CONTENTS

TABLES

FIGURES

TECHNICAL APPENDICES (VOLUME 3)

Acronyms and Abbreviations

AA	Appropriate Assessment
AOD	Above Ordnance Datum
BCI	Bat Conservation Ireland
BoCCI	Birds of Conservation Concern in Ireland
CEMP	Construction Environmental Management Plan
CFB	Central Fisheries Board
CIEEM	Chartered Institute of Ecology and Environmental Management
CRM	Collision Risk Model
CRZ	Collision Risk Zone
DECC	Department of the Environment, Climate and Communications
EcIA	Ecological Impact Assessment
ECoW	Ecological Clerk of Works
eDNA	Environmental DNA
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
GCR	Grid Connection Route
Grid Connection Route (GCR)	Refers to the proposed Grid Connection Route as defined in Chapter 1 of this EIAR.
GSI	Geological Survey Ireland
GWDTE	Groundwater Dependent Terrestrial Ecosystem
HMP	Habitat Management Plan
IEF	Important Ecological Feature
IVC	Irish Vegetation Classification
I-WeBS	Irish Wetland Bird Survey

Main Wind Farm Development Site	The site where the Proposed Development is located. As defined in Chapter 1 of this EIAR.
MCDP	Mayo County Development Plan
NBDC	National Biodiversity Data Centre
NHA	Natural Heritage Area
NHZ	Natural Heritage Zone
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Service
NRA	National Roads Authority
PCH	Potential Collision Height
pNHA	proposed Natural Heritage Area
Proposed Project	Refers to the Proposed Development including the GCR.
PRP	Peatland Restoration Plan
QI	Qualifying Interest
SAC	Special Area of Conservation
SCI	Special Conservation Interest
SEAI	Sustainable Energy Authority of Ireland
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SuDS	Sustainable Drainage Systems
TDR	Turbine Delivery Route
TII	Transport Infrastructure Ireland
Turbine Delivery Route (TDR)	Refers to the proposed turbine delivery route as defined in Chapter 1 of this EIAR.
VP	Vantage Point
WP	Wind Farm Polygon
ZoI	Zone of Influence

5.0 BIODIVERSITY

Introduction

Background

5.1 This chapter identifies, describes and assesses the likely significant, direct and indirect, effects of the Proposed Project, on biodiversity (see **Chapter 2** for a full description of the Proposed Project). It characterises the baseline biodiversity (flora and fauna) within the study area, providing an understanding of existing ecological context such as designated nature conservation sites, habitats and species etc. before assessing potential impacts.

Overview of the Local Environment

5.2 The Proposed Project consists of a few key areas – the Main Wind Farm Development Site, the Grid Connection Route (GCR) and the Turbine Delivery Route (TDR) with associated Over-run Areas. The Main Wind Farm Development Site predominately consists of cutover lowland blanket bog as well as areas of Conifer Plantation on peated substrate. The bog is extensively drained, is subject to scrub encroachment and there is the pervasive presence of invasive species such as rhododendron (Rhododendron ponteticum) and prickly heath (Gaultheria mucronate). Small areas of scrub and wet grassland are also present within the Main Wind Farm Development Site. These habitats are relatively consistent with the general surrounding area, with more peatland habitat available in the surrounding landscape than conifer plantation.

5.3 The Main Wind Farm Development Site is generally flat with levels ranging from c. 3 m above ordnance datum (AOD) to 33m AOD. Several small drains are present within, and along the boundaries of, the Main Wind Farm Development Site; as well as some small streams. For example, a stream runs west along the northern boundary, and another flows south along the lower portion of the eastern boundary. The L5252 road bisects the Main Wind Farm Development Site east to west.

5.4 A single 110 kV Grid Connection Route (GCR) is assessed as part of this EIAR; however, it is not the subject of the current planning application. The GCR will be progressed under a separate consent process and will comprise an underground connection to Bellacorick Substation, entirely along existing public road corridors. Consequently, the receiving ecological environment along the GCR is dominated by modified roadside habitats, including grassy verges (GA1), treelines (WL2), drainage ditches (FW4), and areas of scrub (WS1).

5.5 The TDR extends from Killybegs Port, Co. Donegal to the Main Wind Farm Development Site. Temporary works requiring planning consent to facilitate delivery are required in 3 areas (Over-run Areas 1, 2 and 3, (see Figures 2-4b, 2-4c, 2-4d). The TDR traverses a mosaic of improved farmland, semi-natural grassland, and peatland ecosystems typical of coastal and upland within the receiving environment. The ecological environment along the TDR encompasses a diverse range of terrestrial and semi-natural habitats. Habitats recorded include improved and agricultural grassland (GA1, GS2), hedgerows (WL1), drainage ditches and watercourses (FW4, FW1), scrub (WS1), and wet and dry heath (HH3 and HH2). In the western sections, the route passes through and adjacent to blanket bog (PB3) and cutover bog (PB4), including areas corresponding with Annex I habitat (7130)

Blanket Bog (priority if active1) within the Tristia Bog NHA. These peatland habitats support species such as Sphagnum mosses, Erica tetralix, Molinia caerulea, and Schoenus nigricans. The TDR areas support grass-dominated swards with Lolium perenne, Trifolium repens, and Plantago lanceolata, while hedgerows and treelines of hawthorn, elder, and bramble provide structure and wildlife corridors. Invasive species - including Rhododendron ponticum, Gunnera tinctoria, Rosa rugosa, and Symphoricarpos albus -were recorded, typically at disturbed or roadside sites.

Statement of Authority

Kathryn Robson

5.6 This chapter has been written by Kathryn Robson BSc Hons, MSc. MCIEEM, Kathryn is a senior ecologist at SLR Consulting Ltd with 8 years of experience as a professional ecological consultant. Her project experience has primarily been in the renewable energy sector, mainly onshore wind farms, at all stages of the development process, from design to completion. Competent in undertaking most terrestrial ecology surveys, her survey experience has focussed on ornithology and bat surveys. Kathryn holds a MSc in Ecological Management and Conservation Biology and a BSc in Biological Sciences, both from Queen's University Belfast.

Andrew Torsney

5.7 Andrew Torsney BSc, MRes, PhD, ACIEEM provided the technical review of the chapter and carried out the Annex I habitat condition assessment survey .Andrew is a technical specialist when it comes to environmental impact assessments and was a coauthor on the EPA 2022 Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIARs). Andrew has worked on a number of national environmental assessments and published research in the topic of wind farm development. Andrew was part of the team that developed the Draft Wind Energy Guidelines. With regard to Annex I habitats Andrew has published research on the complexities of habitat classification and has undertaken annex I habitat translocations under licence from the NPWS.

Jonathon Dunn

5.8 The collision risk modelling report was written by Jonathon Dunn MA (Cantab.) MSc PhD MCIEEM. Jonathon also undertook the initial site walkover and survey of the Grid Connection Route (GCR) and TDR. Jonathon has worked in the environmental sector since 2014 and joined SLR Consulting in 2021. Prior to working in environmental consultancy, he undertook research at Newcastle University on avian ecology and conservation. He holds a PhD in avian ecology from Newcastle University, a MSc in Ecology, Evolution and Conservation from Imperial College London and a MA (Cantab.) in Natural Sciences from the University of Cambridge. Jonathon has extensive experience undertaking and managing bird surveys, along with bat, botanical and mammalian surveys. Jonathon has worked on a wide variety of projects with a focus on wind farms.

Sinéad Clifford

5.9 The initial site walkover and survey of the GCR and TDR was undertaken by Sinéad Clifford BSc (Hons). Sinéad has worked in the environmental sector since 2015 and joined SLR Consulting in 2021. She holds a BSc. in Wildlife Biology from Institute of Technology Tralee,

[1] An active blanket bog is a condition criteria which relates to peat forming status.

and a Certificate (Distinction) in Ecological Consultancy from Ecology Training UK (formerly Acorn Ecology). Sinéad has strong field skills, and regularly carries out bat, ornithological, botanical and mammalian surveys. In addition, she has extensive experience managing bat surveys for large scale projects, including wind energy developments.

Ross Macklin

5.10 The aquatic ecology and fisheries reports were written by Ross Macklin PhD (in preparation) B.Sc. (Hons) MCIEEM., MIFM, HDip GIS, PDip IPM (Principal ecologist with Triturus Environmental Ltd). Ross is an ecologist with over 16 years' professional experience in Ireland. He specialises in freshwater fisheries ecology, biology and water quality. He has considerable experience in a wide range of ecological and environmental projects including EIAR, EcIA, AA/NIS, Construction and Environmental Management Plan (CEMP) reporting, as well as biodiversity, water quality monitoring, invasive species and fisheries management. He also has expert identification skills in macrophytes, freshwater invertebrates, protected aquatic habitats and protected aquatic species including freshwater pearl mussel.

