7 ORNITHOLOGY

7.1 INTRODUCTION

This chapter has been prepared by Fehily Timoney and Company (FT) to examine the potential effects that the Proposed Development (described in **Chapter 2**) may have on the avifauna of the study area. This assessment considers the potential effects with regard to each phase of the development: 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 CEMP (**Volume IV, Appendix 2.1**).

A detailed description of the project assessed in this EIAR is provided in **Chapter 2** and is comprised of the following main elements:

- The wind farm site (referred to in this EIAR as 'the Site');
- The grid connection routes (referred to in this EIAR as the 'GCR');
- The turbine delivery route (referred to in this EIAR as the 'TDR' or 'Haul Route');

This Chapter of the EIAR is supported by the following Appendix documents provided in **Volume IV**:

- **Appendix 7.1:** VP flightline figures
- **Appendix 7.2:** Collision Risk Model Report
- **Appendix 7.3:** Survey Details, Dates and Weather Conditions
- **Appendix 7.4:** Survey Results
- **Appendix 7.5:** Survey Figures

Common acronyms used throughout this EIAR can be found in **Appendix 1.4**.

The wind farm Site includes the wind turbines, site access tracks, Turbine Hardstands, the permanent Meteorological Mast, Onsite Substation and Control Building, Internal Wind Farm Cabling, Temporary Construction Compound, drainage infrastructure and all associated works related to the construction of the wind farm.

The chapter also considers the potential effect of the 2 no. proposed Grid Connection Routes (GCR's) Options and Onsite Substation and Control Building. This element of the Project will be subject to a separate planning consent process but will be assessed within this EIAR.

- Option A - Underground Grid Connection to Dunmanway 110kV Substation utilising sections of UGC in public road, primarily regional roads, and private lands. [28 km]
- Option B - Underground Grid Connection to Carrigdangan 110kV Substation utilising sections of UGC in public road, primarily regional roads, and private lands. [22 km]

The Onsite Substation and Control Building (also subject to a separate consent process) will connect via underground 110 kV cable to either the Dunmanway (Option A) or Carrigdangan (Option B) ESB 110 kV substations. The overall length of Option A GCR between the Onsite Substation and Control Building and the existing Dunmanway 110 kV substation is approximately 28 km, of which, approximately 3.98 km is within the Site with the remainder located along the L8776 and the R587. The overall length of Option B between the Onsite Substation and Control Building and the existing Carrigdangan 110 kV substation is approximately 22 km, of which, approximately 3.98 km is within the Site with the remainder located along the L8776 and the L4607.

While not part of the planning consent for this planning application, this chapter also assesses the works at 18 No. locations along the TDR from Port of Cork to Site including proposed temporary accommodation works to facilitate the delivery of wind turbine components.

Bird surveys of the study area following SNH (2017) guidance were carried out over 5 years during the winters of 2019/2020, 2020/2021, 2021/2022, 2022/2023 and 2023/2024, as well as the summers of 2020, 2021, 2022, 2023, and 2024.

Bird surveys and contributions towards this chapter were completed by Aidan Duggan (Senior Ornithologist), Ben O'Dwyer (FT Ecologist, BSc (Hons) Wildlife Biology), Éimear Stephenson (FT Ecologist, BSc (Hons) Marine Science, MSc (Hons) Biodiversity and Conservation), Kate O'Regan (BSc (Hons) Zoology; MSc (Hons) Marine Biology), Rebecca Furlong (FT GIS Technician; BSc Earth and Ocean Sciences, Cert. Geographic Information Systems, MEngSc Civil and Environmental Engineering), Jack Glennon (MSc Marine Biology from University College Cork and a first-class BSc in Wildlife Biology from Munster Technological University) Jon Kearney (FT Director Ecologist; BSc. Applied Ecology MSc. Ecological Management and Biological Conservation), Orla Cummins (Graduate Ecologist first-class BSc Ecology and Environmental Biology), etc.

Background information and biographies of personnel listed above are detailed in Table 7.1:

Table 7.1: Biographies

Surveyor	Responsibility	Biography
Aidan Duggan	Senior Ornithologist Surveyor	Aidan has been a consultant ecologist specialising in wind farm ornithology surveys from 2006 to present. He has completed Hen Harrier Vantage Point Surveys, Hinterland Surveys, Breeding Merlin Surveys, Red Grouse Surveys, Hen Harrier Nest Monitoring, White-tailed Eagle Roost Watches, Hen Harrier Roost Watches, Breeding Bird Surveys, Wintering Bird Surveys, Countryside Bird Surveys at numerous wind farms site throughout the county. He has also completed bird surveys of proposed routes for power grid and gas pipelines. Aidan is a former voting member of the Irish Rare Bird Committee (IRBC), the recognized national expert group on bird identification.
Ben O'Dwyer	Co-Author EIAR Ornithology Chapter	Ben is a Senior Project Ecologist with Fehily Timoney with over 8 years' experience in ecological assessment and holds a BSc (Hons) in Wildlife Biology from Institute of Technology Tralee (now MTU). Ben has prepared EcIAs, EIAR Biodiversity chapters, AA Screening reports and Natura Impact Statements for numerous large scale infrastructure projects in the renewable energy, commercial, waste management and transport sectors. He is an experienced and versatile field surveyor and his experience across a broad range of habitats and projects in Ireland has given him an extensive knowledge of protected sites and species across the country.
Éimear Stephenson	Co-Author EIAR Ornithology Chapter	Éimear Stephenson is a Project Ecologist with Fehily Timoney and Company and has ca. 3 years' experience in the environment sector. Éimear's work focuses on the survey and assessment of proposed wind and solar energy development sites. She has been the lead author on a multitude of reports, and has carried out a variety of surveys including bat, otter, general mammal, botanical, white-clawed crayfish, freshwater pearl mussel, and habitat surveys. Éimear is highly experienced in the use of QGIS and ArcGIS, and is proficient in analysing bird surveys and writing relevant ornithological reports. She holds a BSc in Marine Science from the University of Galway, where she graduated top of her class with a 1:1. She also received an academic scholarship to attend the University of Dublin, Trinity College Dublin, where she graduated with an MSc in Biodiversity and Conservation.
Jack Glennon	Co-Author Ornithology	Jack Glennon is a Graduate Ecologist with Fehily Timoney and Company and has over 2 years of experience in the environmental sector. He holds a MSc in Marine Biology from University College Cork and a first-class BSc in Wildlife Biology from Munster Technological University. Jack has produced a variety of technical reports, including AA Screening Reports, Natura Impact Statements, Biodiversity Enhancement Management Plans, Invasive Species Management Plans, and Ornithology Reports. His field experience encompasses a wide range of ecological surveys, such as bird, habitat, mammal, otter, marsh fritillary, and bat surveys. Jack is skilled in data analysis and proficient in GIS mapping tools, including QGIS and ArcGIS, for ecological data visualisation.
Jon Kearney	Co-Author / Reviewer EIAR Ornithology Chapter and CRM	Jon Kearney is the Technical Director (Ecologist) with FT with over 19 years' experience in both the UK and Ireland. He has extensive experience in Project Management and is a specialist in Ornithological surveys and assessments. His skills include an in-depth knowledge of field survey techniques and methodology, ornithological surveys,

Surveyor	Responsibility	Biography
		mitigation design, water quality assessment, Appropriate Assessment and Ecological Impact Assessment. Jon has extensive experience of ornithological, mammal, reptile and amphibian surveying, habitat surveying, botanical surveying and invertebrate sampling techniques and identification. Jon has completed ecological assessments, biodiversity chapters and Natura Impact Statements for a wide variety of projects in Ireland including numerous solar and wind farm sites. Jon has provided expert witness testimony as the ecology/ornithology discipline lead at several an Bord Pleanála oral hearings. He has considerable experience of EIAR, AA and ecological constraints work, which often includes extensive reference to, and interpretation of, Article 6(3) of 'The Habitats Directive', and to other EU, UK and Irish conservation legislation.
Kate O'Regan	Author Collision Risk Model Assessment (Appendix 7.2)	Kate O'Regan is a Project Ecologist with Fehily Timoney and Company. She holds a first-class MSc in Marine Biology and first-class BSc. in Zoology from University College Cork. Since joining Fehily Timoney, she has prepared Appropriate Assessments and Ecological Impact Assessments for waste facilities and road improvement schemes along with ornithological reports and collision risk models for renewable energy projects. Kate has previous experience in data management, statistical analysis, mapping and technical report writing. Kate has also completed a wide range of fieldwork including ornithological, bat, freshwater aquatic, intertidal, subtidal, insect and mammal surveys.
Orla Cummins	Co-Author Ornithology	Orla Commins is a Graduate Ecologist with Fehily Timoney and Company. She holds a first-class BSc in Ecology and Environmental Biology from University College Cork. Since joining Fehily Timoney. She has prepared AA screening reports and NIS's for numerous projects and has completed ornithological reports, field work and data management.
Rebecca Furlong	GIS Analyst	Rebecca is responsible for the co-ordination of all environmental department geographic information systems (GIS) projects. She is experienced in many aspects of environmental risk/impact assessment modelling in GIS including database design, database management, data conversion/projection, raster spatial analysis / Heat Mapping, ArcGIS Story maps and management of ArcGIS online, data modelling and data processing utilising all main GIS software packages (including ArcGIS, QGIS, MapInfo). Rebecca has experience with various GIS and surveying software packages including Collector, Survey 123.

7.2 METHODOLOGY

7.2.1 Relevant Guidance

The methodology for this appraisal has been devised in consideration of the following relevant guidance published by the Environmental Protection Agency (EPA) '*Guidelines on the information to be contained in Environmental Impact Assessment Reports*' (EPA, 2022) and '*Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*' (DoHPLG, 2018) and the Chartered Institute of Ecology and

Environmental Management (CIEEM) '*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Version 1.1)*' (CIEEM, 2018 and revisions).

Additional guidance available from the EU such as '*Guidance document on wind energy developments and EU nature legislation*' (2020) and '*Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment*' (2013) has also been considered. The Heritage Council publication '*Best Practice Guidance for Habitat Survey and Mapping*' (Smith *et al*., 2011) is also referenced.

Relevant guidance from Scottish Natural Heritage (SNH) in relation to birds such as SNH *Recommended bird survey methods to inform impact assessment of onshore windfarms (2017)*. 'Survey Methods for use in assessing the impacts of onshore wind farms on bird communities (2005 & 2010)' and *'Assessing the cumulative impact of onshore wind energy developments (2012)'* have also been utilised.

Documentation available from Cork County Council (CCC) such as the "Cork County Development Plan 2022 – 2028" has been reviewed and utilised where relevant.

7.2.2 Legislative Context

All birds are protected under the Wildlife (Amendment) Act, 2000 (as amended).

The conservation of birds and their habitats in Ireland has been expanded by EU law, most notably by the EU Birds Directive and EU Habitats Directive, which provide bird protection legislation.

Species listed in Annex I and migratory species are subject to special conservation measures to protect their habitat, through the establishment of Special Protection Areas (SPAs), under Directive 2009/147/EC on the Conservation of Wild Birds (the Wild Birds Directive). The Habitats Directive (Directive 92/43/EC on the Conservation of Natural Habitats and of Wild Fauna and Flora) and Birds Directive were transposed into Irish law inter alia by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), as amended and the Planning and Development Act 2000 (as amended).

7.2.3 Consultation

For a full list of consultations and responses, please see **Appendix 1.3: Scoping Opinion** in **Volume IV**.

7.2.4 Desktop Study

A desk study was carried out to collate and review available information, datasets and documentation sources pertaining to the site's natural environment. Records available on the NPWS and the National Biodiversity Data Centre websites were reviewed, in addition to records of rare/sensitive species within the 10km grid squares overlapped by a 2 km buffer surrounding the study area was requested from NPWS (requested October 2024).

Other data sources include Ireland's Wetlands and their Waterbirds: Status and Distribution (Crowe 2005), and the Breeding and Winter Birds of Britain and Ireland Bird Atlas 2007-11 (Balmer, et al., 2014).

Other sources included:

- OSI Aerial photography and 1:50000 mapping;
- NPWS website (mapviewer) grid squares W15 and W16 flora and fauna records, accessed 12th March 2025;
- National Biodiversity Data Centre (NBDC) website and data obtained on 15th November 2024;
- Teagasc Soil area maps;
- Geological Survey Ireland (GSI) area maps, and;
- EPA website datasets (soil, surface water quality, ground water quality, designated sites).

7.2.5 Field Study

The details, dates and weather conditions are provided in **Appendix 7.3**.

Target Species

The following criteria has been utilised to select target species for the current study. Scottish Natural Heritage (SNH) guidance (SNH, 2017) on the assessment of the effects of wind farms on ornithological interests suggests that there are four important species lists from which target species can be drawn, as follows:

- Species listed on Annex 1 of the Birds Directive (EC, 2009)
- Red-listed birds of Conservation Concern
- Schedule 1 of the Wildlife and Countryside Act 1981 (not applicable in Ireland) and;
- Regularly occurring migratory species.

In addition to the above, consideration was given to species identified locally as being of conservation concern, regionally or those particularly susceptible to impact from wind farm development. Note that not all species on the above lists would be categorised as target species, e.g. most passerine species and general lowland farmland birds are not considered to be particularly susceptible to impacts from wind farms (SNH, 2017).

In the Irish context, it has been suggested that target species should be taken from species of conservation concern in Ireland (BOCCI) (Gilbert et al., 2021), those likely to occur within the vicinity of the proposed wind farm, and those most at risk from particular impacts such as disturbance and displacement (Nairn, R. and Partridge, K., 2013).

'Birds of Conservation Concern in Ireland' (BoCCI) are classified into three separate lists: red, amber, and green. Red-listed species are of high conservation concern, Amber-listed species are of medium conservation concern and Green-listed species are considered to be of no conservation concern (Gilbert et al., 2021).

To date four BoCCI lists have been published with the current list by Gilbert et al., (2021) superseding the three former lists by Colhoun and Cummins (2013), Lynas et al., (2007), and Newton et al., (1999). The conservation status of bird species found in this study was assessed using the most recent (2021) BoCCI List (Gilbert et al., 2021).

Additionally, a review of the bird species listed on Annex I of the EU Birds Directive (2009/147/EC) was undertaken in assessing the conservation status of birds. Annex I species are afforded additional protection through the designation of Special Protection Areas (SPAs) throughout EU countries in addition to existing National legislation.

Overview of methods of surveys

Initial walkovers of the site were carried out to enable the identification of suitable survey locations.

Field surveys were undertaken to gather detailed information on bird distribution and flight activity in order to predict the potential effects of a wind farm development on birds.

The field surveys comprised two main elements; vantage point (VP) watches and targeted distribution and abundance surveys which comprised:

- VP watches undertaken over 5 years at three VPs (winter 19/20, winter 20/21, winter 21/22, winter 22/23, winter 23/24, summer 2020, summer 2021, summer 2022, summer 2023, summer 2024).
- Transect surveys (winter 19/20, winter 20/21, winter 21/22, winter 22/23, winter 23/24, summer 2020, summer 2021, summer 2022, summer 2023, summer 2024);
- Hinterland surveys (winter 19/20, winter 20/21, winter 21/22, winter 22/23, winter 23/24, summer 2020, summer 2021, summer 2022, summer 2023, summer 2024).
- Breeding wader transects (summer 2020, summer 2021, summer 2022, summer 2023, summer 2024).

7.2.5.1 Vantage Point (VP) Watches / Flight Activity Surveys

Selection of VP Locations

Vantage point (VP) surveys were carried out with regard to 'Recommended bird survey methods to inform impact assessment of onshore wind farms' (SNH, 2017).

VP surveys were carried out by suitably qualified personnel over:

- Five winter seasons:
  - a six-month period spanning October 2019 to March 2020(inclusive),
  - a six-month period spanning October 2020 to March 2021(inclusive),
  - a six-month period spanning October 2021 to March 2022(inclusive),
  - a six-month period spanning October 2022 to March 2023(inclusive),
  - a six-month period spanning October 2023 to March 2024(inclusive).

- Five summer seasons:
  - a six-month period spanning April to September 2020 (inclusive),
  - a six-month period spanning April to September 2021 (inclusive),
  - a six-month period spanning April to September 2022 (inclusive),
  - a six-month period spanning April to September 2023 (inclusive),
  - a six-month period spanning April to September 2024 (inclusive).

The overall aim of these surveys was to quantify the level of flight activity and distribution over the flight activity survey area and to determine bird usage of the site. The flight activity survey area was taken to be that area encompassing 500m circular buffers drawn around the location of each proposed turbine, as required by SNH (2017) guidance. Vantage points are ideally located on elevated areas, or other areas, which provide clear views over the survey area.

Achieving maximum visibility over as much of the site as possible is important for these surveys.

SNH (2017) guidance state that vantage points should be located so as to allow full coverage of the flight activity survey area such that no point is greater than 2km from a VP. To minimise observer effect on bird behaviour, VPs should ideally be located outside the survey area but should be located as close as possible.

SNH (2017) stipulates that where VPs are located within the survey area, they should not be used simultaneously with other VPs which overlook them to minimise potential observer effect on birds. This was adhered to during the total survey period.

With regards to the proposed wind farm site, VP locations were selected to provide maximum site coverage. Vantage point locations were based on observations from walkover/reconnaissance surveys, viewshed analysis (using GIS) and collated information on known feeding and roosting sites from both desktop review and consultation. The number and location of vantage points was selected in order to achieve visibility of the entire study area and important features for birds in close proximity to the site (e.g., lakes, wetlands). The vantage points when combined cover a comprehensive viewshed of all turbine locations, and also allowed observation of the wider area surrounding the Site.

In line with recommended best practice, viewshed analysis was undertaken using ArcGIS Desktop, to calculate a theoretical zone of visibility from each vantage point. Visibility is calculated from each vantage point along an invisible layer suspended at the predicted lowermost height passed through by the rotor blade tips, using an observer height of 1.5m. We note the following from SNH guidance in respect of priority areas for viewshed analysis (emphasis added):

"*Where the key purpose is to estimate the risk of collision with turbines, **it is the visibility of the airspace to be occupied by the turbine rotors (the collision risk volume) that is of prime importance**. Therefore, it is recommended that visibility be calculated using the least visible part of this airspace, i.e. an imaginary layer suspended at the lowermost height passed through by the rotor blade tips (typically about 20-30m above ground level). Predicting visibility at this level is a simple task using GIS, however it should be noted that the baseline should take account of any forestry or other features that will potentially obstruct the view. For example, forestry may be 10-30m high and if viewshed height is taken as 20-30m ground level the visible area could be overestimated if there is forestry within the viewshed. Being able to*

view all or most of the site to ground level can be helpful in gauging overall bird activity and usage of the site but is not as important as being able to view the collision risk volume."

The locating of the VPs within the survey area achieved visual coverage of the site in line with SNH (2017) guidance. Each VP overlaps with at least one other VP. Overlap in VP surveys conducted over the course of the survey period was avoided to reduce the risk of surveyor presence affecting bird behaviour. Surveyor presence did not affect bird behaviour during any of the VP surveys which were carried out. This was reflected in the flight paths recorded for the various target and secondary species with birds regularly recorded flying in relatively close proximity to surveyors. If observer presence influenced bird behaviour, we would expect to see alterations in flight path to avoid the surveyor. This was not the case and no obvious alterations in flight paths were observed.

Three VP locations were selected to cover the site (VP1 – VP3). These VP locations remained the same for the full 5 years of surveys.

VP surveys were carried out at the site monthly from April 2019 to September 2024 inclusive. Therefore, over the entire survey period, five summer seasons and five winter seasons were completed. Watches were 2 * 3 hours = 6 hours per VP per month. Thus, the following survey effort was completed for the following seasons:

- Winter 2019/2020: 3 VPs * 6 hours / VP / month * 6 months + additional 7 hours = 115 hours or 414,000 seconds.
- Winter 2020/2021: 3 VPs * 6 hours / VP / month * 6 months = 108 hours or 388,800 seconds.
- Winter 2021/2022: 3 VPs * 6 hours / VP / month * 6 months = 108 hours or 388,800 seconds.
- Winter 2022/2023: 3 VPs * 6 hours / VP / month * 6 months = 108 hours or 388,800 seconds.
- Winter 2022/2023: 3 VPs * 6 hours / VP / month * 6 months = 108 hours or 388,800 seconds.
- Summer 2020: 3 VPs * 6 hours / VP / month * 6 months = 108 hours or 388,800 seconds.
- Summer 2021: 3 VPs * 6 hours / VP / month * 6 months = 108 hours or 388,800 seconds.
- Summer 2022: 3 VPs * 6 hours / VP / month * 6 months = 108 hours or 388,800 seconds.

- Summer 2023: 3 VPs * 6 hours / VP / month * 6 months + an additional 6.4 hours (VP 2.3hrs, VP2 3.1hrs and VP3 1hr) = 114.1 hours or 411,840 seconds.
- Summer 2022: 3 VPs * 6 hours / VP / month * 6 months = 108 hours or 388,800 seconds.
- Spring Migration 2022: 3VPs * 6 hours / VP * 1 month = 18 hours or 64,800.
- Autumn Migration 2023: (2VPs * 6 hours / VP + 1 VP * 5.75 hours) * 1 month = 17.75 hours or 63,900.
- Spring Migration 2024: 3VPs * 6 hours / VP * 1 month = 18 hours or 64,800.

The total survey effort over the 5-year survey period (5 x summer seasons, and 5 x winter seasons) was 1,147 hours and 9 minutes or 4,129,740 seconds. Thus, the combined survey effort required for all seasons exceeds that required by SNH guidance (SNH, 2017) and the 5 years of surveys is significantly greater than the 2 years of surveys required under this guidance document.

The Irish Transverse Mercator (ITM) grid co-ordinate locations of each VP are provided in Table 7.2, below. Figures showing the location of each VP and the viewsheds from each VP in order to show the extent of site coverage are provided in **Appendix 7.5**. Full details on individual VP surveys including survey dates, times and weather conditions can be found in **Appendix 7.3.**

Table 7.2: Vantage Point Locations

VP No.	ITM Grid Co-ordinates
VP 1	515146, 559917
VP 2	513367, 560477
VP 3	515854, 561125

Viewshed Analysis of VP Locations

Viewshed analysis was undertaken for each VP location to determine visual coverage of the survey area (taken to encompass the site and the flight activity survey area). Viewsheds were set to observer height of 2m showing a view of everything over 25m height. Viewsheds encompassed a 2km radius with 360^0 view. Each viewshed was then cropped to an 180^0 arc showing the relevant direction of view.

Viewshed analysis determined that, based on the VP locations selected, visual coverage of 95.16% of the survey area was achieved, thereby ensuring near complete coverage of the flight activity survey area by VP surveys in line with SNH (2017) guidance. Figures showing the viewsheds from each VP in order to show the extent of site coverage are provided in **Appendix 7.5**.

Flight Data Recording

During VP surveys the flight behaviour of target species was recorded. Based on the precautionary principle flight behaviour of secondary species was also recorded; however, recording of secondary species was subsidiary to recording of target species (SNH, 2017). At the time of each species observation the following information was recorded:

- The time that the bird was detected;
- The flight duration (seconds) within various flight height categories:
  0-10m (s), 10-20m (s), 20-30m (s), 30-50m (s), 50-100m (s), 100-185m (s), > 185m (s);
- Sex and age of the bird(s) (adult/juvenile), where possible to determine;
- Type of activity/behaviour such as hunting, flying, displaying, etc;
- Estimation of actual flight height;
- Habitat(s) where the bird was observed;
- Weather conditions at time of sighting including wind speed and direction.

Once an initial sighting was made, each target or secondary species was observed until lost from view. Flight paths were recorded as observed, including where birds travelled or were observed outside of the flight activity survey area; such that all flight activity within the broader landscape was encompassed. All surveys were conducted during suitable weather conditions.

Details on flight behaviour for each individual target/secondary species observed, including a unique map identifier code which corresponds to a mapped flight path, are provided in tabulated format in Appendix 7.4. All flight paths are provided in Appendix 7.1**.** Flight paths are mapped as both lines and polygons in figures. Polygons were provided when flight paths were complex in nature (i.e. larger flock with several individuals moving separately and provides a conservation area of activity). Note that each polygon depicts one separate observation. Summaries and monthly peak counts of all non-target species of conservation concern recorded during VP surveys are provided in **Appendix 7.4**.

7.2.5.2 Distribution and Abundance Surveys

Distribution and abundance surveys were carried out to record numbers and distributions of breeding, wintering and migrant birds using the site that might be affected either directly or indirectly by the proposed development (e.g., collision risk, habitat loss, displacement effects).

Breeding Bird Surveys

For general breeding birds the method utilised was based on the existing British Trust for Ornithology (BTO) Breeding Bird Survey (BBS or CBS; Bibby et al, 2000). The study area for this survey comprised a total of two no. c. 1 km transects which were selected and centred on different habitats present within the subject site. Birds were counted over 5 summer seasons 2020 and 2024 to coincide with the early breeding season in April to mid-May and the later part of the breeding season in mid-May to June.

Surveyors recorded all birds seen or heard as they walked methodically along the transect routes. Birds were noted in four distance categories, measured at right angles to the transect line (within 25 m, between 25 m-100 m and over 100 m from the transect line) and those seen in flight only. Recording birds in distance bands gives a measure of bird detectability and allows relative population densities to be estimated if required (BTO, 2018).

A map showing the transect survey routes within the proposed wind farm site is included in the Figures in **Appendix 7.5**. Details on each transect survey carried out including the survey date, time and weather conditions can be found in Table 7.3 (summer). Tabulated results for all species recorded during monthly transect surveys are provided in Table 7.22.

Table 7.3: Breeding Bird Transects undertaken between 2020 and 2024 (5 years).

Round	Date	Transect	Start	Finish	Weather Conditions
Early	08/05/2020	1 and 2	20:14	20:42	Cloud: 4/8 oktas; rain: none; wind: F3-4; visibility: very good
Late	27/05/2020	1 and 2	20:45	21:18	Cloud: 2/8 oktas; rain: none; wind: F2; visibility: excellent
3rd round	16/06/2020	1 and 2	21:10	21:39	Cloud: 4/8 oktas; rain: none; wind: F3; visibility: very good
Early	13/04/2021	1 and 2	19:29	21:10	Cloud: 1/8 oktas; rain: none; wind: F3; visibility: excellent
Late	13/06/2021	1 and 2	07:42	09:00	Cloud: 2/8 oktas; rain: none; wind: F2-3; visibility: excellent

Round	Date	Transect	Start	Finish	Weather Conditions
Early	14/05/2022	2	08:01	08:28	Cloud: 8/8 oktas; rain: none; wind: F1; visibility: excellent
Early	14/05/2022	1	08:50	09:24	Cloud: 8/8 oktas; rain: none; wind: F1; visibility: excellent
Late	29/06/2022	1	07:21	07:52	Cloud: 6/8 oktas; rain: none; wind: F4; visibility: excellent
Late	29/06/2022	2	08:05	08:36	Cloud: 6/8 oktas; rain: none; wind: F4; visibility: excellent
3rd round	08/07/2022	1	07:01	09:16	Cloud: 1/8 oktas; rain: none; wind: F3; visibility: excellent
3rd round	29/07/2022	2	07:02	07:31	Cloud: 8/8 oktas; rain: none; wind: F2; visibility: excellent
4th Round	29/07/2022	1	07:48	09:36	Cloud: 8/8 oktas; rain: none; wind: F2; visibility: excellent
Early	15/05/2023	2	07:32	08:01	Cloud: 4/8 oktas; rain: none; wind: F2; visibility: excellent
Early	15/05/2023	1	08:22	08:56	Cloud: 4/8 oktas; rain: none; wind: F2; visibility: excellent
Late	27/06/2023	2	07:38	08:05	Cloud: 8/8 oktas; rain: none; wind: F1; visibility: excellent
Late	27/06/2023	1	08:21	08:52	Cloud: 8/8 oktas; rain: none; wind: F1; visibility: excellent
Early	01/05/2024	2	07:19	08:08	Cloud: 7/8 oktas; rain: none; wind: F2; visibility: excellent
Early	01/05/2024	1	08:24	09:00	Cloud: 7/8 oktas; rain: none; wind: F2; visibility: excellent
Late	10/06/2024	1	07:24	08:06	Cloud: 2/8 oktas; rain: none; wind: F4; visibility: excellent
Late	10/06/2024	2	08:17	08:58	Cloud: 2/8 oktas; rain: none; wind: F4; visibility: excellent

Winter site walkovers

Over five winter seasons 2019/2020 to 2023/2024, winter bird transect surveys were carried out at the same two transects as the breeding bird surveys with three rounds per season and one visit to each transect per round. Details on each transect survey carried out including the survey date, time and weather conditions can be found in Table 7.4 (Winter). Tabulated results for all species recorded during monthly transect surveys are provided in Table 7.21.

Table 7.4: Winter Bird Transects undertaken between 2019 and 2024 (5 years).

Round	Date	Transect	Start	Finish	Weather Conditions
1st	09/12/2019	TR1	10:46	11:10	Cloud: 4/8 oktas; rain: none; wind: F1; visibility: good
1st	20/12/2019	TR2	09:55	10:40	Cloud: 7/8 oktas; rain: none; wind: F0-1; visibility: excellent
2nd	30/01/2020	TR1 and TR2	10:15	12:40	Cloud: 8/8 oktas; rain: none; wind: F1-3; visibility: moderate
3rd	11/03/2020	TR1 and TR2	11:30	14:30	Cloud: 6-8/8 oktas; rain: rain & hail; wind: F6-8; visibility: good
1st	05/10/2020	TR2	10:17	10:50	Cloud: 8/8 oktas; rain: none; wind: F3; visibility: good
1st	14/10/2020	TR1	11:28	12:06	Cloud: 8/8 oktas; rain: none; wind: F3; visibility: excellent
2nd	16/12/2020	TR1	16:24	16:57	Cloud: 8/8 oktas; rain: none; wind: F3; visibility: excellent
2nd	19/12/2020	TR2	10:01	10:29	Cloud: 7/8 oktas; rain: none; wind: F4; visibility: good
3rd	03/02/2021	TR1 and TR2	09:43	12:12	Cloud: 3/8 oktas; rain: none; wind: F1-3; visibility: excellent
1st	12/11/2021	1	15:04	15:35	Cloud: 6/8 oktas; rain: none; wind: F4; visibility: excellent
1st	19/11/2021	2	15:20	15:51	Cloud: 3/8 oktas; rain: none; wind: F0; visibility: excellent
2nd	21/01/2022	1	14:45	15:16	Cloud: 8/8 oktas; rain: none; wind: F2; visibility: excellent
2nd	25/01/2022	2	14:54	15:16	Cloud: 6/8 oktas; rain: none; wind: F1; visibility: excellent
3rd	21/03/2022	1	15:07	15:44	Cloud: 8/8 oktas; rain: none; wind: F3; visibility: excellent
3rd	29/03/2022	2	15:01	15:29	Cloud: 2/8 oktas; rain: none; wind: F2; visibility: excellent
1st	17/11/2022	2	16:15	16:43	Cloud: 2/8 oktas; rain: none; wind: F2; visibility: excellent
1st	27/11/2022	1	15:39	16:13	Cloud: 6/8 oktas; rain: none; wind: F5; visibility: excellent
2nd	28/01/2023	1	11:44	12:18	Cloud: 3/8 oktas; rain: none; wind: F4; visibility: excellent
2nd	28/01/2023	2	16:38	17:05	Cloud: 7/8 oktas; rain: none; wind: F3; visibility: excellent
3rd	18/02/2023	1	16:53	17:30	Cloud: 6/8 oktas; rain: none; wind: F5; visibility: excellent
3rd	27/03/2023	2	15:43	16:16	Cloud: 8/8 oktas; rain: none; wind: F4; visibility: excellent
1st	26/10/2023	2	14:27	15:00	Cloud: 8/8 oktas; rain: showers; wind: F4; visibility: excellent

Round	Date	Transect	Start	Finish	Weather Conditions
1st	28/10/2023	1	16:44	17:18	Cloud: 8/8 oktas; rain: showers; wind: F5; visibility: excellent
2nd	19/12/2023	1	15:30	16:02	Cloud: 4/8 oktas; rain: showers; wind: F3; visibility: excellent
2nd	20/12/2023	2	15:18	15:47	Cloud: 7/8 oktas; rain: none; wind: F5; visibility: excellent
3rd	22/02/2024	2	16:27	17:00	Cloud: 6/8 oktas; rain: showers; wind: F3; visibility: excellent
3rd	23/02/2024	1	14:35	15:21	Cloud: 6/8 oktas; rain: showers; wind: F3; visibility: excellent

7.2.5.3 Hinterland Surveys

A total of five years of monthly hinterland surveys were carried out between October 2019 and September 2024. The methodology used for wetland sites during hinterland surveys followed I-WeBS (Irish Wetland Bird Survey) methodology (Lewis et al, 2019), whereby each location was surveyed for the duration necessary to identify and obtain a count for all target species present. The same approach was adapted for non-wetland sites. Timing and details of hinterland surveys are detailed in **Appendix 7.3**.

The surveys were carried out in suitable habitats including woodlands, peatlands and wetlands in the area surrounding the proposed wind farm site. This comprised of 33 hinterland vantage points within 10 km from the Site. These hinterland vantage points (HVP) were chosen as they had suitable habitat for the following target species: raptors, waders, waterfowl, swans, geese, barn owl, wildfowl and other waterbirds. Additionally, checks were made in the general area surrounding the Site. The HVPs detailed in **Appendix 7.4**, were checked regularly across this period.

A hinterland survey for raptors was conducted in accordance with Hardey et al. (2013) to assess Hen Harrier and other raptor activity over the winter and breeding periods in the greater surroundings of the Site.

Timing and details of hinterland surveys are detailed in **Appendix 7.3**. A map showing the areas encompassed by the hinterland surveys is included in the Figures in **Appendix 7.5**.

7.2.5.4 Other Breeding Season Surveys

Breeding Wader Walkover Surveys

Five years of Breeding wader walkover surveys were undertaken in the Summers of 2020 (early May, late May, June, and July), 2021 (April, May, June and July), 2022 (May, early June and late June), 2023 (May, June and July) and 2024 (early May, late May and June) to detect the presence of breeding waders within 2km of the study area. A number of methods were combined from published literature including Bibby et al, (2000), Gilbert et al, (1998), Brown & Shepperd (1993) and SNH (2017) to estimate numbers of target species breeding within this envelope.

Methods utilised were grouped into two categories; those for breeding lapwing *Vanellus vanellus* and those for other species such as Curlew *Numenius arquata*, common Snipe *Gallinago gallinago*, redshank *Tringa totanus*, woodcock *Scolopax rusticola*, common sandpiper *Actitis hypoleucos* and ringed plover *Charadrius hiaticula*. For each species, a pre-defined matrix of suitable habitats was created and used to select target habitats for survey (Table 7.5).

Table 7.5: Target Species and Associated Suitable Breeding Habitat

Target Species	Suitable Breeding Habitat
Lapwing	Lowland wet grassland, arable farmland, cutover bog with pools and wet grassland
Snipe	Wet pastures, marsh, bogs (intact and cutover) and fens
Redshank	Bog
Curlew	Bog
Common Sandpiper	Streams/rivers in bog
Woodcock	Woodland, bog woodland
Ringed Plover	Cutover bog, milled peat with exposed gravel

Survey methods for lapwing followed those in Bibby et al. (2000) where the primary count unit for breeding birds is defined as an incubating female. In addition, displaying birds, birds standing guard near nests or distraction displays were also recorded as indications of occupied territories. Extensive areas of open ground were covered from roads, farm tracks or

roadsides (where possible); larger areas of open ground not visible from easily accessible vantage points were walked using transects.

