a BoCCI red-listed wader species of conservation concern due to a severe decline in the breeding population (Gilbert *et al*., 2021). The wintering population is estimated at 5,700 individuals (Lewis et al., 2019), however this could be an underestimate as it is acknowledged that Wetland Bird Survey methods are poor at detecting this species (BTO, 2004). *Baseline Results* Snipe was recorded on a single occasion during VPS and therefore has been scoped out of CRM due to the low flight activity within the CRZ. Snipe was not recorded during any other survey methodology. Snipe has not been considered an IOF due to its very low activity within and adjacent to the Wind Farm Site and therefore the potential for significant effects is negligible.
Black-headed gull	*Conservation Status* Black headed gull is a BoCCI amber-listed gull species of conservation concern, primarily due to moderate breeding range declines, whilst also being considered a localised breeder (Gilbert et al., 2021), with an Irish population of 12,810 individuals and an all Irish population of 28,230 individuals (Burke et al, 2018). *Baseline Results* Black-headed gull was recorded on six occasions, with a total of 18 birds, during VPS and therefore has been scoped out of CRM due to the low flight activity recorded within the CRZ. Black-headed gull was recorded rarely during hinterland surveys, with two records in the breeding season. Black-headed gull has not been considered an IOF due to its very low activity within and adjacent to the Wind Farm Site and therefore the potential for significant effects is negligible.
Great black-backed gull	*Conservation Status*

Ecological Feature	Rationale
	Great black-backed gull is a large, BoCCI green-listed, gull species (Gilbert *et al*., 2021), however it should be noted that the species has recently been upgraded to red-listed within the UK, due to both breeding and non-breeding population decreases (Stanbury *et al*., 2024). During the 2016/17 and 2017/18 Irish waterbird monitoring programme, a peak monthly count of 1,439 individuals was recorded during the non-breeding season. (Fitzgerald et al., 2021). The 2015-21 Seabird Count estimates the species population in Ireland at 2,825 individuals (Burnell *et al*., 2023) *Baseline Results* Great black-backed gull was recorded on a single occasion during VPS and therefore has been scoped out of CRM due to low flight activity within the CRZ. The species was not recorded during any other survey methodology. Great black-backed gull has not been considered an IOF due to its very low activity within and adjacent to the Wind Farm Site and therefore the potential for significant effects is negligible.
Grey heron	*Conservation Status* Grey heron is a large wading bird that is a BoCCI green-listed species (Gilbert *et al*., 2021), with an Irish population of 1,943 individuals and an all-Ireland population of 2,610 individuals (Burke *et al*., 2018). Grey heron is not listed as a priority bird species for assessment in NatureScot (2025) guidance. *Baseline Results* Grey heron was recorded on three occasions during VPS and therefore has been scoped out of CRM due to low flight activity within the CRZ. Grey heron was not recorded during any other survey methodology. Grey heron has not been considered an IOF due to its very low activity within and adjacent to the Wind Farm Site, along with not being considered a species of conservation concern, and therefore the potential for significant effects is negligible.

Ecological Feature	Rationale
Sparrowhawk	*Conservation Status* Sparrowhawk is a BoCCI green-listed species (Gilber *et al*., 2021). The population of sparrowhawk is estimated at 11,859 individuals (Lewis *et al*., 2019). Sparrowhawk is not listed as a priority bird species for assessment in NatureScot (2025) guidance. *Baseline Results* Sparrowhawk was recorded on seven occasions during VPS and therefore been scoped out of CRM due to low flight activity within the CRZ. Sparrowhawk was not recorded during any other survey methodology. Sparrowhawk has not been considered an IOF due to its very low activity within and adjacent to the Wind Farm Site, along with not being considered a species of conservation concern, and therefore the potential for significant effects is negligible.
Hen harrier	*Conservation Status* Hen harrier is a BoCCI amber-listed species of conservation concern (Gilbert *et al*., 2021) with an Irish population of an estimated maximum of 106 breeding pairs (Ruddock *et al*., 2024). Hen harrier is also listed on Annex I. *Baseline Results* Hen harrier was recorded on seven occasions during VPS and therefore has been scoped out of CRM due to the low flight activity within the CRZ. Hen harrier was not recorded during any other survey methodology, and therefore there is no evidence that hen harrier is using the Wind Farm Site more than occasionally Hen harrier has not been considered an IOF due to its very low activity within and adjacent to the Wind Farm Site and therefore the potential for significant effects is negligible.

Ecological Feature	Rationale
Buzzard	*Conservation Status* Buzzard is a BoCCI green list species (Gilbert *et al*., 2021) with an Irish population estimate of 11,859 individuals (Lewis *et al*., 2019). Buzzard is not listed as a priority bird species for assessment in NatureScot (2025) guidance. *Baseline Results* Buzzard was recorded frequently during VPS with 162 flights observed. However Buzzard was recorded on 28 occasions during transect surveys, the majority of which were during the breeding season. Buzzard has not been considered an IOF due to the species being a commonly occurring species within Ireland and also not being considered a species of conservation concern. As a common species which is not of conservation concern, buzzard has been scoped out of CRM, with the potential for any potential significant effect on this species negligible.
Merlin	*Conservation Status* Merlin is a BoCCI amber-listed species of conservation concern (Gilbert *et al*., 2021). No national census for merlin in Ireland currently exists and uncertainty of the population densities remain (Lusby *et al*., 2017). A survey of SPAs in Ireland designated for merlin estimated a population of 28 to 41 breeding pairs within the six SPAs (Lusby *et al*.,2022). Merlin is also listed on Annex I. *Baseline Results* Merlin was recorded on five occasions during VPS and therefore was screened out of CRM due to low flight activity within the CRZ. Merlin was not recorded during any other survey methodology. As a typically upland species, the habitats present within the Site and surrounding area are of limited importance for this species. Merlin has not been considered an IOF due to its low activity within and adjacent to the Wind Farm Site and therefore the potential for significant effects is negligible.