Alexis Fitzgerald

5.11 Initial habitat survey was undertaken by Alexis Fitzgerald BA MSc ACIEEM (Director of FitzGerald Ecology consultancy). Alexis is a passionate field botanist and vegetation ecologist with over 9 years of professional experience in Ireland. He has extensive expertise in vascular (terrestrial and aquatic) plant, bryophyte and charophyte identification and habitat surveying, including Irish Heritage Council classification (Fossitt, 2000),2 Annex I habitat classification, Irish Vegetation Classification (IVC), National Parks and Wildlife Service 'Uplands Manual' habitat classification and Flora (Protection) Order, 2015 species identification and conservation. Specific details can be found in **Technical Appendix 5-1**.

Woodrow Personnel

5.12 Baseline ornithology and bat reports were provided by Woodrow and the relevant specialisms of the personnel can be found **in Technical Appendix 5-2** & **Technical Appendix 5-3.**

Guidance

5.13 This chapter is in accordance with the guidelines for ecological impact assessment produced by the Chartered Institute of Ecology and Environmental Management in 2018 (updated in September 2024)3 . Guidance for specific surveys is provided in **Table 5-5**.

Legislation and Planning Policy

5.14 In addition to the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, as amended, the legislation set out in **Table 5-1** has been complied with where relevant to this chapter.

[2] Fossitt, J. A. (2000). *A guide to habitats in Ireland*. Kilkenny: Heritage Council.

[3] Chartered Institute of Ecology and Environmental Management (CIEEM). (2018). *Guidelines for ecological impact assessment in the UK and Ireland: Terrestrial, freshwater, coastal and marine* (Version 1.1; updated to Version 1.3, September 2024). Winchester, UK.

Table 5-1: Biodiversity Legislation

Legislation	Description
Wildlife Act, 1976, as amended[4]	The principal national legislation for the protection of wildlife and the control of activities that may adversely affect wildlife. Also seeks to conserve a representative sample of important ecosystems and regulate game resources. It makes licences mandatory for certain activities which may interfere with ecosystems and regulates the possession, trade and movement of wildlife. Areas of importance for wildlife may be protected under the Act, either as Nature Reserves, Refuges for Fauna, or by way of management agreements.
Wildlife (Amendment) Act, 2000[5], 2010[6], 2012[7]	Amended the Wildlife Act, 1976. Main objectives are to designate and give protection to Natural Heritage Areas (NHAs) and improve the conservation of wildlife and their habitats while ensuring Ireland's compliance with international biodiversity agreements. Broadened the scope of the Wildlife Act to include hitherto omitted species. Legislates for fines and punishments and allows for the imposition of prison sentences in certain circumstances.
Flora (Protection) Order 2022	This is the most up to date legislation regarding protected plant species in Ireland and supersedes four earlier versions of the Order. The order makes it illegal to cut, damage, or uproot protected species or to interfere with their habitats and seeds.
The Habitats Directive	Adopted in 1992, the Habitats Directive works alongside the Birds Directive to form the legal foundation of the Natura 2000 network. Its objective is to ensure the long-term conservation of Europe's most valuable and threatened habitats and species by maintaining or restoring them to a favourable conservation status. The Directive requires Member States to designate Special Areas of Conservation (SACs), implement conservation measures, protect listed species across their natural range, and assess the potential effects of plans and projects on Natura 2000 sites to safeguard their ecological integrity.
The Birds Directive	Adopted in 1979 and updated in 2009, the Birds Directive is one of the oldest EU environmental laws and works alongside the Habitats Directive to form the legal foundation of the Natura 2000 network. Its aim is to maintain and restore bird populations to a favourable conservation status, ensuring the long-term survival of Europe's avian biodiversity.
European Communities (Birds and Natural Habitats) Regulations, 2011, as amended.	A collection of regulations which implements the EU Habitats Directive and the EU Birds Directive. The Habitats Directive is the main piece of EU legislation governing the protection and conservation of habitats and organisms (excluding birds) deemed to be threatened and of EU wide importance. It establishes Special Areas of Conservation (SACs) where habitats and/or wildlife present are deemed to be ecologically valuable.

[4] Oireachtas. (1976) *Wildlife Act 1976*. No. 39 of 1976. Dublin: The Stationery Office. Available at: https://www.irishstatutebook.ie/eli/1976/act/39/enacted/en/html

[5] Oireachtas. (2000) *Wildlife (Amendment) Act 2000*. No. 38 of 2000. Dublin: The Stationery Office. Available at: https://www.irishstatutebook.ie/eli/2000/act/38/enacted/en/html

[6] Oireachtas. (2010) *Wildlife (Amendment) Act 2010*. No. 19 of 2010. Dublin: The Stationery Office. Available at: https://www.irishstatutebook.ie/eli/2010/act/19/enacted/en/html

[7] Oireachtas. (2012) *Wildlife (Amendment) Act 2012*. No. 29 of 2012. Dublin: The Stationery Office. Available at: https://www.irishstatutebook.ie/eli/2012/act/29/enacted/en/html

Legislation	Description
	The EU Birds Directive conserves wild bird populations in Europe by protecting not only the birds but also their habitats through the creation of Special Protection Areas (SPAs).
Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species, as amended, together with Commission Implementing Regulation (EU) 2016/1141 and Implementing Regulation (EU) 2019/1262	Mandates measures to prevent introduction, monitor and eradicate or control certain non-native invasive species i.e. those identified in the commission implementing regulations, which provide the list of 54 invasive alien species of Union concern.
The Heritage Act 2018	Amends the Wildlife Act 1976 by creating discretionary powers for the government to allow burning of uncultivated land in March and the cutting of roadside hedgerows in August and provides additional exemptions for cutting roadside vegetation for reasons of road safety, as well as giving additional powers to the police to enforce wildlife legislation, including fixed penalties.
EU Nature Restoration Law	A regulation mandating the regulation and restoration of the degraded ecosystems of EU Member States. Sets out a series of targets with associated timelines for the restoration of habitats in poor condition. All EU Member States are obliged to submit National Restoration Plans by 2026, these plans will detail how they will meet targets, report progress, and align restorative efforts with existing biodiversity laws.
Wildlife Amendment Act 2023	The Wildlife (Amendment) Act 2023 introduces a statutory duty on all public bodies in Ireland to integrate objectives from the National Biodiversity Action Plan into their decision-making and operations. It requires annual reporting on actions taken to support biodiversity and includes provisions to review and, where appropriate, amend or revoke raised bog natural heritage area designations to facilitate habitat restoration.

5.15 In addition to the legislation outlined above, the following planning policies as applicable to the Proposed Project are set out in **Table 5-2**. Please refer to the Planning Statement which accompanies this application for more information.

Table 5-2: Planning Policy and Biodiversity

Policy Document	Description
National Planning Framework (NPF) First Revision April 2025[8]	The Revised National Planning Framework (NPF) provides the State's long-term spatial strategy to 2040, setting out where and how national growth is to be accommodated. It anticipates population growth of c.1 million people and directs this through a balanced regional model, with a 50:50 split between the Eastern and Midland Region and the Southern and Northern & Western Regions. At the urban scale, half of all growth is targeted for the five cities—Dublin, Cork, Limerick, Galway and

[8] https://www.npf.ie/wp-content/uploads/National-Planning-Framework-First-Revision-April-2025-1.pdf