Surveys were carried out during the time periods recommended in Bibby et al. (2000) although territorial behaviour noted outside these periods was also utilised in the assessment. For all additional species of wader the employed method was the same and utilised transects walked through suitable habitat within three hours of dawn or dusk. Count units (Table 7.6) were predefined for each target species and included in the method statement provided to surveyors.

Table 7.6: Count Units for each Wading Species

Species	Unit
Lapwing	Incubating Bird
Common Snipe	Drumming or Chipping Bird
Redshank	Alarming Bird
Woodcock	Displaying Male
Ringed Plover	Presence or Absence/ Fledged Young late in season
Common Sandpiper	Presence or Absence/ Fledged young late in season
Curlew	Territorial Activity

All suitable habitats for waders were visited. All species encountered (seen or heard) were recorded and their abundance, behaviour, sex/age and breeding status noted. Any species occurring more than 100 m from the observer, or flying over the site and not using it, were recorded as 'additional' species to further inform the Baseline survey. **Appendix 7.3** details the survey dates and weather conditions.

A map showing the areas encompassed by the walkover survey is included **Appendix 7.5**.

Merlin Surveys

Merlin surveys were centred on suitable habitat for the species and methods used are based on previous surveys in Ireland (Lusby *et al*. 2011 and Fernandez *et al*. 2010); developed in association with Dr. John Lusby of BirdWatch Ireland. The study area for Merlin is defined as a 1km square centrally placed on suitable habitat. A map showing the areas encompassed by the walkover survey is included **Appendix 7.5**.

Three visits were undertaken to the study square, each at 4-week intervals and timed to coincide with periods of Merlin activity (April to mid-May, mid-May to late June, and July to mid-August). Note an extra fourth visit was undertaken in August, see **Table 7.7** for survey dates. Prior to the first visit, all areas within the square identified as not suitable for Merlin (open water, urban areas, farmland, enclosed pastures and areas above 700m) were be excluded from the target search area. The remaining habitat was walked using parallel transects 120m apart and intensively searched for evidence of Merlin. Features such as suitable nest sites (old corvid nests) and suitable perches (posts, hummocks, boulders, remnant peat stands and root mats) are noted and the grid reference recorded.

Transect locations are recorded on ortho-photographs of the study square. Recorded information/evidence is defined in the form of secondary Merlin evidence (whitewash, pellets, feathers), prey remains (feather spots, moth wings, prey remains etc.), nests (possible or occupied) and direct observations (calling birds, displaying birds, hunting birds, inter-specific aggression etc.). The surveyor walked along conifer forestry edge and lines of sheep wire fence posts throughout the site searching for pellets or plucking posts. Suitable prominent rocks were targeted in the moorland as they can also provide plucking points.

Table 7.7: Merlin survey dates and conditions

Date	Location	Cloud (Okta)	Precipitation	Visibility	Wind
07/05/2020	Gortloughra	8/8	Dry	3km	F3 S
05/06/2020	Gortloughra	8/8	Dry	6km	F2-4 NW
21/07/2020	Gortloughra	8/8	Dry	Good	F2 W
09/08/2020	Gortloughra	3/8	Dry	Excellent	F1-2 S

Red Grouse Surveys

Methodology from the national Red Grouse survey (2006/2007 to 2007/2008, managed by BirdWatch Ireland and financed by the NPWS) was adopted as laid out in the conditions of the licence (licence 02/2021). This methodology is laid out in Cummins *et al*. (2010)

Under the terms of the NPWS licence, surveys are required to be conducted in suitable weather conditions (no rain, no strong winds and with good visibility). Although some very light drizzle was recorded, this was very brief and did not affect visibility, nor was it considered to hamper survey results.

The national survey used national grid one-kilometre by one-kilometre squares, in which surveyors select 1 km transects, in a north-south, or east-west direction, through suitable

habitat. Surveyors walk 250m apart and stop at 250m increments. The chosen Transects can be viewed in **Appendix 7.5**.

A Red Grouse tape lure was played through a megaphone at each of the five 250m intervals for thirty seconds. Surveyors stopped and scanned during this period, continuing scanning for a further thirty seconds. If no Grouse called during this period, the process was repeated once again, before surveyors continued walking to the next 250m interval.

7.2.6 Avifauna Receptor Evaluation

Avifauna resources are to be initially evaluated as to whether or not they constitute key receptors for the assessment following NRA guidance. For the purposes of impact assessment, a receptor 'importance value' or sensitivity, following published guidance as in Percival (2007), SNH (2017) and literature review of published information on birds and wind farms (Pearce-Higgins J. L., 2009; Pearce-Higgins J. S., 2012; Drewitt A. L., 2006; Drewitt and Langston, 2008 and Masden, 2009) is to be calculated. Where provided receptor values from Percival (2007) are below those recommended in guidance within the Irish context (NRA, 2009a); then the evaluation has been increased in line with the recommended Irish evaluation as a precautionary principle. Table 7.8 illustrates the combined receptor evaluation criteria used to assign sensitivity levels to key receptors:

Table 7.8: Avian Resource Evaluation Criteria

Sensitivity of key receptor	Percival 2007 criteria	NRA Resource Evaluation	NRA Criteria	Combined Criteria
Very High.	Species is cited interest of SPA. Species present in Internationally important numbers.	International Importance.	Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive	Species is cited Special Conservation Interest of SPA. Species present in Internationally important numbers. Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive
High	Other non-cited species which	National Importance	Resident or regularly occurring populations (assessed to be	Other non-cited / not a Special Conservation Interest species which

Sensitivity of key receptor	Percival 2007 criteria	NRA Resource Evaluation	NRA Criteria	Combined Criteria
	contribute to integrity of SPA. Ecologically sensitive species (<300 breeding pairs in UK) and less common birds of prey. Species listed on Annex 1 of the EU Birds Directive. Regularly occurring relevant migratory species which are rare or vulnerable		important at the national level) of the following: Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list	contribute to integrity of SPA. Ecologically sensitive species (<300 breeding pairs nationally) and less common birds of prey. Species listed on Annex 1 of the EU Birds Directive. Regularly occurring relevant migratory species which are rare or vulnerable Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list (in this case BOCCI Red list).
Medium	Species present in regionally important numbers (>1% of regional population). Species occurring within SPA's but not crucial to the integrity of the site. Species listed as priority species in the UK BAP subject to special conservation measures	County Importance	Resident or regularly occurring populations (assessed to be important at the County level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; County important populations of species. Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.	Species present in regionally important numbers (>1% of regional population). Species occurring within SPA's but not crucial to the integrity of the site. Resident or regularly occurring populations (assessed to be important at the County level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; County important populations of species. Species that are rare or are undergoing a decline in quality or extent at a national level.

Sensitivity of key receptor	Percival 2007 criteria	NRA Resource Evaluation	NRA Criteria	Combined Criteria
Low	Species covered above which are present very infrequently or in very low numbers. Any other species of conservation interest not covered above, e.g. species listed on the red or amber lists of the BoCC.	Local Importance (High Value)	Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared; Resident or regularly occurring populations (assessed to be important at the Local level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list.	Locally important populations of priority species identified in the Local BAP, if this has been prepared. Resident or regularly occurring populations (assessed to be important at the Local level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Amber listed species.
Negligible	Species that remain common and widespread	Local Importance (Low Value)	n/a	Species that remain common and widespread. Green Listed Species.

7.2.7 Assessing Effect Significance

Once the value of the identified ecological receptors (features and resources) was determined, the next step was to assess the potential effect of the project on the identified key ecological receptors.

Table 7.9 to Table 7.14 outline the EPA (2022) evaluation criteria utilised in this appraisal of the Environmental Factor, Ornithology. These criteria are included in the Guidelines on the Information to be contained in Environmental Impact Assessment Reports:

Table 7.9: Probability of Effects (EPA, 2022)

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

Table 7.10: Quality of Effects (EPA, 2022)

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

Table 7.11: Significance of Effects (EPA, 2022)

Significance of Effect	Description
Imperceptible	An effect capable of measurement but without significant consequences
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging trends
Significant	An effect which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the environment
Very Significant	An effect which, by its character, magnitude, duration, or intensity significantly alters most of a sensitive aspect of the environment
Profound	An effect which obliterates sensitive characteristics

Table 7.12: Duration of Effects (EPA, 2022)

Duration of Effect	Description
Momentary Effects	Effects lasting from seconds to minutes
Brief Effects	Effects lasting less than a day
Temporary Effects	Effects lasting less than a year
Short-term Effects	Effects lasting one to seven years
Medium-term Effects	Effects lasting seven to fifteen years
Long-term Effects	Effects lasting fifteen to sixty years
Permanent Effects	Effects lasting over sixty years

Table 7.13: Types of Effects (EPA, 2022)

Type of Effect	Description
Effect/Impact	A change resulting from the implementation of a project.
Likely Effects	The effects that are specifically predicted to take place – based on an understanding of the interaction of the proposed project and the receiving environment.
Indirect Effects (a.k.a. secondary effects)	Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
Cumulative Effects	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
'Do Nothing' Effects	The environment as it would be in the future should the subject project not be carried out.
'Worst Case' Effects	The effects arising from a project in the case where mitigation measures substantially fail.
Indeterminable Effects	When the full consequences of a change in the environment cannot be described.
Irreversible Effects	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost.
Reversible Effects	Effects that can be undone, for example through remediation or restoration.
Residual Effects	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
Synergistic Effects	Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SOx and NOx to produce smog).

Table 7.14: Definition of Terms – Source, Pathway, Receptor (EPA, 2022)

Term	Description
Source	The activity or place from which an effect originates
Pathway	The route by which an effect is conveyed between a source and a receptor.
Receptor	Any element in the environment which is subject to effects.
Effect/Impact	A change resulting from the implementation of a project

7.2.8 Assessing Effect Type and Magnitude

Assessment of effects considers construction, operational and decommissioning effects with reference to the potential for direct, indirect, and cumulative effects. The assessment also takes account of any residual effects that may persist following the implementation of any mitigation or best practice design. The characterisation of effects reflects the ecological structure and function upon which the key ecological receptors depend. Detailed assessment of effects considers the magnitude of effects affecting populations.

This EIAR uses the EPA classification of effects in order to describe the quality, significance, duration, and type of effect. Effects on avifauna are to be assessed following published guidance by Percival (2003). Once key avian receptors have been selected and assigned an evaluation of importance or sensitivity, the significance of potential effects are rated as a product of both the magnitude of the predicted effect and the sensitivity if the key receptor affected. The magnitude of effect is based on probability of the likely effect occurring.

The criteria outlined in Table 7.15 below has been developed by Percival (2003) to determine the magnitude of potential effects on a species. Methodology for assessing sites outside of European Sites (i.e. SPAs) state 'the test of significance of an impact will be whether the wind farm impact is causing a significant change to the population its range or distribution' (Percival, 2003). It is important to consider availability of alternative habitat elsewhere during this assessment (Percival, 2003).

Table 7.15: Determination of Magnitude Effects (Percival, 2003)

Magnitude	Description
Very High	Total loss or very major alteration to key elements/ features of the baseline conditions such that the post development character/ composition/ attributes will be fundamentally changed and may be lost from the site altogether. *Guide: < 20% of population / habitat remains*
High	Major loss or major alteration to key elements/ features of the baseline (pre-development) conditions such that post development character/ composition/ attributes will be fundamentally changed. *Guide: 20-80% of population/ habitat lost*
Medium	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of baseline will be partially changed. *Guide: 5-20% of population/ habitat lost*
Low	Minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible but underlying character/composition/attributes of baseline condition will be similar to pre-development circumstances/patterns. *Guide: 1-5% of population/ habitat lost*
Negligible	Very slight change from baseline condition. Change barely distinguishable, approximating to the "no change" situation. *Guide: < 1% population/ habitat lost*

The significance of potential effects is assessed by cross tabulating the magnitude of effects and bird sensitivity to predict significance of each potential effect. Population status, distribution, and trends of potentially affected species such as migratory winter birds should be taken into consideration when undertaking the assessment. Significant ratings are

interpreted as follows, **very low** and **low** should not normally be of concern however normal design care should be undertaken to minimise effects, **medium** represents a potentially significant effect that requires careful individual assessment, while **very high** and **high** represents a highly significant effect on bird populations. A significance matrix table, combining magnitude and sensitivity to assess overall significance is presented below in Table 7.16.

Table 7.16: Significance matrix: combining magnitude and sensitivity to assess significance (Percival, 2003)

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

7.3 DESCRIPTION OF THE EXISTING ENVIRONMENT

The ecology of the existing environment is described within this section.

7.3.1 Site Description

The Site is situated within Gortloughra, c. 8 km northwest of Dunmanway, Co. Cork near the Co. Cork/Co. Kerry border. The study area includes parts of the townlands of an tSeithe Bheag (Shehy Beg), (Muscraí Gaeltacht), Gortloughra, Cloghboola and Inchinroe. The redline boundary of the Site extends to 118.7 ha, and according to Tailte Éireann mapping, the habitat within the Site is primarily composed of upland blanket bog, wet heath, dry heath, wet grassland, acid grassland, exposed sliceous rock and artificial surfaces can also be found in the study area and surrounding hinterland.

The townlands along which the two grid connection options transverse include:

- **Option A (Dunmanway):** an tSeithe Bheag (Shehy Beg), Gortloughra, Inchinroe, Cloghboola, Cornery, Garraí na Tórnóra (Garryantornora), Tuairín na Lobhar (Tooreenalour), Gort na Carraige (Gortnacarriga), Moneylea, Coolcaum, Coolmountain, Tullagh, Moneyreague, Togher, Cooranig, Keelaraheen, Neaskin, Ardcahan, Knockduff, Gurteennasowna and Ballyhalwick.

- **Option B (Carrigdangan):** an tSeithe Bheag (Shehy Beg), Gortloughra, Inchinroe, Cloghboola, Cornery, Garraí na Tórnóra (Garryantornora), Tuairín na Lobhar (Tooreenalour), Gort na Carraige (Gortnacarriga), Cooragreenane, Coolroe West, Gortnahoughtee, Derryleigh, Gortatanavally, Carrigdangan and Johnstown.

Temporary works will be required to accommodate the delivery of the turbine components. These temporary works are included as part of this application and are assessed as part of this EIAR and are located in the townlands of Lackanashinnagh, Shanacashel, Mallow, Glan, Curradrinagh, Seanlárach (Shanlaragh), Kilnadur, Inchincurka, Carrigdangan, Johnstown, Commons, Derrygortnacloghy, Gortneadin, Carrignacurra, Cappanclare, Curraheen, Coolroe West, Cooragreenane, Gortaknockane, Gortnacarriga, Tooreenalour, Garraí na Tórnóra (Garryantornora), Cornery, Cloghboola, and Inchinroe.

For further information, please refer to **Chapter 6: Biodiversity**.

7.3.2 Desktop Study

7.3.2.1 Sites of International Importance

Note only Special Protection Areas (relating to birds) are addressed in this chapter. Special Areas of Conservation (relating to habitats, plants, mammals, and all other non-avian taxa of note) are covered in the **Chapter 6: Biodiversity**. The same logic applies to sites of national importance.

Special Protection Areas (SPAs)

Special Protection Areas (SPAs) are designated under the EU Birds Directive (2009/147/EC) ('The Birds Directive'). There are two SPAs within 25km of the study area. See Table 7.17 for more information.

An Appropriate Assessment (AA) Screening Report and Natura Impact Statement (NIS) have been completed in order to ascertain if the proposed development either alone or in combination with other plans or projects, will adversely affect the integrity of a European Site (SACs and SPAs); and accompanies this planning application. Table 7.17 below details the European sites protected for bird species (SPAs) within 25km of the proposed wind farm.

Table 7.17: Summary of Special Protection Areas (SPAs) within 25 km of the project

Designated Site	Site code	Qualifying Interest	Distance to site (km)
The Gearagh SPA	004109	Wigeon (*Anas penelope*) [A050] Teal (*Anas crecca*) [A052] Mallard (*Anas platyrhynchos*) [A053] Coot (*Fulica atra*) [A125] Wetland and Waterbirds [A999]	17km to wind farm 10km GCR 8km TDR
Mullaghanish to Musheramore Mountains SPA	004162	Hen Harrier (*Circus cyaneus*) [A082]	19km to wind farm 12.2km GCR 12km TDR
Killarney National Park SPA	004038	Merlin (*Falco columbarius*) [A098] Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	25km wind farm 26.5km GCR 25km TDR
Clonakilty Bay SPA	004081	Shelduck (*Tadorna tadorna*) [A048] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156] Curlew (*Numenius arquata*) [A160] Wetland and Waterbirds [A999]	30km wind farm 18.5km GCR 20km TDR
Galley Head to Duneen Point SPA	004190	Chough (*Pyrrhocorax pyrrhocorax*) [A346]	32km wind farm. 22km GCR 27.5km TDR
Courtmacsherry Bay SPA	004219	Great Northern Diver (*Gavia immer*) [A003] Shelduck (*Tadorna tadorna*) [A048] Wigeon (*Anas penelope*) [A050] Red-breasted Merganser (*Mergus serrator*) [A069] Golden Plover (*Pluvialis apricaria*) [A140] Lapwing (*Vanellus vanellus*) [A142] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Common Gull (*Larus canus*) [A182] Wetland and Waterbirds [A999]	33.5km wind farm 23km GCR 19.5km TDR

7.3.2.2 Sites of National Importance

Sites of National Importance in Ireland are termed Natural Heritage Areas (NHA) and proposed Natural Heritage Areas (pNHA).

While the Wildlife (Amendment) Act 2000 has been passed into law, pNHAs will not have legal protection until the consultative process with landowners has been completed; this process is currently ongoing. For the purposes of this assessment however pNHAs have be treated as fully designated sites. There are one NHA and four pNHAs present within 10 km of the proposed wind farm.

The closest designated site to the wind farm is Lough Allua pNHA (site code 001065 – 5km northeast). The closest national site after Lough Allua pNHA is the Blackwater Conigar Bog NHA (site code 002386 – 6.5km northwest). See Table 7.18 for more information.

Table 7.18: Summary of National Sites within 10 km of the project

Designated Site	Site code	Features of Interest (Birds)	Distance to site (km)
Lough Allua pNHA	001065	The lakeshore of this pNHA supports Snipe, Sedge Warbler, Lapwing and Heron, while Great Crested Grebe, Little Grebe, Mallard and Moorhen also nest. The number of wintering waterfowl is small but up to 50 Mallard, Tufted Duck and Teal have been recorded.	5km northeast of the proposed wind farm. 1km north of the grid connection route. 200m north of the haul route.
Conigar Bog NHA	002386	This Site is designated as a NHA for peatlands. The Site Synopsis indicates this NHA supports Red Grouse.	6.5km northwest of the proposed wind farm. 7.5km northwest of the grid connection route. 8.5km northwest of the haul route.
Gouganebarra Lake pNHA	001057	This pNHA supports Grey Wagtail, Common Sandpiper and Snipe. The recent NHA survey indicates the lake is used by ducks and swans, while Peregrine Falcons breed on the cliffs.	7.5km north of the proposed wind farm. 8.5km northwest of the grid connection route. 9.5km northwest of the haul route.
Ballagh Bog pNHA	001886	This pNHA comprises a series of small, slightly raised valley bogs.	8km northwest of the proposed wind farm. 9.5km northwest of the grid connection route. 10.5km northwest of the haul route.

Designated Site	Site code	Features of Interest (Birds)	Distance to site (km)
Derryclogher (Knockboy) Bog pNHA	001873	No site synopsis available. However, this pNHA is overlapped y the Derryclogher (Knockboy Bog) SAC, which is designated for blanket bogs.	10.5km north of the proposed wind farm. 11.5km northwest of the grid connection route. 12.5km northwest of the haul route.

7.3.2.3 Other Designated Sites

Nature Reserves

There are no nature reserves within 10km of the Site.

National Parks

There are no National Parks within 10km of the Site.

Ramsar Sites

The closest Ramsar site is The Gearagh, 17km to the northeast of the wind farm site and 8km turbine delivery route, 10km northeast of the grid connection route and 8km northeast of the haul (TDR) route.

7.3.2.4 Avifauna

A desktop study was undertaken to locate any records of rare or protected avian species that have previously been recorded in the site and the surrounding area. Examination of NPWS and NBDC records indicates that there is a combined total of 169 records of avifauna within the two grid squares (W15, W16) that overlap the study area. This includes a total of 94 species, regardless of conservation status or date. Of these 94 species, 47 species are considered rare or protected.

A total of 17 records are considered to be historical records ranging from 1972 to 2001, namely Greylag Goose (*Anser anser*), Great Northern Diver (*Gavia immer*), Corn Crake (*Crex crex*), Common Coot (*Fulica atra*), Common Pochard (*Aythya ferina*), Eurasian Teal (*Anas crecca*), Tufted Duck (*Aythya fuligula*), Common Goldeneye (*Bucephala clangula*), Northern Lapwing (*Vanellus vanellus*), Common Sandpiper (*Actitis hypoleucos*), Common Swift (*Apus apus*), Great Crested Grebe (*Podiceps cristatus*), Lesser Black-backed Gull (*Larus fuscus*), Spotted Flycatcher (*Muscicapa striata*), Stock Pigeon (*Columba oenas*), Black-headed Gull (*Larus ridibundus*), and Yellowhammer (*Emberiza citrinella*).

Table 7.19 below details the 30 species recently recorded within the two grid squares that overlap the study area.

Of the 30 recently recorded species of conservation concern, eight are red-listed (Barn Owl, Common Kestrel, Common Snipe, Eurasian Curlew, Eurasian Woodcock, European Golden Plover, Red Grouse, White-tailed Eagle), 17 are amber-listed (Barn Swallow, Common Kingfisher, Common Linnet, Common Starling, Eurasian Wigeon, Great Cormorant, Hen Harrier, House Martin, House Sparrow, Mallard, Merlin, Mute Swan, Northern Wheatear, Chough, Sand Martin, Skylark, Whooper Swan), and the remaining five are green-listed (Common Grasshopper Warbler, Common Wood Pigeon, Little Grebe, Peregrine Falcon, Rock Pigeon). Kingfisher, Golden Plover, Hen Harrier, Merlin, Peregrine, Chough, White-tailed Eagle and Whooper Swan are also listed under Annex I of the EU Birds Directive.

Table 7.19: Rare and protected species of avifauna recorded historically within the 10km square (W15, W16) in which the subject site is located[1]

Species	Scientific Name	Year of last record	BoCCI status	Annex I status	Legal Status	Grid Square
Barn Owl	*Tyto alba*	29/09/2020	Red List	No	Wildlife Acts	W15, W16
Barn Swallow	*Hirundo rustica*	15/05/2020	Amber List	No	Wildlife Acts	W15, W16
Common Grasshopper Warbler	*Locustella naevia*	26/04/2020	Green List	No	Wildlife Acts	W15, W16
Common Kingfisher	*Alcedo atthis*	31/12/2011	Amber List	Yes	Wildlife Acts	W15, W16
Common Kestrel	*Falco tinnunculus*	20/12/2022	Red List	No	Wildlife Acts	W15, W16
Common Linnet	*Carduelis cannabina*	31/12/2011	Amber List	No	Wildlife Acts	W15, W16
Common Snipe	*Gallinago gallinago*	04/02/2023	Red List	No	Wildlife Acts	W15, W16
Common Starling	*Sturnus vulgaris*	31/12/2011	Amber List	No	Wildlife Acts	W15, W16
Common Wood Pigeon	*Columba palumbus*	31/12/2011	Green List	No	Wildlife Acts	W15, W16
Eurasian Curlew	*Numenius arquata*	18/09/2016	Red List	No	Wildlife Acts	W15, W16
Eurasian Wigeon	*Anas penelope*	31/12/2011	Amber List	No	Wildlife Acts	W15, W16
Eurasian Woodcock	*Scolopax rusticola*	31/12/2011	Red List	No	Wildlife Acts	W15, W16
European Golden Plover	*Pluvialis apricaria*	14/10/2018	Red List	Yes	Wildlife Acts	W16

[1] Colours correspond to BoCCI conservation status, and Annex I species are shown in bold.

Species	Scientific Name	Year of last record	BoCCI status	Annex I status	Legal Status	Grid Square
Great Cormorant	*Phalacrocorax carbo*	31/12/2011	Amber List	No	Wildlife Acts	W15, W16
Hen Harrier	*Circus cyaneus*	13/04/2020	Amber List	Yes	Wildlife Acts	W15, W16
House Martin	*Delichon urbicum*	31/12/2011	Amber List	No	Wildlife Acts	W15, W16
House Sparrow	*Passer domesticus*	31/12/2011	Amber List	No	Wildlife Acts	W15, W16
Little Grebe	*Tachybaptus ruficollis*	31/12/2011	Green List	No	Wildlife Acts	W15, W16
Mallard	*Anas platyrhynchos*	21/02/2020	Amber List	No	Wildlife Acts	W15, W16
Merlin	*Falco columbarius*	31/12/2011	Amber List	Yes	Wildlife Acts	W15, W16
Mute Swan	*Cygnus olor*	31/12/2011	Amber List	No	Wildlife Acts	W15, W16
Northern Wheatear	*Oenanthe oenanthe*	19/06/2020	Amber List	No	Wildlife Acts	W15, W16
Peregrine Falcon	*Falco peregrinus*	29/09/2020	Green List	Yes	Wildlife Acts	W15, W16
Red Grouse	*Lagopus lagopus*	26/05/2021	Red List	No	Wildlife Acts	W15, W16
Red-billed Chough	*Pyrrhocorax pyrrhocorax*	04/02/2023	Amber List	Yes	Wildlife Acts	W15, W16
Rock Pigeon	*Columba livia*	31/12/2011	Green List	No	Wildlife Acts	W15
Sand Martin	*Riparia riparia*	31/12/2011	Amber List	No	Wildlife Acts	W15, W16
Skylark	*Alauda arvensis*	08/04/2023	Amber List	No	Wildlife Acts	W15, W16
White-tailed Eagle	*Haliaeetus albicilla*	16/02/2019	Red List	Yes	Wildlife Acts	W16
Whooper Swan	*Cygnus cygnus*	31/12/2011	Amber List	Yes	Wildlife Acts	W16

7.3.3 Field Surveys

Species of conservation concern that are known to be potentially vulnerable to wind farm developments will be discussed in more detail in this section. Species have been selected for detailed discussion on the basis of conservation status, vulnerability to wind farm developments and if species sightings have been confirmed on or near the proposed wind farm site, which will indicate potential links between species recorded at the proposed site and the surrounding environment.

7.3.3.1 Target Species Observations (Flight Activity Surveys)

As per SNH guidance (2017) the Site, for the purposes of flight activity surveys (vantage point surveys) is defined not by the planning boundary for the Site but by a 500m radius circle (buffer) around the proposed wind turbine locations. The proposed turbine locations form the

centre point of each of these 500m radius buffers. This study area is called the '**flight activity survey area'** and is unique to this survey type. Any target species passing within this 500m buffer from proposed turbine locations (flight activity survey area) is considered within the main wind farm site under the SNH (2017) guidance.

Target species recorded are shown below in **Table 7.20**.

Table 7.20: Target species and species of conservation concern recorded during Gortloughra vantage point surveys between October 2019 and September 2024, inclusive.

Species	BoCCI	Annex I	Summer 2020	Summer 2021	Summer 2022	Summer 2023	Summer 2024	Winter 19/20	Winter 20/21	Winter 21/22	Winter 22/23	Winter 23/24
Buzzard	Green	No	✓	✓	✓	✓	✓	✓			✓	✓
Chough	**Amber**	**Yes**	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cormorant	Amber	No	✓	✓	✓					✓	✓	
Curlew	**Red**	**No**	✓									
Dunlin	**Red**	**Yes**	✓									
Golden Plover	**Red**	**Yes**		✓		✓		✓	✓	✓	✓	✓
Great Black-backed Gull	Amber	No			✓						✓	
Grey Heron	Green	No	✓	✓	✓	✓	✓	✓		✓	✓	✓
Hen Harrier	**Amber**	**Yes**	✓		✓	✓		✓	✓	✓		✓
Kestrel	**Red**	**No**	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lesser Black-backed Gull	**Amber**	**No**	✓	✓	✓	✓	✓	✓				
Little Egret	Green	Yes										✓
Litle Grebe	Green	No								✓		
Mallard	Amber	No	✓	✓	✓	✓	✓	✓	✓	✓		✓
Merlin	Amber	Yes						✓				✓
Peregrine	**Green**	**Yes**	✓	✓	✓	✓	✓		✓		✓	✓
Red Grouse	**Red**	**No**	✓		✓			✓	✓	✓	✓	✓

Species	BoCCI	Annex I	Summer 2020	Summer 2021	Summer 2022	Summer 2023	Summer 2024	Winter 19/20	Winter 20/21	Winter 21/22	Winter 22/23	Winter 23/24
Snipe	**Red**	**No**	✓	✓	✓			✓	✓	✓		✓
Sparrowhawk	Green	No	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Stock Dove	**Red**	**No**			✓							
Swift	**Red**	**No**				✓						
Teal	Amber	No	✓	✓	✓	✓	✓			✓		
Whooper Swan	**Amber**	**Yes**							✓	✓		✓

7.3.3.2 Winter and Breeding Walkover Surveys

Transect surveys for all species were recorded during monthly surveys of the Site over five summers and five winters. This survey captured the Baseline of avian species using the Site as well as their abundance and includes seasonal visitors of the winter (i.e. Golden Plover) and summer months.

Over the entire five-year survey period, a total of 22 bird species were recorded during winter walkovers. Of the 22 species, two are Annex I listed (Chough, Hen Harrier), five are red-listed (Kestrel, Meadow Pipit, Red Grouse, Snipe, Whinchat) and two are amber-listed (Hen Harrier, Skylark). The remaining 16 species are green-listed.

A total of 25 bird species were recorded during breeding walkovers across all five seasons. Of the 25 species, two are Annex I listed (Peregrine, Chough), four are red-listed (Grey Wagtail, Kestrel, Meadow Pipit, Red Grouse) and seven are amber-listed (Chough, Goldcrest, House Martin, Skylark, Swallow, Wheatear, Willow Warbler). The remaining 14 species are green-listed.

The species recorded during winter walkovers are provided in Table 7.21, and the species recorded during breeding walkover surveys are provided in Table 7.22.

Table 7.21: Species and species of conservation concern recorded on Gortloughra transect surveys (wintering) between Winter 2019/20, Winter 20/21, Winter 21/22, Winter 22/23, and Winter 23/24.

Species	Scientific Name	BoCCI	Annex I	Winter 19/20		Winter 20/21		Winter 21/22		Winter 22/23		Winter 23/24	
				Total	Mean	Total	Mean	Total	Mean	Total	Mean	Total	Mean
Chaffinch	*Fringilla coelebs*	Green	No	2	2			1	1	13	13	14	14
Goldfinch	*Carduelis carduelis*	Green	No	`1	1								

Species	Scientific Name	BoCCI	Annex I	Winter 19/20		Winter 20/21		Winter 21/22		Winter 22/23		Winter 23/24	
				Total	Mean	Total	Mean	Total	Mean	Total	Mean	Total	Mean
Great Tit	*Parus major*	Green	No	0	0	1	1						
Hen Harrier	***Circus cyaneus***	**Amber**	**Yes**	**1**	**1**								
Hooded Crow	*Corvus cornix*	Green	No	30	7.5	6	2	4	1.3	2	1	5	1.67
Kestrel	*Falco tinnunculus*	Red	No	1	1							1	1
Magpie	*Pica pica*	Green	No	1	1	1	1						
Meadow Pipit	*Anthus pratensis*	Red	No	43	4.8	16	2.3	12	3	18	3.6	4	1.33
Mistle Thrush	*Turdus viscivorus*	Green	No					3	3				
Peregrine	***Falco peregrinus***	**Green**	**Yes**			**1**	**1**						
Pheasant	*Phasianus colchicus*	Green	No	3	3								
Raven	*Corvus corax*	Green	No	5	1.3	9	1.8	11	3.7	3	1	2	1
Red Grouse	*Lagopus lagopus*	Red	No							6	2		
Reed Bunting	*Emberiza schoeniclus*	Green	No							2	2	7	7
Robin	*Erithacus rubecula*	Green	No	1	1	1	1	1	1				
Rook	*Corvus frugilegus*	Green	No	2	2								
Siskin	*Carduelis spinus*	Green	No			1	1						
Snipe	*Gallinago gallinago*	Red	No			2	1						
Skylark	*Alauda arvensis*	Amber	No	14	7			3	1.5	4	2	15	5
Stonechat	*Saxicola torquatus*	Green	No	1	1	1	1	2	2	2	1	1	1
Whinchat	*Saxicola rubetra*	Red	No									1	1
Wren	*Troglodytes troglodytes*	Green	No	5	1.7	2	1	3	1	1	1	2	1

Table 7.22: Species and species of conservation concern recorded on Gortloughra transect surveys (breeding) between Summer 2020, Summer 2021, Summer 2022, Summer 2023 and Summer 2024.

Species	Scientific Name	BoCCI	Annex I	Summer 2020		Summer 2021		Summer 2022		Summer 2023		Summer 2024	
				Total	Mean	Total	Mean	Total	Mean	Total	Mean	Total	Mean
Buzzard	*Buteo buteo*	Green	No	2	1							1	1
Bullfinch	*Pyrrhula pyrrhula*	Green	No					1	1				
Chaffinch	*Fringilla coelebs*	Green	No					2	1	1	1		
Chough	***Pyrrhocorax pyrrhocorax***	**Amber**	**Yes**					**3**	**3**				
Goldcrest	*Regulus regulus*	Amber	No					1	1				
Grey Wagtail	*Motacilla cinerea*	Red	No	3	1	1	1						
Hooded Crow	*Corvus cornix*	Green	No	5	2.5	2	2	3	1	5	1.25	1	1
House Martin	*Delichon urbicum*	Amber	No			1	1						
Kestrel	*Falco tinnunculus*	Red	No					3	1				
Lesser Redpoll	*Acanthis flammea*	Green	No					9	9				
Magpie	*Pica pica*	Green	No					3	1				
Meadow Pipit	*Anthus pratensis*	Red	No	48	3.7	23	7.6	62	5.6	38	5.4	32	4

Species	Scientific Name	BoCCI	Annex I	Summer 2020		Summer 2021		Summer 2022		Summer 2023		Summer 2024	
				Total	Mean	Total	Mean	Total	Mean	Total	Mean	Total	Mean
Mistle Thrush	*Turdus viscivorus*	Green	No	3	1	2	1	1	1				
Pheasant	*Phasianus colchicus*	Green	No	2	2			2	1				
Peregrine	***Falco peregrinus***	**Green**	**Yes**			**1**	**1**						
Pied Wagtail	*Motacilla alba*	Green	No	1	1			2	1				
Raven	*Corvus corax*	Green	No					5	2.5	1	1	1	1
Red Grouse	*Lagopus lagopus scotica*	Red	No	1	1								
Robin	*Erithacus rubecula*	Green	No					1	1				
Skylark	*Alauda arvensis*	Amber	No	17	1.7	3	1.5	33	3.3	17	1.6	20	2
Swallow	*Hirundo rustica*	Amber	No	3	3	3	3	26	6.5				
Wheatear	*Oenanthe oenanthe*	Amber	No	9	1.8	1	1	14	2.3	6	2	3	1.5
Willow Warbler	*Phylloscopus trochilus*	Amber	No					1	1	1	1		
Woodpigeon	*Columba palumbus*	Green	No			1	1						
Wren	*Troglodytes troglodytes*	Green	No	6	1.5	1	1	9	2.3			2	1

7.3.3.3 Breeding Wader Surveys

Transect surveys to assess the presence of breeding wader populations were completed during the summers of 2020, 2021, 2022, 2023, and 2024. A number of methods were combined from published literature including Bibby et al, (2000), Gilbert et al, (1998), Brown & Shepherd (1993) and SNH (2017) to estimate numbers of target species breeding within the study area. A total of two transects were used to sample habitat deemed suitable for breeding waders on site.