Ecological Feature	Rationale
Raven	*Conservation Status* Raven is a BoCCI green-list species (Gilbert *et al*., 2021) with a 2011-2016 Irish population estimate of 55,878 individuals (Lewis *et al*., 2019). Raven is not listed as a priority bird species for assessment in NatureScot (2025) guidance. *Baseline Results* Raven was recorded on 10 occasions during VPS however, as a common species which is not of conservation concern, raven has been scoped out of CRM. Raven was recorded on 29 occasions during Breeding Bird Surveys however was not considered breeding on the Wind Farm Site. Raven has not been considered an IOF due to its very low activity within and adjacent to the Wind Farm Site, along with not being considered a species of conservation concern, and therefore the potential for significant effects is negligible.
All other species	All other species were recorded very infrequently, and therefore the potential for significant effects is negligible, or are species which are not considered to be impacted by onshore wind developments, such as passerine species.

7.5.4 Valuation of IOFs scoped into the Assessment

IOFs scoped into the assessment are listed below, alongside their importance.

- IOFs of international importance
  - Saltee Islands SPA
- IOFs of national importance
  - Golden plover
- IOFs of regional importance
  - Lesser black-backed gull
  - Kestrel

7.5.5 Elements Scoped out of Assessment

Bird species considered to be of local or lower importance have not been defined as IOFs and have been scoped out of the assessment. Embedded mitigation will be implemented to ensure that potential impacts to all breeding bird species, including those of local importance, are minimised.

Impacts on designated sites (except those designated for breeding seabirds) further than 20 km were scoped out of the assessment based on NatureScot (2016a) connectivity guidance. Impacts on all designated sites within 20 km have been scoped out, as it is considered there is no connectivity to these sites. Pollution impacts on designated sites arising from hydrological connectivity to the site have been scoped out as the potential for any impact is negligible based on distance and construction best practice would ensure that there are no pollution effects.

Grid Connection Options One and Two which will connect the proposed wind farm to the national grid will be via underground cables. As these are buried cables impacts would be short-term and are not likely to be significantly more disturbing than baseline conditions, and therefore the potential for significant effects on ornithological receptors is negligible during construction, and there would be no impacts during the operational phase. An ECoW would be present to ensure that works are completed in compliance with relevant legislation and best practice. Further information on the proposed grid connection can be found in Chapter 2 (Description of the Project Project).

Turbine delivery is not anticipated to have any impacts on ornithological receptors, and therefore has been scoped out of the assessment. Turbine delivery is short-term and temporary in nature that will be confined to pre-existing routes.

Potential effects during the decommissioning phase are likely to be similar to those during the construction phase. As decommissioning will take place more than 35 years from the baseline surveys, it is likely that the baseline conditions during decommissioning will be significantly altered, and therefore it is considered unsuitable to assess the effects at this time. Further surveys will be undertaken prior to decommissioning to determine the potential effects on IOF species, or any other notable species.

7.6 EMBEDDED MITIGATION

Standard good practice measures will also be implemented during construction through adherence to a Bird Protection Plan to ensure compliance with relevant legislation protecting all breeding wild birds. These measures will cover all aspects of the proposed project. This will help to reduce impacts on IOFs and

other ornithological features. Under the Wildlife Acts 1976 and 2000 (as amended) it is an offence to wilfully destroy, injure or mutilate the eggs or nest of a protected wild bird, and to wilfully disturb a protected wild bird on or near a nest containing eggs or unfledged young.

As such, a Bird Protection Plan (BPP) will be produced prior to construction, to safeguard birds and ensure legislative compliance during all stages of the proposed project, a summary of which is provided below.

7.7 BIRD PROTECTION PLAN

7.7.1 Construction Phase

Ecological Clerk of Works (ECoW): To ensure that mitigation measures are reactive to changing conditions on site and compliance with legislation protecting breeding birds, a suitably experienced ECoW will be present to identify any potential constraints to proposed project works and provide advice to comply with all legislation relative to breeding birds during the construction phase.

Toolbox talk: A 'toolbox talk' will be delivered to all construction phase employees prior to construction, and at regular intervals, by the ECoW to ensure that all contractors working on the proposed project are aware of ornithological sensitivities, relevant legislation and best practice.

Timing of works: Given the anticipated construction period, some construction work will take place during the peak breeding season (March to August). No works will start during the breeding season without first establishing the status of breeding birds within likely disturbance distances of the proposed works, this will be determined and confirmed by a suitably experienced ornithologist, using species specific methods where required.

Vegetation removal: Where possible, any removal of vegetation suitable for nesting birds will take place outside of the breeding season. Any vegetation removal during breeding season will be subject to nesting bird checks by the ECoW, with appropriate exclusion areas instated if any nests are located, following current disturbance guidance (Goodship and Furness, 2022).