Policy Document	Description
	Waterford—supported by compact settlement policies that require at least 40% of new housing to occur within existing built footprints. This spatial strategy underpins all sectoral planning, including infrastructure and energy. While the NPF contains broader climate actions, its primary relevance here is the emphasis on sustainable land use, efficient settlement patterns, and the need to accommodate future development—factors that frame national demand for onshore renewable energy and grid reinforcement rather than prescribing specific technologies.
Ireland's 4th National Biodiversity Action Plan (NBAP) 2023–2030	**Ireland's 4th National Biodiversity Action Plan (NBAP) 2023–2030** sets out Ireland's strategic objectives and actions to halt and reverse biodiversity loss. It provides a national framework for biodiversity conservation across all sectors, including land use, infrastructure, and planning. This project aligns with the following key objectives of the NBAP: **Objective 1**: Adopt a whole-of-society approach to biodiversity. **Objective 4**: Enhance the evidence base for action on biodiversity. **Objective 5**: Strengthen Ireland's contribution to international biodiversity initiatives. The ecological assessment for this project contributes to these objectives by ensuring that robust baseline data, impact mitigation, and monitoring measures are incorporated into the planning process.
Species Action Plan for the Lesser Horseshoe Bat 2022-2026 (Rhinolophus hipposideros)	This site lies within the known range of the Lesser Horseshoe Bat (*Rhinolophus hipposideros*), a species listed on Annex II of the EU Habitats Directive and afforded full protection under Irish and EU law. The Lesser Horseshoe Bat Species Action Plan (2022–2026) identifies national priorities for the conservation and management of this species, including roost protection, maintenance of suitable foraging and commuting habitats, and enhancement of landscape connectivity. The mitigation measures proposed in this assessment align with these priorities and ensure that the project will not adversely affect the Lesser Horseshoe Bat or its supporting habitats.
Project Ireland 2040: National Development Plan 2018 – 2027	The National Development Plan sets out the priorities for infrastructure and investment projects and spending. These are informed by the policy objectives of the National Planning Framework and are designed to achieve those objectives. The 10 National Strategic Outcomes described in the Plan include (no. 7) enhanced amenity and heritage, which includes protection and enhancement of biodiversity through the National Development Plan, specifically, implementing the National Biodiversity Action Plan 2017 – 2021, support for local biodiversity action plans and the restoration of peatlands.
Regional Spatial and Economic Strategy (RSES) for the Northern and Western Regional Assembly	The Regional Spatial and Economic Strategy (RSES) for the Northern and Western Regional Assembly (2020–2032) supports biodiversity protection and enhancement through objectives aligned with the National Biodiversity Action Plan, All-Ireland Pollinator Plan, and wider goals of climate resilience, ecological connectivity, and natural capital protection. Key relevant policies include commitments to: Protect and restore peatland and wetland habitats for their biodiversity, carbon storage, and landscape value; Implement the All-Ireland Pollinator Plan and manage the spread of invasive alien species; and

Policy Document	Description
	Integrate biodiversity objectives into land use planning, ecological assessment, and green infrastructure networks. These policies emphasize the need to embed biodiversity protection and ecosystem resilience within all spatial planning and development processes, including Ecological Impact Assessment (EcIA) and Appropriate Assessment (NIS).
Mayo County Development Plan 2022 - 2028	The MCDP has objectives for biodiversity, for instance; Objective NEP 1 related to European Sites or NEO 4 detailing ecological connectivity. Additionally, NEP 17 to NEP 22 and NEO 34-40 for the Protection of Waterbodies and Watercourses • NEP 23, NEO 41 for the Protection of Air Quality • NEO 42, NEO 43 Reduction in Light Pollution • NEP 9-10, NEO 15-16 Protection of native peatland habitats will positively impact on European sites.

Consultations

5.16 A scoping request in relation to the Proposed Project was sent to various consultees in April 2024 (see Chapter 3 for more information). A total of 12 biodiversity- related consultees were contacted, of which three provided responses. A summary of the responses relating and how they have been addressed are provided in **Table 5-3**.

Table 5-3: Response to Consultation Comments

Prescribed Body	**Comment** Summary	Response
Development Applications Unit, National Parks and Wildlife Service (NPWS)	Merlin recorded on site. Guidance documents provided. A meeting was held with NPWS (12 March 2025) to discuss the overall approach. It was noted that an appropriate reference population should be selected for key species within the collision risk modelling process. It was stated that there is a very small breeding Golden Plover population in Mayo, vulnerable to cumulative impacts and that cumulative assessment shouldn't reiterate conclusions of other assessments but focus on mortality effects. It was noted that offshore bird species and developments should be considered in cumulative assessment. A key point of discussion was that the existing site is degraded due to extensive drainage and peat cutting, so suitable for enhancement with the wind farm able to provide a positive Biodiversity Net Gain (BNG). NPWS welcomed opportunities for BNG. Ongoing communication was undertaken with NPWS in relation to the Annex I habitats and the approach being taken. It was agreed in a meeting on the 16th of September 2025 that the following was required. • Apply Irish Vegetation Classification (IVC) alongside existing habitat classification systems.	Four years of baseline bird survey effort has been undertaken within the Main Wind Farm Development Site and immediate area, including vantage point surveys and breeding raptor surveys. Three years of the data was used to inform the assessment process as the analysis was undertaken as the final year of data was being collected. Appropriate reference populations have been selected for communication with NPWS which include those specified related to Merlin and Golden Plover. Offshore bird species were considered extensively with regard to offshore windfarms and ranging patterns, particularly with regard to SPAs. Detailed restoration plans and BNG assessments have been undertaken. The annex I condition assessments have been undertaken for all the peatland habitats – which includes IVC classifications - **Technical Appendix 5-6.** This data was then used to model the outcomes and calculate the overall habitat loss areas and inform the net gain assessment.

Prescribed Body	**Comment** Summary	Response
	• Develop a clear methodology for Annex I impact characterisation, including hydrological and elevation modelling. • Define potential compensatory enhancement scenarios for poor-condition Annex I habitat, recognising this may evolve. • Establish appropriate long-term monitoring metrics for habitat condition.	The results were used to inform and create a Habitat Management Plan (HMP), included as **Technical Appendix 5.5,** to ensure the improvement of the condition of the cutover blanket bog within the Main Wind Farm Development Site. This approach is consistent with that which was outlined to the NPWS.
Irish Peatland Conservation Council (IPCC)	The IPCC state that while they understand the need to shift to renewable energy, installing wind farm infrastructure on the cutaways, cutovers and blanket bog habitats does not maximise the benefit that peatlands can provide. It has been highlighted by the European Commission that for every €1 spent on nature restoration €4-38 is returned in other areas of our lives. The hydrology of an industrial wind farm site has to be continually managed, the fragmentation from the road ways and cabling further disrupts the peat mass and the question as to whether the large wader birds which are under threat of extinction such as the Curlew, will return, has not been answered.	Surveys of the Main Wind Farm Development Site have been undertaken to assess the bird assemblage including species such as curlew. The CRM specifically details potential risks to the species and re-uptake of lands nationally by rare species is not known but the habitat enhancement will support this. A Habitat Management Plan (HMP) has been written and is included as **Technical Appendix 5.5** to ensure the improvement of the condition of the cutover blanket bog within the Main Wind Farm Development Site.
Minister for Rural and Community Development	Felling License required and examination if that in itself requires EIA.	Tree felling will be the subject of a Felling License from the Forest Service and will be in accordance with the conditions of such a license. A Felling License will be in place prior to any felling works commencing on site. This will be obtained after the grant of planning permission.

Methodology

Desk Study

5.17 A desk study was used to collate existing information on ecological receptors in and around the Main Wind Farm Development Site and the three Over-run Areas along the TDR where works will take place (further details on spatial extent is provided below).

5.18 The following resources were used to collate data on habitats and species of the Main Wind Farm Development Site that are either legally protected or have a poor conservation status, or are non-native / invasive:

- Satellite imagery[9];

[9] https://www.google.ie/maps Last accessed 18/05/2026

- Environmental Protection Agency (EPA) maps[10];
- Geological Survey Ireland (GSI) Spatial Resources[11];
- National Biodiversity Data Centre (NBDC) database[12];
- Environmental Sensitivity Mapper[13];
- National Parks and Wildlife Services (NPWS) databases[14];
- The Checklists of Protected and Rare Species in Ireland[15];
- The Irish Wetland Bird Survey (I-WeBS)[16],
- The bat landscapes suitability index for the Main Wind Farm Development Site: The Irish Caves Database (https://www.ubss.org.uk/irishcaves/irishcaves.php).

5.19 These data and sources were used to help shape the scope of the field surveys but were not used for impact assessment. Desktop data was either collected at too coarse a spatial scale or were not specifically collected for the purposes of wind farm impact assessment.

5.20 Some of the organisations listed above collate their data at various spatial scales. The NBDC 10 km grid square F72 was used to collate spatial data for the Main Wind Farm Development Site, whose development footprint is of a similar spatial scale and is entirely contained within this 10 km grid square. Because some species lack Irish population estimates in terms of the estimated number of individuals, in some cases, NPWS have made estimates using geographical range as a proxy for population size. Where this is the case, the number of individuals is presented as the number of occupied 1 km grid squares.

5.21 The accommodation works proposed along the TDR, with the exception of the Over-run Areas (see **Figure 2-4b, 2-4c, 2-4d**) are minor and consist of trimming vegetation, provision of temporary surfaces, and temporary removal of signage/street furniture (**see Technical Appendix 5.6**).