During the 2020 breeding wader surveys, no breeding waders were recorded. However, evidence of breeding passerine species Meadow Pipit, Skylark and Wheatear were detected during the breeding bird transect surveys, as detailed in section 7.3.3.2 above.

During the 2021 breeding wader bird surveys, no breeding waders were seen. However, in April 2021, three Snipe were heard calling. In May, June and July 2021, no signs of any breeding waders were found.

During the 2022, 2023 and 2024 surveys, no breeding waders were observed.

7.3.3.4 Target species recorded during VP, transects and other species-specific surveys

The following target species were recorded during vantage point (VP) surveys, transects and other species-specific survey. The records of these species during hinterland surveys have also been included to provide context in relation to connectivity to important habitats in the surrounding area outside of the Site. The study area for VP surveys is called the 'flight activity survey area' and is unique to this survey type. Any target species passing within this 500m buffer from proposed turbine locations (flight activity survey area) is considered within the proposed wind farm Site under the SNH (2017) guidance. Many of the observations of target species were outside of the flight activity survey area. However, the details of these observations were noted during the survey. The 'rotor sweep zone' is the height at which the proposed turbine blades would be rotating. It extends for the minimum tip of the blade from the ground to the maximum tip height of the blade in rotation. With a proposed hub height of 100m and a blade radius of 75m, the lower tip height is 25m and the upper tip height is 175m. Theoretically birds flying within this height range (25-175m) would be at risk of collision without the consideration of avoidance. However, the height bands used for the VP survey corresponding to this range are (20m – 185m) a more conservative range.

7.3.3.4.1 Buzzard

Buzzards were observed during surveys throughout the five-year survey period. Most records occurred within the 500m buffer zone, where Buzzards were recorded hunting and commuting at rotor-swept height. Buzzards were also recorded commuting and hunting in the wider environment. However, no breeding behaviour was detected over the course of the five-year survey period.

Vantage Point Surveys: Summer Season (2020, 2021, 2022 (summer), 2022 (spring migration), 2023, and 2024)

Buzzards were recorded on 37 occasions across all five breeding seasons. Over half of these records (27) were of birds flying wholly within or partially within the 500m buffer zone, many of which occurred within the rotor-swept height band. Some records also observed Buzzards hunting within the Site. However, no breeding behaviour was observed.

During the 2020 breeding season, a total of 13 records of Buzzard were made across VPs 1, 2 and 3. Nine flightlines occurred within the 500m buffer zone (also known as the flight activity survey area), and the remaining four occurred wholly outside of the buffer zone. 12 of the 13 observations recorded Buzzard flying within rotor-swept height band (20-185m), of which nine occurred within the 500m buffer zone. One record indicated Buzzard flew high (>185m) above heath habitats within the buffer zone in May 2020. Buzzard were predominantly recorded flying across the Site, however, two sightings of hunting behaviour occurred within the Site in August 2020. All records of Buzzards occurring within the Site during this survey season were concentrated around Turbines 1 and 5.

Buzzard were recorded on four occasions during the 2021 breeding season across VPs 2 and 3. Three of which occurred within the 500m buffer zone, whereby one Buzzard was observed flying near Turbine 5 at c. 20-30m height in June 2021; two Buzzards were observed flying near Turbines 1 and 2 at 30-100m height in June 2021; and one Buzzard was sighted flying both inside and outside the 500m buffer zone near Turbine 2 at 50-100m height in June 2021. The remaining observation occurred outside of and to the north-west of the 500m buffer zone in April 2021.

During the 2022 breeding season, Buzzards were observed on five occasions across VPs 2 and 3 in June, July and August 2022. All of which occurred within the 500m buffer zone at rotor-swept height, and predominantly recorded Buzzard hunting alone and flying in the north-west of the study area.

During the 2022 spring migration surveys, Buzzards were noted twice. Both of which occurred from VP 1 in April 2022, whereby one record noted one individual was observed being mobbed by a raven, and the other record denoted two Buzzards hunting.

During the 2023 breeding season, seven observations of Buzzard were made across VPs 2 and 3 in May, June and July 2023. Six of the seven observations indicated Buzzards were either flying over or hunting within the 500m buffer zone.

During the 2024 breeding season, six records of Buzzards were made of lone individuals. Three of which occurred within the 500m buffer zone. One Buzzard was observed flying between 30 and 100m height c. 250m from Turbine 1 in April 2024. Another Buzzard was noted in June 2024 flying over the western edge of the buffer zone c. 450m from Turbine 2, and the final record comprised one Buzzard flying over the eastern edge of the 500m buffer c. 300m from Turbine 7 in July 2024.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

In comparison to surveys during the breeding season, very few records of Buzzards were made across the five winter flight activity survey seasons. No observations of Buzzard were made during the 2020/21 and 2021/22 winter seasons, and only six records were made across the remaining three winter survey seasons. However, three of the six records observed Buzzard within the 500m buffer zone, flying within the rotor-swept height (20-185m). Hunting behaviour was not observed during the non-breeding season.

During the 2019/20 winter season, one record of Buzzard was made. This observation occurred within the 500m buffer zone, and comprised one individual flying within the rotor-swept height (20-185m) from VP1 in March 2020.

During the 2022/23 winter season, Buzzards were recorded on two occasions. Both records observed Buzzards flying over the north of the study area alone at 50-100m height from VP 3 on February 2nd 2023, and VP 2 in March 2023.

During the 2023/24 winter season, Buzzards were observed three times. One of which recorded Buzzard flying at rotor-swept height, within the 500m buffer zone.

Summer Walkover Surveys (2020, 2021, 2022, 2023, and 2024)

Across all five seasons, Buzzards were only observed on two occasions. During the 2020 breeding season, one Buzzard was recorded flying in May. During the 2024 breeding season, one Buzzard was recorded.

Buzzards were not recorded during the 2021, 2022 or 2023 breeding seasons.

Winter Walkover Surveys (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

During the winter walkover surveys, no Buzzards were observed.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

Buzzards were not recorded during the first year of hinterland surveys. However, surveys that occurred in Years 2, 3, 4 and 5 detected Buzzards in the surrounding hinterland. Records were predominantly from HVP 1: An Gearagh, which is located c. 19.85km to the north-east of the Proposed Development

Buzzards were observed of on one occasion during both the winter the 2020/21 and 2021/22 non-breeding seasons, whereby one bird was recorded at HVP 1: An Gearagh. During the 2021 breeding season there was one observation each at HVP 9: Gortaloughra Valley (0.99km northwest) and HVP 12: Lough Allua (6.19km NE). During the same season there were two records at HVP 18: Shanacrane (0.82km SE). During the 2022 breeding season, two observations of single birds were recorded at HVP 1: An Gearagh in June and July 2022.

During the 2022/23 non-breeding season, Buzzards were recorded two times at HVP 1: An Gearagh in numbers of 1-2 birds and once at Bandon River (Keenrath Bridge) in March. During the 2023 breeding season, four records were made of single birds. Two of which occurred at HVP 1 in April and May 2023, and two further records occurred at HVP 18: Shanacrane in July 2023, which is situated c.0.82km to the south-east of the Proposed Development.

During the Year 5 hinterland surveys, lone individuals were recorded five times from HVPs 1, 9 (0.99km north-west of the Site), 18, and twice at 19 (3.19km north-east of the Site).

7.3.3.4.2 Chough

Chough were recorded during surveys throughout the five-year survey period. The majority of records occurred outside of the 500m buffer zone, to the north-west of the Site. Records were also recorded to the south-east outside of the Proposed Development, where successful breeding has been observed. Within the Site, no breeding, nesting or behaviours were

detected. Of the few records that occurred within the 500m buffer zone, Chough were predominantly flying over / commuting through the Site.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

Across all five breeding season surveys, 23 records of Chough were observed. Of which, four records occurred within the 500m buffer zone surrounding the turbines. The remaining 19 records predominantly occurred to the north-west of the study area, outside of the red-line boundary of the Site. These observations indicate that Chough primarily use the habitats outside of the 500m buffer zone, to the north-west of the Site, and predominantly commute or fly over grassland outside of this 500m buffer zone.

Five records occurred in summer 2020, the only observation in flight was of four individuals flying low (<25m in height) outside of the 500m buffer zone.

During the 2021 summer season, two records of Chough were made; both of which were outside of the 500m buffer zone. Two individuals were recorded over VP1 in August 2021 outside of the study area, and a flock of 16 Chough were recorded in an agricultural field to the north-west of the Site in July 2021. No flight activity within 500m of the turbines were reported during this season.

Seven records of Chough were noted during the 2022 breeding season, 5 of which were visual and one of which was auditory only. One record occurred within the 500m buffer zone, which comprised a flock of 9 birds flying along the north-western edge of the 500m buffer on 12th July 2022. The remaining five records occurred outside of the 500m buffer zone to the north-west of the Site, and were all observed from VP 2 in May 2022, July 2022 and September 2022. These records involved Chough observed alone and in flocks of up to 59 individuals, and comprised both adults and juveniles feeding.

During the 2023 survey season, Chough were observed on six occasions, one of which was a call record only. Two of these records occurred within the 500m buffer zone. In June 2023, a flock of five birds were observed flying over the 500m buffer zone, and in July 2023, a flock of four birds were observed flying over the 500m buffer zone. The remining four records occurred outside of the 500m zone, to the north-west of the Site.

During the 2024 breeding season, three records of Chough were made. Of which, only one record occurred within the 500m buffer zone whereby two individuals were observed perched in the grass c. 120m from Turbine T3.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Chough were recorded a total of 28 times across all five wintering seasons. Of which, eight observations occurred within the 500m buffer zone. The remaining 20 records occurred outside of the Site, predominantly to the north-west of the buffer zone. These observations indicate that Chough primarily use the habitats outside of the 500m buffer zone, to the north-west of the Site, and predominantly commute or fly over grassland outside of this 500m buffer zone.

During the 2019/20 winter season, seven records of Chough were made. Of which, only one occurred within the 500m buffer zone, whereby two individuals were sighted at VP 1 in February 2020 flying low (0-10m). All other records occurred outside of the buffer zone. In December 2019, the same two individuals were recorded on three occasions at VP 2 and were reported flying low (0-10m) outside of the buffer zone. In November 2019 and January 2020, surveyors heard Chough calls from VP 2 however the calls were reported outside of the 500m buffer zone.

Six records of Chough were reported during the 2020/21 winter season, four of which were call only. The two visual records occurred on 8th March 2021, and were outside of the buffer zone.

During the 2021/22 winter season, Chough was recorded once. This record occurred within the 500m buffer zone, and comprised one individual flying low (0-10m) from the centre / north of the study area in a north-easterly direction from VP 1.

During the 2022/23 survey season, Chough were recorded on six occasions. Two of which occurred within the 500m buffer zone. On 28th November 2022, two birds were identified on the track leading to VP 2, and on 28th January 2023, three birds were observed flying from heath habitats in the northern section of the Site. The remaining four records occurred outside of the 500m buffer zone, and comprised sightings from VP1 on November 28th 2022 and January 28th 2023, and from VP 2 on January 31st 2023, February 21st 2023, March 6th 2023, and March 18th 2023. All records comprised Chough alone or in small groups of two to three birds flying over, predominantly outside of and to the north-west of the Site.

During the 2023/24 winter season, eight records of Chough were made. Of which, four occurred within the 500m buffer zone.

Summer Walkover Surveys (2020, 2021, 2022, 2023, and 2024)

Across all five breeding seasons, Chough were observed on one occasion which occurred during the 2022 breeding season. In this case, three individuals were recorded flying within the

25-100m distance band. Chough were not observed during any other breeding season walkover surveys.

Winter Walkover Surveys (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

No Chough were not observed during any of the winter walkover surveys.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

Chough were not recorded during the winter surveys for years 3, 4 or 5. However, a total of fifteen observations of this species across HVPs 5, 9, 16, 18 and 28, which are located c. 2.32km to the south-west, c. 0.99km north-west, c. 8km west, c. 0.82km south-east and 3.79km south-east of the Site, respectively.

Chough were recorded three times during the Year 1 hinterland surveys, two of which occurred in HVP 18: Shanacrane in December 2019 and June 2020, and one occurred in HVP 9: Gortloughra Valley in December 2019. Hinterland records indicate Chough nest near HVP 18, in Shanacrane.

During the Year 2 hinterland surveys, Chough were recorded six times. Two of which occurred at HVP 5: Cousane Gap. At this site, Chough were recorded roosting in the roof of a derelict house in December 2020. Two further records occurred at HVP 9: Gortloughra Valley. At this site, a Chough was observed with nesting material, which dictates breeding in the area. The remaining observations occurred at HVP 16: Mealagh Valley West during the 2021 breeding season.

Chough were recorded on two occasions during summer 2022 hinterland surveys. Five individuals, including two adults and three young were observed at HVP 5 (2.32km SW) on June 12th 2022, and two individuals were observed at HVP 28 (3.79km SE) on May 7th 2022. Three records of this species were made during summer 2023, all of which were noted on May 15th 2023 at HVP 5 (2.32km SW) and 16 (7.98km S). Each record found two birds in close proximity to a ruin and were considered to be breeding at both sites.

During the Year 5 surveys, Chough were recorded once, where six individuals were recorded in June 2024 at HVP 5.

7.3.3.4.3 Cormorant

Cormorant were recorded seven times across breeding and non-breeding season flight activity (VP) surveys. Over the course of the five-year survey period, only one record occurred within

the 500m buffer zone, where two individuals were recorded flying through the Site. No breeding or foraging behaviour was detected within the Site. All other records recorded Cormorant on or near Lough Nambrackderg, c. 1.08km to the north of the Proposed Development. Cormorant were also recorded throughout the existing wider environment. However, no breeding was observed.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

Few records of Cormorant were made across all five breeding flight activity surveys, whereby a total of three observations were recorded of a single bird either on or landing on Lough Nambrackderg, which is located c. 1.08km to the north of the Site. No observations were made during the 2023 or 2024 seasons.

During the 2020 summer season, one Cormorant was observed on Lough Nambrackderg from VP3 on May 9th 2020. No flight activity was observed.

During the 2021 summer season, one Cormorant was recorded on Lough Nambrackderg from VP3 on July 26th 2021. No flight activity was observed.

During the 2022 summer season, Cormorant were observed once, whereby one bird was recorded landing on Lough Nambrackderg on July 2nd 2022 from VP 3.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Cormorants were only recorded on four occasions across all five winter flight activity survey seasons, and no observations were made during the 2019/20, 2020/21 and 2023/24 seasons. All records indicate Cormorant were on or flying towards / from Lough Nambrackderg.

During the 2019/20, 2020/21, and 2023/24 winter seasons, no observations of Cormorant were made.

During the 2021/22 winter season, one Cormorant was observed from VP 3 on January 14th 2022, whereby one individual flew at 20-30m height in a northerly direction outside of the 500m buffer zone.

During the 2022/23 winter season, Cormorant were recorded on three occasions. Only one record occurred within the 500m buffer zone, where, on March 6th 2023, two individuals were sighted flying from the centre / west of the study area in a northerly direction. The remaining

two records occurred outside of the 500m buffer zone, near Lough Nambrackderg, which is located c. 1.08km to the north of the Site

Summer and Winter Walkover Surveys (2020, 2021, 2022, 2023, and 2024; 2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Cormorant were not observed during any breeding or any winter season walkover surveys.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

Cormorant were recorded during every year of Hinterland surveys. They were sighted 134 times across the five years of surveys. Records primarily comprised of individuals, however flocks of up to 35 birds were also noted. Records occurred at HVPs 1, 2, 4, 6, 7, 10, 11, 12, 14, 20 and 29. HVP 14: Lough Nambrackderg was the closest to the site located 1.08km to the north.

7.3.3.4.4 Curlew

Curlew were recorded once throughout the five years of flight activity (VP) surveys, which occurred outside of the 500m buffer zone. There were no records of Curlew within the Proposed Development. However, Hinterland surveys indicate Curlew are present in the wider environment, predominantly 19.85km away near An Gearagh, but also at Lough Nambrackderg, c. 1.08km from the Site. No breeding behaviour was observed.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

Curlew were only observed once across all five breeding flight activity survey seasons.

This record occurred during the 2020 summer season on July 12th 2020 from VP 3 where one individual was flying outside of the 500m buffer zone.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Curlew were not observed during any of the five winter flight activity survey seasons.

Summer and Winter Walkover Surveys (2020, 2021, 2022, 2023, and 2024; 2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Curlew were not observed during any breeding or any winter season walkover surveys.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

Curlew were observed during each year of hinterland surveys. During these surveys, Curlew were recorded on 35 occasions.

Curlew was noted on six occasions during the year 1 Hinterland surveys. Four of which occurred during the 2019/20 non-breeding season at HVP 1: An Gearagh, c. 19.85km from the Site. In December 2019, a flock of 51 Curlew were seen, and in January 2020 a flock of 37 Curlew were observed. During the summer season 2020 two observations of Curlew were made HVP 14: Lough Nambrackderg, c. 1.08km from the Site, both observations were from July 2020 of individual birds flying over the Lough.

During year 2 Curlew were observed on six occasions all at HVP 1: An Gearagh. Five occurred during the winter season and one in September 2021 with numbers ranging from 3 to 116 individuals.

During year 3 Curlew were observed on four occasions all at HVP 1: An Gearagh. Three occurred during the winter season and one in September 2021, with numbers ranging from 2 to 33 individuals. In year 4 the species was recorded eight times at an Gearagh, six in the winter and two in the summer. Curlew were also recorded twice on the same day at HVP 17: Toon Valley 14.48km north east of the development site.

During the Year 5 surveys, Curlew were recorded eight times. All of which occurred from HVP 1. Five of the eight records occurred during the 2023/24 winter season, and the remaining three records occurred during the 2024 summer season. The average flock size recorded comprised 37 individuals, however flocks of up to 168 birds were recorded. The flock sizes were smaller during the summer survey season.

7.3.3.4.5 Dunlin

Dunlin were recorded once during the flight activity (VP) surveys, where three birds were recorded within the 500m buffer zone in September 2020. This record indicates the individuals flew over the Site, and there is no evidence of foraging or breeding within the Proposed Development. Dunlin were not observed within the flight activity survey area on any other occasion. Hinterland surveys indicate this species are not present in the immediate wider environment, however there were records c. 19.85km from the Site at HVP 1: An Gearagh. Three records occurred at

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

During the 2020 summer season, Dunlin was noted once on September 11th 2020 from VP 1 where three birds were recorded flying at rotor-swept height (25-175m) within the 500m buffer zone. This species was not observed during any other summer flight activity survey across the entire five-year survey period.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

This species was not recorded during any of the winter flight activity surveys that were conducted during the five-year survey period.

Summer and Winter Walkover Surveys (2020, 2021, 2022, 2023, and 2024; 2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Dunlin were not observed during any breeding or any winter season walkover surveys.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

This species was recorded every winter over the 5-year period of Hinterland surveys (winter 2019/20 to winter 2023/24), and during 2 summers (Summer 2021 and 2022). Of the 24 total records only two occurred during the summer season both of which occurred in September 2021 and 2022 at HVP 1: An Gearagh. Twenty-two records occurred at HVP 1: An Gearagh with flocks of up to 305 birds present.

Two records occurred at HVP 17: Toon Valley 14.48km north east of the development site in January 2023 and February 2024 with flocks of 50 and 68 individuals recorded respectively.

7.3.3.4.6 Golden Plover

Golden Plover were predominantly observed during the non-breeding flight activity surveys, where flocks of up to 130 individuals were recorded. All records were of Golden Plover commuting, with no evidence of foraging, roosting or breeding made. Larger flocks of up to 1,054 individuals were recorded during Hinterland surveys, all of which occurred c. 19.85km from the Site at An Gearagh.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

Golden Plover were not recorded during the 2020, 2022 or 2024 breeding season flight activity surveys. However, this species was observed during the 2021 and 2023 breeding season surveys. Three observations were made across the five-year survey period, all of which were within the 500m buffer zone.

During the 2021 breeding season, Golden Plover were recorded on two occasions. Both records occurred in April 2021, at rotor-swept height within the 500m buffer zone. One flock of 43 birds was recorded within the buffer, and another flock of 14 birds was recorded within the 500m buffer.

During the 2023 breeding season, one record of a flock of 30 birds was recorded at rotor-swept height for 20 seconds in the north-east section of the 500m buffer zone in April 2023.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Golden Plover were not recorded during the 2020/21 winter season. However, 38 records were made across the 2019/20, 2021/22, 2022/23 and 2023/24 winter seasons. A total of 22 occurred within or partially intersected the 500m buffer zone over the entire 5 year period, an average of 4.4 flights per season.

During the 2019/20 non-breeding season, Golden Plover were observed 18 times. Eight observations were recorded within the 500m buffer zone surrounding the turbine locations. During this season, Golden Plover were primarily sighted in groups of three to five, and flocks of 15-50. However, one large flock of 130 birds flying within the rotor-swept height band (25-175m) was recorded within the 500m buffer zone, in February 2020. Six flight lines occurred below 25m, and one flock of 15 birds was recorded at a height of >175m. The remaining birds recorded within the 500m buffer zone flew within the rotor-swept height band.

During the 2020/21 non-breeding season, Golden Plover were recorded five times. Three of which were recorded within the 500m buffer zone. One flock of 16 birds was observed flying near Turbine 4 in March 2021, and a pair were recorded flying south of T4 in January 2021. The three remaining records were call-only, however the surveyor indicated that one of these call-only records occurred near Turbine 4.

During the 2021/22 non-breeding season, this species was recorded in flocks of 21-26 birds on four occasions. Three of which intersected within the 500m buffer zone.

During the 2022/23 non-breeding season, Golden Plover were recorded three times. Two of which occurred within the 500m buffer zone, whereby flocks of 24-37 birds were observed flying.

During the 2023/2024 winter season, eight records of Golden Plover were made. Seven were recorded from VP3 and six of which occurred within the 500m buffer zone. Flocks of between 7 and 120 individuals were recorded during this season, with an average of 40 birds per flock.

Summer and Winter Walkover Surveys (2020, 2021, 2022, 2023, and 2024; 2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Golden Plover were not observed during any breeding or any winter season walkover surveys.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

This species was recorded 14 times during Years 2, 3, 4, and 5 of Hinterland surveys (winter 2020/21 to winter 2023/2024). The most recent surveys indicate a large number of individuals occur at HVP 1, c. 19.85km from the Site, as flocks of up to 1,054 individuals were detected.

During the Year 2 surveys, this species was recorded five times. All five records originated from HVP 1: An Gearagh during the 2020/21 non-breeding season, and comprised flocks of eight to 132 birds.

During the Year 3 and 4 surveys, Golden Plover were recorded on nine occasions, all of which occurred at HVP 1. Records from the 2021/22 non-breeding season recorded individuals and flocks of up to 167 birds. During the 2022/23 non-breeding season, large flocks were primarily sighted with flocks between 550 and 1,054 birds being recorded at HVP 1. In April 2023, one record of 94 birds was recorded.

During the Year 5 surveys, this species was recorded once in November 2023, with 450 individuals were recorded at HVP 1.

7.3.3.4.7 Great Black-backed Gull

Great Black-backed Gull were recorded five times during flight activity surveys, two of which occurred within the 500m buffer zone. All records indicate this species was flying over / commuting through the Site, and no evidence was recorded of foraging, roosting or breeding. This species was not recorded during any other survey.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

Great Black-backed Gull were recorded during the 2022 breeding season. During this season, one record of this species was made whereby one adult was observed flying 10-20m in height to the north of the Site, at Lough Nambrackderg, outside of the 500m buffer zone.

Additionally, during the 2022 spring migration flight activity surveys, this species was observed twice. Both of which occurred from VP 3 in April 2022. One record occurred outside of the 500m

buffer zone on Lough Nambrackderg, whilst the other observed two individuals flying at rotor-swept height within the 500m buffer zone.

This species was not recorded during any other survey across the five-year survey period. As such, there are only three records of this species – two of which occurred at Lough Nambrackderg, c. 1.08km to the north of the Site, outside of the 500m buffer zone, and one of which occurred within the 500m buffer zone.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)
This species was only recorded during the 2023/24 winter season, where two records of Great Black-backed Gull were made. One of which occurred at rotor-swept height, within the 500m buffer zone

Summer and Winter Walkover (2020, 2021, 2022, 2023, and 2024; 2019/20, 2020/21, 2021/22, 2022/23, 2023/24)
Great Black-backed Gull were not observed during any breeding or any winter season walkover surveys.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)
The species were recorded during each of the last four years of Hinterland surveys. They were sighted 20 times across the five years of surveys. Records primarily comprised of individuals, however flocks of up to 4 birds were also detected. Records occurred at HVPs 1 and 12 (Lough allua 6.19 km north east). Sixteen recorded occurred at HVP 1 while four occurred at HVP 12.

7.3.3.4.8 Greenland White-fronted Goose

There was no records of this species at the proposed development site over the five years of surveys. This species was only recorded during the 2021/22 and winter 2020/21 non-breeding season hinterland surveys. All of which occurred at HVP 17, which is located c. 14.48km to the north-east of the Site. Each of the eleven records comprised single birds, four of which were juveniles.

7.3.3.4.9 Grey Heron

Grey Heron were observed 13 times across the five-year survey period. A total of 11 of these records occurred outside of the 500m buffer zone, near Lough Nambrackderg, which is situated c. 1.08km from the Site. Hinterland surveys dictate that Grey Heron are present in the wider environment.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

Grey Heron were observed eight times across the five-year survey period. However, only two of these records intersected the 500m buffer zone. The remaining records occurred outside the buffer and predominantly associated with Lough Nambrackderg, c. 1.08km from the Site.

During the 2020 breeding season, no flight activity was observed. However, one individual was recorded on the shore of Lough Nambrackderg in July and August 2020.

During the 2021 breeding season, this species was recorded once, where one individual was recorded on the shore of Lough Nambrackderg.

During the 2022 breeding season, three records of Grey Heron were made. All bar one of which occurred outside of and to the north of the 500m buffer. One record on the 28th of June 2022 was of a single bird flight which intersected the 500m buffer.

During the 2023 breeding season, a single observation of a Grey Heron was made, consisting of a lone individual recorded intersecting of the 500m buffer zone.

During the 2024 breeding season, one Grey Heron was recorded. This occurred outside of the 500m buffer zone.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

This species was recorded five times across the five-year survey period and was primarily associated with the Lough Nambrackderg, c. 1.08km from the Site

During the 2019/20 non-breeding season, Grey Heron was observed on one occasion, where one individual was recorded on the shore of Lough Nambrackderg in December 2019.

During the 2021/22 non-breeding season, one record of this species was made of one individual sighted flying up to 20m in height outside of and to the north of the 500m buffer zone near Lough Nambrackderg.

During the 2022/23 non-breeding season, two observations of Grey Heron were made. Both of which were outside of the 500m buffer zone.

During the 2023/24 winter season, one Grey Heron was recorded. This occurred outside of the 500m buffer zone.

Summer and Winter Walkover Surveys (2020, 2021, 2022, 2023, and 2024; 2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Grey Heron was not observed during any breeding or winter season walkover surveys.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

Grey Heron was observed every season throughout all five years of Hinterland surveys. A total of 177 records occurred across the survey period. Records primarily comprised of individuals, however flocks of up to 12 birds were also detected. Records occurred at HVPs 1, 2, 3, 4, 7, 10, 11, 12, 14, 17, 20, 23 and 29. HVP 14: Lough Nambrackderg was the closest to the site located 1.08km to the north

7.3.3.4.10 Grey Wagtail

This species was recorded five times across the entire five-year survey period.

During the breeding bird transects, this species was recorded on three occasions during the 2020 breeding season. During the 2021 breeding season, one record of Grey Wagtail was made whereby one individual was observed flying between 0-25m from the surveyor in June 2021.

During the hinterland surveys the species was recorded during every season of surveys across 17 different hinterland sites.

7.3.3.4.11 Hen Harrier

Hen Harrier were recorded very infrequently across summer and winter flight activity surveys. These records consisted of both adults and juveniles recorded within the 500m buffer zone. However, no breeding behaviour or Hen Harrier roosts were observed within the Site. Records indicate Hen Harrier within the buffer zone were very infrequently observed commuting through the Site, and hunting.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

Hen Harrier were observed on three occasions during the five-year survey period, with records both inside and outside of the 500m buffer zone, and records of adults and juveniles flying, commuting, hunting and circling within the Site. This species was not observed during the 2021 or 2024 breeding seasons.

During the 2020 breeding season, one record of this species was made. This record observed a ringtail (juvenile) flying within the 500m buffer zone at a rotor-swept height (25-175m) near Turbine 1, where it was seen commuting, hunting, cruising and circling.

During the 2022 breeding season, Hen Harrier was recorded on one occasion. This recorded comprised a single female hunting outside of the 500m buffer zone, along the northern edge of this study area in September 2022.

During the 2023 breeding season, one record of this species was made whereby a ringtail (juvenile) was observed in the centre / west of the 500m buffer zone, flying at a height band of 0-10m in August 2023.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)
This species was recorded eight times during the five-year survey period. No evidence of winter roosting was recorded over the five-year period.

During the 2019/20 winter season, Hen Harrier were recorded on three occasions. Two of which occurred within the 500m buffer zone, consisting of a ringtail (juvenile) recorded calling and flying between 10-20m height and commuting over rough grassland and heath near Turbines 5 and 6 in January 2020, and one adult individual recorded circling close to Turbine 1 and heading towards Turbine 4 at a rotor-swept height (25-175m) in March 2020.

During the 2020/21 winter season, one individual was recorded. This record occurred outside of the 500m buffer zone, whereby one male was observed hunting to the north of the Site and flying below 10m.

During the 2021/22 winter season, one observation of Hen Harrier was made of a single male hunting outside the 500m buffer zone to the north-west of the study area up to 20m in height.

During the 2023/24 winter season, three records were made. Two of which occurred within the 500m buffer zone. Both of these records comprised one individual flying low (<20m) in October 2023.

Summer Walkover Surveys (2020, 2021, 2022, 2023, and 2024)
This species was not observed during any breeding season walkover survey.

Winter Walkover Surveys (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

During the 2019/20 non-breeding season, Hen Harrier were recorded on one occasion. This record comprised one individual flying in March 2020. No other records of Hen Harrier were made during any other winter walkover survey.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

Hen Harrier were only observed during the Year 2 surveys in December 2020 and February 2021. This species was not recorded during any other Hinterland survey across the five years of surveys.

During Year 2 surveys, Hen Harrier were recorded on four occasions. The first record comprised a male Hen Harrier hunting at HVP 9: Gortloughra Valley in December 2020, which is situated 0.99km to the north-west of the Site, a second record comprised a male flying across a road near HVP 25: Togher, c. 4.33 km from the Site. There were also two records of Hen Harrier in December 2020 at HVP 5 Cousan Gap 2.32km to the southwest.

7.3.3.4.12 Kestrel

Kestrel were recorded relatively frequently throughout the five-year survey period. The majority of which occurred during the breeding season. A little over half of these records intersected the 500m buffer zone, and consisted of Kestrel hunting throughout the study area. However, no breeding or roosting behaviours were observed. Hinterland surveys indicate Kestrel are also present within the wider environment.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

Kestrel was recorded 102 times across the five breeding seasons. A total of 51 flightlines intersected the 500m buffer zone, and hunting behaviours were observed on numerous occasions. Kestrel activity within the site primarily occurred in the north of the buffer zone, where the majority of the hunting behaviour was recorded.

During the 2020 breeding season, Kestrel were recorded on 10 occasions. Three occurred within the 500m buffer zone. Two of which comprised one individual flying at rotor-swept height.

During the 2021 breeding season, Kestrel were observed 18 times. Of which, one record was call-only and 17 flight lines were recorded. 12 flight lines occurred within the 500m buffer, and the remaining records occurred outside of the 500m buffer. Kestrel were observed hunting on 13 occasions, nine of which occurred within the 500m buffer zone. Of the flight lines that

occurred within the 500m buffer zone, Kestrel were recorded to fly between 10m and 185m in height.

During the 2022 breeding season, 22 records of this species were made from every VP between June and September 2022. Of which, 11 records occurred within the 500m buffer zone, where groups of 1-3 individuals were hunting in the north / north-west of the 500m buffer zone. One record sighted a male Kestrel interacting with a Sparrowhawk in August 2022.

During the 2023 breeding season, 26 records of this species were made. Of which, 14 records occurred within the 500m buffer zone. Observations primarily recorded this species alone or in numbers of two to four individuals. Hunting behaviour was detected across all 26 records.

During the 2024 breeding season, Kestrel were recorded on 26 occasions. Of which, 11 records occurred within the 500m buffer zone. Ten of these records comprised a lone individual, and one record comprised of two birds. The majority of these records observed Kestrel hunting within or near the Site.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Kestrel were recorded a total of 32 times during the non-breeding season flight activity surveys, Of which, 18 occurred within the 500m buffer zone, and hunting and commuting behaviours observed.

During the 2019/20 winter season, Kestrel were observed on seven occasions. Two of which recorded Kestrel flying at rotor-swept height within the 500m buffer zone. Both records observed Kestrel hunting over heath habitats. The remaining eight records indicated Kestrel were flying and hunting outside of the 500m buffer zone.

During the 2020/21 non-breeding season, Kestrel were recorded six times. Three of which occurred outside of the 500m buffer zone, and comprised lone individuals hunting to the north of the Site. The remaining three records occurred within the 500m buffer zone. Regarding the records within the 500m buffer, one pair was recorded in October 2020 flying between Turbines 3 and 4 at heights of up to 10m. Additionally, a lone individual was recorded hunting near Turbines 1 and 2 and flying at heights of 20-50m in October 2020. The final flight line that was recorded within the 500m buffer zone comprised a lone individual flying at heights of 10-20m.

During the 2021/22 non-breeding season, this species was recorded seven times. Six of these were of lone individuals hunting across the centre of the 500m buffer zone.

During the 2022/23 non-breeding season, Kestrel were recorded on four occasions. Three which occurred within the 500m buffer zone, where Kestrel were recorded flying over and hunting in the north-west and towards the south-west of the 500m buffer zone.

During the 2023/24 winter season, Kestrel were observed eight times. Of which, four occurred within the 500m buffer zone. Two of these records observed Kestrel flying within the site, and two other records recorded one individual hunting.

Summer Walkover Surveys (2020, 2021, 2022, 2023, and 2024)

Kestrel were recorded on three occasions during the 2022 breeding season. Each of the three records comprise one individual flying. Kestrels were not observed during any other breeding season walkover survey.

Winter Walkover Surveys (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

During the 2019/20 non-breeding season, Kestrel were recorded on one occasion. This record comprised one individual flying in March 2020. During the 2023/24 winter season, a single Kestrel was observed. No other records of Kestrel were made during any other winter walkover survey.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

Hinterland surveys across all five seasons dictate that Kestrel are present in the surrounding hinterland, as records suggest Kestrel are both flying through and hunting in these habitats.

During the Year 1 hinterland surveys, Kestrel were recorded on seven occasions. One record occurred during the 2019/2020 non-breeding season, where one individual was recorded at HVP 12: Lough Allua in December 2019. The remaining six records occurred during the 2020 breeding season. Most of these summer sightings (three) occurred at HVP 9: Gortloughra Valley, where single birds were recorded. Two of which observed Kestrel hunting over heath and bog habitats. The remaining three records occurred in HVP 5: Cousane Gap, HVP 15: Mealagh Valley East, and HVP 16: Mealagh Valley West.

Kestrel were recorded eight times during the Year 2 surveys. Of which, two observations occurred at HVP 19: Shehymore East, and one comprised a male hunting. A further three records were made at Hinterland site 16: Mealagh Valley West, two records were recorded at HVP 12: Lough Allua, and one record was made at HVP 7: Cullenagh Lake.