Pre-construction Confirmatory Surveys: Pre-construction confirmatory surveys will be undertaken to identify any breeding birds nesting within or close to working areas. Surveys will be undertaken by the ECoW, who will determine the scope of surveys required, which will be based on current disturbance guidance and professional judgement (Goodship and Furness, 2022).

Protection of nesting birds: It is an offence to wilfully destroy, injure or mutilate the eggs or nest of a protected wild bird, and to wilfully disturb a protected wild bird on or near a nest containing eggs or unflown young. If any active nests are identified during pre-construction confirmatory surveys which could be damaged or destroyed, an exclusion zone around the nest/breeding territory will be established which would be informed by current guidance (Goodship and Furness, 2022). No works will be permitted within the exclusion zone and no personnel or vehicles will be allowed to enter or pass through until the ECoW has confirmed that the nesting attempt has reached a natural conclusion.

Minimising disturbance from Site vehicles: Where construction works are required during the breeding bird season, mitigation measures to limit the impact of vehicular disturbance will be implemented. This will include no idling of vehicles, appropriate speed restrictions and dust suppression measures on site.

7.7.2 Operational Phase

Routine maintenance required during operation is expected to be minimal, limited to small areas and of temporary duration. However, should significant operational works (for example widespread track upgrades or turbine replacement) be required during the breeding bird season, the mitigation measures outlined above for the construction phase will be implemented to ensure compliance with the relevant legislation.

7.7.3 Decommissioning Phase

As decommissioning works are likely to be of a similar nature and duration as construction activities, the mitigation measures outlined above for the construction phase will be implemented to ensure compliance with relevant legislation.

7.8 Potential Effects

7.8.1 Do-Nothing Scenario

In the absence of the proposed project, the availability and quality of suitable habitat within the proposed wind farm are expected to change over time due to ongoing forestry operations and changing agricultural practises. Clear-felling activities will create new open areas of habitat, while forest maturation will result in the loss of existing open habitats. In addition, changing land use as a result of farming practises will result in areas becoming more or less suitable for IOFs. For example, fields left to grow fallow will be less suitable for foraging gull species and golden plover, however will be more suitable for foraging kestrel. When vegetation is shorter, the opposite will be the case.

These dynamic changes will influence the presence and activity of local avian populations, particularly species dependent on open or early, successional habitats for foraging or breeding. In the wider area surrounding the site, habitat suitability will continue to fluctuate annually in response to variations in land management practices, such as agricultural field use, and weather conditions, including periodic flooding. Over the longer term, climate change is likely to further influence habitat quality and availability across the landscape.

7.8.2 Impacts on Golden Plover

Golden plover is a BoCCI4 red-listed wader species, due to severe declines in both breeding and non-breeding populations (Gilbert *et al*., 2021), with an Irish population of 80,707. However, this is likely an underestimate as golden plover is widely distributed in grassland habitat, much of which is not routinely covered by I-WeBS surveys. (Burke *et al*., 2018). There is no available IWeBS population for Co. Kilkenny, and therefore the national population has been used. As the majority of flight activity related to passage birds, it is considered most relevant to assess impacts upon the national population.

Based on the limitations set out above, the effects set out and discussed in this section are presented as worst-case scenarios which likely overestimates the impacts at each stage.

7.8.2.1 Potential Construction Effects

This species was only recorded during the non-breeding season during VPS, with birds recorded in flight, while usage of the survey area by foraging birds (three flights were noted with birds foraging on the ground) was also noted during VPS surveys. There were 14 records of golden plover during VPS, with the

majority (eight) of golden plover flights recorded during a single survey on the 28/10/25, which were considered to be passage birds, while there were a small number of records during the core winter. Flights were concentrated within an area of open habitat south of T7 and east of T9.

Based on the results of surveys, which did not record any foraging by resident golden plover within the proposed wind farm site boundary, there are no effects associated with habitat loss predicted.

A 500 m buffer is the maximum recommended disturbance distance for non-breeding golden plover (Goodship and Furness, 2022). A study by Pearce-Higgins *et al*., (2012) did not find any evidence of significant negative effects of windfarms upon golden plover during the construction phase. Additionally, any disturbance during construction will be temporary.

The peak count of non-breeding birds recorded foraging within 500 m of the proposed project was 33 individuals. Therefore, in a worst-case scenario there is potential to displace 33 individuals during the construction phase. This equates to 0.04% of the Irish population of 80,707 (Burke *et al*., 2018).

It should be noted that there is no evidence that the site and surrounding area are regularly used by non-breeding golden plover as the majority of foraging records were on a single day, and therefore there is no evidence that the proposed wind farm site is a key foraging resource for golden plover. There is suitable foraging habitat outside the proposed wind farm site which could be used by any displaced birds if this were to occur.

Given the effects during the construction phase are short-term and reversible, along with the abundance of suitable foraging habitat outside the proposed wind farm site, the displacement effects on non-breeding golden plover are likely to be negligible and not significant.

7.8.2.2 Potential Operation Effects

Research into the effects of operational wind farms on non-breeding wader species is limited, with most studies focusing on breeding birds. Findings on upland breeding birds, such as golden plover, have been mixed. Two studies (Douglas *et al*., 2011; Fielding and Haworth, 2013) found no evidence of displacement due to wind farm infrastructure. However, two others (Sansom *et al*., 2016; Pearce-Higgins *et al*., 2009) reported significant displacement of breeding golden plover, with birds avoiding areas up to 500 m from operational turbines.