[10] https://gis.epa.ie/EPAMaps/ Last accessed 18/05/2026

[11] https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228, Last accessed 18/05/2026

[12] https://maps.biodiversityireland.ie/Map Last accessed 18/05/2026

[13] https://airomaps.geohive.ie/ESM/ Last accessed 18/05/2026

[14] Such as the Article 17 reporting data, Article 12 reporting data, floral protection order data, Irish Semi Natural Grassland data and bryophyte mapping data, ; https://www.npws.ie/maps-and-data Last accessed 18/05/2026

[15] Nelson, B., Cummins, S., Fay, L., Jeffrey, R., Kelly, S., Kingston, N., Lockhart, N., Marnell, F., Tierney, D. and Wyse Jackson, M. (2019) Checklists of protected and threatened species in Ireland. Irish Wildlife Manuals, No. 116. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland. https://www.npws.ie/publications/irish-wildlife-manuals https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.npws.ie%2Fsites%2Fdefault%2Ffiles%2Fpublications%2Fpdf%2FIWM%2520116%2520Checklists%2520Protected%2520and%2520Threatened%2520Species%2520Version%25203.1%25201%2520February%25202023.xlsx&wdOrigin=BROWSELINK Last accessed 18/05/2026

[16] www.birdwatchireland.ie/our-work/surveys-research/research-surveys/irish-wetland-bird-survey/ Last accessed 27/11/2024. Data were supplied by the Irish Wetland Bird Survey (I-WeBS), a scheme coordinated by BirdWatch Ireland under contract to the National Parks and Wildlife Service of the Department of Housing, Local Government and Heritage

5.22 In addition, all European and national designated nature conservation sites within 15 km, as recommended by NatureScot (2010)[17], of the Main Wind Farm Development Site were identified. Designated nature conservation sites include Special Areas of Conservation (SACs[18]), Special Protection Areas (SPAs[19]) and Ramsar sites. For national sites, this included Natural Heritage Areas (NHAs), proposed NHAs (pNHAs), and nature reserves. This search distance was extended to 20 km for SPAs or national sites designated for birds, in recognition that this is the maximum distance that Special Conservation Interest (SCI) bird species typically travel. For national sites, this included Natural Heritage Areas (NHAs), proposed Natural Heritage Areas (pNHAs) and nature reserves.

5.23 SNH Guidance Note 3[20] has been used to consider marine birds from SPAs beyond 20 km as the distances provided in this guidance relates to foraging at-sea ranges. Given the coastal location of the Main Wind Farm Development Site, we also assessed potential functional connectivity with more distant SPAs, including sites whose qualifying species may range offshore.

5.24 The data from the following I-WeBS sites were reviewed (as presented in **Table 5-4**):

Table 5-4: I-WeBS Sites Examined for County Population Estimates

I-WeBS sites	
Carrownacon Lake,	Lough Mask,
Cashel Turlough,	Lough Muck (Mayo),
Castlebar Lakes/ Islandeady chain,	Lough Nahaltora,
Clew Bay, Cloonagh Lough (Mayo),	Manulla Lakes,
Derrymannin Lake,	Mullet West,
Keel Lough,	River Moy,
Killala Bay,	Rostaff Lake,
Lough Alick,	South Mayo Coast,
Lough Carra,	Tawnyard Lough,
Lough Conn,	Termoncarragh & Annagh Marsh,
Lough Cullin,	Washpool Lough and
Lough Levally,	Wetland near Drumcarrabaun (Belcarra/Ballyglass Road).

[17] NPWS (2010) Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular Letter NPWS 1/10 & PSSP 2/10. National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin

[18] For the purpose of this assessment candidate SACs – referred to as cSACs are considered as designated SACs with the same legal protections, therefore the term cSAC is not referenced within the report at any point beyond this.

[19] For the purpose of this assessment proposed SPAs (pSPAs) are considered designated SPAs with the same legal protections, therefore the term pSPA is not referenced within the report at any point beyond this.

[20] Guidance Note 3: Guidance to support Offshore Wind applications: Marine Birds - Identifying theoretical connectivity with breeding site Special Protection Areas using breeding season foraging ranges | NatureScot. Accessed 10/11/2025

5.25 Where likely significant effects were predicted, they were also contextualised in terms of regional populations, which were identified based on NatureScot (2025) guidance.[21] Following discussion with NPWS, bird atlases (e.g. shown on BirdWatch Ireland) were used to define biogeographically meaningful areas and thus, regional populations. This is an acceptable approach, as NatureScot (2025) guidance states that 'alternative areas to NHZs may be acceptable as the basis for assessment where there are definable regional or biogeographical populations that do not conform to Natural Heritage Zone (NHZ) boundaries'19. Ireland does not have NHZs and so other means of determining regional populations must be made.

Field Assessments

5.26 **Table 5-5** details all baseline ecology surveys undertaken at the Proposed Project (which comprises the Main Wind Farm Development Area, the TDR including the three Over-run Areas, and the GCR).

Table 5-5: Summary of Ecology Surveys

Survey	Brief description	Timing	Reference
Data Validity Extended habitat survey	A verification walkover and drive-through of the Main Wind Farm Development Site, grid connection route and turbine delivery route was completed to validate the data collected in July 2023 (see Extended habitat surveys below) and confirm that no material changes to baseline habitat conditions had occurred.	May 2025	CIEEM, 2019[22] CIEEM, 2017[23]
Extended habitat surveys	Initial Walkover/drive of Main Wind Farm Development Site, grid connection route and turbine delivery route.	July 2023	CIEEM, 2017[24]
Marsh fritillary survey	Habitat condition assessment for marsh fritillary *Euphydryas aurinia.* Larval web and adult butterfly transect surveys	September 2023	NBDC, 2021[25]

[21] NatureScot. (2025) *Recommended bird survey methods to inform impact assessment of onshore wind farms*. Perth: NatureScot. Available at: https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms

[22] CIEEM (2019) *Advice Note: On the Lifespan of Ecological Reports & Surveys*. April 2019. Winchester: Chartered Institute of Ecology and Environmental Management.

[23] Chartered Institute of Ecology and Environmental Management (CIEEM). (2017, December). *Guidelines for Ecological Report Writing* (2nd ed.). Winchester, UK. Retrieved from CIEEM website

[24] Chartered Institute of Ecology and Environmental Management (CIEEM). (2017, December). *Guidelines for Ecological Report Writing* (2nd ed.). Winchester, UK. Retrieved from CIEEM website

[25] National Biodiversity Data Centre. (2021). *Marsh fritillary habitat condition assessment survey* [Survey report]. In *Marsh Fritillary Report*. (Appendix 6D).

Survey	Brief description	Timing	Reference
	through the Main Wind Farm Development Site. For more information please refer to **Technical Appendix 5-7**.		
Habitat surveys	Habitats within the Main Wind Farm Development Site were mapped according to the Fossitt classification system.	September 2023	Fossitt, 2007[26] Smith, 2011[27]
	Annex I habitat condition assessment within the identified Peatland Habitats within the Main Wind Farm Development Site. For more information please refer to **Technical Appendix 5-6.**	November 2024	Fossitt, 2007[24] Smith, 2011[25] Smith, G.F. & Crowley, W., 2020[28] Perrin *et al*., 2014[29]
	Habitats within the Turbine Delivery Route – notable the 3 areas where works are proposed to take place that are not along the existing road network. This was undertaken following the Fossitt classification system. For more information please refer to **Technical Appendix 5-6.**	July 2025 January 2026	Fossitt, 2007 Smith, 2011
Bird surveys	Vantage point (VP) surveys undertaken at four locations. For more information please refer to **Technical Appendix 5-2**.	Breeding season 2021 Autumn passage season 2021 Non-breeding season 2021-22 Breeding season 2022 Autumn passage season 2022 Non-breeding season 2022-23 Passage season 2023	NatureScot, 2025[30]

[26] Fossitt, J.A. (2007) *A guide to habitats in Ireland*. Kilkenny: The Heritage Council.

[27] Smith, O. P. (2011). Best practice guidance for habitat survey and mapping. Ireland: The Heritage Council.

[28] Smith, G.F. & Crowley, W. (2020) *The habitats of cutover raised bog*. Irish Wildlife Manuals, No. 128. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Dublin.

[29] Perrin, P.M., Barron, S.J., Roche, J.R. & O'Hanrahan, B. (2014) *Guidelines for a National Survey and Conservation Assessment of Upland Vegetation and Habitats in Ireland*. Version 2.0. Irish Wildlife Manuals, No. 79. Dublin: National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

[30] NatureScot (2025) *Pre-application guidance for onshore wind farms: requirements for bird survey data, including vantage point surveys*. Perth: NatureScot. Available at: https://www.nature.scot/doc/naturescot-pre-application-guidance-onshore-wind-farms

Survey	Brief description	Timing	Reference
		Breeding season 2023 Autumn passage season 2023 Non-breeding season 2023/24 Spring passage season 2024	
	Breeding bird surveys For more information please refer to **Technical Appendix 5-2.**	May – June 2021 May – July 2022 April – August 2023	O'Brien and Smith (1992)[31]
	Breeding raptor surveys For more information please refer to **Technical Appendix 5-2.**	May – June 2021 June 2022 March 2023 – July 2023	Hardy et al., 2013[32]
	Winter walkover surveys For more information please refer to **Technical Appendix 5-2.**	October 2021 – February 2022 October 2022 – February 2023 October 2023 – January 2024	Bibby, 2000[33]
	Wintering waterbird surveys For more information please refer to **Technical Appendix 5-2.**	October 2021 – March 2022 October 2022 – March 2023 October 2023 – March 2024	Irish Wetland Bird Survey Counter Manual (2025) NatureScot, 2025[19]
	Hen harrier roost searches For more information please refer to **Technical Appendix 5-2.**	October 2021 – January 2022 October 2022 – March 2023 January – February 2024	Hardy et al., 2009[34] O'Donoghue, 2019[35]

[31] O'Brien, M.G. & Smith, K.W. (1992). Changes in the status of waders breeding on wet lowland grasslands in England and Wales between 1982 and 1989. Bird Study, 39, pp. 165–176.