During the Year 3 and 4 surveys, Kestrel were recorded on 16 occasions. Three of which occurred during the 2021/22 non-breeding season, nine of which occurred during the 2022 breeding season, three occurred during the 2022/23 non-breeding season, and one during the 2023 breeding season. All records involved one individual, and occurred across a number of HVPs, namely HVP 1, 9, 12, 16, 18, 19, and 28.

During the Year 5 surveys, six observations of Kestrel were made. Four observations were made during the 2024 summer season. Two individuals were sighted at HVP 9, and the remaining five records comprised lone individuals at HVP 9 and HVP 19.

7.3.3.4.13 Lesser Black-backed Gull

Lesser Black-backed Gull was recorded primarily during the breeding season flight activity surveys. Most of which occurred outside of the Proposed Development, near Lough Nambrackberg (1.08km from the Site). However, six records were made within the 500m buffer zone, where birds were recorded flying through the Site. No foraging, roosting or breeding behaviours were observed within the site. Hinterland surveys recorded this species is present in the wider environment, particularly c. 19.85km from the Site at An Gearagh, where flocks of up to 347 individuals were recorded.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

Lesser Black-backed Gull were observed 26 times throughout the five-year survey period. Six records occurred within the 500m buffer zone, and the remaining 20 records occurred outside of the 500m buffer zone on or near Lough Nambrackderg.

During the 2020 breeding season, this species was recorded 6 times, only five of which recorded in flight. Of these only one record occurred within the 500m buffer zone. This record comprised one individual flying within the rotor-swept height band near Turbine 2 in June 2020. The remaining records occurred outside of the 500m buffer zone.

During the 2021 breeding season, Lesser Black-backed Gull were recorded eight times. Flight activity was observed seven times, with the eight record comprising an observation of a single gull on the shore of Lough Nambrackderg (no flight activity). Three records occurred within the 500m buffer zone, consisting of one bird in flight at a height of 30-50m near Turbine 6 in June 2021, one individual flying up to 30m in height near Turbine 1 in June 2021, and one bird at a height of 20-50m near Turbine 1 in June 2021. All other observations occurred outside of the 500m buffer zone, to the north of the Site.

During the 2022 breeding season, five observations of this species were made. All of which occurred outside of the 500m buffer zone, and were primarily concentrated around Lough Nambrackderg in small numbers of 1-2 individuals.

During the 2022 spring migration survey, two observations were made of Lesser Black-backed Gulls outside of the 500m buffer zone.

During the 2023 breeding season, two observations were made. On both occasions, one individual was recorded flying outside of the 500m buffer zone.

During the 2024 breeding season, two records of this species were made. Both of which occurred at rotor-swept height within the 500m buffer zone. In May 2024, four individuals (two adults, two immature birds) were recorded, and in June 2024, a single bird was observed flying into the northern portion of the Site.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Lesser Black-backed Gull was only observed during the 2019/20 non-breeding season. During this season, two birds were recorded outside of the 500m buffer zone. This species was not recorded during any other winter season flight activity survey across the five-year survey period.

Summer and Winter Walkover Surveys (2020, 2021, 2022, 2023, and 2024; 2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Lesser Black-backed Gull were not observed during any breeding or any winter season walkover surveys.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

Lesser Black-backed Gull were recorded during every year of Hinterland surveys. They were sighted 81 times across the five years of surveys. Records primarily comprised of individuals, however flocks of up to 347 birds were also detected. Records occurred at HVPs 1, 2, 3, 4, 6, 7, 9, 11, 12, 14, 16, 17 and 29. HVP 9: Gortloughra Valley and HVP 14: Lough Nambrackderg were the closest to the site located 0.99km northwest and 1.08km to the north of the site respectively.

7.3.3.4.14 Little Egret

Little Egret was recorded once during the winter 2023/24 flight activity surveys, which comprised of one individual flying outside of the 500m buffer zone. No other observations of Little Egret were made during any of the other surveys within the site, across the five-year survey period.

7.3.3.4.15 Mallard

Mallard were observed across various surveys. However, there were no records of this species occurring within the flight activity survey area. All records indicate Mallard habituate Lough Nambrackderg, c. 1.08km from the Site, and do not fly through or use the habitats within the red line boundary of the Proposed Development.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

Mallards were recorded 11 times during the summer flight activity surveys. However, the observations recorded during the breeding seasons indicate that this species did not regularly use the habitats within the Site, but rather were more commonly found on or near Lough Nambrackderg, c. 1.08km from the Site.

During the 2020 breeding season, this species was recorded on two occasions. Both of which occurred on Lough Nambrackderg in April and May 2020. In April 2020, a pair was sighted.

During the 2021 breeding season, Mallard was observed once, where a lone male was flushed en route to VP3 in May 2021.

During the 2022 breeding season, there were three records of this species on Lough Nambrackderg, outside of the 500m buffer zone.

During the 2023 breeding season, two records of this species were made outside of the 500m buffer zone.

During the 2024 breeding season, three records of Mallard were made. All of which occurred outside of the 500m buffer zone, near Lough Nambrackderg.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Similar to the breeding season surveys, the winter season flight activity surveys indicate that there are Mallard within the surrounding environment. However, they do not use the habitats within the Proposed Development and are more likely to be found on or near Lough Nambrackderg.

During the 2019/20 non-breeding season, Mallard was observed twice, whereby two pairs were recorded on Lough Nambrackderg in March 2020.

During the 2020/21 non-breeding season, five records of Mallard were made and all records occurred outside of the 500m buffer zone on Lough Nambrackderg, and sightings primarily consisted of pairs.

During the 2021/22 non-breeding season, Mallard were recorded on Lough Nambrackderg outside of the 500m buffer zone on two occasions.

This species was not recorded during the 2022/23 winter season.

During the 2023/24 non-breeding season, two records of Mallards were made on the ground outside of the 500m buffer zone.

Summer and Winter Walkover Surveys (2020, 2021, 2022, 2023, and 2024; 2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Mallard were not observed during any breeding or winter season walkover surveys

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

Mallard are evident in the surrounding hinterland, as 213 records of up to 200 birds were recorded at a multitude of HVPs across all five seasons of Hinterland surveys.

Mallard were recorded during every year of Hinterland surveys. Records occurred at HVPs 1, 2, 3, 4, 7, 10, 11, 12, 14, 17, 20, 28 and 29. HVP 14: Lough Nambrackderg was the closest to the site located 1.08km to the north.

7.3.3.4.16 Meadow Pipit

Meadow Pipit were recorded during all five years of breeding and winter walkovers, as well as the latest year of flight activity surveys (summer 2024, and winter 2023/24).

Summer Walkover Surveys (2020, 2021, 2022, 2023, and 2024)

Meadow Pipit were observed during the summer walkover surveys. A total of 42 observations were made across this five-year survey period with records of lone individuals and flocks of up to 14 birds at the Site. These records indicate Meadow Pipit are using the Site and surrounding environment and regularly fly within the rotor-swept height band.

During the 2020 breeding season, this species was recorded on 13 occasions, with records of comprising of individuals to flocks of up to 10 birds.

During the 2021 breeding season, Meadow Pipit were observed on three occasions in flocks of three to 14 birds

During the 2022 breeding season, this species was recorded on eleven occasions in flocks of one to ten birds.

During the 2023 breeding season, seven records of Meadow Pipit were made. Each record comprised individuals or flocks of up to ten birds.

During the 2024 breeding season, Meadow Pipit were observed on eight occasions,

Winter Walkover Surveys (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Meadow Pipit were recorded on 26 occasions. Each record comprised individuals or flocks of up to 16 birds.

During the 2019/20 non-breeding season, Meadow Pipit were recorded in flocks of up to 16 individuals on nine occasions.

During the 2020/21 non-breeding season, eight records of this species were made. Each record comprised individuals or flocks of up to three birds.

During the 2021/22 non-breeding season, Meadow Pipit were recorded on four occasions with records of individuals or flocks of up to six birds.

During the 2022/23 non-breeding season, five records of Meadow Pipit were made of individuals or flocks of up to eleven birds.

During the 2023/24 winter season, Meadow Pipit were recorded three times, with one to two birds recorded.

7.3.3.4.17 Mediterranean Gull

During the 2023 breeding season, one individual was recorded in June 2023 at HVP1 c. 19.85km to the north-east of the Proposed Development. No other record of this species was made during any of the surveys, across all five survey seasons.

7.3.3.4.18 Merlin

Merlin were only recorded on three occasions during the five-year survey period. All three records occurred outside of the 500m buffer zone during the 2019/20 and 2023/23 winter seasons. No records of hunting or breeding were made. Merlin were not recorded during any other survey, including targeted Merlin surveys. This evidence indicates Merlin are not present within the Site, and are not well established in the wider environment.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

During the summer season flight activity surveys across the entire five-year survey period, Merlin were not observed.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

During the 2019/20 winter season, Merlin were recorded on two occasions. Both records occurred outside of the 500m buffer zone, where a Merlin was observed on a fence post flying into a plantation in December 2019, and another Merlin was recorded flying low in March 2020.

During the 2023/24 non-breeding season, a single Merlin was observed outside of the buffer zone in February 2024.

Merlin were not recorded during any of the other winter flight activity surveys across the five-year survey period.

Summer and Winter Walkover and Hinterland Surveys (2020, 2021, 2022, 2023, and 2024; 2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Merlin were not observed during any breeding or winter season walkover or hinterland surveys.

Merlin Survey (2020)

No Merlin or signs of Merlin were recorded during the dedicated Merlin surveys that were conducted during the 2020 breeding season. Merlin were not observed across any other survey conducted during breeding seasons.

7.3.3.4.19 Peregrine

Peregrine were recorded infrequently across the five-year survey period, the predominantly brief observations consisted of Peregrine (adults and juveniles) flying over and hunting within the 500m buffer zone. However, no breeding behaviour was observed within the Site over the five year period. Hinterland surveys indicate Peregrine are present in the wider environment.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

Peregrine were recorded a total of 13 times across the five-year survey period, either individually or in pairs. Twelve of these observations intersected the 500m buffer zone. Records consisted of both adults and juveniles. However, no breeding activity was recorded.

During the 2020 breeding season, Peregrine were recorded on seven occasions, either individually or in pairs. One record comprised two individuals perched near the ridge. The remaining observations were recorded within the 500m buffer zone. One record observed a pair of Peregrine commuting from behind the ridge at the centre of the site, and another recorded a lone individual soaring above 185m around Turbine 2. The remaining five records observed Peregrine flying within the height band 25-185m, and most of the flight lines were concentrated around Turbines 5, 6 and 9.

During the 2021 breeding season, the species was recorded twice. On one occasion, this species was recorded within the 500m buffer zone, whereby one individual was recorded flying between 100-185m in height near Turbine 2. The second record comprised a juvenile flying between 20-30m in height outside of the buffer zone.

During the 2022 breeding season, there was one record of a lone bird briefly soaring (180 seconds) within the 500m buffer zone.

During the 2023 breeding season, Peregrine were recorded once, where one individual was recorded flying over the Site, at rotor-swept height within the 500m buffer zone.

During the 2024 breeding season, this species was recorded twice. Both records occurred within the 500m buffer zone, where a single individual flew along the centre of the site June 2024, and a pair were recorded calling c. 100m west of Turbine T8 in July 2024.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Peregrine were recorded eight times during the winter season flight activity surveys, five of which intersected the 500m buffer zone, and were within the height band 25-185m (an average of one record per season). There were no records of the species during 2 winter seasons (2019/20 and 2021/22).

During the 2020/21 winter season, this species was observed five times and all observations were of lone individuals. Three of which occurred within the 500m buffer zone, near Turbines

1, 2 and 3. Birds flew at a height of 10-20m, 30-50m and 30-185m in height. The remaining two records occurred outside of the 500m turbine buffer to the north of the Site.

During the 2022/23 non-breeding season, a single observation of Peregrine was made. This record comprised one individual flying from the centre / north of the 500m buffer zone in a westerly direction between 30 – 100m for 76 seconds.

During the 2023/24 winter season, two records of Peregrine were made. Of which, one record occurred within the 500m buffer zone where a single bird was observed flying over the site between Turbines T1 and T2 predominantly below 20m in height.

Summer Walkover Surveys (2020, 2021, 2022, 2023, and 2024)

During the 2021 breeding season, Peregrine was recorded on one occasion. In June 2021, one individual was observed in flight. This species was not recorded during any other summer walkover survey.

Winter Walkover Surveys (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

During the 2020/21 non-breeding season, Peregrine was recorded on one occasion. This observation comprised one individual flying in October 2020. This species was not recorded during any other winter walkover survey.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

Peregrine were recorded across all five years of Hinterland surveys, except for Year 4 (winter 2022/23 to summer 2023). Records indicate both juveniles and adults are present in the surrounding hinterland habitats, and hunting was recorded on two occasions.

Peregrine were recorded twice during Year 1 Hinterland surveys. Both records occurred in September 2020. The first of which was recorded at HVP 15: Mealagh Valley East, where a juvenile was observed eating prey items, and the second record occurred at HVP 20: Ship Lough.

During the Year 2 surveys, Peregrine was recorded once, which occurred at HVP 1: An Gearagh where one individual was recorded on the ground with prey in October 2020.

During the Year 3 surveys, two individuals were recorded on two occasions at HVP 17 (14.48km north east) in November 2021.

During the Year 5 surveys, Peregrine were observed on a single occasion in December 2023 at HVP 1.

7.3.3.4.20 Red Grouse

Red Grouse were recorded 11 times during VPs throughout the five-year survey period. Most records occurred outside of the 500m buffer zone. However, this species was sighted or heard within the Site, and both males and females were observed commuting through the Site. The study is considered to hold one pair inside the 500m buffered site and one outside the buffer.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

No evidence of this species was found during the 2021, 2023 or 2024 breeding season surveys. Red Grouse were recorded three times across the 2020 and 2022 breeding seasons. These surveys indicate both males and females are present in the area, and commute through the habitat. Two of the three records occurred within the 500m buffer zone.

During the 2020 breeding season, Red Grouse were recorded on two occasions all on the 17th of April 2020. Both of which occurred within the 500m buffer zone in April 2020, and were observed c. two minutes apart. On 17th April 2020, one male was observed flying low within the north-eastern portion of the 500m buffer zone. Two minutes later, a single female was recorded flying low in the same area in close proximity to the flight path of the male bird. Red Grouse was heard calling at VP3 on 17th April 2020.

During the 2022 breeding season, Red Grouse were recorded on one occasion. This record comprised two individuals that were flushed. This record also occurred outside of the 500m buffer zone.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Red Grouse were observed eight times across the five-year survey period. However, only two observations occurred within the 500m buffer zone.

During the 2019/20 non-breeding season, this species was recorded on three occasions. Two of which comprised observations of birds in flight. However, only one record occurred within the 500m buffer zone. This record observed one individual near Turbine 2 that was flushed, and then flew low (<25m in height) over heath habitat. The other sighting occurred outside of the 500m buffer zone to the north of the Site in December 2019, and the final record was call-only and appeared to be located to the south-west of VP 3.

During the 2020/21 non-breeding season, Red Grouse was heard calling in March 2021.

During the 2021/22 non-breeding season, a single call-only record of this species was made.

During the 2022/23 season, this species was recorded twice in October and December. Both of which were call-only records and were noted in the north of the study area.

No records were made during the 2023/24 winter season. However, during the extra migration VP surveys that were carried out in Winter 2023/24, one Red Grouse was heard calling from VP3 on the 25th of October 2023.

Summer Walkover Surveys (2020, 2021, 2022, 2023, and 2024)

During the 2020 breeding season, one individual was recorded flying in May.

Winter Walkover Surveys (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

During the 2022/23 non-breeding season, Red Grouse were recorded on three occasions. Each record comprised of between one and three birds. Two birds were recorded along Transect 1 on the 28th of January 2023. 3 birds were recorded along transect 2 on the 17th of November 2022 and 1 bird was recorded along the same transects later than season on the 27th of March 2023. This species was not recorded during any other winter walkover survey.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

Red Grouse were not found during any of the Hinterland surveys.

Red Grouse Survey (2022)

During the 2022 Red Grouse surveys, there were two sightings of Red Grouse. The first sighting observed a male individual, and a second individual that was likely a female, located approximately 500m south west of T1 outside the development footprint.; whilst the second sighting consisted of a male and female approximately 390m south east of T2.

7.3.3.4.21 Redwing

Redwing have been recorded 13 times across the five years of surveys. All of which pertain to VP surveys, exclusively during the winter season. Eight of the observations were made at VP 2, four of them were made at VP 3, and the remaining observation was recorded at VP 1. The majority of records (six) were made during the 2020/21 winter season, however one was also recorded during the 2019/20 winter season, one during the 2021/22 season, two during the

2022/23 season, and three during the latest 2023/24 winter season. This species was not recorded during any other survey.

7.3.3.4.22 Ruff

Ruff was observed on five occasions during hinterland surveys only. Three of these records occurred during the 2022/23 winter season. Of the three records during this winter season, one record observed four birds at HVP 1, and two records were of one bird at HVP 17. One record occurred during hinterland surveys the 2023/24 non-breeding season, where one individual was recorded at HVP 1. Another record occurred in September 2021 at HVP 1. This species was not recorded during any of the other surveys, across all five years of survey seasons.

7.3.3.4.23 Snipe

Snipe were observed primarily during the non-breeding season. However, the majority of records are located outside of the 500m buffer zone. Over the 5 years of breeding wader surveys the species was only recorded on one occasion. On the 13th of April 2021, 3 birds were heard calling in flight but not seen prior to sunrise along transect T2 within the site.

No other evidence of breeding was detected over the course of the five-year survey period. Hinterland surveys indicate this wader is present in the wider environment, particularly at An Gearagh, c. 19.85km from the Site.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

Snipe were recorded five times across the 2020, 2021 and 2022 breeding seasons. Records indicate this species sometimes commutes and flies through the Site.

During the 2020 breeding season, Snipe were recorded three times. However, only one record observed flight activity whereby in September 2019, one individual was recorded flying near Turbine 1 within the rotor-swept height band and within the 500m buffer zone. The other two records did not observe any flight activity, as one was call-only, and the other record comprised one bird on the ground.

During the 2022 breeding season, one individual was recorded from VP 3, whereby a single bird was flushed en route to a VP.

During the 2022 spring migration surveys, one observation was made of a single bird flying up to 30m in height in the north-east section of the study area.

No records were made in 2023 or 2024.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Snipe were recorded 19 times across the 2019/20, 2020/21, 2021/22, and 2023/24 winter seasons. No evidence of Snipe was found during the winter 2022/23 surveys. However, the results of the earlier surveys indicate Snipe were present within the wider environment occasionally use the habitats within the Proposed Development.

During the 2019/20 non-breeding season, Snipe were recorded eight times. Seven of which did not observe flight activity, as one pair was observed in November 2019, three records of lone individuals on the ground were made, and a further three call-only records were made. The remaining record, the only flight-activity record, comprised one individual commuting low across heath habitats near Turbine 5 within the 500m buffer zone.

During the 2020/21 non-breeding season, Snipe was observed on seven occasions. Three of which occurred within the 500m buffer zone, however they were flushed en route to the VP.

During the 2021/22 non-breeding season, a single observation of Snipe was made. This record occurred from VP 3 in March 22 and comprised a single bird flying outside of the 500m buffer zone, towards Lough Nambrackderg.

During the 2023/24 winter season, three records of Snipe were made all in the month of January, with two occurring on the same day. None of these records occurred within the 500m buffer zone.

Summer Walkover Surveys (2020, 2021, 2022, 2023, and 2024)

This species was not observed during any breeding season walkover survey.

Winter Walkover Surveys (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

During the 2020/21 winter walkover surveys, Snipe were observed on two occasions. Both records comprised one individual in December 2020. This species was not recorded during any other winter walkover survey.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

Hinterland Surveys indicate Snipe are present in the surrounding hinterland habitats, with 19 of the 22 records occurring c. 19.85km from the Site at HVP 1, and the remaining three records

occurring c.5.52km from the Site at HVP 4 (2 records) and HVP 11: Inchigeelagh c. 8.18 km from the Site.

In Year 1, Snipe were recorded three times during the 2019/20 non-breeding season. Two records were made at HVP 1: An Gearagh in January and February 2020, and the remaining record was made at HVP 4: Coolkellure Lake/St. Edmunds Church in February 2020.

During the Year 2 surveys, Snipe was recorded once, consisting of a flock of 45 birds at HVP 1: An Gearagh in September 2021.

During the Year 3 and 4 surveys, Snipe were detected 13 times. Four records occurred during the 2021/22 non-breeding season, where single birds were detected twice in October and November 2021, and a flock of four birds were detected twice in April and September 2022. During the 2022/23 non-breeding season, six observations of up to 76 birds were made. Five of which occurred at HVP 1 and one of which occurred at HVP 4. The remaining three records comprised individuals and flocks of up to 3 birds at HVP 1 in April, June and July 2023.

During year 5, Snipe were recorded 5 times over the course of winter 2023/24. Four records occurred at HVP1 while one record occurred at HVP 11.

7.3.3.4.24 Sparrowhawk

Sparrowhawk were recorded 26 times over five years of flight activity surveys, where both adults and juveniles were observed on a very infrequent basis. No breeding or roosting was recorded. Hinterland surveys indicate this species is also widely present in the wider environment.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

Sparrowhawk were recorded 15 times across the entire five-year survey period, 7 of which occurred within the 500m buffer over the five year period. Both adults and juveniles have been observed within the Proposed Development, and records indicate this species commutes and hunts on a very infrequent basis within the Site and the surrounding environment.

During the 2020 breeding season, Sparrowhawk were recorded six times, five of which occurred within the 500m buffer zone. Three of the five records occurred close to Turbine 5, one was located near Turbines 4 and 9, and one record was located near Turbine 2. Four of the five flight lines were also within 25-175m high band, whilst only one was outside of this height band

as it flew at a low height (<25m). Four of the six records occurred on the same day in April 2020 within and 1.5 hour window.

During the 2021 breeding season, this species was recorded twice. In June 2021, one individual was recorded flying between 10 and 185m near Turbine 6, within the 500m buffer zone. In May 2021, one male was recorded hunting and flying low to the north-west of the Site, outside of the 500m buffer.

During the 2022 breeding season, two records of this species were made. Both of which occurred to the north-west of the study area, outside of the buffer zone. One observation in June was a female Sparrowhawk that was mobbed by a Hooded Crow, and the other observation comprised an individual hunting in at the end of August.

During the 2023 breeding season, Sparrowhawk were observed on two occasions. One record consisted of a juvenile male flying outside of the buffer zone, and the other comprised a lone individual flying along the north-western edge of the buffer zone for 20 seconds.

During the 2024 breeding season, Sparrowhawk were recorded on three occasions. None of which occurred within the 500m buffer zone.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Sparrowhawk were recorded 11 times across the five-year survey period. Five of the observations intersected the 500m buffer. These records indicate this species rarely uses the habitats within the Proposed Development.

During the 2019/20 non-breeding season, this species was recorded three times. Two of these records occurred within the 500m buffer zone, whereby one individual flew below the rotor-swept height band to the north west of the Site in November 2019, and another individual circled within the rotor-swept height band near Turbines 5 and 6 in December 2019. The final record occurred outside of the 500m buffer zone, and comprised one male to the north of the Site.

During the 2020/21 non-breeding season, Sparrowhawk were observed twice. One record occurred wholly outside of the 500m buffer zone, and comprised one lone individual flying at a height of 20-30m to the north-west of the Site. The other record occurred began outside of the 500m buffer zone, where two individuals were observed in a display fight that entered the 500m buffer zone near Turbine 1 whilst at heights of 50-100m.

During the 2021/22 non-breeding season, four observations of this species were made. One of which occurred within the 500m buffer zone. All four records comprised lone individuals, and three of the records are male. Records indicate this species was hunting primarily outside of the study area.

During the 2022/23 non-breeding season, a single observation of this species was made. This record comprised of a single Sparrowhawk flying outside of the 500m buffer zone, near Lough Nambrackderg.

During the 2023/24 winter season, one observation of Sparrowhawk was made where a single individual was recorded flying within the 500m buffer, c. 200m from Turbine T8 in February 2024.

Summer and Winter Walkover Surveys (2020, 2021, 2022, 2023, and 2024; 2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Sparrowhawk were not observed during any breeding or winter season walkover surveys.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

This species was recorded during every year of Hinterland surveys. Sparrowhawk were observed on 21 occasions at HVPs 1, 5, 7, 9, 11, 12, 13, 16, 18, 23 and 28 indicating that this species occurs throughout the wider hinterland. The closest record occurred at HVP 18 in March 2022, c. 0.82km to the south-east of the Proposed Development.

7.3.3.4.25 Stock Dove

During the 2022 spring migration flight activity surveys, this species was recorded on one occasion whereby two individuals were recorded as being outside of and to the north-west of the study area. Stock Dove were not recorded during any other surveys within the site across the entire five-year study period.

7.3.3.4.26 Swift

During the 2023 breeding season, a single observation of Swift was made. Two birds were observed foraging in the north-east of the study area. This species was not recorded during any other survey within the site across the entire five-year survey period.

7.3.3.4.27 Teal

Teal were observed ten times during the breeding season flight activity (VP) surveys, and once during the non-breeding season flight activity surveys. Of which, only one record of Teal was

made within the 500m buffer zone, where three individuals were observed in a pool. All other records were found c. 1.08km from the Site, at Lough Nambrackderg, where successful breeding was observed. Hinterland surveys indicate this species is present in larger flocks of up to 224 individuals in the wider environment.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)
Teal were recorded on ten occasions across the five-year survey period, however all records were made outside of the 500m buffer zone, near Lough Nambrackderg. At this lough, successful breeding was recorded in 2020 and 2021.

During the 2020 breeding season, Teal were recorded three times, however no flight activity was observed. In June 2020, successful breeding of Teal was confirmed outside of the 500m buffer zone, on Lough Nambrackderg as one adult was observed with seven chicks.

During the 2021 breeding season, Teal was recorded once. However, this record occurred outside of the 500m buffer zone where one adult was observed with four young chicks on Lough Nambrackderg in July 2021.

During the 2022 breeding season, this species was observed once, outside of the 500m buffer zone.

During the 2023 breeding season, three observations of Teal were made where up to three individuals were recorded outside of the 500m buffer zone.

During the 2024 breeding season, two records were made outside of the 500m buffer zone.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)
This species was recorded once, during the 2021/22 non-breeding season, where 3 individuals were recorded in a pool within the 500m buffer zone (ITM 513932, 558554). There were no further record that season or for any of the other four winters of surveys.

Summer and Winter Walkover Surveys (2020, 2021, 2022, 2023, and 2024; 2019/20, 2020/21, 2021/22, 2022/23, 2023/24)
Teal were not observed during any breeding or winter season walkover surveys.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

This species was recorded during every year of Hinterland surveys. Teal were observed on 80 occasions at HVPs 1, 2, 3, 4, 11, 12, 14 and 17 indicating that this species occurs throughout the wider hinterland. The closest record occurred at HVP 14: Lough Nambrackderg, c. 1.08km to the north-east of the Proposed Development.

This species was observed six times during the Year 1 hinterland surveys. Four of which comprised records of up to 33 birds at HVP 1: An Gearagh. One additional record was made at HVP 4: Coolkellure Lake/St. Edmunds Church where five pairs were observed in January 2020, and the final observation of three Teal was made at HVP 12: Lough Allua.

During the Year 2 surveys, Teal were recorded 18 times across five different HVPs, namely 1: An Gearagh; 3: Bandon River SAC (Dunmanway); 4: Coolkellure Lake/St. Edmunds Church; 12: Lough Allua and 14: Lough Nambrackderg. Both adults and juveniles were recorded, and flocks of up to 224 individuals were detected.

During years 3 and 4, Teal were recorded 38 times across seven different HVPs, namely 1: An Gearagh; 2: Bandon River (Keenrath Bridge); 4: Coolkellure Lake/St. Edmunds Church; 11 Inchigeelagh, 12: Lough Allua; 14: Lough Nambrackderg and 17 Toon Valley. Both adults and juveniles were recorded, and flocks of up to 720 individuals (An Gearagh) were detected.

In year 5, Teal were recorded 18 times across the same seven HVPs. Both adults and juveniles were recorded, and flocks of up to 400 individuals (An Gearagh).

7.3.3.4.28 Whooper Swan

Throughout the five-year survey period, no records of Whooper Swan within the 500m buffer zone were made. Instead, most records observed Whooper Swan at Lough Nambrackderg, c. 1.08km from the Site. Both adults and juveniles were recorded at this Lough, however no breeding behaviours were observed. Hinterland surveys indicate this species is present predominantly at Lough Nambrackderg, and at An Gearagh, c. 19.85km from the Site.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)

No evidence of this species was found during the five-year survey period.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

Whooper Swan were recorded six times across the five-year survey period. Both adults and juveniles were recorded. However, all sightings occurred outside of the Proposed Development, near Lough Nambrackderg.

During the 2020/21 non-breeding season, two records of this species were made. Both of which occurred outside of the 500m buffer zone, where two adults and two juveniles were recorded on Lough Nambrackderg in October and November 2021. Both records appear to comprise the same individuals.

During the 2021/22 non-breeding season, a single observation of Whooper Swan was made when a group of five birds was sighted on Lough Nambrackderg.

During the 2023/24 winter season, three records of this species was made where between two and five individuals were recorded at VP3.

No other sighting of Whooper Swan has been made across the five-year survey period,

Summer and Winter Walkover Surveys (2020, 2021, 2022, 2023, and 2024; 2019/20, 2020/21, 2021/22, 2022/23, 2023/24)

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

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

The five years of Hinterland surveys indicate Whooper Swan are present in the surrounding Hinterland, as 72 observations were made across multiple HVPs. Records comprise lone individuals, males and females, adults and juveniles, and flocks of up to 148 birds (HVP 17: Toon Valley). The closest record of Whooper Swan to the Proposed Development was located c. 1.08km to the north, at HVP 14 where flocks of between 4 and 5 individuals were recorded.

During Year 1 surveys, Whooper Swan were observed on six occasions, all of which occurred during the 2019/20 non-breeding season. Three of the six observations were made at HVP 1: An Gearagh where up to 25 birds were sighted in February 2020, two adults and a juvenile were recorded in October 2019, and one single bird was recorded in December 2019. At HVP 12: Lough Allua, a flock of the same ten birds (seven adults, three juvenile) was recorded three times, in December 2019, January 2020, and February 2020.

During the Year 2 surveys, Whooper Swan were recorded 16 times at five different sites, namely 1: An Gearagh; 10: Gougane Barra; 12: Lough Allua and 14: Lough Nambrackderg and 17: Toon Valley. Both adults and juveniles were recorded, and flocks of up to 104 individuals were recorded.

During the Year 3 Hinterland surveys, this species was recorded 14 times. Of which, 13 records occurred during the 2021/22 non-breeding season and one occurred on the 2nd of April at HVP17. Flocks of up to 61 birds were detected at HVPs 1, 14, 17 and 31.

During the Year 4 Hinterland surveys, Whooper Swan were identified 21 times. Twenty observations of two to 104 individuals occurred during the 2022/23 non-breeding season at HVPs 1, 12, 17 and 31, and one record of 18 birds were made on the 2nd of April 2023 at HVP 17.

Whooper Swan were identified 14 times during year 5 at HVPs 1, 10, 12, 14 and 17.

7.3.3.4.29 Woodcock

Woodcock were only recorded once during flight activity (VP) surveys. However, this observation occurred outside of the 500m buffer zone. This species was not recorded during any summer or winter walkover surveys, and was only observed once during Hinterland surveys in November 2020. Due to the absence of woodland within and immediately surrounding the Site, the Proposed Development does not offer suitable habitat for this species.

Vantage Point Surveys: Summer Season (2020, 2021, 2022, 2023, and 2024)
No evidence of this species was found during the five-year survey period.

Vantage Point Surveys: Winter Season (2019/20, 2020/21, 2021/22, 2022/23, and 2023/24)
This species was recorded on one occasion during the five-year survey period, whereby woodcock was recorded outside of the 500m buffer zone in January 2020 during the 2019/20 non-breeding season.

Summer and Winter Walkover Surveys (2020, 2021, 2022, 2023, and 2024; 2019/20, 2020/21, 2021/22, 2022/23, 2023/24)
Woodcock were not observed during any breeding or winter season walkover surveys.

Hinterland Surveys (2020, 2021, 2022, 2023, and 2024)

This species was observed once during the Year 2 hinterland surveys. This record occurred at HVP 14: Lough Nambrackderg, whereby one individual was flushed from the hillside in November 2020. The Proposed Development does not offer suitable habitat for Woodcock due to the absence of woodland. Woodcock were not recorded during any other Hinterland survey.

7.3.3.4.30 Other Species

The following species were recorded as secondary target species during Vantage Point (flight activity), breeding transect, winter transect and / or hinterland surveys across the five years of surveys.

House Martin

House Martin were recorded on seven occasions across the five years of flight activity surveys. All of which occurred during breeding seasons. No House Martins were observed during any winter non-breeding season, and no records of House Martin were noted during the most recent year of surveys (summer 2024 to winter 2023/24). Three records occurred during the 2020 summer season (May, June and August 2020), where up to five individuals were identified at VPs 2 and 3. One record was made in July 2021, where a flock of 17 individuals were flushed en route to VP 3. One record was made in September 2022, where three House Martin were recorded at VP 3. The remaining three records occurred during the 2023 summer season, where one individual was recorded at VP 3 in May 2023, and one individual was recorded at VP 2 in September 2023. House Martin were only observed on one other occasion during any other survey across all five years of surveys, where one House Martin was recorded in June 2021 during breeding transect surveys.

Goldcrest

This species was observed once during breeding bird transects in Summer 2022, where one individual was recorded flying. This species was also recorded on 18 occasions within the wider environment during summer and winter Hinterland surveys.

Linnet

Linnet were recorded on four occasions across all five years of surveys. All records pertained to individuals recorded during flight activity surveys, exclusively during breeding seasons. One record was made during the 2021 breeding season, where one Linnet was flushed en route to VP 3. Another record was observed during the 2023 breeding season, where one individual

was found at VP 2, and the final two records observed one individual at VP 3 during the 2024 breeding season. No other record of this species, across any other year or surveys, were made.

Little Grebe

This species was recorded six times across 2022, 2023 and 2024 breeding season flight activity surveys, and two records across 2021/22 and 2023/24 non-breeding season flight activity surveys. The majority of which comprised lone individuals on or near Lough Nambrackderg.

Little Grebe were not observed during any breeding or winter season walkover surveys.

Sand Martin

Sand Martin were recorded twice across all five years of surveys, whereby two records of a single Sand Martin were made from VP3 during the 2023 breeding season of flight activity surveys. This species was not observed on any other occasion.

Skylark

During flight activity surveys, Skylark were observed in groups of one to 11 birds, a total of 71 times across all five years of surveys. Of which, the majority of records (53) occurred during the breeding season.

Skylark were also observed during Winter transect surveys, where between one and seven birds were recorded 12 times during the 2019/20, 2021/22, 2022/23, and 2023/24 non-breeding seasons. All winter transect records originated along transects 1 and 2.

During the Breeding transect surveys, Skylark were recorded 48 times across all five years of surveys. Records indicate between one and eight individuals were observed at any one time, across transects 1 and 2.

Skylark were also recorded within the wider environment, where up to four individuals were recorded across six Hinterland Sites during all five breeding seasons, and the 2021/22 and 2022/23 non-breeding seasons.

House Sparrow

Sparrows were recorded once during flight activity surveys, whereby Sparrows were flushed en route to VP 2 during the 2020/21 non-breeding season. This species was also recorded during Hinterland surveys, where up to three individuals were recorded across six Hinterland sites

during the 2021, 2022, and 2023 breeding seasons and the 2020/21, 2021/22, 2022/23 and 2023/24 non-breeding seasons.