Pearce-Higgins *et al*., (2012) suggests that following any detrimental effects of disturbance during construction, golden plover may become habituated to effects of operational wind farms. Birds foraging on site would be selecting foraging areas regardless of the presence of operational turbines, and it is considered likely that displacement effects on non-breeding birds would be of a lower magnitude in comparison to breeding birds discussed within the study (Pearce-Higgins *et al*., 2012). It is expected that onsite human activity will be minimal (both spatially and temporally) during the operational phase and it is considered that disturbance effects are likely to be negligible and not significant.

Golden plover was recorded foraging occasionally, with a peak count of 33 individuals. Therefore, in a worst-case scenario, there is potential for the displacement of 33 birds, which based on the Irish population of 80,707 (Burke *et al*., 2018) equates to 0.04% of the Irish population. It should be noted that there is no evidence that the Site and surrounding area are regularly used by non-breeding golden plover as the majority of foraging records were on a single day on passage. There is suitable foraging habitat outside the proposed wind farm site which could be used by any displaced birds if this were to occur.

Based on VPS data, the CRM has predicted 3.19 collisions annually (all of which are during the non-breeding season). The majority of flights recorded were during October, due to this and the low flight density throughout the rest of the non-breeding season, any collisions would likely be birds on passage. This would equate to 11.15 collisions during the 35-year lifespan of the proposed project, or a collision every 0.03 years. There is also evidence that the default 98% avoidance rate is overly precautionary for golden plover, and it has been suggested by Tom Gittings (2020a), following a review of post-construction collisions, that an avoidance rate of 99.8% is more accurate.

Based on the Irish non-breeding population of 80,707, the fatality of three birds annually through collision with the wind turbines would equate to <0.01% of the total population. As stated previously, it is possible that collisions have been overestimated as the standard 98% avoidance rate has been used. Therefore, collision risk effects upon golden plover are considered negligible and not significant.

Given that it is assumed that displacement effects during the operation phase will be negligible, it is therefore considered that there will be no barrier effects on golden plover during the operational phase of the proposed project.

7.8.3 Impacts on Lesser Black-Backed Gull

Lesser black-backed gull is a large BoCCI amber-listed gull species, due to breeding populations within Ireland considered to be localised (Gilbert *et al*., 2021) with the Irish breeding population estimated at 21,552 individuals. No Co. Kilkenny population for lesser black-backed gull was available, however , based on the very large mean-max foraging range for this species of 236 km (mean-max plus standard deviation), it is considered most suitable to assess impacts on the national population.

Based on the limitations set out above, the effects set out and discussed in this section are presented as worst-case scenarios which likely overestimates the impacts at each stage.

Lesser black-backed gull was recorded regularly across all survey methods during both the breeding and non-breeding season, with birds recorded commuting across the proposed wind farm site and foraging/loafing.

7.8.3.1 Potential Construction Effects

Lesser black-backed gull was not recorded breeding during either year with a lack of breeding habitat within the BBS Survey Area. However, the species was recorded foraging frequently during both the breeding and non-breeding season. The proposed wind farm site and surrounding area are therefore likely to be used for foraging and commuting during the construction phase.

Lesser black-backed gull was recorded frequently during BBS, Wintering Bird Surveys and incidentally during VPS foraging and loafing within 500 m of the proposed wind farm site. During the non-breeding and breeding season, a peak count of 80 and 250 individuals, respectively, were recorded foraging within 500 m of the proposed project.

It should be noted that the number of birds recorded foraging during surveys was variable, as is expected from a species which is a generalist and opportunistic forager. During the non-breeding season, although a peak count of 80 foraging birds was recorded, the average number of foraging birds was 41 from a total of 10 records. During the breeding season, a peak flock of 250 individuals was recorded foraging, however this was noted as birds following a tractor in a freshly cut field and is therefore an anomalous result in

response to an opportunistic foraging opportunity. The average number of foraging birds during the breeding season was 38 from a total of 10 records.

Lesser black-backed gull has as very large foraging range of 236 km (mean-max plus standard deviation) (Woodward *et al*., 2019), and given the abundance of suitable habitat for foraging gulls in the wider area, it is considered unlikely that habitats within the proposed wind farm site are a key foraging resource, with birds likely to forage widely and use the proposed wind farm site occasionally as part of a wide core foraging area. As noted during baseline surveys, gulls will readily alter their foraging activity in response to specific conditions, as was noted during surveys where a large flock of 250 birds was noted foraging after a field was cut.

Foraging gulls are relatively tolerant of disturbance and will associate with potential sources of disturbance related to agriculture, however there is no stated disturbance distance for gull species within NatureScot guidance (Goodship and Furness, 2022).

As there are existing sources of potential disturbance relating to agriculture and from surrounding roads which birds foraging within the site will be habituated to, it is considered that additional disturbance during the construction phase will be minor and not significant, and it is considered that gulls will continue to forage within the Site during construction. Records of gulls foraging further than 500 m from the proposed wind farm site also demonstrates the presence of suitable, alternative foraging habitat for birds that are displaced.