[32] Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. (2013) *Raptors: a field guide for surveys and monitoring.* (3rd edn). Edinburgh: The Stationery Office.

[33] Bibby, C.J., Burgess, N.D., Hill, D.A. and Mustoe, S. (2000). *Bird Census Techniques*. Academic Press. Harcourt Place, London, UK.

[34] Hardey, J., Etheridge, B. W. & Summers, R. W. (2009) '*Breeding ecology and nest-site monitoring of Hen Harrier (Circus cyaneus) in Britain and Ireland*', in Raptors: a field guide for surveys and monitoring (3rd edn), Edinburgh: The Stationery Office.

[35] O'Donoghue, B.G. (2019) *Hen Harrier Roost Types and Guidelines to Roost Watching*. Irish Hen Harrier Winter Survey. Available at: http://www.ihhws.ie/IHHWS

Survey	Brief description	Timing	Reference
	Bioacoustic monitoring For more information please refer to **Technical Appendix 5-2.**	March – April 2023 February – April 2024	Assessment Steering Group. (2025)[36]
Bat surveys	Bat habitat suitability surveys for roosting and foraging potential For more information please refer to **Technical Appendix 5-3.**	March 2021 March 2022 July and September 2024	Collins, 2023[37] Hundt, 2012
	Roost emergence/ re-entry surveys For more information please refer to **Technical Appendix 5-3.**	August 2021 June, July, September and October 2022 June 2023 July and September 2024	Collins, 2023[35]
	Activity survey – transect survey For more information please refer to **Technical Appendix 5-3.**	August 2021 June, July and September 2022 June 2023	Collins, 2023[35]
	Activity survey – static bat detector survey (ground-level) For more information please refer to **Technical Appendix 5-3.**	August 2021 Spring 2022 Summer 2022 Autumn 2022 Spring 2023 Summer 2023 Autumn 2023 Spring 2024 Summer 2024 Autumn 2024	NatureScot, 2021[38]
Terrestrial Mammal Survey	Searches within 150 m of any proposed infrastructure undertaken within the Main Wind Farm Development Site. These surveys were not undertaken at the Over-run Areas or along the TDR. Please refer to Limitations	July 2022 November 2024	Cresswell et al., 2012 Bird Survey & Assessment Steering Group. (2025)

[36] Bird Survey & Assessment Steering Group. (2025). *Bird Survey Guidelines for assessing ecological impacts*, https://birdsurveyguidelines.org [13/05/2025].

[37] Collins, J. (. (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). London: The Bat Conservation Trust.

[38] NatureScot. (2021). Bats and onshore wind turbines - survey, assessment and mitigation. NatureScot

Survey	Brief description	Timing	Reference
	Section of this chapter for more information		
Aquatic surveys	Aquatic and fisheries surveys were undertaken within the Main Wind Farm Development Site. For more information please refer to **Technical Appendix 5-4**.	September 2023	Please refer to Triturus, 2023a and Triturus 2023b for methodology references

Habitats

5.27 Terrestrial habitats were classified according to Fossitt (2000),[39] and mapped according to the good-practice measures outlined in Heritage Council guidance (Smith et al., 2011).[40] The locations of any rare, threatened, legally protected or invasive plant species were mapped. The habitat survey was conducted in September 2023, which is an optimal time of year for surveying habitats. Please refer to **Figures 5-1a-e** and **Technical Appendix 5.1** for more information.

5.28 A habitat condition survey was undertaken in November 2024. Firstly, the Main Wind Farm Development Site was surveyed according to the standard guidelines set out in Smith et al., 2011. Habitats were classified using habitat descriptions and codes published in Fossitt (2000).2 This process identified that the habitats aligned with the cutover bog (PB4) and the habitat type which also aligns with the Annex I criteria for Blanket bogs (priority if active bog) [7130]. Additionally, the habitat assessments in January 2026 identified lowland blanket bog (PB3) habitat which also aligns with Annex I criteria for Blanket bogs (priority if active bog) [7130]. No other habitat on site was identified to have any Annex I habitat potential. The resultant habitat map (**Figures 5-5a & 5-5c**) and **Technical Appendix 5.1**) was then used to calculate the area of peatland habitat within the Main Wind Farm Development Site and all peatland habitats identified aligned with the Annex I habitat criteria. In accordance with Smith and Crowley (2020) it was determined that 16 monitoring stops were required given the area of the peatland habitat to be assessed against the condition criteria. However, to get a robust representation of species composition and overall condition, 28 monitoring stops were undertaken. At each monitoring stop a 2 m x 2 m quadrat was set and all species within those areas were identified and the percentage cover of each species was identified. Further details are provided in **Technical Appendix 5-6**.

Habitat Survey and Condition Assessment of Turbine Delivery Route – including the 3 Over-run Areas which are not within the existing road network.

5.29 A driven preliminary survey of the TDR and walkover preliminary survey of the three Over-run areas was undertaken to search for protected, rare and invasive species in June 2025. Focus was also placed on identifying suitable habitat for marsh fritillary. Following the preliminary survey, a follow-on extended habitat survey and condition assessment of the Over-run Areas was undertaken to map and classify habitats identified following the Fossitt

[39] Fossitt, J. A. (2000). *A guide to habitats in Ireland*. Kilkenny: Heritage Council.

[40] Smith G., O'Donoghue P., O'Hora K. and Delaney E. (2011) Best practice guidance for habitat survey and mapping; The Heritage Council.

level III classification system (Fossitt, 2000)[41], along with protected, invasive and rare species; January 2026. The survey along the TDR focused on areas where accommodation works were due to occur and/or where load bearing surfaces were to be deployed.

Birds

5.30 The methodologies for ornithological surveys are outlined in the following sections and adhere to NatureScot [formerly SNH] (2025) guidance19. The surveys were designed in accordance with the previous NatureScot guidelines, which were superseded in 2025. It is important to note that no survey changes or methodological updates were required once the new guidelines were released.

5.31 Baseline ornithology surveys were conducted during the period April 2021 to May 2024. Full data are presented within **Technical Appendix 5.2**.

Flight Activity Surveys

5.32 Surveys were carried out following NatureScot guidance (NatureScot, 2025).19 Surveys commenced in April 2021 and ended in May 2024. In compliance with current guidance, a minimum of 36 hours of flight activity surveys were conducted during the breeding season and non-breeding season from each of four vantage point (VP) locations across three years i.e. a minimum of 72 hours per VP per year. Additional VP effort was carried out during the spring (March to April) and autumn (September to October) passage seasons. Thus, for every VP at least 295 hours of survey effort was conducted over the entire survey period, far more than the minimum of 144 hours of survey required.

5.33 The number of hours completed at each VP, in each season, is summarised in **Table 5-6.**

Table 5-6: VP survey hours

Survey year	Season	VP1	VP2	VP3	VP4
Year 1	Breeding season 2021	38	36	36	36
	Autumn passage season 2021	4.5	4.5	4.5	4.5
	Non-breeding season 2021-22	36	38	36	36
Year 2	Breeding season 2022	36	36	39	36
	Autumn passage season 2022	18	18	18	18
	Non-breeding season 2022-23	36	36	36	36
	Spring passage season 2023	18	18.5	18	18
Year 3	Breeding season 2023	36	39	36	36
	Autumn passage season 2023	18	18	18	20.8
	Non-breeding season 2023-24	35.5	36	37	36
	Spring passage season 2024	21	18	18	18

[41] Fossitt, J. A. (2000). *A guide to habitats in Ireland*. Kilkenny: Heritage Council.