Starling

Starling were observed on 18 occasions during flight activity surveys. Of which, the majority of records (15) occurred during the breeding seasons. Between one and 100 individuals were recorded during each of these observations.

Hinterland Surveys also indicate that Starling exist within the wider environment, as records of between one and 40 individuals were made across all five years of surveys.

Swallow

56 records of between one and 160 Swallows were made across VPs 1, 2 and 3, throughout all five years of breeding season flight activity surveys.

Swallows were also observed throughout the wider environment, as numerous records were made during all five breeding seasons of Hinterland surveys, where up to 60 individuals were recorded at any one time.

Wheatear

Wheatear were recorded alone or in groups of up to eight individuals, a total of 34 times during all five breeding season, and the 2019/20, 2021/22, 2022/23 non-breeding season flight activity surveys. On one occasion (in April 2020), a record of a breeding male displaying was made at VP 2.

During breeding transect surveys, 20 records of up to four individuals were made across all five breeding seasons.

Whinchat

Whinchat were recorded once during winter transect surveys, where one individual was observed during the 2023/24 winter walkovers. This species was not recorded during any other survey.

Willow Warbler

During summer transects, this species was only recorded twice, where one individual was recorded in summer 2022, and one in summer 2023.Willow Warbler were also recorded on

numerous occasions during the latest four years of Hinterland surveys across 15 different HVPs.

7.4 AVIFAUNA EVALUATION

The basis of impact assessment should be a determination of which ecological resources within the zone of influence of the proposed development are of sufficient value to be material in decision making and therefore, included in the assessment (NRA, 2009a and CIEEM 2018). Table 7.23 outlines the key receptors selected for assessment and the rationale for same based on NRA guidance (NRA, 2009a); the overall importance or sensitivity evaluation for each key receptor, taken from guidance such as Percival 2007 is also illustrated.

Table 7.23: Avifauna Key Receptor Evaluations

Species	BoCCI	Annex I (Y/N)	NRA Evaluation	Receptor Evaluation for Impact Assessment (Sensitivity)	Key Receptor	Rationale
Buzzard	Green	No	Local Importance (Higher Value)	Low	Yes	This species was recorded a total of 37 times across all breeding seasons and 6 times during three winter seasons over the five-year survey period. Records indicate the Site is used to commute over / through, and as occasional hunting grounds.
Chough	Amber	Yes	County Importance	Very High	Yes	Chough were recorded across every season of the five-year survey period. Of the 51 records of Chough, only twelve occurred within the 500m buffer zone, and the remainder are predominantly concentrated to the north-west of the buffer zone. Although breeding was recorded during Hinterland surveys in Shanacrane c. 0.82km south-east of the Proposed Development, no breeding was recorded within the Site. All records within the flight activity survey area indicate Chough were flying through/over the Site.
Cormorant	Amber	No	County Importance	Medium	Yes	There is only one record of Cormorant within the flight activity study area, and the remainder are located outside of the 500m buffer zone, near Lough Nambrackderg. However, based on the precautionary principle, this species has been included as a Key Receptor.
Curlew	Red	No	National Importance	High	No	There are no records of this species within the 500m buffer zone. Due to the absence of this species within the Site, Curlew have been excluded as a Key Receptor.
Dunlin	Red	Yes	National Importance	Very High	Yes	Dunlin were recorded within the 500m buffer zone once. However, flocks of between 30 and 144 birds are present in the wider area, particularly near HVP 1: An Gearagh c. 19.85km from the Site. Based on the precautionary principle, this species has been included as a Key Receptor.

Species	BoCCI	Annex I (Y/N)	NRA Evaluation	Receptor Evaluation for Impact Assessment (Sensitivity)	Key Receptor	Rationale
Great Black-backed Gull	Green	No	Local Importance (Lower Value)	Negligible	Yes	This species was recorded twice within the 500m buffer zone. Based on the precautionary principle, this species has been included as a Key Receptor.
Goldcrest	Amber	No	County Importance	Medium	Yes	This species was observed during breeding bird transects and hinterland surveys. Based on the precautionary principle, this species has been included as a Key Receptor.
Golden Plover	Red	Yes	National Importance	Very High	Yes	41 records were made across the five years of surveys . A total of 25 occurred within or partially intersected the 500m buffer zone over the entire 5 year period, an average of 5 flights per year.
Greenland White-fronted Goose	Amber	Yes	County Importance	Very High	No	This species was only recorded on eleven occasions during the 2020/21 and 2021/22 non-breeding season. All four records occurred at HVP 17, which is located c. 14.8km from the red-line boundary of the Proposed Development. There are no records of Greenland White-fronted Geese within or adjacent to the 500m buffer zone. Due to the lack of observation over the five years of surveys, and absence from the Proposed Development, this species is not considered a Key Receptor.
Grey Heron	Green	No	Local Importance (Higher Value)	Low	Yes	Grey Heron were observed 13 times during flight activity surveys. A total of 11 of these records occurred outside of the 500m buffer zone, near Lough Nambrackderg, which is situated c. 1.08km from the Site. Based on the precautionary principle, this species has been included as a Key Receptor.
Grey Wagtail	Red	No	National Importance	High	Yes	This species was recorded during the breeding season walkover surveys. Based on the precautionary principle, this species has been included as a Key Receptor.
Hen Harrier	Amber	Yes	County Importance	Very High	Yes	There are six observations of Hen Harrier within the study area, comprising both adults and juveniles. Hen Harrier were recorded within the

Species	BoCCI	Annex I (Y/N)	NRA Evaluation	Receptor Evaluation for Impact Assessment (Sensitivity)	Key Receptor	Rationale
						500m buffer zone on a very infrequent basis consider the lack of sightings over five full years of surveys.
House Martin	Amber	No	County Importance	Medium	Yes	House Martin were observed seven times during breeding season flight activity surveys as a secondary target species. Based on the precautionary principle, this species has been included as a Key Receptor.
House Sparrow	Amber	No	County Importance	Medium	Yes	Sparrows were recorded once during flight activity surveys during the 2020/21 non-breeding season. Based on the precautionary principle, this species has been included as a Key Receptor.
Kestrel	Red	No	National Importance	High	Yes	Kestrel have been recorded 69 times within the study area across the five-year flight activity survey period. Observations have confirmed Kestrel are regularly using the Site.
Lesser Black-backed Gull	Amber	No	County Importance	Medium	Yes	Most records of this species occur outside of the 500m buffer zone. However, this species was recorded flying at rotor-swept height within the buffer zone on six occasions.
Linnet	Amber	No	County Importance	Medium	Yes	Linnet were observed four times during breeding season flight activity surveys as a secondary target species. Based on the precautionary principle, this species has been included as a Key Receptor.
Little Egret	Green	Yes	National Importance	Very High	No	This species was only observed once during flight activity surveys, where one individual was recorded outside of the 500m buffer zone in 2024. Due to the absence of records within the flight activity survey area, this species has not been seleced as a Key Receptor.
Little Grebe	Green	No	Local Importance (Higher Value)	Low	No	This species was only recorded twice. Both records occurred outside of the 500m buffer zone. Due to the absence of this species within the Proposed Development, as well as the green-listed status of this species, Little Grebe is not considered a Key Receptor.

Species	BoCCI	Annex I (Y/N)	NRA Evaluation	Receptor Evaluation for Impact Assessment (Sensitivity)	Key Receptor	Rationale
Mallard	Amber	No	County Importance	Medium	No	Mallard have been recorded 22 times across the five-year survey period. However, records show this species is typically found on Lough Nambrackderg c. 1.08km from the red line boundary of the Proposed Development. No records occurred within the 500m buffer zone. As such, due to the absence of records within the Site, this species has been excluded as a Key Receptor.
Meadow Pipit	Red	No	National Importance	High	Yes	Meadow Pipit were recorded across flight activity surveys, and winter and summer walkover surveys. As such, this species has been included as a Key Receptor based on the precautionary principle
Mediterranean Gull	Amber	Yes	County Importance	Very High	No	This species was recorded once, whereby one individual was observed c. 19.85km to the north-east of the red line boundary of the Proposed Development in June 2023. Due to the absence of records within the Proposed Development, this species is not considered a Key Receptor.
Merlin	Amber	Yes	County Importance	Very High	No	Dedicated Merlin surveys did not detect Merlin or any signs of Merlin. Additionally, this species was only recorded on three occasions, all of which occurred outside the 500m buffer zone. As this species has not been recorded within the buffer zone, and due to the absence of evidence of Peregrine in the area, this species has not been selected as a Key Receptor.
Peregrine	Green	Yes	Local Importance (Higher Value)	Very High	Yes	Peregrine were recorded infrequently across the five-year survey period, the predominantly brief observations consisted of Peregrine (adults and juveniles) flying over and hunting within the 500m buffer zone. While no breeding behaviour was observed within the Site over the five year period

Species	BoCCI	Annex I (Y/N)	NRA Evaluation	Receptor Evaluation for Impact Assessment (Sensitivity)	Key Receptor	Rationale
						this species has been included as a Key Receptor based on the precautionary principle
Red Grouse	Red	No	National Importance	High	Yes	11 records of Red Grouse were made during VPs throughout the five-year survey period, however most were call-only records, and only four observations occurred within the 500m buffer zone. Based on the precautionary principle, this species has been included as a Key Receptor.
Redwing	Red	No	National Importance	High	Yes	This species was recorded a total of 13 times during non-breeding season flight activity surveys, across all three VPs. Based on the precautionary principle, this species has been included as a Key Receptor.
Ruff	Amber	Yes	County Importance	Very High	No	Ruff has been recorded on three occasions during hinterland surveys that were conducted in the 2022/23 non-breeding season. All records are located outside of the Proposed Development. Due to a lack of on-site records, this species is not considered a Key Receptor.
Sand Martin	Amber	No	County Importance	Medium	Yes	This species was observed twice during breeding season flight activity surveys as a secondary target species. Based on the precautionary principle, this species has been included as a Key Receptor.
Skylark	Amber	No	County Importance	Medium	Yes	Skylark were observed 71 times across breeding and non-breeding flight activity surveys. They were also recorded during breeding and winter walkovers. Based on the precautionary principle, this species has been included as a Key Receptor.
Snipe	Red	No	National Importance	High	Yes	Snipe were observed primarily during the non-breeding season. However, the majority of records are located outside of the 500m buffer zone. Over the 5 years of breeding wader surveys the species was only recorded on one occasion. Based on the precautionary principle, this species has been included as a Key Receptor.

Species	BoCCI	Annex I (Y/N)	NRA Evaluation	Receptor Evaluation for Impact Assessment (Sensitivity)	Key Receptor	Rationale
Sparrowhawk	Green	No	Local Importance (Higher Value)	Low	Yes	Sparrowhawk were recorded 26 times over five years of flight activity surveys, where both adults and juveniles were observed on a very infrequent basis. No breeding or roosting was recorded.
Starling	Amber	No	County Importance	Medium	Yes	Starlings were recorded 18 times across breeding and non-breeding season flight activity surveys, where flocks of up to 100 individuals were sighted. Based on the precautionary principle, this species has been included as a Key Receptor.
Stock Dove	Red	No	National Importance	High	No	One observation of Stock Dove was made during the 2022 spring migration flight activity surveys. This record shows two individuals outside of the 500m buffer zone. Due to the limited number of records and absence from the buffer zone, this species is not considered to be a Key Receptor.
Swallow	Amber	No	County Importance	Medium	Yes	Flocks of up to 160 birds were observed 56 times during breeding season flight activity surveys. Based on the precautionary principle, this species has been included as a Key Receptor.
Swift	Red	No	National Importance	High	Yes	A single observation of this species was made in 2023, where two individuals were recorded hunting in the north-east of the study area Based on the precautionary principle, this species has been included as a Key Receptor.
Teal	Amber	No	County Importance	Medium	Yes	Teal were observed within the 500m buffer zone on one occasion. However, successful breeding of Teal has been confirmed in the surrounding environment, and flocks of up to 224 individuals have been observed in the wider hinterlands. Based on the precautionary principle, this species has been included as a Key Receptor.
Wheatear	Amber	No	County Importance	Medium	Yes	Wheater were recorded in flocks of up to eight individuals 34 times across breeding and non-breeding season flight activity surveys.
Whinchat	Red	No	National Importance	High	Yes	This species was recorded once during winter walkovers, where one individual was observed

Species	BoCCI	Annex I (Y/N)	NRA Evaluation	Receptor Evaluation for Impact Assessment (Sensitivity)	Key Receptor	Rationale
						flying during the 2023/24 non-breeding season. Based on the precautionary principle, this species has been included as a Key Receptor.
Whooper Swan	Amber	Yes	County Importance	Very High	No	This species has been recorded six times over the past five years, all of which occurred outside of the Proposed Development at Lough Nambrackderg c. 1.08km from the Site. Due to the absence of on-site records, this species is not considered a Key Receptor.
Willow Warbler	Amber	No	County Importance	Medium	Yes	Willow Warbler were observed on two occasions during breeding season walkovers. Based on the precautionary principle, this species has been included as a Key Receptor.
Woodcock	Red	No	National Importance	High	No	Woodcock have only been recorded once across the entire five-year survey period during flight activity surveys near Lough Nambrackderg, Due to the absence of on-site records, this species is not considered a Key Receptor.

The following species were recorded within the 10km grid squares W15 and W16 encompassing the study area within the last 15 years:

- Barn Owl (high sensitivity, last recorded in 2020),
- Common Grasshopper Warbler (low sensitivity, last recorded in 2020)
- Kingfisher (medium sensitivity, last recorded in 2011)
- Wigeon (medium sensitivity, last recorded in 2011)
- Mute Swan (medium sensitivity, last recorded in 2011)
- White-tailed Eagle (very high sensitivity, last recorded in 2019)

However, none of the above species were observed during the five-year study period and are consequently not listed as Key Receptors.

7.5 POTENTIAL EFFECTS ON AVIFAUNA

The effects of infrastructure such as wind farms on birds are highly variable and depend on a wide range of factors including the specification of the development, the topography of the surrounding land, the habitat affected and the numbers and species of birds present (Drewitt, A., and Langston, R., 2006). Developments such as wind farms in general have many effects on birds, including potential direct habitat loss and fragmentation, displacement due to disturbance, death, and injury due to collisions and disruption of local or migratory movements, with a consequent increase in energy expenditure (Drewitt, A., and Langston, R., 2008). However, the principal concerns in terms of adverse effects on birds are (1) disturbance / displacement, (2) collision, (3) habitat loss/change and (4) barriers to movement (Langston, R., 2010). Of these, only two are applicable during construction: 1) disturbance and / or displacement and 2) habitat loss/alteration. Habitat loss is the primary potential direct impact during constructions and although disturbance and / or displacement could be viewed as effective habitat loss, it is essentially indirect (SNH, 2017) and therefore covered under Indirect Impacts.

With regard to impacts on bird species, it is considered that the main potential source of impacts on avian fauna is the construction of the wind farm, particularly the construction of turbines and the associated road network.

The potential likely significant impact of wind turbines on birds may be considered as:

- Possible loss or deterioration of habitats; and
- Disturbance or displacement of birds.

Consideration of the survey data against Table 7.23 indicates that five 'Very High' sensitivity species have been recorded within the project study area:

- Chough (amber-listed, annex I);
- Dunlin (red-listed, annex I);
- Golden Plover (red-listed, annex I);
- Hen Harrier (amber-listed, annex I);
- Peregrine (amber-listed, annex I).

Consideration of the survey data against Table 7.23 indicates that eight 'High' sensitivity species have been recorded within the project study area.

- Grey Wagtail (red-listed);
- Kestrel (red-listed);
- Meadow Pipit (red-listed);
- Red Grouse (red-listed);
- Redwing (red-listed);
- Snipe (red-listed);
- Swift (red-listed);
- Whinchat (red-listed).

'Medium' sensitivity species recorded in the study area are also considered in this assessment, amounting to the following 13 species:

- Cormorant (amber-listed);
- Goldcrest (amber-listed);
- House Martin (amber-listed);
- House Sparrow (amber-listed);
- Lesser Black-backed Gull (amber-listed);
- Linnet (amber-listed);
- Sand Martin (amber-listed);
- Skylark (amber-listed);
- Starling (amber-listed);
- Swallow (amber-listed);
- Teal (amber-listed);
- Wheatear (amber-listed);

- Willow Warbler (amber-listed).

Four 'Low' sensitivity species are considered in this assessment:

- Buzzard (green-listed);
- Great Black-backed Gull (green-listed);
- Sparrowhawk (green-listed);
- Grey Heron (green-listed).

7.5.1 Potential Construction Effects

The Onsite Substation and Control Building will connect via underground 110 kV cable to either the Dunmanway (Option A) or Carrigdangan (Option B) ESB 110 kV substations. The overall length of Option A GCR between the Onsite Substation and Control Building and the existing Dunmanway 110 kV substation is approximately 28 km, of which, approximately 3.98 km is within the Site with the remainder located along the L8776 and the R587. The overall length of Option B between the Onsite Substation and Control Building and the existing Carrigdangan 110 kV substation is approximately 22 km, of which, approximately 3.98 km is within the Site with the remainder located along the L8776 and the L4607. The 3.98 km within the site travel along existing tracks and proposed new tracks.

The proposed Grid Connection Route Options outside the wind farm site shall be placed fully within existing roads and therefore there shall be minimal vegetation clearance or resultant habitat loss.

It is proposed that the turbine nacelles, tower hubs and rotor blades will be landed in Port of Cork. From there, they will be transported to the Site via the public road corridor to the site entrance. There are eighteen areas on the haul route (TDR) that will require works in third party lands.

Table 7.24: Areas of Works on Haul Route in Third Party Lands

No.	ITM (Easting / Northing)	Description	Habitat Loss
Location No. 7	E:523246 N:559558	Overrun Area=512 m^2 Area to be cleared for Oversail Boundary Vegetation To be Trimmed	Improved agricultural grassland - 512.54 m^2 Hedgerow – 32.7 m (length)
Location No. 12C	E:523777 N:565003	Overrun Area=167 m^2 Area to be cleared for Oversail Bridge Widening & Loadbearing Area to be Constructed.	Buildings and artificial surfaces - 59.47 m^2 Scrub - 107.53 m^2 Hedgerow - 42.13 m

No.	ITM (Easting / Northing)	Description	Habitat Loss
Location No. 14	E:522064 N:565137	Overrun Area=167 m^2 Area to be cleared for Oversail Boundary Vegetation To be Trimmed	Wet grassland - 41.76 m^2 Dense bracken - 102.52 m^2 Buildings and artificial surfaces - 39.67 m^2 Scrub - 25.39 m^2 Hedgerow - 37.51 m
Location No. 17A	E:519425 N:564233	Overrun Area=270 m^2 Area to be cleared for Oversail Bridge Parapet to be Modified to Allow Oversail	Buildings and artificial surfaces - 245.60 m^2 Stonewall - 24.01 m^2 Hedgerow - 25.12 m
Location No. 17C	E:518813 N:563759	Overrun Area=349 m^2 Area to be cleared for Oversail	Scrub - 349.28 m^2
Location No. 17D	E:518599 N:563727	Overrun Area=59 m^2 Area to be cleared for Oversail	Scrub - 58.20 m^2
Location No. 18B	E:517474 N:563425	Overrun Area=70 m^2 Area to be cleared for Oversail	Dry meadows and grassy verges - 68.36 m^2
Location No. 19	E:517137 N:563211	Overrun Area=85 m^2 Area to be cleared for Oversail Boundary Vegetation to be Trimmed	Dry meadows and grassy verges - 85.47 m^2
Location No. 19A	E:516480 N:562950	Overrun Area=201 m^2	Dense bracken - 201.75 m^2
Location No. 20	E:515804 N:562521	Overrun Area=540 m^2	Dense bracken - 192.76 m^2 Buildings and artificial surfaces - 116.02 m^2 Buildings and artificial surfaces - 97.16 m^2 Scrub - 81.11 m^2
Location No. 20A	E:514912 N:561795	Overrun Area=300 m^2 Area to be cleared for Oversail	Dry meadows and grassy verges - 237.74 m^2 Scrub - 59.40 m^2
Location No. 20B	E:514461 N:561642	Overrun Area=90 m^2 Boundary Vegetation to be Trimmed	Wet heath - 90.63 m^2
Location No. 21	E: 514148 N:561110	Overrun Area=255 m^2, Area to be cleared for Oversail	Dry meadows and grassy verges – 118.38 m^2 Buildings and artificial surfaces – 125.96 m^2 Stonewall - 12.45 m (length) Drainage ditch - 19.54 m (length)
Location No. 21A	E:513671 N:560837	Overrun Area=345 m^2 Area to be cleared for Oversail	Dry meadows and grassy verges – 179.97 m^2 Buildings and artificial surfaces – 163.14 m^2

No.	ITM (Easting / Northing)	Description	Habitat Loss
Location No. 22	E:513395 N:560551	Overrun Area=940 m^2 Area to be cleared for Oversail	Dry meadows and grassy verges – 217.81 m^2 Buildings and artificial surfaces – 141.04 m^2 Improved agricultural grassland – 289.43 m^2
Location No. 28	E:543962 N:566922	Blade Laydown Area Area=12,000 m^2	Improved agricultural grassland – 12000.00 m^2
Location No. 29	E:539792 N:563872	Blade Laydown Area Area=12,000 m^2	Improved agricultural grassland – 12000.00 m^2 Hedgerow - 62.75 m
Location No. 30	E:506514 N:556534	Blade Laydown Area Area=12000 m^2	Improved agricultural grassland – 12000.00 m^2

It is noted that the construction of the proposed underground Grid Connection and along the haul route will progress in a sequential manner along both routes. Therefore, the works in any one location will be of a temporary duration only. Because the works will progress relatively quickly along a linear corridor, any fugitive noise will be highly localised, temporary and are not expected to be of sufficient magnitude to create any disturbance or displacement impacts outside of areas contiguous or adjacent to the corridor. These adjacent habitats are widespread in the surrounding area therefore any resident species can easily move in response to any temporary disturbance. It is also noted that these areas are located along existing roads which are subject to ongoing management including hedge cutting and traffic, therefore the habitats are already subject to disturbance.

7.5.1.1 Direct Effects: Habitat Loss or Alteration

Habitat loss can be direct through land take of breeding or foraging habitats for key species or indirect such as effective habitat loss through avoidance or disturbance due to the above factors. For direct effects during construction, land take of potential breeding or foraging habitat is the primary effect. This may constitute land stripping or vegetation removal affecting ground nesting birds, hedgerow removal or trimming if this takes place during the breeding season and loss of nesting or roosting sites such as trees. Some species (for example sand martin) may also be affected through material extraction requirements for construction purposes.

Effects on avifauna are to be assessed following guidance in Percival (2007). As outlined previously, key avian receptors have been assigned an evaluation of importance (or sensitivity) for assessment. Following this, the significance of potential effects are rated as a

product of both the magnitude of the predicted effect and the importance value (sensitivity) of the key receptor affected, based on the probability of the likely effect occurring.

The construction of the wind farm tracks, Turbine Foundations and Turbine Hardstands, the Onsite Substation and Control Building compound, Temporary Construction Compound and other infrastructure will result in some habitat damage and loss. For further details on predicted habitat losses please see **Chapter 6: Biodiversity**.

For the purpose of the consideration of the potential effects on birds, species have been grouped into four categories namely passerines, birds of prey, game birds and waders/waterfowl.

A passerine is any bird of the order Passeriformes, which includes more than half of all bird species. A notable feature of passerines is the arrangement of their toes (three pointing forward and one back) which facilitates perching. The group are sometimes known as perching birds or, less accurately, as songbirds. Pigeon/dove belong to the order Columbidae comprised of birds with stout bodies, short necks, and slender bills which primarily feed on seed, fruits, and plants. Bird of prey are raptors that actively hunt other bird species. Gamebirds are birds that traditionally could be hunted, and terrestrial species often include pheasants and grouse, of which Red Grouse is an example. Waders are shorebirds with the majority of species eating small invertebrates picked out of mud or exposed soil. Waterfowl are swimming gamebird and are comprised of duck, geese, and swan.

Passerines/Non-target Species

The loss of habitat due to the construction of the project has the potential to affect some passerines. Habitat loss is inevitable in the development of any wind farm, especially when the development of Turbine Foundations and Turbine Hardstands, access tracks and other associated construction is considered. This can result in reduced feeding and nesting opportunities for birds. However, direct habitat loss by the development of wind farms tends to be relatively small (Drewitt and Langston 2006).

The wind farm site is predominantly comprised of Wet Heath (31.24%), as well as a mosaic of Wet Heath HH3, Siliceous Rock ER3, and Acid Grassland GS3 (26.56%). Other habitats on Site include the following: Wet Grassland GS4/Acid Grassland GS3 (12.63%), Upland Blanket Bog PB2 (9.69%), Wet Heath HH3 Siliceous Rock ER3 Mosaic (7.80%), Dry Acid Grassland (4.61%), Wet Heath HH3/Acid Grassland GS3 Mosaic (3.99%), Wet Grassland GS4 (3.42%), and Dry Heath HH1/Siliceous Rock ER3 Mosaic (0.05%).

The Proposed Development will result in the loss of the following habitats:

- Wet heath HH3: 5.73 HA, 4.88%
- Wet Heath HH3/Siliceous Rock ER3/Acid Grassland GS3 Mosaic: 2.03 HA, 2.04%
- Wet Grassland GS4/Acid Grassland GS3: 0.99 HA, 2.08%
- Upland Blanket Bog PB2: 0.99 HA, 2.73%
- Wet Heath HH3/Siliceous Rock ER3 Mosaic: 0.39 HA, 1.35%
- Dry Acid Grassland GS3: 0.69 HA, 4.00%
- Wet Heath HH3/Acid Grassland GS3 Mosaic: 2.46 HA, 16.39%
- Wet Grassland GS4: 1.08 HA, 8.39%
- Dry Heath HH1/Siliceous Rock ER3 Mosaic: 0.01%, 4.55%

Additional works along the TDR and Grid Connection will result in the removal of trees as well as the trimming of branches along the corridor of the route.

Grey Wagtail forage along watercourses and may nest in bridges and buildings. As such this species will not be subject to the direct effect of habitat loss.

Goldcrest (Percival sensitivity: Medium), and Linnet (Percival sensitivity: Medium), typically use woodland and scrub habitats. There are no woodland habitats within the site and scrub habitat is marginal. Thus, these species have a Percival effect of **Negligible** (< 1% habitat lost).

Linnet are seed-eaters, and although they do require trees and shrubs for breeding, they also need open spaces, with seed, for foraging. Looking at a worst-case scenario, there will be a loss of 14.38 Ha of open peatland, heathland and semi natural grassland habitat which equates to 3.83% of total available suitable habitat for the species. This results in a *Long-term, Slight Effect in a local context* which is *Reversible* (Criteria: EPA, 2022). Percival effect significance is **Low** (1 – 5 habitat loss for open habitats).

Meadow Pipit (Percival sensitivity: High) and Skylark (Percival sensitivity: Medium) are ground-nesting birds, that uses open habitats with some low-lying vegetative cover (typically grassland and heath) for breeding and foraging purposes. While overgrazing of these habitats within the site by sheep has greatly limited the amount of suitable habitat for these species Meadow Pipit and Skylark continue to forage and nest within the heath and grassland habitats within the Proposed Development and the greater area. Looking at a worst-case scenario,

there will be a loss of 14.38 Ha of suitable habitat which equates to 3.83% of total available suitable habitat for the species. This results in a *Long-term, Slight Effect in a local context* which is *Reversible* (Criteria: EPA, 2022). Percival effect significance is **Low** (1 – 5 habitat loss for open habitats).

Wheatear (Percival sensitivity: Medium) is similar to Meadow Pipit and Skylark in that it requires open habitats with low lying vegetative cover, but with interspersed rocky areas for perching and feeding. There is a predicted loss of 3.83% of heathland, peatland and grassland. This results in a *Long-term, Slight Effect in a local context* which is *Reversible* (Criteria: EPA, 2022). Percival effect significance is **Low** (1-5% habitat loss).

Starlings (Percival sensitivity: Medium) primarily forage in grassland and open habitats, and typically nest in the eaves of old buildings, but also use cavities in mature trees and reedbeds. No nesting habitat shall be lost. However, looking at a worst-case scenario, there will be a loss of 3.83% of suitable foraging habitat for the species. Percival impact significance is **Low** (1 - 5% habitat loss for open foraging habitats), however, there is an abundance of grassland habitats in the surrounding area with ample trees and buildings for nesting, thus a *Temporary Imperceptible Effect* and *Reversible in a local context* is predicted for Starling.

House Sparrow (Percival sensitivity: Medium) breeds throughout Ireland and usually stays close to human habitation - mainly around farm buildings and built-up areas including parks and gardens. Nests in cavity in building, especially under eaves or holes formed by missing brickwork. There is an absence of suitable nesting habitats on-site, and therefore no effects are predicted in terms of nesting habitat for this species. Percival impact significance is **Low** (1 - 5% habitat loss for open foraging habitats), however, there is an abundance of grassland habitats in the surrounding area with ample trees and buildings for nesting, thus a *Temporary Imperceptible Effect* and *Reversible in a local context* is predicted for House Sparrow.

Redwing (Percival sensitivity: High) are winter visitors which uses trees and open habitats to forage in. This species has been added to the red list due to the severity of long and short-term declines in its wintering population. There will be a loss of 14.38 Ha of open habitat which equates to 3.83% of total available suitable habitat for the species. Percival effect significance is **Low** (1-5% habitat lost). Furthermore, suitable foraging habitat is generally abundant in agricultural landscapes which are commonplace in the surrounding landscape. Thus, a *Temporary Imperceptible Effect* and *Reversible in a local context* is predicted for Redwing.

Barn Swallow, House Martin and Sand Martin (Percival significance: Medium) are aerial species that forage over open habitats. Barn Swallow and House Martin require buildings for nesting, and Sand Martin typically nest in sand banks or crevices in walls or bridges. There is no suitable breeding habitat for these species on site, and as such, habitat loss is not envisaged to effect this species.

Whinchat (Percival sensitivity: High) are a seasonal visitor and are typically found in moorland habitats, as well as grass and heathlands during the breeding season. Looking at a worst-case scenario, there will be a loss of 3.83% of total available suitable habitat for the species. This results in a *Long-term, Imperceptible Effect* and *Reversible in a local context* (Criteria: EPA, 2022).

Willow Warbler (Percival sensitivity: Medium) are predominantly found along the edges of bogs and marshes, and less frequently recorded in hedgerows, woodlands and well-vegetated gardens. The potential effects are *Long-term* and *Slight* in a local context which is *Reversible* (Criteria: EPA, 2022). Percival effect significance is **Low** (1-5% habitat loss).

It is not expected that the proposed development will cause a reduction in the Baseline population of passerines as the area of nesting/foraging habitat lost will be *Imperceptible to Slight*. It is considered that the proposed effect of habitat loss will be a *Permanent Imperceptible to Not Significant Effect in a local context* which is *Reversible*. However, the trimming of vegetation along with the removal of scrub or felling of trees during the nesting season for birds could result in a *Localised Temporary Significant Reversible Effect* to nesting birds if it were to be undertaken during the bird nesting season (1st March – 31st of August).

Birds of Prey, Red Grouse and Waders/Waterfowl – Other Target Species

Table 7.25 below displays the direct effect character during construction as well as the significance of effects without the implementation of mitigation.