Given that lesser black-backed gull was regularly recorded breeding close to existing roads and agriculture, only those within 250 m of the proposed project infrastructure are considered for potential displacement as birds will be habituated to other infrastructure such as access roads. In a worst-case scenario, 80 birds during the non-breeding season and 250 during the breeding season could be displaced during the construction phase however, any displacement effects would be reversible.

The displacement of 80 birds from the non-breeding population would equate to 0.37% of the national population. The displacement of 250 birds from the breeding population would equate to 1.16% of the national population. However, as noted previously, these peak counts are higher than the average counts of foraging birds of 41 during the non-breeding season and 38 during the breeding season.

Given that gulls are highly tolerant to human activity and show evidence of foraging close to other human disturbance within and close to the proposed project, along with the presence of abundant suitable foraging habitat outside the proposed wind farm site, the impacts of displacement and habitat loss on non-breeding gulls are considered minor and not significant.

The number of gulls recording during the breeding and non-breeding season fluctuated, and the proposed wind farm site is not considered to be a key foraging resource for lesser black-backed gull. As a generalist and opportunistic forager with a very large foraging range, lesser black-backed gull will forage widely, is not solely on habitats within and adjacent to the proposed wind farm site, and is accustomed to foraging within suitable fields as and when these are available.

It should also be considered that even under a do-nothing scenario, the availability and suitability of foraging habitat will vary with changing land use.

7.8.3.2 Potential Operation Effects

Given that lesser black-backed gull was recorded foraging within 250 m of the proposed wind farm site, there is potential for disturbance/displacement during the operational phase. However, as gulls are highly tolerant to disturbance and were recorded on site foraging close to roads and agriculture which are existing sources of disturbance, it is considered that displacement of foraging birds during the operational phase is unlikely to be significant.

Lesser black-backed gulls have an extensive foraging range and given the availability of suitable habitat in the wider area, the proposed wind farm site is unlikely to represent a key foraging resource, though it may be used occasionally within a broader core foraging area. Based on expert opinion and regular observations of lesser black-backed gulls foraging near existing roads and agricultural areas, only individuals within 250 m of the proposed project infrastructure are considered at potential risk of displacement. This is a precautionary estimate as there is limited information on displacement of gulls around operational wind turbines.

In a worst-case scenario, there is potential for 80 birds to be displaced during the non-breeding season and 250 birds during the breeding season. This would equate to 0.37% and 1.16% of the national population for the non-breeding and breeding populations respectively. However, as noted previously, these peak counts are higher than the average counts of foraging birds of 41 during the non-breeding season and 38 during the breeding season.

Given that gulls are highly tolerant to human activity and show evidence of foraging close to other human disturbance within and close to the proposed project, along with the presence of abundant suitable foraging habitat outside the proposed wind farm site, the impacts of displacement on non-breeding gulls are considered minor and not significant.

The number of gulls recording during the breeding and non-breeding season fluctuated, and the proposed wind farm site is not considered to be a key foraging resource for lesser black-backed gull. As a generalist and opportunistic forager with a very large foraging range, lesser black-backed gull will forage widely, is not solely reliant on habitats within and adjacent to the proposed wind farm site, and is accustomed to foraging within suitable fields as and when these are available.

Lesser black-backed gull flight activity recorded across survey years showed seasonal variation, with 330 individuals observed during the breeding season and 1,243 during the non-breeding season. This activity is likely associated with commuting between roosting and foraging habitats. Gull movement patterns are influenced by land-use and weather conditions, which can affect habitat availability and foraging opportunities. As a result, the use of fields within the wider landscape is likely to vary temporally, potentially influencing levels of flight activity over the proposed Development Site (Isaksson *et al*., 2016; Schwemmer *et al*., 2008).

Evidence indicates that lesser black-backed gull does not exhibit macro-avoidance behaviour in response to wind farms. Consequently, barrier effects are considered negligible and not significant for this species (Furness, 2019).

Based on VPS data, the CRM has predicted 7.27 collisions during the non-breeding season and 1.18 collisions during the breeding season. This would equate to 295.64 collisions during the 35-year lifespan of the proposed project, or a collision every 0.70 years. Based on the Irish population of 21,552 the fatality of a single bird through collision with the wind turbines during the breeding season would equate to

<0.01% of the population. The fatality of 7 birds during the non-breeding season would equate to 0.03% of the population Therefore, collision risk effects upon lesser black-backed gull are considered negligible and not significant.

7.8.4 Impacts on Kestrel

Kestrel is a BoCCI red-listed species of conservation concern due to severe breeding population decline (Gilbert *et al*., 2021). The Irish breeding population was estimated at 13,500 individuals (Lewis *et al*., 2019). No Co. Kilkenny population was available, however assuming that individuals are distributed equally across 26 counties, this would give a basic estimate of 519 individuals.

Based on the limitations set out above, the effects set out and discussed in this section are presented as worst-case scenarios which likely overestimates the impacts at each stage.

7.8.4.1 Potential Construction Effects

Kestrel was not recorded breeding during either year of surveys, therefore is only likely to use the proposed wind farm site and surrounding area for foraging or commuting. Kestrel was recorded foraging in all seasons during VPS, suggesting that the proposed wind farm site and surrounding area are an important foraging area. The proposed project will result in some loss of habitat for small mammalian prey species; however, this impact is expected to be minimal given the relatively limited extent of habitat loss in relation to the broader foraging range of this species (Garratt *et al*., 2011). Additionally, any effects during the construction period will be temporary. It is considered that any indirect effects associated with habitat loss would be negligible and not significant.