Target Species

5.34 Current NatureScot guidelines (NatureScot, 2025) state that "in most circumstances the target species will be limited to those species which are afforded a higher level of legislative protection."[19]

5.35 Primary target species were specifically limited to species upon which effects are most likely to be potentially significant in EIA terms, e.g. breeding and non-breeding species forming qualifying features (sometimes termed 'special conservation interests' or SCIs) for nearby SPAs, or species listed on Annex I of the Birds Directive. In addition, some species red-listed under the Birds of Conservation Concern in Ireland (BoCCI) scheme (Colhoun & Cummins, 2013; Gilbert et al., 2021) were also included as primary targets.[4243] While being red-listed does not afford species a higher level of legislative protection, it does reflect poor conservation status and vulnerability of bird populations to negative effects from wind farms. This approach to identifying primary target species enabled recording to focus on the species of greatest importance without the distraction of having to record detailed flight data for a larger number of more common species.

5.36 Target species for which flight activity data was captured were as follows:

- Waders and wildfowl (ducks, geese and swans),
- Other waterbirds (including grebes, herons, rails, crakes and gulls),
- Raptors and owls,
- Any species listed on Annex I of the Birds Directive, and
- Any species listed as red on the latest Birds of Conservation Concern in Ireland (BoCCI) scheme (Gilbert et al., 2021).[40]

Breeding Bird Surveys

5.37 A total of three survey visits were conducted in each of 2021, 2022 and 2023 between April and July. Surveys were carried out within the Main Wind Farm Development Site plus a 500 m buffer zone beyond as recommended by NatureScot (2025) guidance, using the O'Brien and Smith (1992) methodology which is suitable for lowland sites[29].

5.38 In addition, dusk surveys were undertaken to record crepuscular and nocturnal species, including woodcock and owls. One dusk visit was completed during the 2021 breeding season; three dusk visits were completed during the 2022 breeding season and five dusk visits were completed during the 2023 breeding season.

Breeding Raptor Surveys

5.39 A combination of mini-VPs, as well as driven and walked transects were undertaken to survey potential nesting habitats within the Main Wind Farm Development Site and a 2 km buffer following the methodology outlined in Hardey (2013).[44] Surveys were conducted between March and July during the 2021, 2022 and 2023 breeding seasons. A total of two

[42] Colhoun, K., & Cummins, S. (2013). *Birds of Conservation Concern in Ireland 2014–2019*. Irish Birds, 9, 523–544.

[43] Gilbert, G., Stanbury, A., & Lewis, L. (2021). *Birds of Conservation Concern in Ireland 4: 2020–2026*. Irish Birds, 43, 1–22.

[44] Hardey, J. H. (2013). *Raptors: a field guide for surveys and monitoring*. 3rd Edition. Edinburgh: The Stationary Office.

visits were carried out during the 2021 breeding season, one visit during the 2022 breeding season, and four visits during the 2023 breeding season.

Winter Walkover Surveys

5.40 Winter transect surveys were used to obtain a fuller picture of species of conservation concern within the Main Wind Farm Development Site plus a 500 m buffer. Winter walkovers of the Main Wind Farm Development Site were undertaken between; October and February (inclusive) for three survey periods. These surveys therefore took place October 2021 to February 2022, October 2022 to February 2023, and October 2023 to February 2024. Surveyors walked the survey area noting down all species encountered, making sure to cover a sample of all habitats present.

Wintering Waterbird Surveys

5.41 All publicly accessible wetland sites within 6 km of the Main Wind Farm Development Site were surveyed for waterbird populations. The surveys were based on the approach employed by BirdWatch Ireland's Irish Wetland Bird Surveys (I-WeBS).[45] Surveys were undertaken between October and March in Years 1, 2 and 3 (namely 2021-2022, 2022-2023 and 2023-2024; there were multiple calendar years due to the seasonality of surveys). A minimum of six survey visits were conducted in each year.

Hen Harrier Roost Searches

5.42 Hen harrier roost surveys were carried out in compliance with NatureScot (2025) guidance[19]. Roost watches were carried out at suitable roosting habitat within the Main Wind Farm Development Site and a 2 km buffer. Methodology followed that given by the Irish Hen Harrier Winter Roost Survey (O'Donoghue, 2019).[46] A total of four survey visits were carried out during the 2021-22 non-breeding season, 12 visits during the 2022-23 non-breeding season and four visits during the 2023-24 non-breeding season.

Bioacoustic Monitoring

5.43 Due to the location of the Main Wind Farm Development Site in the north-west of Ireland and proximity of Blacksod Bay/Broad Haven SPA and Carrowmore Lake SPA it was considered appropriate to undertaken bioacoustic monitoring to record potential nocturnal migratory species.

5.44 In the spring passage season 2023 (March – April, inclusive), two bioacoustic monitors (SongMeter-minis) with an acoustic microphone set to record bird calls, were deployed. Three bioacoustic monitors were deployed during the spring passage season 2024 (February and April, inclusive). The bioacoustic monitor locations aimed to cover a geographical spread across the survey area and to detect birds flying from the north, west and east where waterbodies, and features potentially used by waterbirds, exist in the wider area.

5.45 Before analysis, sound classifiers were constructed for each target species (raptors and waterbirds), facilitating automated scanning of the data for calls specific to each species. Data analysis was undertaken by a suitably trained ecologist.

[45] https://birdwatchireland.ie/app/uploads/2019/03/IWeBS-Counter-Manual.pdf

[46] O'Donoghue, B. G. (2019). Hen harrier roost types and guidelines to roost watching. Irish Hen Harrier Winter Survey (IHHWS). Retrieved from http://www.ihhws.ie/IHHWS_Guide.pdf

Bats

5.46 Baseline bat surveys were conducted during the period Summer 2021 to Autumn 2024. Surveys were carried out following the relevant NatureScot guidance (NatureScot, 2021).[36] Further details are provided below and in **Technical Appendix 5.3.**

Bat Habitat Suitability Surveys for Roosting and Foraging Potential

5.47 A desk study was undertaken to compile information on potential roosts within 10 km of the Main Wind Farm Development Site. Information on potential foraging habitat was also obtained from aerial imagery. In March 2020, features within a 300 m buffer around proposed infrastructure and 30 m buffer around the access tracks were assessed for roost features according to criteria described in Collins (2023).[35]

5.48 A survey for potential bat hibernacula was conducted within 200 m plus rotor radius of the Main Wind Farm Development Site in March 2022 in accordance with Collins, 2023[35].

Roost Emergence/Re-entry Surveys

5.49 Following roost searches, dusk emergence/dawn re-entry surveys were completed in 2021, 2022, 2023 and 2024 to ascertain if potential roost features identified during the roosting suitability surveys were being utilised by roosting bats. The surveys were undertaken using Elekon Batlogger M bat detectors to collect geo-referenced records of bat activity, which were then analysed using BatExplorer. A total of two buildings were surveyed.

Activity Survey – Transect Survey

5.50 A preliminary transect survey was conducted in August 2021. A single transect route was walked and 5-minute point counts were conducted at two locations.

5.51 In 2022 and 2023, four walked transects and one walked transect were completed, respectively. There were two transect routes; one covering the northern area of the Main Wind Farm Development Site and the other covering the southern area of the Main Wind Farm Development Site. Methodology followed Collins (2023) and field records were made of bat species encountered, number of bat passes, activity, travelling direction and approximate height.[35]

Activity Survey – Static Bat Detector Survey (Ground-Level)

5.52 A scoping static bat detector survey was carried out in August 2021 to inform anticipated levels of bat activity and potential constraints before conducting more comprehensive survey effort. A total of four static bat detectors (Wildlife Acoustics Song Meters: SM4) were deployed for 12 – 13 nights.

5.53 Ground-level static bat detectors (Wildlife Acoustics Song Meters: Song Meter 2 (SM2BAT+) and Song Meter 4 (SM4BAT-FS)) were also deployed during the 2022, 2023 and 2024 spring, summer and autumn seasons, following methodology from NatureScot, 2021.36 A total of 12 detectors were deployed in 2022 and 13 detectors were deployed in 2023 and 2024.

5.54 Before analysis, sound classifiers were constructed for each target species, facilitating automated scanning of the data for calls specific to each species. Data analysis was undertaken by a suitably trained ecologist.

Terrestrial Mammals (Excluding Bats)

5.55 Dedicated mammal surveys were carried out in the summer of 2022 and repeated in November 2024. The focus of these surveys was to search for mammal resting/breeding

places, which are most vulnerable to disturbance and habitat loss. In addition, any other signs/sightings were recorded and mapped using a hand-held GPS during both dedicated mammal surveys and opportunistically during other ecological surveys. Survey methodology followed that outlined by Cresswell et al. (2012),[47] with a particular focus on badger *Meles meles*, pine marten *Martes martes* and red squirrel *Sciurus vulgaris*.