Table 7.25: Effect of habitat loss to target species

Key Receptor (Sensitivity)	Construction Direct Effect Character	Significance without mitigation
Buzzard (Low)	Buzzards were recorded on 37 occasions across all five breeding seasons. The majority of which recorded Buzzards flying wholly within or partially within the 500m buffer zone. Some records also observed Buzzards hunting within the Site. No breeding activity was detected over the course of the five-year survey period, and there are no suitable habitats to support breeding Buzzards due to the absence of mature	**Sensitivity:** Low **Magnitude:** Low (1-5% habitat loss) **Overall significance:** Very Low. (Criteria: Percival, 2003) Loss of foraging habitat will be a **Long-term Imperceptible** based on the fact

Key Receptor (Sensitivity)	Construction Direct Effect Character	Significance without mitigation
	trees. In comparison to surveys during the breeding season, very few records of Buzzards were made across the five-winter flight activity survey seasons. No observations of Buzzard were made during the 2020/21 and 2021/22 winter seasons, and only six records were made across the remaining three winter survey seasons. However, Buzzards were recorded flying over and hunting within the Site in the northern portion of the flight activity survey area, and hunting to the north-west of the Site. Looking at a worst-case scenario, there will be a loss of 14.38 Ha of suitable habitat which equates to 3.83% of total available suitable habitat for the species.	that breeding habitat is not available on site and the species is common and increasing (Criteria: EPA, 2022)
Chough (Very High)	Chough is typically associated with coastal grassland and montane habitats, such as machair, sand dunes, dry heath, vegetated cliffs and low-intensity pastoral grasslands. Chough were recorded during surveys throughout the five-year survey period. The majority of records occurred outside of the 500m buffer zone, to the north-west of the Site. Records were also recorded to the south-east outside of the Proposed Development, where successful breeding has been observed. Within the Site, no breeding or nesting behaviours were detected. Of the few records that occurred within the 500m buffer zone, Chough were predominantly flying over / commuting through the Site. Therefore, habitat loss is not envisaged to result in a significant effect this species.	**Sensitivity:** Very High **Magnitude:** Negligible **Overall significance:** Low Loss of habitat will be a **Long-term, Slight** effect, based on lack of suitable foraging and breeding habitats on-site, and due to low numbers of sightings (Criteria: EPA, 2022).
Cormorant (Low)	Cormorant were observed seven times across breeding and non-breeding season flight activity surveys. Most records occurred outside of the Proposed Development, near Lough Nambrackderg. However, this species was recorded for a total of 35 seconds within the flight activity survey area over five years of surveys, where it was observed flying to / from Lough Nambrackderg. Cormorants predominantly breed and forage along the coast and feed on fish. The streams/drainage ditches within the redline boundary are not suitable to support breeding or wintering populations of cormorant. Therefore, no significant effects of direct habitat loss are envisaged.	**Sensitivity:** Low **Magnitude:** Negligible **Overall significance:** Very Low Loss of habitat will be a **Long-term Imperceptible** effect, based on minimal sightings within the Site, and a lack of suitable breeding and foraging habitats (Criteria: EPA, 2022).
Curlew (High)	Curlew were recorded once throughout the five years of flight activity (VP) surveys, which occurred outside of the 500m buffer zone. There were no records of Curlew within the Proposed Development. This species was not recorded during breeding or winter walkovers. Curlew are ground-nesting species, that nest in rough pastures, meadows and heather. During the winter season, this species prefers a wide range of inland and coastal wetland habitats. With no records of Curlew within the Site over five years of surveys and the lack of breeding evident, the resultant habitat loss will not be significant. Due to the absence of suitable foraging and breeding habitats on-site, habitat loss is not envisaged to effect this species.	**Sensitivity:** High **Magnitude:** Negligible **Overall significance:** Low Loss of habitat will be a **Long-term, Imperceptible** effect, based on minimal sightings within the Site (Criteria: EPA, 2022).
Dunlin (Very High)	This species was not recorded during any breeding or winter walkovers; however it was noted on one occasion during the 2020 breeding season flight activity surveys. This record observed three individuals flying within the flight activity survey area, near Turbine T4. No evidence of this species	**Sensitivity:** Very High **Magnitude:** Negligible **Overall significance:** Low

Key Receptor (Sensitivity)	Construction Direct Effect Character	Significance without mitigation
	landing or using the habitats within the Proposed Development was made. This ground-nesting species typically inhabits sparse, low vegetation habitats; winters primarily in coastal areas; and feeds in muddier sections of estuarine mudflats. Due to the absence of suitable foraging and breeding habitats on-site, habitat loss is not envisaged to effect this species.	Loss of habitat will be a **Long-term, Imperceptible** effect, based on lack of suitable foraging and breeding habitats on-site, and due to low numbers of sightings (Criteria: EPA, 2022).
Golden Plover (Very High)	Golden Plover were not recorded during the 2020/21 winter season. However, 41 records were made across the five years of surveys. A total of 25 occurred within or partially intersected the 500m buffer zone over the entire 5-year period, an average of 5 flights per year. However, they were not recorded during breeding or winter walkover surveys. Golden Plover breed on open upland habitats (which includes blanket bogs, heather dominated areas and marginal grasslands), where they are known to favour areas of short vegetation (<10 cm), particularly dominated by heather mixed with grasses (Parr, 1980; Whittingham et al., 2001). The species has a restricted range in Ireland, breeding in upland areas in the north-west. There was no evidence of breeding or roosting within the study area and immediately surrounding areas during the non-breeding season. Typically the species forage in arable fields, wetlands, short-cropped heath, mainly coastal species. Looking at a worst-case scenario, there will be a loss of 14.38 Ha of suitable habitat which equates to 3.83% of total available suitable habitat for the species.	**Sensitivity:** Very High **Magnitude:** Low (1-5% habitat loss) **Overall significance:** Medium Loss of habitat will be a **Long-term Slight to Moderate** effect (Criteria: EPA, 2022).
Great Black-backed Gull (Low)	Great Black-backed Gull were only observed within the flight activity survey area on two occasions over five years of surveys. Both records observed two individuals flying during the 2023/24 non-breeding season and summer 2022. Observations exclusively were of birds flying over the Site, and no records exists of Great Black-backed Gulls landing in or using the habitats within the 500m buffer zone. Although this species nests primarily on the coast, it is also known to nest on buildings, in larger towns and cities. Birds nesting inland occur near larger waterbodies, and thus there is no scope for breeding on-site. Habitats on site are also largely unsuitable for foraging birds. Therefore, habitat loss is not envisaged to effect this species.	**Sensitivity:** Low **Magnitude:** Negligible **Overall significance:** Very Low Loss of habitat will be a **Long-term Imperceptible** effect, based on minimal sightings within the Site, and a lack of suitable breeding and foraging habitats (Criteria: EPA, 2022).
Grey Heron (Low)	Grey Heron were observed 13 times during flight activity surveys. A total of 11 of these records occurred outside of the 500m buffer zone, near Lough Nambrackderg, which is situated c. 1.08km from the Site. Habitats on site are also largely unsuitable for foraging birds. Therefore, habitat loss is not envisaged to effect this species.	**Sensitivity:** Low **Magnitude:** Negligible **Overall significance:** Very Low Loss of habitat will be a **Long-term Imperceptible** effect, based on minimal sightings within the Site, and a lack of suitable breeding and foraging habitats (Criteria: EPA, 2022).
Hen Harrier (Very High)	Hen Harrier were recorded very infrequently across summer and winter flight activity surveys. This species was recorded within the flight activity survey area six times across five years of winter and breeding season flight activity surveys. The species was observed on two occasions within the 500m buffer of the site over five consecutive breeding	**Sensitivity:** Very High **Magnitude:** Low (1-5% habitat loss) **Overall significance:** Medium

Key Receptor (Sensitivity)	Construction Direct Effect Character	Significance without mitigation
	seasons. No evidence of winter roosting was recorded over the five-year period. Hen Harrier typically forage over heath, bog, low intensively farmed grassland with well-established hedgerows and areas of scrub (Irwin et al., 2012). Heath and bog habitats are important hunting and nesting grounds for Hen Harrier. There were no records of breeding or nesting within the Proposed Development or immediate wider environment, hunting was observed. Looking at a worst-case scenario, there will be a loss of 14.38 Ha of suitable habitat which equates to 3.83% of total available suitable habitat for the species in the site boundary. However, loss of habitat types alone does not provide a complete picture and the very low number of sightings over five years of surveys reduces the potential for effects.	Loss of foraging habitat will be a **Long-term Slight to Moderate** effect due to the low number of sightings of hunting (3 observations in 5 years) within the 500m buffer of the sites (Criteria: EPA, 2022).
Kestrel (High)	Kestrel were observed a total of 51 times during the breeding season, and 18 times during the non-breeding season intersecting the 500m buffer zone over five years of surveys (an average of 13.8). This species typically breeds and forages in conifer plantation, dry heath, dry meadows, grassy verges, improved agricultural grassland, recently felled woodland and scrub - thus the species is rather flexible in its habitat needs. No breeding behaviours were observed over the course of the five-year survey period, however the site was used by commuting and foraging birds. There will be a loss of 14.38 Ha of potential foraging habitat which equates to 3.83% of total available suitable habitat for the species.	**Sensitivity:** High **Magnitude:** Low (1-5% habitat loss) **Overall significance:** Low Loss of habitat will be a **Long-term, Slight** effect, (Criteria: EPA, 2022).
Lesser Black-backed Gull (Medium)	This species was recorded a total of 25 times during breeding season flight activity surveys, and once during the winter season over five years of flight activity surveys. However, only six records in 5 years occurred within the 500m buffer zone, and the remaining 20 records occurred outside of the 500m buffer zone on or near Lough Nambrackderg c. 1.08km to the north of the Site. Breeding and roosting were not observed within the site over the five-year survey period. Although this species nests primarily on the coast, it is also known to nest on buildings, in larger towns and cities. Birds nesting inland occur near larger waterbodies, and thus there is no scope for breeding on-site. Habitats on site are also largely unsuitable for foraging birds. Therefore, habitat loss is not envisaged to effect this species.	**Sensitivity:** Medium **Magnitude:** Negligible **Overall significance:** Very Low Loss of breeding and/or foraging habitat will be a **Long-term Imperceptible** effect due to minimal sightings on site, and lack of suitable breeding and foraging habitats (Criteria: EPA, 2022).
Peregrine (Very High)	Peregrine were recorded infrequently across the five-year survey period, the predominantly brief observations consisted of Peregrine (adults and juveniles) flying over and hunting within the 500m buffer zone. However, no breeding behaviour was observed within the Site over the five year period. Peregrine were recorded a total of twelve times during breeding season flight activity surveys, and five times during non-breeding season flight activity surveys over five years of surveys. Peregrine require tall cliff-faces or man-made structures which resemble these, for breeding. No such habitats or structures occur on site. Peregrines are aerial hunters which dive on prey from above and as such are not strictly limited to any particular habitat, instead they	**Sensitivity:** Very High **Magnitude:** Negligible **Overall significance:** Low Loss of habitat will be a **Long-term, Imperceptible** effect based on a lack of suitable breeding habitat on site (Criteria: EPA, 2022)

Key Receptor (Sensitivity)	Construction Direct Effect Character	Significance without mitigation
	require sufficient numbers of avian prey. As such, there are no envisaged habitat loss impacts on the species.	
Red Grouse (High)	This species was not observed during the latest two years of breeding season flight activity surveys (2023 and 2024). However, this species was recorded 11 times during VPs. Six observations occurred within the 500m buffer zone. Many records were call-only. The site holds one pair of breeding Red Grouse located outside the footprint of the proposed development with a second pair recorded outside the site. Red Grouse require heather for both food and shelter/nesting. Overgrazing of the peatlands within the site by sheep has greatly limited the amount of suitable habitat for the species. The nesting locations recorded during surveys were confined to discrete pocket of land which were less accessible to sheep and held taller stands of heather at the time of the surveys. Neither of these nesting locations are located within the footprint of the development. Looking at a worst-case scenario, considering all peatland/heathland habitats and mosaics there will be a loss of 11.62 Ha of suitable habitat which equates to 3.9% of total available suitable habitat for the species within the site.	**Sensitivity:** High **Magnitude:** Low (1-5% habitat loss) **Overall significance:** Low Loss of breeding and/or foraging habitat will be a **Long-term Slight** effect (Criteria: EPA, 2022).
Snipe (High)	Snipe were observed five times during the breeding season flight activity surveys, and 19 times during the non-breeding season flight activity surveys. The majority (19) occurred outside the 500m buffer zone. Snipe were also recorded during the winter walkovers, however no records were made during the summer walkovers or breeding wader walkovers. Snipe are ground-nesting birds that breed in grassy tussocks in or adjacent to bog habitats. Snipe are commonly found in bog and wet grassland habitats during the breeding season, as well as wetland habitats and lowland lake shores during the non-breeding season. Although Snipe were not recorded within the Proposed Development, there are records of this species in the immediate surroundings and there is habitat on-site to support this species. Looking at a worst-case scenario, there will be a loss of 14.38 Ha of potential foraging habitat which equates to 3.83% of total available suitable habitat for the species within the site.	**Sensitivity:** High **Magnitude:** Low (1-5% habitat loss) **Overall significance:** Low Loss of breeding and/or foraging habitat will be a **Long-term Imperceptible to Not Significant** effect due to minimal sightings on site (Criteria: EPA, 2022).
Sparrowhawk (Low)	Sparrowhawk were recorded a total of 7 times during the breeding season, and 5 times during the non-breeding within the 500m buffer of the site over the 5 year survey period (an average of 2.4 sightings a year). Both adults and juveniles were observed on a very infrequent basis. No breeding or roosting was recorded. Hinterland surveys indicate this species is also widely present in the wider environment. This species requires mature trees for nesting and are commonly found in coniferous plantations. A second key requirement is an abundance of small birds, including Meadow Pipit and Skylark. Although Meadow Pipit and Skylark are present, the site does not contain habitats to support breeding Sparrowhawk. Hunting was observed on-site, however this is an aerial bird and feeds on prey caught in flight. Looking at a worst-case scenario, there will be a loss of 14.38 Ha of potential foraging habitat which equates to 3.83% of total available suitable habitat for the species within the site.	**Sensitivity:** Low **Magnitude:** Negligible **Overall significance:** Very Low Loss of habitat will be a **Long-term Imperceptible** effect, based on minimal sightings within the Site, (Criteria: EPA, 2022).
Swift (High)	Swift were recorded once during the 2023 breeding season flight activity surveys, where two birds were recorded	**Sensitivity:** High

Key Receptor (Sensitivity)	Construction Direct Effect Character	Significance without mitigation
	hunting in the north-east of the study area. This species breeds throughout Ireland, usually in small recesses in buildings, both occupied and derelict, and less frequently in holes in trees or caves in uplands or coastal areas. Swift feed exclusively on various invertebrates (midges, flies, spiders) caught in flight. Optimal breeding habitat does not occur on site, and forages in open aerial habitats, thus habitat loss is not envisaged to be a big factor with this species.	**Magnitude:** Negligible **Overall significance:** Very Low Loss of habitat will be a **Long-term, Imperceptible** effect, based on a low number of sightings (Criteria: EPA, 2022)
Teal (Medium)	Teal were observed ten times during the breeding season flight activity (VP) surveys, and once during the non-breeding season flight activity surveys. Of which, only one record of Teal was made within the 500m buffer zone, where three individuals were observed in a pool. All other records were found c. 1.08km from the Site, at Lough Nambrackderg, where successful breeding was observed. This species usually nests near small freshwater lakes or pools and small upland streams away from the coast, and also in thick cover. Teal typically forage in similar habitats, Therefore, the site does not have potential to host breeding and foraging birds, and is unlikely to be effected by habitat loss.	**Sensitivity:** Medium **Magnitude:** Negligible **Overall significance:** Very Low Loss of foraging habitat will be a **Long-term, Imperceptible** effect, based on a low number of sightings, as well as a lack of suitable breeding/foraging habitat on site (Criteria: EPA, 2022)

7.5.1.2 Indirect Effects: Disturbance and Displacement

High levels of activity and disturbance during construction may cause birds to vacate territories close to works, especially for species vulnerable to disturbance. The displacement of birds from areas within and surrounding developments can effectively amount to habitat loss (Drewitt, A. L. and Langston, R. H., 2006). If a habitat is therefore avoided as a result of the disturbance, then effective habitat loss can occur. Examples of causes of disturbance during construction which may lead to displacement are vehicle and personnel movements, vibration and noise impacts from the construction process and visual intrusion (Drewitt, A. L. and Langston, R. H., 2006).

Additional effects may occur during the construction process due to road works along turbine delivery routes, the laying of cabling, the placement of underground cabling, re-working structures such as bridges along turbine delivery routes, and excavation of materials.

Studies both during construction (Pearce-Higgins *et al*., 2012) and during operational effects of wind farms (Pearce-Higgins *et al*., 2009) have shown that certain species (e.g. large wading species) can be affected particularly as a result of construction impacts (in that the affected species fail to recover to pre-construction densities).

Indirect effects may occur on species linked to aquatic habitats through pollution events, sediment laden runoff and dust deposition.

Table 7.26: Indirect Construction Effects on Avifauna

Key Receptor (Sensitivity)	Construction Indirect Effect Character	Significance without mitigation
Buzzard (Low)	Buzzards were recorded on 37 occasions across all five breeding seasons. The majority of which recorded Buzzards flying wholly within or partially within the 500m buffer zone. In comparison to surveys during the breeding season, very few records of Buzzards were made across the five winter flight activity survey seasons. No observations of Buzzard were made during the 2020/21 and 2021/22 winter seasons, and only six records were made across the remaining three winter survey seasons. No breeding behaviour was observed, and there are no suitable habitats on Site for such due to the absence of tall mature trees. However, Buzzards were recorded flying over and hunting within the northern portion of the flight activity survey area, and hunting to the north-west of the Site. Therefore, there is potential for noise or visual disturbance to foraging Buzzard within the Site.	**Sensitivity:** Low **Magnitude:** Medium **Overall significance:** Very Low (Percival, 2003) Disturbance and/or displacement will be a **Short term, Slight** effect (Criteria: EPA, 2022).
Chough (Very High)	Chough were recorded during surveys throughout the five-year survey period, however the vast majority of activity was situated outside of the 500m buffer zone, to the north-west of the Site. Here, foraging was observed. 2.32km to the south-west of the Site at HVP5 Cousane Gap, successful breeding was confirmed. However, breeding behaviour was observed within the 500m buffer zone. Only twelve records occurred within this flight activity survey area over five years of surveys, where Chough were recorded flying / commuting through the Site. As this species does not regularly forage or breed within on-site habitats, there is no potential for visual or noise disturbance.	**Sensitivity:** Very High **Magnitude:** Negligible (few sightings within the Site, and no evidence of regular habitat usage) **Overall significance:** Low (Percival, 2003) Disturbance and/or displacement will be a **Short term, Imperceptible** effect (Criteria: EPA, 2022).
Cormorant (Low)	Cormorant were predominantly recorded outside of the site, near Lough Nambrackderg. Only one record of this species exists within the flight activity survey area, where one individual was observed commuting over the Site. Due to the absence of suitable foraging habitats (wetlands) on-site, and absence of records of Cormorants landing on / using on-site habitats, it is unlikely that this species would be effected via noise or visual disturbance.	**Sensitivity:** Low **Magnitude:** Negligible **Overall significance:** Very Low Disturbance and/or displacement will be a **Short term, Imperceptible** effect (Criteria: EPA, 2022).
Curlew (High)	Curlew were recorded once throughout the five years of flight activity (VP) surveys, which occurred outside of the 500m buffer zone. There were no records of Curlew within the Proposed Development. This species was not recorded during breeding or winter walkovers. Curlew are ground-nesting species, that nest in rough pastures, meadows and heather. During the winter season, this species prefers a wide range of inland and coastal wetland habitats. With no records of Curlew within the Site over five years of surveys and the lack of breeding evident, the resultant habitat loss will not be significant. Due to the absence of suitable foraging and breeding habitats on-site, habitat loss is not envisaged to effect this species.	**Sensitivity:** High **Magnitude:** Negligible **Overall significance:** Low Loss of habitat will be a **Long-term, Imperceptible** effect, based on minimal sightings within the Site (Criteria: EPA, 2022).
Dunlin (Very High)	This species was observed within the 500m buffer zone on only one occasion, where birds were recorded commuting across the Site.	**Sensitivity:** Very High **Magnitude:** Negligible **Overall significance:** Low

Key Receptor (Sensitivity)	Construction Indirect Effect Character	Significance without mitigation
	This species typically feeds on small invertebrates (polychaete worms and small gastropods) in muddier sections of estuarine mudflats. Due to the absence of suitable foraging habitats on-site, there is no potential for foraging birds to be indirectly effected by noise or visual disturbance. No breeding or roosting behaviour was observed. Dunlin are ground-nesting birds, that typically breed in sparse, low vegetation and favour machair habitats. Due to the absence of suitable breeding habitats on-site, there is no potential for breeding birds to be indirectly effected by noise or visual disturbance.	Disturbance and/or displacement will be a **Short term, Imperceptible** effect (Criteria: EPA, 2022).
Goldcrest (Medium)	Goldcrest were recorded during breeding bird transects and VP surveys, as a secondary target species. This species typically uses woodland, treeline and scrub habitats to forage. As a result, due to the absence of suitable on-site habitats, it is unlikely that Goldcrest would be indirectly effected by visual or noise disturbance.	**Sensitivity:** Medium **Magnitude:** Negligible **Overall significance:** Very Low Disturbance and/or displacement will be a **Short-term, Imperceptible** (Criteria: EPA, 2022).
Golden Plover (Very High)	Human related disturbance for Golden Plover can occur at distances of up to 200-500m (NatureScot, 2025). Goodship and Furness (2022) note that disturbance studies on Golden Plover are more limited during the nonbreeding season although flocks can be disturbed on foraging and roosting grounds; Ross and Liley (2014) reported high flush rates for Golden Plover around the Humber estuary during the winter. However, the studies in question relate to breeding sites, roosting sites and established foraging habitats. There was no evidence over the 5 years of surveys of breeding or roosting onsite. All records indicate Golden Plover recorded within the Site, were exclusively commuting through the study area. As such, it is unlikely that Golden Plover would be indirectly effected significantly by visual or noise disturbance and the effects are considered to be similar to that of the worst-case scenario effect due to habitat loss.	**Sensitivity:** Very High **Magnitude:** Low (1-5% habitat loss) **Overall significance:** Medium Loss of habitat will be a **Short-term-term Slight to Moderate** effect (Criteria: EPA, 2022).
Great Black-backed Gull (Low)	This species was observed commuting through the 500m buffer zone on two occasions during flight activity surveys. This species was not observed during any other survey across the Site. Additionally, no evidence of Great Black-backed Gull foraging on site was recorded. As there are no such habitats within or near the Site, there is no potential to indirectly effect breeding birds. Therefore it is unlikely that Great Black-backed Gull would be indirectly effected by visual or noise disturbance	**Sensitivity:** Low **Magnitude:** Negligible **Overall significance:** Very Low Disturbance and/or displacement will be a **Short-term, Imperceptible** effect (Criteria: EPA, 2022).
Grey Heron (Low)	Grey Heron were observed 13 times during flight activity surveys. A total of 11 of these records occurred outside of the 500m buffer zone, near Lough Nambrackderg, which is situated c. 1.08km from the Site. Habitats on site are also largely unsuitable for foraging birds. Therefore, habitat loss is not envisaged to effect this species.	**Sensitivity:** Low **Magnitude:** Negligible **Overall significance:** Very Low Disturbance and/or displacement will be a **Long-term Imperceptible** effect, based on minimal sightings within the Site, and a lack of suitable breeding and foraging habitats (Criteria: EPA, 2022).
Grey Wagtail (High)	This species was recorded three times during breeding bird transects, and twice during Hinterland surveys. Grey Wagtail are typically associated with fast-flowing waters such as streams and rivers, however they may also be found near lakes.	**Sensitivity:** High **Magnitude:** Negligible **Overall significance:** Very Low

Key Receptor (Sensitivity)	Construction Indirect Effect Character	Significance without mitigation
	Due to the absence of such habitats on-site, lack of observations of Grey Wagtail landing in or using the habitats on-site, and lack of breeding potential on-site, noise or visual disturbance is highly unlikely to be an issue with this species.	Disturbance and/or displacement will be a **Short-term, Imperceptible** effect (Criteria: EPA, 2022).
Hen Harrier (Very High)	A non-quantitative study suggests that Hen Harrier will stay at least 188m away from human habitation (Goodship and Furness, 2022). Ruddock and Whitfield (2007) considered from expert opinion that the upper pedestrian disturbance distance limit for Hen Harrier during the breeding season is 500-750m. Hen Harrier will nest at 200 to 300m from an operational wind turbine (Madders and Whitfield 2006) or closer (Ruddock and Whitfield, 2007). Hen Harrier is most likely to be disturbed at nest sites early on in the breeding season as well as at communal roosting areas and potentially foraging grounds during the nonbreeding season. Depending on the level of habituation to disturbance, a buffer zone of 300-750m is suggested to protect both breeding and nonbreeding Hen Harriers from pedestrian and aircraft disturbance, but habituation to disturbance influences the size of the buffer required and further studies on the impacts of human disturbance are required to help inform such decisions (Goodship and Furness, 2022). The same study also noted that a buffer zone at the lower end of this range may be sufficient to protect individuals that have some habituation to disturbance. However, the studies in question relate to breeding sites, roosting sites and established foraging habitats. There was no evidence over the 5 years of surveys of breeding, roosting or regular foraging onsite. Over the 5 year period Hen Harrier were recorded a total of 11 occasions and only six of these observations occurred within 500m of a turbine. Of these 4 occurred in total across the five winter seasons and 2 occurred over the 5 breeding seasons. With no evidence of nesting, roosting or foraging within the study area the potential for noise or visual disturbance to Hen Harrier is considered to be Imperceptible.	**Sensitivity:** Very High **Magnitude:** Negligible **Overall significance:** Low Disturbance and/or displacement will be a **Short-term, Imperceptible** effect (Criteria: EPA, 2022).
House Martin (Medium)	House Martin were observed during breeding season flight activity surveys. During the breeding season, House Martin require buildings or cliffs to construct their nests. Due to the absence of suitable habitats, it is unlikely that this species breeds on-site. This bird is an aerial species that forages over open habitats, and is typically found in pastures, arable lands, villages and towns. However, it can also occur in heathland and moorland. As such, there is potential for occasional foraging House Martin on the Site. Therefore, there is possible noise/visual intrusion disturbance to foraging birds within the Site.	**Sensitivity:** Medium **Magnitude:** Medium **Overall significance:** Low Disturbance and/or displacement will be a **Short-term, Slight** effect (Criteria: EPA, 2022).
House Sparrow (Medium)	House Sparrows were only recorded once during flight activity surveys, where Sparrows were flushed en route to VP 2 during the 2020/21 non-breeding season. This species can be found in a range of habitats, including urban and sub-urban areas, pastures and arable lands, woodlands, and coastal habitats. House Sparrow breed throughout Ireland, but typically remains close to human habitation including farm buildings and built-up areas such as parks and gardens. This species nests in cavities in buildings, especially under eaves or holes formed by missing brickwork. As this species does not breed or have the potential to breed on-site, and as there is just one record, noise or visual disturbance is highly unlikely to be an issue with this species.	**Sensitivity:** Medium **Magnitude:** Negligible **Overall significance:** Very Low Disturbance and/or displacement will be a **Short-term, Imperceptible** effect (Criteria: EPA, 2022).
Kestrel (High)	Kestrel is assessed to have a low to medium sensitivity to human disturbance and Goodship and Furness, (2022) cite a buffer zone of between 100-200m during the breeding season and ≤ 50m during the non-breeding season.	**Sensitivity:** High **Magnitude:** Low **Overall significance:** Low

Key Receptor (Sensitivity)	Construction Indirect Effect Character	Significance without mitigation
	Kestrel were recorded 102 times during the breeding season flight activity surveys, and 32 times during the non-breeding season flight activity surveys. However, a little over half of these observations (69) intersected the 500m buffer zone. Included in this number are observations which partially intersected this buffer zone. The 100-200m buffer zone is suggested to protect nesting Kestrels from forestry operations. No breeding (nesting) or roosting was detected throughout the five-year survey period. However, Kestrels were observed hunting within the Site and the greater study area. Therefore, there is possible noise/visual intrusion disturbance to foraging birds within the Site. The effect is reduced however given the availability of habitat greater than the maximum 200m buffer from turbines where the majority of activity was concentrated.	Disturbance and/or displacement will be a **Short-term, Slight** effect (Criteria: EPA, 2022).
Lesser Black-backed Gull (Medium)	Lesser Black-backed Gull were primarily recorded during the breeding season, outside of the 500m buffer zone during flight activity surveys. However, there are six records of this species within the Site over 5 years of surveys. No foraging or breeding behaviours were observed, and it appears this species was commuting / flying through the Site towards Lough Nambrackderg (1.08km from the Site), where the majority of observations were made. As this species does not have the potential to breed within the Site, is unlikely to forage within the Site, and is only recorded commuting through the flight activity survey area, noise and visual disturbance is unlikely to effect this species.	**Sensitivity:** Medium **Magnitude:** Negligible **Overall significance:** Very Low Disturbance and/or displacement will be a **Short-term, Imperceptible** effect (Criteria: EPA, 2022).
Linnet (Medium)	Linnet were recorded during breeding season flight activity surveys. Breeding does not occur on-site, nor is there suitable habitat to support breeding, as this species prefers rough grasslands in upland and coastal areas with gorse. Typically this species forages in woodland, treeline and scrub habitats. However, they may forage in heathland, moorland and bogland habitats. Although there are few records of this species across the five-year survey period, there is limited potential for noise / visual disturbance to effect foraging Linnet.	**Sensitivity:** Medium **Magnitude:** Low **Overall significance:** Low Disturbance and/or displacement will be a **Short-term, Slight** effect (Criteria: EPA, 2022).
Meadow Pipit (High)	Meadow Pipit were recorded frequently across flight activity surveys, and breeding and winter walkover surveys. This is a ground-nesting species that uses open habitats with low-lying vegetation, typically grassland and heathland for breeding and foraging purposes. As such, there is potential for noise and visual disturbance to effect this species.	**Sensitivity:** High **Magnitude:** Low **Overall significance:** Low Disturbance and/or displacement will be a **Short-term, Slight** effect (Criteria: EPA, 2022).
Peregrine (Very High)	Peregrine were recorded infrequently across the five-year survey period, the predominantly brief observations consisted of Peregrine (adults and juveniles) flying over and hunting within the 500m buffer zone. Goodship and Furness, (2022) cite buffer zones to protect breeding Peregrines from forestry operations in the UK range from 200 to 600m. A safe working distance for aircraft in Scotland is considered to be 500-750m (lateral). However, no breeding or nesting has been recorded, and there is no potential for breeding within the Site given the habitats present. Therefore, the resultant potential for effects is considered to be reduced.	**Sensitivity:** Very High **Magnitude:** Negligible **Overall significance:** Low Disturbance and/or displacement will be a **Short-term, Imperceptible to Slight** effect (Criteria: EPA, 2022).
Red Grouse (High)	This species requires heather for both food and shelter/nesting, and thus can be found in heath and bog habitats, where heather is abundant (where overgrazing is not a prevalent). Pearce-Higgins et al. (2012) has found that densities of Red Grouse, were reduced on	**Sensitivity:** High **Magnitude:** Low **Overall significance:** Low

Key Receptor (Sensitivity)	Construction Indirect Effect Character	Significance without mitigation
	wind farms during construction, although Red Grouse densities appeared to recover by the first year of operation. Therefore, there is potential for noise and visual disturbance to effect this species in the short-term with the one pair within the site expected to return post construction.	Disturbance and/or displacement will be a **Short-term, Moderate** effect (Criteria: EPA, 2022).
Redwing (High)	This species favour open fields in lowland areas. However, Redwing were observed 13 times during non-breeding season flight activity surveys. While the habitat present would not be considered typically optimal for the species, it has been recorded traversing the site which may result in some localised noise or visual disturbance.	**Sensitivity:** High **Magnitude:** Low **Overall significance:** Low Disturbance and/or displacement will be a **Short-term, Imperceptible** effect (Criteria: EPA, 2022).
Sand Martin (Medium)	Only two records of Sand Martin were made during breeding season flight activity surveys. This species nests in sand banks or crevices in walls and bridges. As such there is no potential for the Site to support breeding birds. It is unlikely that this species will be effected by noise or visual disturbance.	**Sensitivity:** Medium **Magnitude:** Negligible **Overall significance:** Very Low Disturbance and/or displacement will be a **Short-term, Imperceptible** effect (Criteria: EPA, 2022).
Skylark (Medium)	Skylark are ground-nesting birds, that use open habitats with some low-lying vegetative cover (typically grassland and heath) for breeding and foraging purposes. While overgrazing of these habitats within the site by sheep has greatly limited the amount of suitable habitat for Skylark, the species continues to forage and nest within the heath and grassland habitats within the Proposed Development and the greater area. As such, there is potential for noise or visual disturbance to effect this species.	**Sensitivity:** Medium **Magnitude:** Low **Overall significance:** Low Disturbance and/or displacement will be a **Short-term, Slight** effect (Criteria: EPA, 2022).
Snipe (High)	The wind farm development site is of very limited value for waders and waterfowl. Literature suggests significant declines in densities of Snipe during construction (Pearce-Higgins et al, 2012) which may lead to density declines post construction. Snipe were also shown by Pearce-Higgins et al. (2009) to use areas of habitat within 400m of turbines less than expected, leading to an expected 48% decline in abundance within 500m of the turbines. This ground-nesting bird breeds where there are grassy tussocks within or adjacent to boggy areas, and are typically found in bog and wet grassland habitats during the breeding season, and wetland, wet habitats and lowland lake shores during the non-breeding season. Snipe were observed 24 times during the breeding and non-breeding season flight activity surveys, of which 5 occurred within the 500m buffer zone over a five year period, equating to one record every 12 months of surveys. Although there was a very low number of Snipe records within the site and no evidence of breeding within the site or the 500m buffer surrounding turbine, there are records of this species in the immediate surroundings and there is habitat on-site to support this species. However the quality of this habitat has been compromised by overgrazing currently prevalent within the site. As such, there is a small potential that Snipe may be effected by noise and visual disturbance.	**Sensitivity:** High **Magnitude:** Low **Overall significance:** Low Disturbance and/or displacement will be a **Short-term, Slight** effect (Criteria: EPA, 2022).
Sparrowhawk (Low)	Sparrowhawk were observed within the Site on 12 occasions over the 5 year period, where adults and juveniles have been observed hunting. No breeding behaviour was detected, however, and there are no suitable habitats to support breeding Sparrowhawk as they favour woodlands and require mature trees for nesting. There is potential for noise and visual disturbance to effect foraging Sparrowhawk.	**Sensitivity:** Low **Magnitude:** Medium **Overall significance:** Very Low Disturbance and/or displacement will be a **Short-term, Slight** effect (Criteria: EPA, 2022).

Key Receptor (Sensitivity)	Construction Indirect Effect Character	Significance without mitigation
Starling (Medium)	Starling were observed on 18 occasions during flight activity surveys. Of which, the majority of records (15) occurred during the breeding seasons. Between one and 100 individuals were recorded during each of these observations. However, the species was not observed during breeding of non-breeding transect surveys No breeding was recorded onsite and records indicate this species was commuting through the Site. There are no habitats to support breeding or evidence of regular foraging for Starling on-site. As such, there is a reduced potential for visual or noise disturbance to effect this species.	**Sensitivity:** Medium **Magnitude:** Negligible **Overall significance:** Very Low Disturbance and/or displacement will be a **Short-term, Imperceptible** effect (Criteria: EPA, 2022).
Skylark (Medium)	Skylark are ground-nesting birds, that use open habitats with some low-lying vegetative cover (typically grassland and heath) for breeding and foraging purposes. While overgrazing of these habitats within the site by sheep has greatly limited the amount of suitable habitat, the species continues to forage and nest within the heath and grassland habitats within the Proposed Development and the greater area.	**Sensitivity:** Medium **Magnitude:** Low **Overall significance:** Low (Criteria: Percival, 2003) Disturbance and/or displacement will be a **Short-term, Slight** effect (Criteria: EPA, 2022).
Swallow (Medium)	Swallows were recorded 56 times during the breeding season flight activity surveys, in flocks of up to 160 birds. No breeding habitat is available within the site. Swallows typically feed on insects in open habitats. As such, there is potential foraging habitats (heath and grassland) within the Site. Therefore, there is potential for noise or visual disturbance with this species.	**Sensitivity:** Medium **Magnitude:** Low **Overall significance:** Low (Criteria: Percival, 2003) Disturbance and/or displacement will be a **Short-term, Slight** effect (Criteria: EPA, 2022).
Swift (High)	Swift was recorded once within the Site, where two individuals were recorded hunting at VP3 in July 2023. As this species does not breed and does not have the potential to breed on-site, and there is only one foraging record, noise and visual disturbance is unlikely to be an issue with this species.	**Sensitivity:** High **Magnitude:** Negligible **Overall significance:** Very Low Disturbance and/or displacement will be a **Short-term, Imperceptible** effect (Criteria: EPA, 2022).
Teal (Medium)	Teal was recorded once within the flight activity survey area, where a group of three individuals were observed within a pool on-site. Successful breeding was recorded in the wider environment, however this species does not breed and does not have the potential to breed within the Site itself. There are also no records of foraging within the Site. As such, it is unlikely that this species would be effected by noise or visual disturbance.	**Sensitivity:** Medium **Magnitude:** Negligible **Overall significance:** Very low Disturbance and/or displacement will be a **Short-term, Imperceptible** effect (Criteria: EPA, 2022).
Wheatear (Medium)	Wheatear were observed 34 times during flight activity surveys, and are typically associated with heahland and moorland habitats. During breeding transect surveys, 20 records of up to four individuals were made across all five breeding seasons. As such, there is potential for this species to be effected by visual and noise disturbance.	**Sensitivity:** Medium **Magnitude:** Medium **Overall significance:** Low Disturbance and/or displacement will be a **Short-term, Slight e**ffect (Criteria: EPA, 2022).
Whinchat (High)	Only one record of Whinchat was made, where one individual was recorded during the 2023/24 winter walkovers. This is an unusual observation, as Whinchat are considered seasonal visitors to Ireland, and over-winter in Africa. It is unlikely that Whinchat would be recorded within the Proposed Development again. As such, noise and visual disturbances are unlikely to effect this species.	**Sensitivity:** High **Magnitude:** Negligible **Overall significance:** Low Disturbance and/or displacement will be a **Short-term, Imperceptible** effect (Criteria: EPA, 2022).

Key Receptor (Sensitivity)	Construction Indirect Effect Character	Significance without mitigation
Willow Warbler (Medium)	Willow Warbler were observed twice during summer transects. This species typically breeds along the edges of bogs and marshes, and can be found in heath and moor habitats. Although there are no records of foraging or breeding on-site, there is limited potential. As such, this species may be effected by noise or visual disturbance.	**Sensitivity:** Medium **Magnitude:** Low **Overall significance:** Low Disturbance and/or displacement will be a **Short-term, Slight** effect (Criteria: EPA, 2022).

7.5.2 Potential Operational Effects

7.5.2.1 Direct Effects: Collision Risk

Studies on operational impacts of wind farms (Pearce-Higgins *et al*., 2009) have shown that certain species do exhibit levels of turbine avoidance during operational phases which may be extrapolated to reductions in breeding bird densities; however, this may not be as significant as previously thought, certainly in comparison to impacts during construction (Pearce-Higgins *et al*., 2012). It seems that there is little evidence for consistent post-construction population declines in any species, suggesting for the first time that wind farm construction can have greater effects on birds than wind farm operation; this is supported in the literature (Devereux *et al*., 2008).

The primary cause of direct effects on birds during the operational phase of a development is collision risk. Collision risk behavioural observations of birds in relation to operational wind farms provide the basis of studies on collision risk. Fixed point observations of flight behaviour, flight lines into, through and out of the area and information about the birds' use of the area help to inform the environmental evaluation of the proposed wind farm development. Bird mortality may result from potential bird collision with turbine structures or turbine blades.