Given the relatively limited spatial extent of the proposed project in relation to the broader foraging range of kestrel, disturbance and displacement effects during the construction phase are assessed as negligible and not significant for both the breeding and non-breeding seasons.

Given this, along with the large foraging range of kestrel and the abundance of suitable foraging habitat outside the proposed wind farm site, displacement effects on kestrel are likely to be negligible and not significant.

7.8.4.2 Potential Operation Effects

As kestrel was not recorded breeding during either year of baseline surveys no operational disturbance or displacement of breeding birds are predicted.

Despite the frequent flight activity of kestrel during VPS, given the relatively limited spatial extent of the proposed project in relation to the broader foraging range of kestrel (Garratt *et al*., 2011), disturbance and displacement effects during the operation phase are considered negligible and not significant for both the breeding and non-breeding seasons.

There was no evidence of kestrel commuting through the proposed wind farm site, and therefore barrier effects have not been considered for this species.

Based on VPS data, the CRM has predicted 1.82 collisions annually. This would equate to 63.80 collisions during the 35-year lifespan of the proposed project, or a collision every 0.15 years. Based on the Irish population of 13,500, the fatality of two birds through collision with the wind turbines would equate to 0.01% of the total population annually. Using an assumed Co. Kilkenny population of 519 birds, two annual

collisions would be 0.39%. Therefore, collision risk effects upon kestrel are considered negligible and not significant.

For kestrels, a substantial portion of their flight activity typically involves hovering. During hovering, their flight speed is effectively zero. As such, using the mean flight speed of kestrels to predict transit rates in these situations is not a true reflection and therefore true collision mortalities are likely lower.

7.8.5 Great Saltee SPA

Great Saltee SPA is designated under the Birds Directive as it is of special conservation interest for the following breeding species: fulmar, gannet, cormorant, shag. lesser black-backed gull, herring gull, kittiwake, guillemot, razorbill and puffin. The designated site is located approximately 41.6 km south-east from the proposed wind farm site.

The SPA qualifying features other than gull species are typically confined to marine habitats. As herring gull was not recorded during any baseline survey, there is no potential connectivity for this species associated with Great Saltee SPA and the proposed wind farm site, and therefore only lesser black-backed gull is considered to have potential connectivity to the proposed wind farm site. The citation count for lesser black-backed gull is 164 pairs, based on counts in the 1998-2000 breeding seasons.

Lesser black-backed gull was recorded regularly across all breeding season baseline surveys.

7.8.5.1 Potential Construction Effects

Whilst lesser black-backed gull was recorded commuting from the south, it is unclear what the degree of linkage between the SPA population and the proposed wind farm site is as birds associating with the site could commute from other breeding colonies, or be non-breeding birds present during the breeding season.

Gittings 2020b states that, based on a review of North Sea lesser black-backed gull colonies, that 95% of birds inland foraging occurs within 60 km of their breeding colony. A 60 km foraging range from Great Saltee SPA would include around 3,700 km^2 of terrestrial habitat which could potentially be used by foraging birds breeding at the SPA. Within the Bird Atlas (Balmer *et al*.,2013), lesser black-backed gulls were recorded within the majority of this area.

Lesser black-backed gull is a generalist foraging species and will vary its feeding behaviour dependent on the availability and location of food. Within terrestrial habitats this is evident from birds making use of freshly ploughed fields to forage. Available terrestrial foraging habitat would be in addition to marine habitat available to foraging birds within the mean-max foraging range of lesser black-backed gull (234 km ±SD, [Woodward *et al*., 2019]). It is therefore considered that although the Site and surrounds will be used by foraging lesser black-backed gulls, this will be as part of a wider foraging resource across a large area, and that habitats within the site and immediate surrounds are not considered to be a key foraging resource for SPA birds.

An assessment of impacts on lesser black-backed gull has been undertaken and informs the assessment of effects on the SPA population. There is the potential for loss of suitable foraging habitat, however considering habitat loss relative to the size of lesser black-backed gull foraging range, and that the Site is not considered a key foraging resource for the species, impacts of habitat loss are considered negligible and not significant.

It is also stated that there is the potential for construction activities to disturb/displace up to 250 birds during the breeding season. Assuming these were all birds associated with the SPA (which is considered unlikely), this would equate to 76.22% of the SPA population. However, as noted previously, this peak count is higher than the average counts of foraging birds of 38 during the breeding season (11.595 of the SPA population).

As displacement would be within an extremely small area relative to the size of lesser black-backed gull foraging range, and that the Site is not considered a key foraging resource for the species, impacts of disturbance/displacement are considered negligible and not significant.

7.8.5.2 Potential Operation Effects

Due to the flight activity recorded within 500 m of the turbine locations, there is collision risk associated with lesser black-backed gulls. These are set out in Section 7.8.3. In a worst case scenario, there is potential for 6.84 collisions during the breeding season.

Assuming all flights recorded are associated with the SPA population and therefore that all breeding season collision risk is attributed to the SPA population, which represents a worst-case scenario and is considered unlikely, the collision effects would be outlines as below.