5.56 Otters were searched for during the aquatic surveys (see **Section 5.74** below).

Marsh Fritillary Survey

5.57 In September 2023, a 50 m buffer around each of the proposed turbine locations (subsites) was surveyed for marsh fritillary according to Transport Infrastructure Ireland – formerly National Roads Authority (NRA) – (2009) guidance.54 ; this is the only standard guidelines for Marsh Fritillary and is used for all projects not just road works. A walkover of each subsite was undertaken to determine if suitable habitat for this species was present. Where suitable habitat occurred a detailed habitat condition assessment was conducted following the methods developed by the NBDC (2021[48]). Following the methodology, the presence/absence of larval webs was also noted at subsites with suitable habitat. If found, the locations of larval webs were recorded on Qfield GIS software. Additionally, adult butterfly surveys were carried out in habitats representative of those at the proposed turbine locations and in accordance with methodology. Further details are provided in **Technical Appendix 5.7**.

5.58 A May 2025 data-validity review, undertaken in line with CIEEM 2019[49] confirmed that baseline ecological conditions had not materially changed. While the survey timing was too early for Marsh Fritillary detection, habitat quality and structure were unchanged from earlier assessments. Accordingly, the original survey results remain valid.

Aquatic and Fisheries Surveys

5.59 Baseline surveys were carried out in September 2023. All freshwater watercourses which could be affected directly or indirectly by the Proposed Project were considered as part of the assessment. This included sites in vicinity of the proposed turbine array and site boundary (17 no. sites) in addition to watercourse crossings of the GCR and watercourses adjacent to TDR nodes (37 no. sites). Surveys were not conducted at the three Over-run Areas. However, due to the temporary nature of the works this is not identified to be a significant limitation. These are detailed in **Table 2.1** and mapped in **Figures 2.1, 2.2 and 2.3** of the **Technical Appendix 5.4**. Thus, a total of 54 no. sites were selected for detailed aquatic assessment. Surveys focused on the detection of freshwater habitats and species of high conservation value. Further details are provided in **Technical Appendix 5.4**.

[47] Cresswell, W. J., Birks, J. D. S., Dean, M., Pacheco, M., Trewhella, W. J., Wells, D., & Wray, S. (2012). *UK BAP mammals: Interim guidance for survey methodologies, impact assessment and mitigation.* The Mammal Society.

[48] National Biodiversity Data Centre. (2021). *Marsh fritillary habitat condition assessment survey* [Survey report]. In *Marsh Fritillary Report*. (Appendix 6D).

[49] CIEEM (2019) *Advice Note: On the Lifespan of Ecological Reports & Surveys*. April 2019. Winchester: Chartered Institute of Ecology and Environmental Management.

Physical Surveys

5.60 All survey sites were assessed in terms of physical watercourse characteristics, substrate and flow.

Fisheries Assessment (Electrofishing)

5.61 A single anode Smith-Root LR24 backpack (12V DC input; 300V, 100W DC output) was used to electro-fish sites on watercourses in the vicinity of the Main Wind Farm Development Site in September 2023 following notification to Inland Fisheries Ireland, under the conditions of a Department of the Environment, Climate and Communications (DECC) licence. The survey was undertaken in accordance with best practice (CEN, 2003; CFB, 2008) and Section 14 licencing requirements[50] [51].

5.62 Further details are provided in **Technical Appendix 5.4**.

5.63 Furthermore, a fisheries habitat appraisal of the aquatic survey sites was undertaken to establish their importance for salmonid, lamprey, European eel (Anguilla anguilla) and other fish species. The baseline assessment also considered the quality of spawning, nursery and holding habitat for salmonids and lamprey within the vicinity of the survey sites.

White Clawed-crayfish Survey

5.64 Surveys were undertaken under a NPWS open licence (C31/2022) to capture and release crayfish at their site of capture. Hand searching and sweep netting was undertaken following Reynolds et al. (2010).[52] An appraisal of crayfish habitat was undertaken.

5.65 Further details are provided in **Technical Appendix 5.4**.

eDNA Analysis

5.66 Composite water samples were collected from two unnamed rivers (sites A2 & B6) and the Doolough Stream (C5) in September 2023 to detect for the presence of freshwater pearl mussel (*Margaritifera margaritifera*), and crayfish plague (*Aphanomyces astaci*). No white-clawed crayfish were recorded through hand searching of instream refugia during the surveys, or via eDNA sampling. The eDNA sampling was undertaken to detect low populations of these species should they occur in the study area.

5.67 Further details are provided in **Technical Appendix 5.4**.

Biological Water Quality (Q-sampling)

5.68 Biological water quality was assessed via Q-sampling at all riverine survey sites (40 no. sample sites) in September 2023. Methodology followed Feeley et al. (2020) and samples

[50] European Committee for Standardization. (2003). EN 14011:2003: Water quality – Sampling of fish with electricity. CEN/TC 230.

[51] Central Fisheries Board. (2008). *Methods for the Water Framework Directive: Electrofishing in Wadeable Reaches* [Unpublished monitoring protocol]. Central Fisheries Board, Dublin.

[52] Reynolds, J. D., O'Connor, W., O'Keeffe, C., & Lynn, D. (2010). A technical manual for monitoring white-clawed crayfish (Austropotamobius pallipes) in Irish lakes (Irish Wildlife Manuals No. 45). National Parks and Wildlife Service, Dublin.

were converted into Q-ratings as per Toner et al. (2005).[53] [54] Any rare invertebrate species were identified.

5.69 Further details are provided in **Technical Appendix 5.4**.

Pond macro-invertebrate communities

5.70 Four pond sites were sampled for macro-invertebrates via sweep netting in September 2023. A standard pond net (250mm width, mesh size 500µm) was used to sweep macrophytes and submerged vegetation to capture macro-invertebrates. The net was also moved along the lake/pond bed to collect epibenthic and epiphytic invertebrates from the substratum (as per Cheal et al., 1993).[55] A 3-minute sampling period was employed.

5.71 Further details are provided in **Technical Appendix 5.4**.

Macrophytes & Aquatic Bryophytes

5.72 Botanical surveys were conducted via instream wading at all riverine sites. Specimens were collected for on-site identification. Any rare macrophyte or bryophyte species were recorded, and the aquatic vegetation community assessed for correspondence with Annex I habitat types. Links with Annex I lake habitats were also assessed at lacustrine sites.

5.73 Further details are provided in **Technical Appendix 5.4**.

Otter Survey

5.74 Dedicated searches were made for otter signs and sightings on watercourses within and in the vicinity of the Main Wind Farm Development Site. Each otter sign was logged by type, location (handheld GPS), condition and approximate age for later interpretation to distinguish differences in habitat use and activity.

5.75 Further details are provided in **Technical Appendix 5.4**.

Other Protected Fauna

5.76 Invertebrate species, except for marsh fritillary, were recorded on an ad-hoc basis during all surveys.

5.77 No specific surveys for reptiles were conducted, but they were searched for on an ad hoc basis during other surveys, as NRA (2009) guidance states that direct observation is an effective survey technique.[56]

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[53] Feeley, K., Kelly-Quinn, M., Regan, E., & Bonada, N. (2020). *Stoneflies (Plecoptera) of Ireland: identification guide and sensitivity to environmental change*. [Also describes macroinvertebrate survey methodology—including Q-sampling]. Environmental Protection Agency of Ireland.

[54] Toner, P. F., Bowman, J. J., Clabby, K. J., Lucey, J., McGarrigle, M., Concannon, C., Clenaghan, P., Cunningham, J., Delaney, S., O'Boyle, M., MacCárthaigh, M., Craig, R., & Quinn, R. *(2005). Water quality in Ireland 2001–2003*. Environmental Protection Agency, Ireland.

[55] Cheal, F., Davis, J. A., Growns, J. S., Bradley, J. S., & Whittles, F. H. (1993). The influence of sampling method on the classification of wetland macroinvertebrate communities. *Hydrobiologia, 257*, 47–55.

[56] National Roads Authority (now Transport Infrastructure Ireland). (2009). *Ecological surveying techniques for protected flora and fauna during the planning of national road schemes*. National Roads Authority, Dublin.

5.78 Amphibians were surveyed for during aquatic ecology surveys and on an ad hoc basis during other surveys.

Limitations

5.79 The survey and assessment are subject to several limitations and uncertainties as set out below.

Habitat condition assessment

5.80 The blanket bog habitat condition assessment surveys were conducted in the sub-optimal period – however, vegetative identification was used, meaning the flowering heads were not needed to record the species. All species found on site were identified. Cryptic species such as orchids – which would be sub-terranean in this period were not possible to identify. However, given the habitat type and general condition of the Main Wind Farm Development Site this is not thought to be a significant limitation for the survey.

5.81 The Floral Protection Order (FPO) species which are likely to occur in peatland habitats are; Hammarbya paludosa (Bog Orchid), Eriophorum gracile (Slender Cottongrass) and Salix phylicifolia (Tea-leaved Willow). Bog orchid are restricted in their known range to the NW of Ireland and Slender cottongrass are more strongly associated with fen habitats. Willow species are identifiable all year. Therefore, there are no limitations associated with FPO species due to the timing of the surveys.