Not all bird species are equally susceptible to collision, and some species suffer proportionately high levels of collision mortality (Drewitt and Langston, 2008). Morphology, physical flight characteristics and differences in vision are all influencing factors. Martin and Shaw (2010) suggest that it is the characteristics of the section of a birds visual field that projects forward and hence 'looks' that are the key factors.

In some species the vertical extent of the forward binocular vision is reduced and therefore the bird is rendered blind, if, whilst in the process of flying, it undertakes behaviour such as the detection of conspecifics, remote food sources, etc. (Martin, 2011 and Martin and Shaw, 2010).

Other species have reduced fovea, are emmetropic (default focus is distant) or may contain blind spots in their field of vision (as an evolutionary trait) which may cause susceptibility to collision. Flight height or the flight heights which birds habitually use along either migration or local flight paths is also an influencing factor. Relative size and high wing loading (or low manoeuvrability) are influencing factors as larger birds with poor manoeuvrability are generally perceived as at greater risk of collision with structures (see Brown et al., 1992, quoted in Drewitt and Langston, 2006). Various species therefore exhibit different morphological and behavioural attributes which may contribute to collision risk.

Recent studies show that modern, larger multi-MW turbines show comparable fatality estimates with older generation models and expected increases in fatalities due to increases in rotor surface are not as expected, possibly due to increased altitude, increased distance between turbines and slower rotation speeds (Krijgsveld et al., 2009). Appraisal of collision risk for the proposed development is based on a predicted rotor envelope of 25-175m (see **Chapter 2: Project Description**).

Relatively little is known about collision as a threat to birds. One problem is that most studies rely on the number of corpses found, but this can be extremely unreliable, since it is known that corpses are quickly removed by predators. At a wind farm site in Co. Tipperary in 2011, it was found that 72% of bird corpses left out were removed after five days. At this site in Co. Tipperary in 2012, scavengers were present at a bird corpse within forty-five minutes of it being placed in the vicinity of a turbine (J. Kearney Technical Director of Ecology FT, pers. comm. 2025).

The colour, mode, intensity, and density of lighting has been shown to influence the degree to which birds (specifically, nocturnally migrating passerines) are attracted to wind turbines at night. Studies have shown that red lighting is more attractive to birds, and that steady burning lights are more attractive than flashing ones, while structures with no lighting were the least attractive (Kerlinger *et al*., 2010; Gehring *et al*., 2009). The directional intensity of lighting is also a factor in reducing the attraction of birds. As such, specification of aviation obstruction lighting to minimise effects on birds is included under operational mitigation measures.

7.5.2.2 Collision Risk Model Analysis

The Collision Risk Model Report (see **Appendix 7.2**) presents the results of collision risk modelling for the proposed Gortloughra Wind Farm, Co. Cork. This modelling used data from vantage point surveys carried out in the winters of 2019/20, 2020/21, 2021/22, 2022/23 and 2023/24 as well as the summers of 2020, 2021, 2022, 2023 and 2024. The modelling was

carried out using the NatureScot Collision Risk Model (Band, 2024). The spreadsheet accompanying the NatureScot report was used to calculate collision probabilities for birds transiting through the rotors.

A total of fourteen species were selected for collision risk modelling: Buzzard, Cormorant, Chough, Dunlin, Great Black-backed Gull, Golden Plover, Heron, Hen Harrier, Kestrel, Lesser Black-backed Gull, Peregrine, Sparrowhawk, Snipe and Swift. These species have been selected because they were recorded within the 500 m buffers of the proposed turbines (the flight activity survey area) and at rotor swept heights, and are of conservation concern: i.e., they are red or amber-listed in Birds of Conservation Concern Ireland 2020-2026 (Gilbert *et al*., 2021), and/or are listed on Annex I of the Birds Directive (2009/147/EC) or green-listed and sensitive to wind farm developments (i.e., Buzzard).

For all the other species recorded but not included for collision risk modelling, the effective collision risk can be assumed to be zero as there was no activity recorded within the collision risk zone over the survey period. The following target species were never recorded within the study area over the 5 years of surveys Curlew, Little Egret, Mallard, Merlin, Stock Dove or Whooper Swan. Similarly, there were no observations of Red Grouse or Teal flying at rotor height.

As the proposed grid connection will be buried underground there is no resultant collision risk associated with this element of the wind farm project.

Passerines

Collision by resident passerines is not considered likely to be a significant issue as their flight activity is generally well below the height of rotor blades and the proposed impact of collision risk will be a *Long-term Imperceptible Reversible Effect*.

Non-Passerines

Potential collision risk to non-passerine target species is outlined in Table 7.27 below. The Collision Risk Model Report (see **Appendix 7.2**) provides further information on the predicted collision rate as a percentage of the populations of those species with a predicted collision risk per annum of 0.1 of greater, namely: Buzzard, Chough, Golden Plover and Kestrel.

The other species analysed in the CRM (Cormorant, Dunlin, Great Black-backed Gull, Heron, Hen Harrier, Lesser Black-backed Gull, Peregrine, Sparrowhawk, Snipe and Swift) are predicted to be subject to less than one collision over the proposed 40-year lifespan of the

wind farm. As such the magnitude of effects for all of these species can be assessed as *Negligible*. Due to their small and declining population, an exception to this approach was made for Hen Harrier, and potential impacts on national, SPA and local populations were assessed in detail for this species based on an extreme interpretation of the precautionary principle. A similar exception was made for Peregrine falcon, which was also assessed in terms of effects on national and county populations due to it's Annex I status and because the predicted collision rate over the 40-year operational period is greater than 1 (1.22).

Table 7.27: Potential collision risk to target species

Key Receptor (Sensitivity)	Operational Direct Effect Character	Significance without mitigation
Buzzard (Low)	A total of 27 Buzzard fatalities have been recorded within the European Context, in a review of 46 wind farms up to 2004 (Hötker et al., 2006). However, this number is low in relation to the estimated European population of up to one million pairs (Gensbol, 2008) and best available knowledge suggests mortality due to wind farms is not sufficient to cause significant population declines of this green-listed species. The predicted annual collision rate for Buzzard equates to 0.007% of the national population and 0.066% of the county population. It is noted that the county population is an estimate based on the proportion of the national population split by county area, used due to lack of a county estimate. Buzzard is a green-listed species of low conservation concern due to it ongoing expansion in population size and range. The national population estimate available for the species was taken from the Article 12 report covering the period 2008-2012. As this data is more 10 years old it does not account for the continued expansion of the species range throughout Ireland and therefore certainly underestimates the current population size for this species. **Predicted number of collisions per year (assuming avoidance) is 0.12 per year (0.036 % of the of the county population and 0.004 % of the national population).**	**Sensitivity:** Low. **Magnitude:** Negligible – based on predicted 0.12 collisions per year which is equal to 0.036% of the conservative county population estimate or 0.004% of national population. **Overall significance:** Very Low. (Criteria: Percival, 2003). The proposed impact of collision risk will be a **Long-term Imperceptible** effect (Criteria: EPA, 2022).
Chough (Very High)	While corvids are not typically the focus of avian collision studies focusing on wind farms, there are records of corvid collision fatalities attributed to turbine strikes. In a review of 46 European wind farms up to 2004 (Hötker et al., 2006), a total of 20 corvid fatalities are recorded (comprised of 2x Magpies, 1x Jackdaw, 9x Ravens, 2x Rooks, 5x Carrion Crows An 1x Crow sp.). The absence of Chough from these records is likely to be reflective of their habitat preferences being alpine and rugged coastal regions – both limiting their population size relative to other corvid species, and reducing their likelihood of encountering wind farms. The regional Chough population in West Cork has demonstrated a recent tendency to colonise inland upland areas, moving beyond their traditional habitat preference in Ireland for rocky coastlands with short open grassland foraging areas. It is considered that the tightly grazed grasslands created by intensive upland sheep farming, in addition to suitable breeding locations provided by rocky ledges and derelict buildings which occur in this region	**Sensitivity:** Very High. **Magnitude:** Negligible – based on predicted 0.06 collisions per year which is equal to 0.023% of the conservative county population estimate or 0.012% of national population. **Overall significance:** Low. (Criteria: Percival, 2003). The proposed impact of collision risk will be a **Long-term Slight** effect (Criteria: EPA, 2022).

Key Receptor (Sensitivity)	Operational Direct Effect Character	Significance without mitigation
	makes it suitable for Chough to expand inland from their traditional coastal strongholds. Due to the limited amount of flight activity at potential collision height, and relatively low amount of flight activity overall, the predicted collision risk for Chough is 3.7 collisions over the entire operational lifespan of the wind farm (40 years). The number of confirmed breeding pairs recorded during the 2021 national Chough survey (Colhoun et al, 2024) was used to calculate the national and county populations (536 and 288 individuals respectively); however, Colhoun et al. (2024) note that the breeding population is likely to be much larger, and when probable and possible breeding pairs are also included, the national breeding population would be 12,060 birds. As such, the use of confirmed breeding pairs only to estimate population effects is highly conservative. **Predicted number of collisions per year (assuming 98% avoidance) is 0.06 per year (0.023 % of the of the county population and 0.012 % of the national population).**	
Cormorant (Medium)	A published review of the number of bird fatalities owing to collision with wind turbines showed there were two fatalities across 46 European wind farms (Hötker et al., 2006). Furthermore, the published avoidance rate is 98% (SNH 2010), suggesting cormorant exhibit high levels of micro-avoidance at wind farms. **The predicted collision risk for cormorant is less than one collision over the entire operational lifespan of the wind farm (0.14 collisions over 40 years). As such, the predicted magnitude is *Negligible*.**	**Sensitivity:** Medium. **Magnitude:** Negligible. **Overall significance:** Very Low. (Criteria: Percival, 2003). The proposed impact of collision risk will be a **Long-term Imperceptible** effect (Criteria: EPA, 2022).
Dunlin (High)	A published review of the number of bird fatalities owing to collision with wind turbines showed there were zero fatalities across 46 European wind farms (Hötker et al., 2006). Furthermore, the published avoidance rate is 98% (SNH 2010), suggesting cormorant exhibit high levels of micro-avoidance at wind farms. **The predicted collision risk for cormorant is less than one collision over the entire operational lifespan of the wind farm (0.02 collisions over 40 years). As such, the predicted magnitude is *Negligible*.**	**Sensitivity:** High. **Magnitude:** Negligible. **Overall significance:** Very Low. (Criteria: Percival, 2003). The proposed impact of collision risk will be a **Long-term Imperceptible** effect (Criteria: EPA, 2022).
Great Black-backed Gull (Low)	A published review of the number of bird fatalities owing to collision with wind turbines showed there were zero fatalities across 46 European wind farms (Hötker et al., 2006). Furthermore, the published avoidance rate is 98% (SNH 2010), suggesting great black-backed gulls exhibit high levels of micro-avoidance at wind farms. **The predicted collision risk for Great Black-backed Gull is less than one collision over the entire operational lifespan of the wind farm (0.77 collisions over 40 years). As such, the predicted magnitude is *Negligible*.**	**Sensitivity:** Low. **Magnitude:** Negligible. Overall significance: Very Low. (Criteria: Percival, 2003). The proposed impact of collision risk will be a **Long-term Imperceptible** effect (Criteria: EPA, 2022).
Golden Plover (Very High)	Golden Plover have been recorded in low numbers as collision fatalities at wind farms (Hötker et al., 2006; Grunkorn 2011). The SNH guidance (SNH, 2018) does not provide a specific avoidance rate for Golden Plover, but states that for species not covered by the guidance "*we recommend a default value of 98%* ". However, the review study based on 3 years of post-construction monitoring sites included in the CRM (Appendix 7.2 and Gittings, 2022) indicates a much higher avoidance rate should be applied for non-	**Sensitivity:** Very High. **Magnitude:** Negligible (county and National Population). **Overall significance:** Low. (Criteria: Percival, 2003).

Key Receptor (Sensitivity)	Operational Direct Effect Character	Significance without mitigation
	breeding Golden Plover populations. The studies had robust survey methodologies and were carried out at wind farm sites with high levels of Golden Plover flight activity. The review considers that an avoidance rate of 99.8% is a suitable precautionary estimate for winter Golden Plover. In further support of a high micro-avoidance rate, a study in the Netherlands of three operational wind farms where Golden Plovers were both diurnally and nocturnally active found no fatalities (Krijgsveld et al., 2009). No breeding or roosting Golden Plover were recorded during surveys, reducing magnitude. While a slightly higher collision rate of 0.6 per year is predicted, the predicted effects at county and national level remain *Negligible*. **Predicted number of collisions (assuming 99.8% avoidance) is 0.5 per year (0.0054 % of the county population and 0.0006 % of the national population).**	The proposed impact of collision risk will be a **Long-term Slight** effect (Criteria: EPA, 2022).
Grey Heron (Low)	A published review of the number of bird fatalities owing to collision with wind turbines showed there were three fatalities across 46 European wind farms (Hötker et al., 2006). Furthermore, the published avoidance rate is 98% (SNH 2010), suggesting Grey Heron exhibit high levels of micro-avoidance at wind farms. **The predicted collision risk for Grey Heron is less than one collision over the entire operational lifespan of the wind farm (0.22 collisions over 40 years). As such, the predicted magnitude is *Negligible*.**	**Sensitivity:** Low. **Magnitude:** Negligible. **Overall significance:** Very Low. (Criteria: Percival, 2003). The proposed impact of collision risk will be a **Long-term Imperceptible** effect (Criteria: EPA, 2022).
Hen Harrier (Very High)	No Hen Harriers were observed breeding on site, so potential collision risk is significantly reduced due to the absence of the territorial display known as 'sky-dancing', which often occurs at heights within the predicted rotor envelope. Documented as occasionally soaring or arriving at winter roosts 'at height' (Watson, 1977), however no roosting was documented during hinterland surveys in a 10km buffer of the site. Literature suggests flying at low heights is a 'ubiquitous trait' supported by a number of studies (e.g. Whitfield and Madders, 2006). The species has a high published avoidance rate (99%) (SNH, 2017) in relation to wind turbines. The predicted collision risk for Hen Harrier is less than one collision over the entire operational lifespan of the wind farm (0.3 collisions over 40 years). Based on a national population of 95.5 birds (Ruddock et. al 2024), the predicted collision rate of 0.004 per year would result in a 0.004% population loss. The closest SPA for this species located c. 18 km north-east (outside core and maximum breeding season foraging ranges) had one breeding pair in 2022, and an extremely conservative estimate of one pair occurring locally would result in a predicted annual loss of 0.18% of the SPA or estimated local population. As such, the predicted magnitude is confirmed to be *Negligible*. **Predicted number of collisions (assuming 99% avoidance) is 0.004 per year (0.18 % of the Mullaghanish to Musheramore Mountains SPA or highly conservative estimated local population and 0.004 % of the national population).**	**Sensitivity:** Very High. **Magnitude:** Negligible **Overall significance:** Low. (Criteria: Percival, 2003). The proposed impact of collision risk will be a **Long-term Not Significant** effect (Criteria: EPA, 2022).
Kestrel (High)	Twenty-nine fatalities were recorded across 46 wind farms in a published review of the effects of turbine collision on birds in the European Context (Hötker et al., 2006). The published avoidance rate is 95% (SNH, 2016).	**Sensitivity:** High. **Magnitude:** Negligible, based on predicted annual loss of 0.14% of

Key Receptor (Sensitivity)	Operational Direct Effect Character	Significance without mitigation
	While Kestrel has the highest predicted collision rate (2.4 per year), this represents a loss of 0.14% of the county population (estimate based on proportion of national population split by county area, used due to a lack of a county estimate). At national level this represents an annual loss of 0.015% of the population. As such, the predicted magnitude of collision effects for Kestrel remains *Negligible*. While impacts on the local population are not possible to measure objectively due to a lack of 'local' Kestrel counts, it is likely that the local magnitude would be *Medium*. **Predicted number of collisions (assuming 95% avoidance) is 2.4 per year (0.14 % of the of the county population and 0.015 % of the national population)**	county population and 0.015% of national population. A Medium magnitude is estimated for the 'local' population. **Overall significance:** Very Low. (Criteria: Percival, 2003). On an estimated basis, the proposed impact of collision risk could result in a **Long-term Significant** effect at local level (Criteria: EPA, 2022). The proposed impact of collision risk will be a **Long-term Imperceptible** effect at national and county level (Criteria: EPA, 2022).
Lesser Black-backed Gull (Medium)	A published review of 46 European wind farms (Hötker et al., 2006) found 45 fatalities across wind farms. However, the published avoidance rate (SNH, 2010) is 98%, suggesting birds exhibit a high level of micro-avoidance. **The predicted collision risk for Lesser Black-backed Gull is less than one collision over the entire operational lifespan of the wind farm (0.91 collisions over 40 years). As such, the predicted magnitude is *Negligible*.**	**Sensitivity:** Medium. **Magnitude:** Low **Overall significance:** Low. (Criteria: Percival, 2003). The proposed impact of collision risk will be a **Long-term Slight** effect (Criteria: EPA, 2022).
Peregrine (Very High)	Evidence of collision fatality is low, with only two birds recorded in published reviews of wind farm fatalities (Hötker et al., 2006). The SNH recommended avoidance rate for collision-risk modelling is 98% (SNH, 2010), suggesting high micro-avoidance capabilities. **Predicted number of collisions (assuming avoidance) is 0.03 per year (0.027 % of the of the county population and 0.003 % of the national population)**	**Sensitivity:** Very High. **Magnitude:** Negligible **Overall significance:** Low. (Criteria: Percival, 2003). The proposed impact of collision risk will be a **Long-term Not Significant** effect (Criteria: EPA, 2022).
Snipe (High)	Evidence of collision fatality is low, with only one bird recorded in published reviews of wind farm fatalities (Hötker et al., 2006). The SNH recommended avoidance rate for collision-risk modelling is 98% (SNH, 2010), suggesting high micro-avoidance capabilities. **The predicted collision risk for Sparrowhawk is less than one collision over the entire operational lifespan of the wind farm (0.01 collisions over 40 years). As such, the predicted magnitude is *Negligible*.**	**Sensitivity:** High. **Magnitude:** Negligible **Overall significance:** Very Low. (Criteria: Percival, 2003). The proposed impact of collision risk will be a **Long-term Imperceptible** effect (Criteria: EPA, 2022).
Sparrowhawk (Low)	Sparrowhawks are a resident species of the wind farm study area, although no breeding has been recorded within the site. Published fatality rates are low, with two fatalities from a review of 46 wind farms across Europe (Hötker et al., 2006). **The predicted collision risk for Sparrowhawk is less than one collision over the entire operational lifespan of the wind farm (0.66 collisions over 40 years). As such, the predicted magnitude is *Negligible*.**	**Sensitivity:** Low. **Magnitude:** Negligible **Overall significance:** Very Low. (Criteria: Percival, 2003). The proposed impact of collision risk will be a **Long-term Imperceptible** effect (Criteria: EPA, 2022).

Key Receptor (Sensitivity)	Operational Direct Effect Character	Significance without mitigation
Swift (High)	A published review of the number of bird fatalities owing to collision with wind turbines showed there were 14 recorded fatalities across wind farms from eight European countries (Netherlands, Belgium, Spain, Sweden, Austria, Britain, Denmark, and Germany) (Hötker et al., 2006). However, the published avoidance rate is 98% (SNH 2010), suggesting birds exhibit high levels of micro-avoidance at wind farms. **The predicted collision risk for Swift is less than one collision over the entire operational lifespan of the wind farm (0.58 collisions over 40 years). As such, the predicted magnitude is *Negligible*.**	**Sensitivity:** High. **Magnitude:** Negligible **Overall significance:** Very Low. (Criteria: Percival, 2003). The proposed impact of collision risk will be a **Long-term Imperceptible** effect (Criteria: EPA, 2022).

7.5.2.3 Indirect Effects: Disturbance and Displacement

There is evidence that the rotor blades of wind turbines during operation can displace or exclude some species, which effectively results in habitat loss for these birds. Habitat loss can be direct through land take of breeding or foraging habitats for key species or indirect such as effective habitat loss through avoidance or disturbance due to factors such as perceived collision risk. Birds may therefore avoid areas proximal to turbines until habituation takes place. There are examples in the literature of habituation in species such as geese and swans (see Fijn *et al*., 2012 and Madsen and Boertmann, 2008).

Available evidence suggests that breeding passerines are not adversely affected by the presence of wind turbines, and for this reason they are omitted from Table 7.28. For example, a German study found no effect on numbers or spatial distribution of Skylarks within 1km of turbines (Langston and Pullan, 2004).

Whitfield and Madders (2006), suggest that most studies do not detect any significant displacement of raptor species by wind turbines although there are occasional notable exceptions.

Generally speaking, displacement of birds by the presence of turbines is not considered to be a significant effect on the species assemblage given the limited amount of habitat available onsite and the availability of habitat in the greater area. However, a Long-term Moderate effect may occur for Kestrel and a Long-term Slight – Moderate effect may occur for Red Grouse.

Displacement of birds by the presence of turbines is not considered to be a significant effect on the species assemblage given the limited amount of habitat available onsite and the availability of habitat in the greater area.

No further excavation works shall be required along the haul route or the proposed grid route during the operational phase. Only occasional maintenance works will be required (these shall be minimal without the need for large scale construction). No significant operational phase effects are predicted for both elements of the wind farm.

7.5.2.4 Indirect Effects: Barrier Effect

One of the potential operational effects of wind farms is avoidance where the wind farm may act as a barrier to movements (Masden *et al.*, 2009). The effect of birds altering their migration flyways or local flight paths to avoid any infrastructure is a form of displacement (Drewitt and Langston, 2006). The primary effect of barrier effect is increased energy expenditure when birds have to fly further to circumvent an obstacle.

Effects can be highly variable and range from slight 'checks' in-flight direction, height, or speed, through to larger diversions around objects. Studies have shown that birds on migration may show avoidance of wind farms (Masden, 2009) but the observed distances involved were trivial in regard to total migration distances, and hence energy expenditure.

In relation to nocturnal flight activity recent studies utilising radar on both offshore and coastal wind farms in Europe have recorded macro-avoidance rates in wildfowl at least as high, or higher at night than during the day, implying that diurnal avoidance rates are comparable to those in periods of lower visibility (Desholm, and Kahlert, 2005). In the same study migrating flocks at night were recorded increasing their distance from individual turbines once inside the wind farm and also travelling in the corridors between turbines (Desholm, and Kahlert, 2005).

Potential disturbance and barrier effects due to the operation of the proposed wind farm are outlined in Table 7.28 below:

Table 7.28: Disturbance and Barrier effect on target species

Key Receptor (Sensitivity)	Operational Indirect Effect Character	Significance without mitigation
Buzzard (Low)	**Disturbance/Displacement:** In a review of the published impacts of wind farms on Buzzard populations (Hötker et al., 2006), it was found that overall, impacts on Buzzard populations post-construction, across both winter and breeding seasons was not significant and that Buzzards do show habituation to the presence of wind farms (Hötker et al., 2006). It should also be noted that just one case of habituation is documented in this study with a second case showing signs of a lack of habituation.	**Disturbance/Displacement:** **Magnitude:** Negligible **Sensitivity:** Low **Overall Significance:** Very Low (Criteria: Percival 2003).

Key Receptor (Sensitivity)	Operational Indirect Effect Character	Significance without mitigation
	Considering this, in conjunction with the high amount of displacement habitats in the surrounding area, the magnitude of disturbance effect is assessed as *Negligible*. **Barrier Effect:** Barrier effects on either migration or regular flights of Buzzard has been shown at two out of six studies to date (2004) in a European context (Hötker et al., 2006). The overall barrier effect results were shown to be not significant.	Significance of effects is assessed as a **Long-term Imperceptible** (Criteria: EPA, 2022). **Barrier Effect:** **Magnitude:** Negligible **Sensitivity:** Low **Overall Significance:** Very Low (Criteria: Percival 2003). Significance of effects to migrating birds in terms of energy expenditure assessed as Imperceptible to Slight; significance of daily barrier effect assessed as Imperceptible to Slight; overall significance considered a **Long-term Imperceptible - Slight** effect (Criteria: EPA, 2022).
Chough (Very High)	**Disturbance/Displacement:** There is limited information on the effects of operational wind farms on Chough. In a review of the published impacts of wind farms on Carrion Crow populations (Hötker et al., 2006), two cases of habituation vs. one case with lack of habituation are documented. While not directly applicable to Chough, these observations are of some use in giving approximate guidelines for corvids in general. The majority of literature concerned with disturbance of Chough is focused on disturbance caused by human presence, particularly recreational activities in or near areas inhabited by Chough (Norfolk and Siriwardena, 2024). The most sensitive receptors are Chough breeding sites; however, no breeding Chough were recorded in the vicinity of the proposed wind farm. There is potential for occasional human presence during operation to temporarily displace foraging Chough; however, since the majority of Chough activity and optimal foraging habitat is concentrated in the valleys to the north and south of the proposed wind farm, potential for disturbance to foraging Chough will be minimal. As such, the predicted magnitude for disturbance is *Negligible*. **Barrier Effect:** Collectively for corvids, the studies reviewed in Hötker et al. (2006) observed barrier effects in six studies, and lack of barrier effects in four studies. As such, there is potential for barrier effect to impact Chough. It is however assessed that the additional flight time required to avoid individual turbines or the whole wind farm would result in minimal additional energy expenditure. As such, the predicted magnitude for barrier effect is *Low*.	**Disturbance/Displacement:** **Magnitude:** Negligible **Sensitivity:** Very High **Overall Significance:** Low (Criteria: Percival 2003). Significance of effects is assessed as a **Long-term Not Significant** effect (Criteria: EPA, 2022). **Barrier Effect:** **Magnitude:** Low **Sensitivity:** Very High **Overall Significance:** Medium (Criteria: Percival 2003). Significance of daily barrier effect assessed as Low; overall significance considered a **Long-term Slight** effect (Criteria: EPA, 2022).
Cormorant (Medium)	**Disturbance/Displacement:** In a review of the published impacts of wind farms on birds (Hötker et al., 2006), there was no information available on Cormorant populations post-construction. There is no suitable foraging habitat within the 500m turbine buffer. The Cormorant activity observed during	**Disturbance/Displacement:** **Magnitude:** Negligible **Sensitivity:** Medium

Key Receptor (Sensitivity)	Operational Indirect Effect Character	Significance without mitigation
	surveys confirms this species uses Lough Nambrackderg located north of the proposed wind farm to forage, but does not use any habitats within the 500m turbine buffer As such, the predicted magnitude for disturbance is *Negligible*. **Barrier Effect:** Barrier effects on either migration or regular flights of cormorant has been shown for 2/6 studies to date (2004) in a European context (Hötker et al., 2006), with the overall effect significance being non-significant. The observations of cormorant site utilisation confirm individual Cormorants or pairs use Lough Nambrackderg located north of the proposed wind farm to forage. Due to the reduced likelihood of barrier effect for this species, and the fact that turbine spacing will allow cormorant flying to or from Lough Nambrackderg to continue flying through the proposed wind farm, any additional energy expenditure required to avoid individual turbines is assessed as minimal. As such, the predicted magnitude for barrier effect is *Negligible*.	**Overall Significance:** Very Low (Criteria: Percival 2003). Significance of effects Imperceptible due to location of foraging habitat outside 500m buffer; overall significance considered a **Long-term Imperceptible** effect (Criteria: EPA 2022). **Barrier Effect:** **Magnitude:** Negligible **Sensitivity:** Medium **Overall Significance:** Very Low (Criteria: Percival 2003). Significance of effects to migrating birds in terms of energy expenditure assessed as Imperceptible; significance of daily barrier effect assessed as Imperceptible; overall significance considered a **Long-term Imperceptible** effect (Criteria: EPA 2022).
Dunlin (High)	**Disturbance/Displacement:** In a review of the published impacts of wind farms on birds (Hötker et al., 2006), there was no information available on Dunlin populations post-construction. However, due to the absence of suitable habitat for Dunlin at or near the proposed wind farm, no effects in this category are predicted. As such, the predicted magnitude for disturbance is *Negligible*. **Barrier Effect:** Barrier effects on either migration or regular flights of waders as a group has been shown for 10 studies to date (2004) in a European context (Hötker et al., 2006), with the overall effect significance being non-significant. While one of the studies found no barrier effect for *Caladris* spp. (the genus to which Dunlin *Calidris alpina* belongs), no information specific to Dunlin is available. Due to the very low amount of Dunlin flight activity recorded over the 5-year survey period (a single observation of three birds), the predicted magnitude for barrier effect is *Negligible*.	**Disturbance/Displacement:** **Magnitude:** Negligible **Sensitivity:** High **Overall Significance:** Very Low (Criteria: Percival 2003). Significance of effects Imperceptible due to lack of foraging habitat in the area; overall significance considered a **Long-term Imperceptible** effect (Criteria: EPA 2022). **Barrier Effect:** **Magnitude:** Negligible **Sensitivity:** High **Overall Significance:** Very Low (Criteria: Percival 2003). Significance of effects to migrating birds in terms of energy expenditure assessed as Imperceptible; significance of daily barrier effect assessed as Imperceptible; overall significance considered a **Long-term Imperceptible** effect (Criteria: EPA 2022).
Golden Plover (Very High)	**Disturbance/Displacement:** Literature suggests differences in densities pre-and post-construction of wind farms is significant (Pearce-Higgins et al., 2012); displacement is not significant but may occur up to 400 m (Sansom et al. 2016). Pearce-Higgins et al. (2009) recorded a reduced occurrence of Golden Plovers within 200m of turbines	**Disturbance/Displacement:** **Magnitude:** Negligible **Sensitivity:** Very High **Overall significance:** Low (Criteria: Percival, 2003)

Key Receptor (Sensitivity)	Operational Indirect Effect Character	Significance without mitigation
	across 12 upland wind farms. However, Fielding and Haworth (2010) and Douglas et al. (2011) suggest that under some circumstances, Golden Plovers may be more tolerant of wind farm infrastructure. At Farr wind farm, Fielding and Haworth (2010) showed that the median distance of 16 Golden Plover nests to the nearest turbine was 168.8m, with nine nests being less than 200m and three less than 100 m from the nearest turbine. At Beinn Tharsuinn wind farm, Douglas et al. (2011) found that the distribution of breeding Golden Plovers appeared to be unaffected by proximity to turbines or tracks, with no evidence for this lack of association changing through time Depending on the level of habituation to disturbance, a buffer zone of 200-500m is suggested in Goodship and Furness (2022) to protect nesting Golden Plover as well as foraging and roosting birds during the nonbreeding season from pedestrian disturbance. However, no nesting or roosting activity was noted over the 5 years of surveys. The observations of Golden Plover activity recorded during VP surveys confirm this species commutes through the proposed site, but does not use the site for roosting or foraging. As such, the predicted magnitude for disturbance is *Negligible*. **Barrier Effect:** High published avoidance rates of wind farms (Krijgsveld et al., 2009) and changes in densities within wind farms post construction (Pearce-Higgins et al., 2012), suggests wind farms act as significant barriers to Golden Plover. Considering the periodic occurrence of Golden Plover flocks of up to 130 birds during the non-breeding season and three observations of flocks ranging from 14-43 birds during the spring migration period, there is potential for this species to be affected by barrier effect. The small scale of the proposed wind farm will however limit barrier effect to a relatively small locality. Considering these factors, the predicted magnitude for barrier effect is *Low* to *Medium*.	Due to lack of site utilisation by Golden Plover, loss of wintering and/or foraging habitat will be a **Long-term Not Significant** effect (Criteria: EPA, 2022). **Barrier Effect:** **Magnitude:** Low/Medium **Sensitivity:** Very High **Overall Significance:** Medium (Criteria: Percival 2003). Significance of effects to migrating birds in terms of energy expenditure assessed as Moderate; significance of daily barrier effect assessed as Moderate as literature suggests high published avoidance rates of wind farms; overall significance considered a **Long-term Moderate** effect (Criteria: EPA, 2022).
Great Black-backed Gull (Low)	**Disturbance/Displacement:** Of a literature review, carried out by Percival (2003), all studies which indicated gull species being significantly affected or being a species found to have collided, were identified at wind farms on coastal habitats. It is uncertain that disturbance may affect gull species inland. Furthermore, in a review of the published impacts of wind farms on bird populations (Hötker et al., 2006), it was found that common gulls do show habituation to the presence of wind farms (Hötker et al., 2006). Gulls will be more at risk from collision impacts as a result of their flight behaviour, but less sensitive to disturbance and displacement effects (Humphreys et al., 2015). **Barrier Effect:** Information on barrier effects on either migration or regular flights of Great Black-backed Gull is limited; lack of barrier effect has been shown in a single study	**Disturbance/Displacement:** **Magnitude:** Negligible **Sensitivity:** Low **Overall Significance:** Very Low (Criteria: Percival 2003). Overall significance considered be a **Long-term Imperceptible** effect (Criteria: EPA, 2022). **Barrier Effect:** **Magnitude:** Negligible **Sensitivity:** Low **Overall Significance:** Very Low (Criteria: Percival 2003).