A predicted 1.18 breeding season collisions would equate to approximately 0.36% of the SPA population (164 pairs). However, it should be noted that this citation count is from 1998-2000, a more recent count was conducted as part of the Seabirds Count 2015-21 (Burnell *et al.*, 2023) that states 251 pairs are breeding within the Great Saltee SPA. Based on this more recent count, 1.18 predicted collisions would equate to approximately 0.23% of the population. As stated above, whilst Great Saltee lesser black-backed gulls are likely to visit the proposed wind farm site, other colonies (non-SPA) also exist within the species foraging range and therefore it is considered that birds recorded on Site also include birds from other non-SPA colonies.

It should be noted that non-breeding lesser black-backed gulls are widespread during the summer months, and individuals recorded on site are therefore likely to include non-breeding birds not associated with any breeding population. Furthermore, as the breeding season concludes, this species typically disperses more widely from breeding colonies. During late summer, proposed wind farm site usage may also increase due to the presence of migratory individuals. This pattern is reflected in the survey data, where 55% of lesser black-backed gull flight activity was recorded in August (the final month considered to fall within the species' breeding season).

Therefore, collision risk effects are predicted to be low magnitude and not significant for lesser black-backed gulls associated with Great Saltee SPA.

As gull species are not considered to exhibit macro-avoidance in relation to onshore wind developments, it is considered that barrier effects for these species would be imperceptible and not significant (Furness, 2019).

7.9 Proposed Mitigation and Monitoring

7.9.1 Mitigation

Due to the lack of significant effects on IOF species and sites, no additional mitigation is recommended.

7.9.2 Monitoring

In order to confirm how IOF species are affected by the proposed project and how this compares to predicted effects, ornithological monitoring will take place during and post-construction. This will be agreed with consultees including NPWS prior to commencement of construction. Surveys will include the following:

- Year-round collision monitoring: carcass searches, carcass persistence trials and observer efficiency trials will be completed at least once per month throughout the non-breeding season, to determine whether actual bird collisions are in line with predicted values. Carcasses of all species found on Site will be recorded.

In line with NatureScot guidance (2009), the above monitoring is proposed to take place annually during construction, and after the proposed wind farm becomes operational during years 1-3, 5, 10 and 15.

7.10 Residual Effects

Given that no significant effects are predicted for golden plover, lesser black-backed gull or kestrel during any phase of the proposed project, along with the implementation of embedded mitigation measures, no significant residual effects are predicted for any species.

7.11 Cumulative Effects

Potential cumulative effects can include direct habitat loss, disturbance, barrier effects and collision risk. The potential for the proposed project to make a material contribution to cumulative effects on IOFs is assessed below following NatureScot guidance (SNH, 2018b).

It is possible that potential cumulative effects may change over time, notably with respect to species with large foraging ranges or expanding ranges that may occupy territories that encompass the proposed project. Further monitoring of wind farm sites, along with other developments, across Ireland will support future measures for bird conservation. This highlights the importance of an appropriate monitoring programme and associated potential mitigation.

Table 7-9: Wind Farms within 20 km of the proposed project

Address	Distance from proposed project	Status
Ballymartin Wind Farm	0.1 km	Operational
Castlebanny Wind Farm	1.5 km	Consented
Smithstown Wind Farm	0.6 km	Operational
Beallough Wind Farm	18.5 km	Operational
Rahora Wind Farm	1.0 km	Operational
Michael Aylward DG993	3.8 km	Operational

Another potential wind farm development in County Kilkenny that is currently within the public domain but not within the Irish planning system is Curraghmore Wind Farm in County Kilkenny. According to the

project website, this project will submit for planning permission in the 2nd Quarter 2026. No site layout or boundary was available at the time of writing this EIAR and so cannot be included in any quantitative assessment.

A search was made for the EIAR for each project on the relevant planning portal, however not all could be sourced and therefore the cumulative impact assessment was undertaken based upon information that was reasonably available.

7.11.1 Golden Plover

Collison risk modelling undertaken for Castlebanny Wind Farm estimated 0.079 annual golden plover collisions, the addition of 3.19 collisions associated with the proposed project would equate to <0.01% of the national population and therefore no significant cumulative effect is predicted. No collision risk modelling is available for any of the other wind farm projects considered for cumulative assessment, therefore it is not possible to make a further quantitative assessment. However, given that the effects associated with collision are considered negligible, it is unlikely that the proposed project would contribute to any significant cumulative effects.

Golden plover was not considered to have a population of conservation significance within the vicinity of Castlebanny Wind Farm site and therefore no disturbance or displacement impacts were predicted.

It is acknowledged that there is potential for greater cumulative impact however, given that the effects of the proposed project on golden plover in isolation are considered negligible, it is highly unlikely that the proposed project would contribute to any significant cumulative effects associated with other the other wind farms that EIAR's could not be sourced.

There is no potential for any other significant cumulative impacts to golden plover.

7.11.2 Lesser Black-Backed Gull

The EIAR undertaken for Castlebanny Wind Farm assessed lesser black-backed gull for collision risk. The assessment predicted an annual collision mortality of 1.4 birds. The addition of 8.45 predicted annual mortalities, attributed to this proposed project, would equate to 0.05% of the national population and therefore no significant cumulative effects are predicted. No collision risk modelling is available for any of the other wind farm projects considered for cumulative assessment, therefore it is not possible to make a further quantitative assessment. However, given that the effects associated with collision are considered negligible, it is unlikely that the proposed project would contribute to any significant cumulative effects.