Key Receptor (Sensitivity)	Operational Indirect Effect Character	Significance without mitigation
	to date (2004) in a European context (Hötker et al., 2006). At the level of gulls as a grouping, 14 out of 22 studies indicated a lack of a barrier effect.	Significance of effects to migrating birds in terms of energy expenditure assessed as Imperceptible; significance of daily barrier effect assessed as Imperceptible; overall significance considered a **Long-term Imperceptible** effect (Criteria: EPA, 2022).
Grey Heron (Low)	**Disturbance/Displacement:** In a review of the published impacts of wind farms on birds (Hötker et al., 2006), they found that typically, birds of open habitats were avoiding turbines by several hundred metres. Grey Herons were an exception to this rule and were frequently found close to or within wind farm sites, suggesting habituation. **Barrier Effect:** Hötker et al., 2006 found evidence of a barrier effect in four out of seven cases, with the remaining three showing no barrier effect. Results were deemed not significant.	**Disturbance/Displacement:** **Magnitude:** Negligible **Sensitivity:** Low **Overall Significance:** Very Low (Criteria: Percival 2003). Significance of effects Imperceptible due to published evidence of habituation to wind farms; overall significance considered **Long-term Imperceptible** effect (Criteria: EPA 2022). **Barrier Effect:** **Magnitude:** Negligible **Sensitivity:** Low **Overall Significance:** Very Low (Criteria: Percival 2003). Significance of daily barrier effect assessed as Imperceptible; overall significance considered to be a **Long-term Imperceptible** effect (Criteria: EPA 2022).
Hen Harrier (Very High)	**Disturbance/Displacement:** Considering the exceptionally low usage of the 500 m turbine buffer and that no roosts or breeding sites were detected within the 2 km turbine buffer, beyond providing habitat for the occasional foraging Hen Harrier, the Proposed Development site and surrounding area was not found to be important for Hen Harriers. Noise disturbance/visual intrusion unlikely to deter foraging as evidence suggests birds may continue to utilise wind farms post construction (Robinson et al., 2012). **Barrier Effect:** Although barrier effect has been documented in at least one study in the European context; recent evidence suggests that birds continue to use wind farms post construction (Whitfield and Madders, 2006) (Robinson et al., 2012) indicating wind farms may not be significant barriers.	**Disturbance/Displacement:** **Magnitude:** Negligible **Sensitivity:** Very High **Overall Significance:** Low (Criteria: Percival 2003). Significance of effects Not Significant to Slight due to scarcity (six in total) sightings during the total survey period; overall significance considered as **Long-term Not Significant** effect (Criteria: EPA, 2022). **Barrier Effect:** **Magnitude:** Negligible **Sensitivity:** Very High **Overall Significance:** Low (Criteria: Percival 2003). Significance of effects to birds in terms of energy expenditure assessed as Not Significant; magnitude of daily barrier effect assessed as Not Significant to Slight; overall significance considered **Long-term Not Significant** effect (Criteria: EPA, 2022).
Kestrel (High)	**Disturbance/Displacement:**	**Disturbance/Displacement:**

Key Receptor (Sensitivity)	Operational Indirect Effect Character	Significance without mitigation
	Disturbance (in terms of minimal distance to wind farm) has been recorded in 14 studies on wind farms in Europe (Hötker et al., 2006). Habituation to wind farms has been recorded in one case, however the only other case recorded the opposite (Hötker et al., 2006). A case study on the impacts of wind farms on birds conducted in southern Spain (Farfán et al., 2009), found that raptors utilise the space around the wind farm with lower frequency than prior to its existence, which represented a displacement of the home range of these species. In particular, Kestrel was noted to decline sharply in the second year of operation, with other raptor species showing a decline in the first year. **Barrier Effect:** Barrier effects have been shown to a degree in either migrating Kestrel or regular flight paths within the European context (3 of 5 studies; Hötker et al., 2006).	**Magnitude:** Medium **Sensitivity:** High **Overall Significance:** High (Criteria: Percival 2003). Significance of effects Moderate due to published cases of disturbance and high usage of the site by Kestrel; overall significance considered **Long-term Moderate** effect (Criteria: EPA, 2022). **Barrier Effect:** **Magnitude:** Medium **Sensitivity:** High **Overall Significance:** High (Criteria: Percival 2003). Significance of effects in terms of energy expenditure assessed as Moderate; magnitude of daily barrier effect assessed as Slight as literature suggests low published avoidance rates of wind farms with habituation; overall significance considered a **Slight to Moderate Long-term** effect (Criteria: EPA 2022).
Lesser Black-backed Gull (Medium)	**Disturbance/Displacement:** Of a literature review, carried out by Percival (2003), all studies which indicated gull species being significantly affected or being a species found to have collided, were identified at wind farms on coastal habitats. It is uncertain that disturbance may affect gull species inland. Gulls will be more at risk from collision impacts as a result of their flight behaviour, but less sensitive to disturbance and displacement effects (Humphreys et al., 2015). **Barrier Effect:** For gull species such as Lesser Black-backed, Herring and Great Black-backed, some studies indicate evidence for attraction, whereas others for displacement, with the remainder indicating no significant response (Cook et al., 2014; Humphreys et al., 2015).	**Disturbance/Displacement:** **Magnitude:** Negligible **Sensitivity:** Medium **Overall Significance:** Very Low (Criteria: Percival 2003). Significance of effects is assessed as a **Long-term Imperceptible** effect (Criteria: EPA, 2022). **Barrier Effect:** **Magnitude:** Negligible **Sensitivity:** Medium **Overall Significance:** Very Low (Criteria: Percival 2003). Significance of effects to migrating birds in terms of energy expenditure assessed as Imperceptible; significance of daily barrier effect assessed as Imperceptible; overall significance considered a **Long-term Imperceptible** effect (Criteria: EPA, 2022).
Peregrine (Very High)	**Disturbance/Displacement:** Possible disturbance to foraging birds through noise, visual intrusion. No displacement from breeding sites	**Disturbance/Displacement:** **Magnitude:** Low

Key Receptor (Sensitivity)	Operational Indirect Effect Character	Significance without mitigation
	due to none being recorded within the proposed site boundary. Peregrine are known to nest in urban areas often in cathedrals with loud ringing bells, as well as quarries where regular rock-breaking works are undertaken. For example, Moore et al. (1997), estimated that 65 quarries were occupied in Ireland between 1991 and 1993. Thus there is evidence to suggest that the species is tolerant of noise and human activity. **Barrier Effect:** Hötker et al., 2006 report one case of barrier effect in Peregrines. Barrier effects on either migration or regular flights of Peregrine has not been shown to date in a European context (Hoetker et al., 2006). Recorded infrequent flight activity suggests the wind farm is unlikely to act as a significant barrier to a far-ranging species such as Peregrine.	**Sensitivity:** Very High **Overall Significance:** Medium (Criteria: Percival 2003). Significance of effects Not Significant to Slight due to low level of sightings within the site and evidence suggesting tolerance to noisy human activities; overall significance considered **Long-term Not Significant to Slight** effect (Criteria: EPA 2022). **Barrier Effect:** **Magnitude:** Negligible **Sensitivity:** Very High **Overall Significance:** Low (Criteria: Percival 2003). Significance of effects to migrating birds in terms of energy expenditure assessed as Imperceptible; significance of daily barrier effect assessed as Imperceptible; overall significance considered to be a **Long-term Imperceptible to Not Significant** effect (Criteria: EPA, 2022)
Red Grouse (High)	**Disturbance/Displacement:** In a review of the published impacts of wind farms on grouse populations (eight different grouse species were studied) (Coppes et al., 2019), effects including spatial avoidance, displacement of nesting sites and changes in time invested in breeding vs. non-breeding behaviour were observed. Grouse were affected at up to distances of 500m by wind farm infrastructure. In six cases, a local reduction in grouse abundance was reported in areas with wind turbines, which possibly affected population size. The range of cases examined include variable, but overall approximately equal numbers of cases of grouse being affected vs. not being affected by operational wind farms. While the findings of this study are not directly specific to Red Grouse, they provide general guidance and confirm the existence of potential for effects in this category. Pearce-Higgins et al. (2012) has found that densities of Red Grouse, were reduced on wind farms during construction, although Red Grouse densities appeared to recover by the first year of operation. While good-quality Red Grouse habitat is limited within the proposed site, there is suitable habitat on the north-western ridge of Shehy Mountain (located between T02/T04/T06). While part of this area is outside the 500m turbine buffer, the majority is inside this buffer. This are of suitable habitat is located c. 200-250m from proposed turbines. Red Grouse occur in low densities on site, with a total of two birds flushed in 1km grid square W1459 and another two birds recorded in 1km grid square in W1359. There is a limited amount of	**Disturbance/Displacement:** **Magnitude:** Low **Sensitivity:** High **Overall Significance:** Low (Criteria: Percival 2003). Overall significance considered a **Long-term Slight – Moderate** effect (Criteria: EPA 2022). **Barrier Effect:** **Magnitude:** Negligible **Sensitivity:** High **Overall Significance:** Very Low (Criteria: Percival 2003). Overall significance considered to be a **Long-term Imperceptible** effect (Criteria: EPA, 2022)

Key Receptor (Sensitivity)	Operational Indirect Effect Character	Significance without mitigation
	intact heather moorland on site would suggest that breeding, is at low densities. Considering the factors detailed above, the predicted magnitude for disturbance is *Low*. **Barrier Effect:** No evidence of barrier effect relating to grouse was identified in the studies reviewed in Coppes et al. (2019) and Hötker et al. (2006). The predicted magnitude for barrier effect is *Negligible.*	
Snipe (High)	**Disturbance/Displacement:** Possible disturbance to birds traversing or occasionally feeding within the site. Literature suggests differences in densities pre- and post-construction of wind farms has a significant impact upon Snipe within an area (Pearce-Higgins et al., 2012). Snipe were also shown by Pearce-Higgins et al. (2009) to use areas of habitat within 400m of turbines less than expected, leading to an expected 48% decline in abundance within 500m of the turbines. Snipe were observed 24 times during the breeding and non-breeding season flight activity surveys, of which 5 occurred within the 500m buffer zone over a five year period, equating to one record every 12 months of surveys. Although there was a very low number of Snipe records within the site and no evidence of breeding within the site or the 500m buffer surrounding turbine, there are records of this species in the immediate surroundings > 500m from the proposed turbines. The predicted magnitude for disturbance is *Low*. **Barrier Effect:** Recorded infrequent activity contains minimal flight activity within the 500m turbine buffer; the proposed wind farm is unlikely to act as a significant barrier to a species such as Snipe. The predicted magnitude for barrier effect is *Negligible.*	**Disturbance/Displacement:** **Magnitude:** Low **Sensitivity:** High **Overall Significance:** Low (Criteria: Percival 2003). Overall significance considered a **Long-term Imperceptible to Slight** effect (Criteria: EPA 2022). **Barrier Effect:** **Magnitude:** Negligible **Sensitivity:** High **Overall Significance:** Very Low (Criteria: Percival 2003). Overall significance considered to be a **Long-term Imperceptible** effect (Criteria: EPA, 2022)
Sparrowhawk (Low)	**Disturbance/Displacement:** In a review of the published impacts of wind farms on Sparrowhawk populations (Hötker et al., 2006), it was found that overall, effects on Sparrowhawk populations post-construction, across both winter and breeding season was not significant. Sparrowhawk do show habituation to the presence of wind farms (Hötker et al., 2006). Breeding was not proven although the activity observed and presence of juveniles suggest that this species likely breeds locally outside the site. The predicted magnitude for disturbance is *Negligible* **Barrier Effect:** Sparrowhawk is considered to be less sensitive or less willing to change their original migration direction when approaching wind farms (Hötker et al., 2006). Three	**Disturbance/Displacement:** **Magnitude:** Negligible **Sensitivity:** Low **Overall Significance:** Very Low (Criteria: Percival 2003). Overall significance considered to be a **Long-term Imperceptible** effect (Criteria: EPA, 2022). **Barrier Effect:** **Magnitude:** Negligible **Sensitivity:** Low

Key Receptor (Sensitivity)	Operational Indirect Effect Character	Significance without mitigation
	cases of no barrier effect are reported by Hötker et al., 2006, with one case of barrier effect. The predicted magnitude for barrier effect is *Negligible*	**Overall Significance:** Very Low (Criteria: Percival 2003). Overall significance considered to be a **Long-term Imperceptible** effect (Criteria: EPA, 2022).
Swift (High)	**Disturbance/Displacement:** Studies on the impact of wind farms during both construction (Pearce-Higgins et al., 2012) and operation (Pearce-Higgins et al., 2009) have found little evidence of significant disturbance effects on passerine species. Evidence suggests that flying insects are attracted to turbines (Long, et. al, 2011; Scholz & Voigt, 2021) which in turn, attracts insectivorous birds, especially hirundines and Swifts (Ahlén, 2002). This evidence further suggests that construction of wind farms, instead of disturbing birds, may in fact actually lure such bird species into the rotor sweep zone, thus significantly increasing collision risk. Swift activity observed during surveys was limited. Swift was recorded just once within the Site, where two individuals were recorded hunting at VP3 in July 2023. The predicted magnitude for disturbance is *Low.* **Barrier Effect:** Hötker et al., 2006 found evidence of a barrier effect in Swift in two cases. However, as mentioned above, attraction of insects to turbines may further attract insectivorous bird species, which would reduce/preclude barrier effect. The predicted magnitude for barrier effect is *Low.*	**Disturbance:** **Magnitude:** Low **Sensitivity:** High **Overall Significance:** Low (Criteria: Percival 2003). Significance of effects Imperceptible due to relatively low number of sightings, lack of breeding habitat and possible attraction of wind farms to insectivorous species which feed on the wing; overall significance considered **Long-term Imperceptible** effect (Criteria: EPA, 2022). **Barrier Effect:** Significance of effects to migrating birds in terms of energy expenditure assessed as Imperceptible; significance of daily barrier effect assessed as Imperceptible; overall significance considered to be a **Long-term Imperceptible** effect (Criteria: EPA, 2022).
Teal (Medium)	**Disturbance/Displacement:** Information on the disturbance of this species with respect to wind farms is lacking. This species uses Lough Nambrackderg which is located outside the 500m turbine buffer thus disturbance is not envisaged to be an issue with this species. Teal was recorded once within the flight activity survey area, where a group of three individuals were observed within a pool on-site. Successful breeding was recorded in the wider environment, however this species does not breed and does not have the potential to breed within the Site itself. There are also no records of foraging within the Site. The predicted magnitude for disturbance is *Negligible* **Barrier Effect:** Hötker et al., 2006 found evidence of a lack of a barrier effect in Teal in just one case. Barrier effect is not envisaged to be an issue with this species due to lack of recorded flight activity and the reasons outlined above.	**Disturbance:** **Magnitude:** Negligible **Sensitivity:** Medium **Overall Significance:** Very Low (Criteria: Percival 2003). Significance of effects Imperceptible due to lack of sightings in the flight activity survey area; overall significance considered **Long-term Imperceptible** effect (Criteria: EPA, 2022). **Barrier Effect:** **Magnitude:** Negligible **Sensitivity:** Medium **Overall Significance:** Very Low (Criteria: Percival 2003).

Key Receptor (Sensitivity)	Operational Indirect Effect Character	Significance without mitigation
	The predicted magnitude for barrier effect is *Negligible.*	Significance of effects to migrating birds in terms of energy expenditure assessed as Imperceptible due to lack of sightings in the flight activity survey area; significance of daily barrier effect assessed as Imperceptible; overall significance considered to be a **Long-term Imperceptible** effect (Criteria: EPA, 2022).

7.5.3 Potential Decommissioning Effects

The decommissioning phase of the proposed wind farm site poses similar risks to potential effects vis-á-vis the construction phase. However, it should be noted that the magnitude of the effect of decommissioning is normally reduced as all infrastructure is already in situ. No works will be required along the haul route as the turbine components will be broken up on site and therefore require less clearance to remove along the same haul road. Grid connection cables will be left in the ground, therefore no potential impacts during decommissioning stage are likely to occur.

7.5.3.1 Direct & Indirect Effects

The following matrix outlines the assessment of direct effects on key avifauna receptors during decommissioning, based on the criteria previously outlined.

Note: the criteria utilised in the current assessment to define duration were as follows, from published guidance (EPA, 2022):

- Momentary: seconds to minutes;
- Brief: less than a day;
- Temporary: up to 1 year;
- Short-term: from 1-7 years;
- Medium-term: 7-15 years;
- Long-term: 15-60 years; and
- Permanent: over 60 years.

It is likely that the time period for decommissioning of the project would be ca. six months.

<u>Passerines and Pigeons/Doves</u>

Decommissioning during the breeding season may result in some minimal disturbance to breeding passerine species due to increased human activity and noise. Tree trimming shall not however be carried out during the bird breeding season. There will be no further habitat

loss during the decommissioning phase and the resultant impact to passerine species is a *Temporary Imperceptible Reversible Effect*.

Birds of Prey

Although no birds of prey were noted breeding or roosting on Site, there are suitable habitats to support foraging Buzzard and Kestrel. Tree trimming will not be carried out during the bird breeding season. There shall be no further habitat loss during the decommissioning phase. Decommissioning during the breeding or wintering season may result in some minimal disturbance to foraging Buzzard or Kestrel due to increased human activity and noise.

The resultant impact to birds of prey is a *Temporary Imperceptible Reversible Effect*. As no breeding or roosting of raptors was noted on site, this prediction is worst-case scenario.

Waders and Wildfowl

Two gull species were noted during surveys, namely Great Black-backed Gull and Lesser Black-backed Gull. These species do not breed on or in the vicinity of the Site. Additionally, there are no records of foraging on Site and it is unlikely that the habitats on or surrounding the Site supports foraging gulls. All records indicate Gulls were commuting through / flying past the Site. As such, no effect is anticipated for Gulls.

Similarly, Cormorant, Dunlin, and Teal were recorded on very few occasions within the flight activity survey area. Additionally, Golden Plover were noted over the winter seasons, and exclusively involved birds in flight over the Site. However, there are no suitable habitats on Site to support foraging, roosting or breeding Cormorant, Dunlin, Golden Plover, or Teal. As such, it is unlikely that these species will be effected during the decommissioning phase.

Meadow Pipit, Wheatear, Skylark and Snipe were noted as being present within and immediately adjacent to the Site. Although no breeding or foraging was observed in the case of Snipe, there are suitable habitats on-site to support such activities. As a result, the increase in human activity and noise may result in in minimal temporary disturbance to these species.

Again, as there will be no further habitat loss during the decommissioning phase, and tree trimming will not be carried out during the bird breeding season. The worst-case scenario resultant impact to waders and waterfowl is a *Temporary Imperceptible Reversible Effect*.

Red Grouse

The site holds one pair of breeding Red Grouse located outside the footprint of the proposed development with a second pair recorded outside the site.

As there will be no further habitat loss during the decommissioning phase, and tree trimming will not be carried out during the bird breeding season, the resultant impact to Red Grouse would be a *Temporary Slight Reversible Effect*.

7.5.4 Potential Cumulative Effects

There are 28 operational, consented and proposed wind farms within 20 km of the Site. **Figure 2.1** shows the location of proposed, permitted and operational wind farms within a 20 km radius of the proposed turbines and Table 7.29 below provides further information on these wind farms.

The nearest operational wind farm is Shehy More Wind Farm which is located approximately 260 m to the north of the Site. The closest distance between turbines within Shehy More and the Proposed Development is approximately 567 m, which is between the western-most turbine of Shehy More Wind Farm and T2 of the Proposed Development.

Table 7.29: Consented and operational wind farms within 20km of the proposed site.

Wind Farm	Status	No. of Turbines	Approximate Distance to Nearest Turbine	Direction from the Proposed Development
Shehy More Wind Farm	Operational	11	0.55	North
Carrigarierk Wind Farm	Permitted	5	5.22	Northeast
Carrigarierk Wind Farm 2	Operational	3	5.74	Northeast
Derrenacrinnig	Permitted	3	7.08	South
Milane Wind Farm	Operational	9	9.20	South
Cleanrath Wind Farm	Operational	9	9.86	Northeast
Grousemount Wind Farm	Operational	38	9.89	Northwest
Derragh Wind Farm	Operational	6	9.93	North
Sillahertane Kilgarvan Wind Farm	Operational	10	11.63	North

Wind Farm	Status	No. of Turbines	Approximate Distance to Nearest Turbine	Direction from the Proposed Development
Gortyrahilly Wind Farm	Proposed	14	11.72	North
Killaveenoge Wind Farm	Operational	10	12.01	South
Currabwee Wind Farm	Operational	7	13.04	Southeast
Lahanaght Hill Wind Farm	Operational	5	13.78	South
Coolknoohil (Everwind) Wind Farm	Operational	11	14.01	North
Foilgreana Wind Farm	Operational	6	15.30	North
Midas Wind Farm (Glanlee I)	Operational	6	15.70	North
Midas Wind Farm (Inchee)	Operational	6	14.85	North
Coomagearlahy Wind Farm	Operational	15	16.58	North
Coomatallin Wind Farm	Operational	4	16.61	South
Rosseightragh Wind Farm	Operational	6	17.11	North
Kilvinane Wind Farm	Operational	3	17.98	Southeast
Ballybane Wind Farm	Operational	21	18.00	Southwest
Barnadivane Wind Farm	Proposed	6	18.04	East
Inchacoosh Kilgarvan Wind Farm	Operational	6	18.18	North
Kilgarvan Repower	Proposed	11	18.18	North
Kilgarvan II Wind Farm (Lettercannon)	Operational	7	16.03	Northwest
Inchamore Wind Farm	Proposed	5	18.57	North
Garranereagh Wind Farm	Operational	3	19.72	East

The primary wind farm of interest in terms of potential for cumulative effects is the adjacent existing Shehy More wind farm. This is due to its close proximity (c. 570m from the nearest proposed turbine location at the Proposed Development).

The identified construction and operational phase effects for other proposed, consented and operational wind farms within 10 km of the Proposed Development are discussed in Sections 7.5.4.1 and 7.5.4.2.

The potential cumulative effects which could occur in conjunction with these projects are assessed as not having the potential to exceed the highest magnitude effects identified for any given category/species identified for the Proposed Development or any of the other wind farms identified in the cumulative assessment.

Similarly, it is assessed that the highest magnitude effects identified for the Proposed Development and/or any projects beyond 10 km will not be exceeded in magnitude by any potential cumulative effects.

7.5.4.1 Cumulative Effects During Construction

Direct effects on avifauna during construction are primarily land take related, mainly due to the loss of nesting habitats to key species. Other sources of land take as outlined above do have the potential for cumulative effects on nesting or resident upland species which use open habitats (the Proposed Development comprises heath and grassland habitats and lacks any wooded habitats). It is noted that Red Grouse were not recorded at any of the wind farm projects within 10 km, and as such a cumulative effect for this species is unlikely. Species such as Meadow Pipit and Skylark may be affected cumulatively by further loss or alteration of upland heath or grassland habitats due to farming practices, etc. Even though in-combination land take is unlikely to result in range loss of any species which frequent the subject site, mitigation may be required to neutralise the effect of the proposed wind farm. Disturbance or effective habitat loss indirectly is more difficult to quantify; especially as most species of birds may habituate to disturbance over time. It is noted that the adjacent Shehy More wind farm is operational and as such potential for cumulative effects in conjunction with Shehy More is limited at construction stage. There is some limited potential for operational phase disturbance associated with Shehy More to act cumulatively with construction phase effects from the Proposed Development, however any such effects would be minor in comparison to the non-cumulative construction effects from the Proposed Development. Any cumulative effects on birds during the construction phase would be a *Long-Term Imperceptible Cumulative Effect*.

7.5.4.2 Cumulative Effects During Operation

Direct effects on avifauna during operation which may be cumulatively added to by other existing pressures or proposed developments include collision related mortality, ongoing disturbance/displacement, and barrier effect. Flight height or the flight heights which birds habitually use along either migration or local flight paths is an influencing factor in determining

whether the proposed development will combine with additional wind farms to produce additive, synergistic or antagonistic effects.

These effects include increased Barrier Effect (potentially obstructing migratory flightpaths), increased collision risk (through combined mortality in susceptible species) and increased disturbance to birds utilising foraging grounds whilst on migration. As noted above, the primary wind farm of interest in terms of potential for cumulative effects is the adjacent existing Shehy More wind farm due to it's close proximity.

The EIAR for Shehy More identified a Long-term Negligible effect arising from collision risk for Hen Harrier, based on a predicted collision rate of one collision every 143 years. This is similar to the predicted collision rate for Hen Harrier calculated for the Proposed Development (one collision every 131 years) which is assessed as a Long-term Not Significant effect. The relatively low level of activity, lack of breeding activity and low risk habitual flight patterns observed across both Shey More wind farm and the Proposed Development site are consistent in indicating that the potential for cumulative effects remains low for Hen Harrier, and as such the cumulative collision risk for this species is assessed as a ***Long-term Not Significant*** effect.

While surveys at Shehy More did not detect any migratory activity, the EIAR did identify potential for a Long-term Slight effect for migrating birds due to barrier effect. This is of relevance to Golden Plover, which has been observed flying over the Proposed Development and is assessed as being subject to a Long-term Moderate effect due to barrier effect. While Shehy More and the Proposed Development are in close proximity, it is noted that a gap of over 1 km separates the three western-most turbines of Shehy More from the remaining 11 Shehy More turbines to the north-east. This large gap, in conjunction with minimum turbine spacing of 500m at the Proposed Development and 400m at Shehy More results in reduced potential for barrier effect, both individually and cumulatively. As such, the potential cumulative barrier effect arising from both the Proposed Development and Shehy More does not increase above the magnitude identified for the Proposed Development and is assessed as a ***Long-term Moderate*** cumulative effect.

A Long-term Slight effect in terms of operational disturbance/displacement was identified for Hen Harrier, Kestrel and Sparrowhawk in the Shehy More EIAR. Effects on these species in this category identified for the Proposed Development are Long-term Not significant to Slight for Hen Harrier, Imperceptible for Sparrowhawk and Moderate for Kestrel. While a moderate effect on Kestrel was identified for the Proposed Development, this arises from the activity

patterns observed there. Since Kestrel activity was assessed as relatively low in the Shehy More EIAR, the potential for a cumulative effect for Kestrel in this regard is low and is assessed as ***Long-term Slight***.

Considering the distances of the other wind farm sites within 20 km relative to the Proposed Development, in conjunction with the collision risk impacts identified for wind farms within 10 km, the cumulative collision risk on any avian receptors is assessed as ***Long-term Negligible*** to ***Not Significant*** for all species. It is noted that the Slight collision risk impact identified for Golden Plover for Cleanrath wind farm (9.8 km north-east) is applicable to the local population at that site, and as such, potential cumulative effects for this species remain at the level of ***Long-term Not Significant***. The cumulative collision risk for Golden Plover based on wind farms within 10 km for which collision risk modelling was completed is 0.95 (Keel Energy 0.45 + Proposed Development 0.5 = 0.95), which equates to 0.010% of the county population and 0.0012% of the national population. Cumulative collision effects for Golden Plover are not predicted to exceed the threshold of 'Not Significant'.

As the predicted annual collision rate of Kestrel at the Proposed Development is 2.4 per year, this also warrants closer examination in terms of cumulative impact. The cumulative collision risk for Kestrel based on wind farms within 10 km for which collision risk modelling was completed is 2.68 (Keel Energy 0.28 + Proposed Development 2.4), which equates to 0.15% of the county population and 0.016% of the national population. Cumulative collision effects for Kestrel are will not exceed the threshold of 'Not Significant' at county level. It is not envisaged that a cumulative collision rate of this magnitude could occur for wind farms within 20 km. As such, the predicted cumulative impact of collision risk for Kestrel is considered to be a ***Long-term Slight*** at county level, and ***Long-Term Not Significant*** at national level.

7.6 MITIGATION MEASURES FOR AVIFAUNA

Mitigation measures are described below which will avoid, reduce and where possible, offset potential negative effects arising in relation to avifauna from the construction, operation and decommissioning of the site. These mitigation measures shall be implemented in full.

7.6.1 Mitigation by Avoidance and Design

See **Chapter 6: Biodiversity.**

7.6.2 Mitigation measures during the construction phase of the project

7.6.2.1 Introduction

Construction of this project is expected to cause temporary (disturbance) adverse effects on local ecological receptors, as outlined in **Section 7.5** above. The mitigation measures described below will reduce these effects significantly.

7.6.2.2 Project Ecologist/ECoW

A Project Ecologist/Ecological Clerk of Works (ECoW) with appropriate experience and expertise (in implementing ecological mitigation measures for wind farm developments) will be employed for the duration of the construction phase to ensure that all the mitigation measures outlined in relation to the environment are implemented. The Project Ecologist/ECoW will be awarded the authority to stop construction activity if there is potential for significant adverse ecological effects to occur.

7.6.2.3 Avifauna

Subject to other environmental concerns (e.g., run-off), the removal of vegetation and scrub as well as trimming of trees along the GCR, TDR and general wind farm area will be undertaken outside of the bird breeding season (March 1st to August 31st inclusive). This will help protect nesting birds.

This is in line with best practice recommendations for mitigation measures in regard to birds and wind farms as recommended by statutory bodies such as English Nature and the Royal Society for the Protection of Birds (Drewitt, A. L. and Langston, R. H., 2006).

Construction operations will take place during the hours of daylight to minimise disturbances to roosting birds, or active nocturnal bird species. This is in line with best practice recommendations for mitigation measures in regard to birds and wind farms as recommended

by statutory bodies such as English Nature and the Royal Society for the Protection of Birds (Drewitt and Langston, 2006). Limited operations such as concrete pours, turbine erection and installation of the grid connection may require night-time operating hours; these works will be supervised by the project ecologist/ECoW.

Toolbox talks will be undertaken with construction staff on disturbance to key species during construction. This will help minimise disturbance. This is in line with best practice recommendations for mitigation measures with regard to birds and wind farms as recommended by statutory bodies such as English Nature and the Royal Society for the Protection of Birds (Drewitt and Langston, 2006).

Where/if removed or altered, re-instated hedgerows will be planted with locally sourced native species. This will result in habitat enhancement for local species of conservation importance such as Meadow Pipit. This is in line with best practice recommendations for mitigation measures in regard to birds and wind farms as recommended by statutory bodies such as English Nature and the Royal Society for the Protection of Birds (Drewitt and Langston, 2006).

A re-confirmatory survey (March/April) will be conducted of the proposed turbine locations to assess any evidence of target species activity or occupation of new territories (e.g. in the case of breeding Snipe or Red Grouse). Should any nesting locations be recorded, works at these locations will be restricted to outside the breeding season (March 1st to August 31st inclusive) or until chicks are deemed to have fledged (following monitoring).

The use of "white lights" on the turbines will not occur as these can attract night flying birds such as migrants, and insects, which in turn can attract bats. Certain turbines will be illuminated with medium intensity fixed red obstacle lights of 2000 candelas where required by the IAA Lighting will be fitted with baffles to ensure that the light is directed skywards and will not be discernible from the ground.

7.6.3 Habitat Management Plan (HMP)

A Habitat Management Plan (HMP) has been prepared for the proposed Gortloughra Wind Farm in Co. Cork (**Appendix 6.4**). This HMP has been prepared for lands occurring within the Gortloughra Wind Farm Site Redline boundary. The lands that are the subject of the habitat management actions set out in this HMP are situated to the northeast of the Site Redline Boundary consisting of an area of heathland to the north of Shehy More.

The parcels of land (referred to hereafter as the HMP lands) that will be targeted for habitat management of wet and montane heath habitat will amount to approximately 2 Ha.

The HMP lands will be managed throughout the lifetime of the wind farm with a view to restoring and maintaining wet and montane heath habitat that corresponds to structure of Annex 1 quality wet heath.

Red Grouse require a broad age-range of heather to allow for cover, shelter, nesting and feeding. Hens usually nest in mature heather adjacent to freshly cut/burnt or second year cut/burnt heather, where fresh shoots will be available for chicks. This improved micro-climate is beneficial to the reproduction of invertebrates which are a vital food source for chicks. A patchwork of old and new heather is widely considered as the best management practise for Red Grouse.

Heather burning will be avoided within the Study Area. Instead, targeted cutting (e.g., using a hand held strimmer) of short, 10 m wide strips in areas with Heather growing at heights of 30 cm or more will be considered. This practice would need to be carefully assessed and accompanied by monitoring to determine effectiveness and identify any adverse effects, with the rotation period for cutting determined by the rate of Heather re-growth. Any cutting operations will be carried out from October to March inclusive (outside the bird nesting season), with only a relatively small area cut at any one time and cut strips left surrounded by taller Heather. The proposed cutting will be monitored by an ecologist to avoid adverse effects to habitats and species.

The habitat management measures described in the HMP, notably for heath and heath mosaic habitats, are also applicable to habitat management for Red Grouse. In particular, management of heath will be required to maintain heath vegetation in favourable condition for nesting, foraging and sheltering for Red Grouse. General management prescriptions will also benefit Red Grouse; notably the prohibition of any shooting or burining within the site including the management area, and the sensitive timing of activities and/or adoption of exclusion zones to avoid effects on Red Grouse when they are likely to be most sensitive (e.g., when nesting).

7.6.4 Mitigation measures during operation

A post construction monitoring programme is to be implemented at Gortloughta in order to confirm the efficacy of the mitigation measures; the results of this will be submitted annually to the competent authority and NPWS. Published guidance on assessing the impacts of wind farms on birds from English Nature and the Royal Society for the protection of birds

recommends the implementation of an agreed post development monitoring programme as a best practice mitigation measure (Drewitt and Langston, 2006).

In addition, published recommendations on swans and wind farms (Rees, 2012) suggests that systematic post construction monitoring; adapted to quantify collision, barrier, and displacement, be conducted over a period of sufficient duration to allow for annual variation or in combination effects. The following individual components are proposed:

1) Fatality Monitoring (to be conducted during years 1, 2, 3, 5, 10 and 15 post construction)- A comprehensive fatality monitoring programme is to be undertaken following published best practice (Shawn et al., 2010; Fijn et al., 2012 and Grunkorn, 2011); the primary components are as follows:
    a. Initial carcass removal trials to establish levels of predator removal of possible fatalities.
       This is to be done following best recommended practice and with due cognisance to published effects such as predator swamping, whereby excessive placement of carcasses increases predator presence and consequently skews results (Shawn et al., 2010).
    b. Turbine searches for fatalities are to be undertaken following best practice (Fijn et al., 2012 and Grunkorn, 2011) in terms of search area (minimum radius hub height) and at intervals selected to effectively sample fatality rates based on carcass removal rates (e.g. 1 per month). To be conducted during years 1, 2, 3, 5, 10 and 15 post construction to allow for annual variation and cumulative effects. Dependant on results further monitoring to be agreed with NPWS.
    c. A standardised approach with a possible control group and/or variation in search techniques such as straight line transects/ randomly selected spiral transects/ dog searches will be undertaken. This will provide a means of robustly estimating the post construction collision fatality impact (if any).
    d. Recorded fatalities to be calibrated against known predator removal rates to provide an estimate of overall fatality rates.

Reports will be submitted to the competent authority and NPWS following each round of surveys.

2) Flight Activity Survey (to be conducted during years 1, 2, 3, 5, 10 and 15 post construction) - A flight activity survey is to be undertaken during the summer and winter months to include both vantage point and hinterland surveys as Per SNH (2017) guidance:

a. Record any barrier effect i.e. the degree of avoidance exhibited by species approaching or within the wind farm (Drewitt and Langston, 2006). Target species to be all raptors and owls, all wild goose and duck species, all swan species, and all wader species.
b. Record changes in flight heights of key receptors post construction.

Reports will be submitted to the competent authority and NPWS following each round of surveys. This survey is to be conducted during years 1, 2, 3, 5, 10 and 15 post construction to allow for annual variation and cumulative effects. Dependant on results further monitoring requirements will be agreed with NPWS.

3) Monthly Wildfowl Census (to be conducted during years 1, 2, 3, 5, 10 and 15 post construction). A monthly wildfowl census, following the methods utilised for the Baseline survey, is to be repeated on a monthly basis during the winter period. This aims to:
   a. Assess displacement levels (if any) of wildfowl such as swans post construction
   b. Assess overall habitat usage changes within the vicinity of the Gortloughra Wind Farm Development post construction.

This survey is to be conducted during years 1, 2, 3, 5, 10 and 15 post construction to allow for annual variation and cumulative effects. Dependant on results further monitoring requirements will be agreed with NPWS. Reports will be submitted to the competent authority and NPWS following each round of surveys.

4) Breeding Bird Survey (to be conducted during years 1, 2, 3, 5, 10 and 15 post construction). A breeding bird survey (moorland breeding bird and Common Bird Census), following methods used in the Baseline survey to be repeated yearly between early April to early July. This aims to:
   a. Assess any displacement effects such as those recorded on breeding birds. Overall density of breeding birds to be annually recorded.

5) Breeding Wader Survey (to be conducted during years 1, 2, 3, 5, 10 and 15 post construction). A breeding bird survey, following methods used in the Baseline survey to be repeated yearly April-May-June.
6) Red grouse survey (to be conducted during years 1, 2, 3, 5, 10 and 15 post construction). following methods used in the Baseline survey

Both of the above surveys are to be conducted during years 1, 2, 3, 5, 10 and 15 post construction to allow for annual variation and cumulative effects. Dependant on results further monitoring requirements will be agreed with NPWS.

7.6.5 Mitigation Measures during the Decommissioning

The same mitigation measures will apply for the decommissioning phase as for the construction phase.

7.7 RESIDUAL EFFECTS FOR AVIFAUNA

To minimise effects on those species which the literature suggests can be negatively impacted, a re-confirmatory preconstruction survey (March/April) will be conducted of the proposed turbine locations to assess any evidence of target species activity or the occupation of new territories. Should any new nests be recorded, works at these locations will be restricted to outside the breeding season (April-July) or until chicks are deemed to have fledged (following monitoring).

A comprehensive monitoring program will also be implemented following construction of the proposed wind farm; this will monitor the degree of barrier effect, if any, on existing species as a result of the development, in addition to comprehensively monitoring any bird fatalities.

It is considered that with the implementation of mitigation, the proposed wind farm development will have an *Imperceptible to Slight Reversible Residual Effect and in the local context* on birds. It will result in a *Moderate Reversible Residual Effect* to Kestrel and *Slight Reversible Residual Effect* to Red Grouse due to disturbance/displacement during the operational phase. In relation to barrier effect a *Long-term Slight to Moderate effect in the local context* on Kestrel and Golden Plover is predicted. However, habituation over the lifetime of the wind farm is likely to reduce these effects.

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