Disturbance and displacement effects associated with Castlebanny Wind Farm were considered to be negligible. Therefore, it is unlikely that the proposed project would contribute any significant cumulative effects.

It is acknowledged that there is potential for greater cumulative impact however, given that the effects of the proposed project on lesser black-backed gull in isolation are considered negligible, it is highly unlikely that the proposed project would contribute to any significant cumulative effects associated with other the other wind farms that EIAR's could not be sourced.

There is no potential for any other significant cumulative impacts to lesser black-backed gull.

7.11.3 Kestrel

The EIAR undertaken for Castlebanny Wind Farm assessed kestrel for collision risk, with a predicted 4.8 collisions per year. No collision risk modelling is available for any of the other wind farm projects considered for cumulative assessment, therefore it is not possible to make a further quantitative assessment. The addition of 1.982 predicted collision mortalities associated with the proposed project in isolation would equate to 0.05% of the national population and therefore no significant cumulative effects are predicted.

At a County scale, there is the potential for minor cumulative effects, as assuming a county population of 519 individuals, an annual collision of 6.62 birds would result in mortality of 1.28%. However, it is noted within the Castlebanny EIA that predicted collisions are likely an overestimate, and due to all flights for the proposed project being scoped into the CRM, it is likely that collision risk in isolation has also been overestimated. Considering this, it is possible that the annual cumulative collisions would be lower than 1% of the County population, and therefore not significant. Given the uncertainty over the county population, it is considered most appropriate to determine significance at a national scale.

No significant disturbance/displacement or habitat loss effect was predicted within the EIAR for Castlebanny Wind Farm. Therefore, it is unlikely that the proposed project would contribute any significant cumulative effects.

It is acknowledged that there is potential for greater cumulative impact however, given that the effects of the proposed project on kestrel are considered negligible, it is highly unlikely that the proposed project would contribute to any significant cumulative effects associated with other the other wind farms that EIAR's could not be sourced.

There is no potential for any other significant cumulative impacts to kestrel.

7.11.4 Great Saltee SPA

As 95% of gulls forage within 60km of their breeding colony (Gittings, 2020b), a 60km buffer was applied to the Great Saltee SPA to assess for potential cumulative impacts. No collision risk modelling results are available for any wind farm project within this buffer, therefore it is not possible to carry out a further quantitative assessment of collision risk.

Most of the projects are at a similar distance or further from the site than the proposed wind farm site. Wind farms that are closer to the SPA have the greatest likelihood of connectivity, these are Richfield and Carnsore Wind Farms. Collision risk modelling results are not available for either site however, a 74% increase in the SPA lesser black-backed gull population between 1998-2002 and 2015-2018 (Cummins *et al.*, 2019) indicates that any impact from either wind farm, or any other existing wind farm has not impacted population growth.

As collision risk arising from the proposed wind farm site is predicted to be not significant in isolation, in the absence of any predicted collisions from other wind farms, and in the context of the increasing SPA population it is considered unlikely that there would be a significant cumulative effect on the SPA population.

7.11.5 Summary of Effects

An assessment has been made of the potential for significant effects of the proposed project on IOFs. By implementing embedded measures detailed in Section 7.6 and following best practice guidance during all phases of the project, the significance of effects on IOFs both alone and in combination with other schemes are assessed as not significant.

Table 7-10 provides a summary of the effects, along with the proposed mitigation if applicable, detailed within this chapter.

Table 7-10: Summary of Potential Impacts, proposed Mitigation, Significance of Effect and Residual Effects

IOF	Potential Impacts	proposed Mitigation	Significance of Effect	Residual Effect
Construction Phase				
Golden plover	Displacement	Not required	Not significant	Not significant
Lesser black-backed gull	Displacement	Not required	Not significant	Not significant
Kestrel	Displacement	Not required	Not significant	Not significant
	Habitat loss (Indirect)	Not required	Not significant	Not significant
Operation Phase				
Golden plover	Displacement	Not required	Not significant	Not significant
	Collision risk	Not required	Not significant	Not significant
	Barrier effects	Not required	Not significant	Not significant
Lesser black-backed gull	Displacement	Not required	Not significant	Not significant
	Collision risk	Not required	Not significant	Not significant
	Barrier effects	Not required	Not significant	Not significant
Kestrel	Displacement	Not required	Not significant	Not significant
	Collision risk	Not required	Not significant	Not significant
	Barrier effects	Not required	Not significant	Not significant

7.12 CONCLUSIONS

An assessment of potential impacts on avian receptors across all phases of the proposed project was undertaken, focusing on the identified Important Ornithological Features (IOFs): Saltee Islands SPA, golden plover, lesser black-backed gull, and kestrel. The assessment concluded that the proposed project is not predicted to result in significant effects on any of the IOFs during construction, operation, or decommissioning phases. Accordingly, no residual or cumulative impacts have been identified, and no additional species-specific mitigation measures are considered necessary.

A long-term monitoring programme will be implemented to evaluate ornithological responses to the development and to verify the accuracy of the predicted impact outcomes. This will include the formulation of an Ornithological Monitoring Plan, to be finalised in consultation with relevant stakeholders and agreed prior to the commencement of construction activities.

7.13 REFERENCES

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