Bats

5.82 It was not possible to collect 10 no. consecutive nights of static bat data in suitable weather conditions during the summer deployment period for 2022 (06 – 19 July 2022) as weather on 07 July 2022 was non-compliant.

5.83 Two detector failures occurred during the 2023 autumn survey season, detector locations D.10 and D.12. In addition, one detector failure occurred during the 2024 summer survey season at location D.12. Overall, the combined survey approach and coverage over the 2022 and 2023 survey seasons, provides robust data giving a full insight into the use of the Main Wind Farm Development Site by bats. The survey methodologies employed are in line with the recommended guidelines (NatureScot, 2021[19]), and as such, this information can be appropriately used to assess the potential impacts of the Proposed Project on the local bat population.

Birds

5.84 A total of four breeding bird survey visits between 2021 and 2023 were not conducted in a single day. Specifically, one survey visit in 2022 was conducted over two consecutive days, two survey visits in 2023 were each conducted over three consecutive days and a further one survey visit in 2023 was conducted over three non-consecutive days.

5.85 The number of breeding raptor surveys recommended by NatureScot (2017 and 2025) were not accomplished in the 2021 and 2022 breeding seasons19. It is recommended by NatureScot 2017 and NatureScot 2025 that four visits are conducted to establish occupancy and the presence of a breeding pair. However, if there is no evidence of occupation on the first two visits, then further visits to that home range can be omitted. Two visits were conducted in 2021, despite the established occupancy of a pair of kestrels, and one visit in 2022. A total of four visits were conducted in 2023.

5.86 Access to the full ornithological survey area for walkover surveys could only be undertaken on lands where permission had been granted.

5.87 IWeBS data were used to assess county populations of wintering wildfowl (data from all IWeBS sites in County Mayo were collated); however, this is only available for wintering wildfowl and is not available for all birds or for the breeding season. Where detailed county-level species population data was absent, we have estimated county-level populations for Mayo by multiplying the Republic of Ireland (ROI) population totals by 0.07. This 0.07 figure is the land area taken up by the County of Mayo as a proportion of the ROI total land area. This assumes that species populations are evenly distributed, which may not be realistic; however, in the absence of detailed spatial data this is considered a reasonable approximation.

5.88 Despite the minor limitations mentioned above, it is considered that the surveys carried out in April 2021 – October 2022, April 2022 – October 2023 and April 2023 – October 2024 provide sufficient data to identify any ornithological constraints and provide a robust data set for the purpose of an ornithological impact assessment for the Main Wind Farm Development Site.

Aquatic and Fisheries Surveys

5.89 The three Over-run Areas were not surveyed. However, due to the temporary nature of the works this is not identified to be a significant limitation. It is considered that the area surveyed provides sufficient data to identify any aquatic and/or fisheries constraints and provides a robust data set for impact assessment.

5.90 Overall, none of the limitations outlined above for the habitat condition assessment, bat surveys and bird surveys are considered to significantly affect the validity of the data on which the assessment is based.

Evaluation Criteria for Ecological Assessment

5.91 An *ecological feature* is any component of the natural environment that may be relevant to an ecological assessment. This includes designated nature conservation sites, habitats, species populations, assemblages, ecosystem functions and processes, and features of ecological structure such as corridors, watercourses or mature trees. Ecological features can vary widely in scale and complexity, from broad habitat mosaics to highly localised populations or microhabitats.

5.92 In line with CIEEM (2018) and EPA (2022) guidance, it is not necessary to carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to impacts from the Proposed Project and would remain viable and sustainable. However, the EU Biodiversity Strategy 2020 and the Ireland's 4th National Biodiversity Action Plan 2022 - 2030 emphasise the need to achieve no net loss and enhancement of biodiversity. Also, the EIA Directive requires full consideration of biodiversity. Therefore, only those ecological features that are both important and potentially affected - hereafter referred to as 'Important Ecological Features' (IEFs) report (CIEEM, 2018)64 - are taken forward for detailed assessment.

5.93 The assessment follows a structured process whereby ecological features are first assigned an appropriate geographic level of importance, after which the potential Zone of Influence (ZoI) of the Proposed Project is defined to identify which ecological features may plausibly be affected. For those ecological features within the ZoI and of sufficient importance, the characteristics of potential impacts and effects (e.g. magnitude, duration, extent, reversibility) are then described to enable a transparent evaluation of significance. This stepwise approach ensures that only those ecological features that are both important and realistically subject to impact are carried forward for detailed assessment of significant effects; these steps are outlined below.

5.94 The following definitions are key considerations regarding the methods outlined below:

- *Importance* refers to the inherent ecological value of a feature, defined within an appropriate geographical context (as described in the following section). It reflects how rare, threatened or functionally important a site, habitat or species population is, irrespective of the Proposed Development.

5.95 *Significance*, by contrast, refers to the *degree of effect* that the Proposed Project is predicted to have on that feature. A feature may be important but not significantly affected, or conversely a feature of lower importance may experience a significant effect if the impact is substantial, irreversible or contrary to law or policy. Significance is therefore determined by evaluating the characteristics of predicted impacts (e.g. magnitude, duration, extent, reversibility) on features that have already been assessed as important.

- *Direct Effects* are changes that occur at the same time and place as the activity that causes them. Examples include the permanent or temporary loss of habitat due to groundworks, mortality or injury of species during construction, or disturbance arising directly from machinery, lighting, or human presence.
- *Indirect Effects* are changes that do not occur at the same place or moment as the initiating activity. Examples include hydrological or hydrogeological alterations leading to changes in wetland condition, noise or light causing behavioural displacement of fauna, or sediment mobilisation affecting downstream habitats.

Determining Ecological Importance and Geographic Context

5.96 Ecological features can be important for a variety of reasons. The importance of ecological receptors are considered within a defined geographical context and for the Proposed Project the following geographic frame of reference is used – as per the (CIEEM, 2018)[64]:

- International and European,
- National,
- Regional i.e., North Western Region or relevant biogeographic region,
- Metropolitan, County, vice-county or other local authority-wide area i.e., Mayo,
- River Basin District
- Local i.e. Townland and Surrounding area to the Site
- Site i.e. within the Main Wind Farm Development Site, and
- Negligible.

5.97 The CIEEM guidelines specifies how to apply the concept of importance to assess the impacts of projects on designated nature conservation sites, habitats, species and ecosystem services.

5.98 For designated nature conservation sites (SAC, SPA, Ramsar, NHA, and pNHA), importance should reflects the geographical context of the designation. For example, an SAC or SPA is considered internationally important while a Natural Heritage Area (NHA) or proposed pNHA is considered nationally important.

5.99 Important habitats are listed on Annex I of the Habitats Directive, the Irish National Biodiversity Action Plan 2023-2030, under the Wildlife Act 2023 (as amended) and in the Mayo County Development Plan (CDP) 2022-2028 specifically in Chapter 12: Natural

Heritage and Green Infrastructure of the CDP[57] [58] [59]. Where habitats are currently in a degraded or unfavourable conservation condition, it is their potential value rather than their current value that is considered.

- In assigning a level of value to a species population, it is necessary to consider its rarity, distribution and status, including a consideration of trends based on available historical records. Reference has therefore been made to published lists where available.
- Species of European conservation importance (as listed on Annex I of the Birds Directive or Annex II, IV and V of the Habitats Directive), and
- Species red-listed in Ireland under the relevant lists e.g. Birds of Conservation Concern (BoCCI) (Gilbert et al., 2021).[40]

5.100 Where appropriate, the value of resident or regularly occurring species populations has been determined using the standard '1% criterion' method (Percival, 2003; Holt, et al., 2012). Using this, the presence of >1% of the international population of a species is considered internationally important and >1% of the national population is considered nationally important. IWeBS data were used to assess county populations of wintering wildfowl (data from all IWeBS sites in County Mayo were collated); however, this is only available for wintering wildfowl and is not available for all birds or for the breeding season. Where detailed county-level species population data was absent, we have estimated county-level populations for Mayo by multiplying the Republic of Ireland (ROI) population totals by 0.07. This 0.07 figure is the land area taken up by the County of Mayo as a proportion of the ROI total land area. This assumes that species populations are evenly distributed, which may not be realistic; however, in the absence of detailed spatial data this is considered a reasonable approximation. Data collected from bird surveys for the Main Wind Farm Development Site are at the local scale as they pertain to the visible area surrounding the Main Wind Farm Development Site in a local context – as specified above following the CIEEM 2018 guidelines. For certain species of birds (e.g. European golden plover and merlin), populations of biogeographic regions equivalent to Scottish Natural Heritage Zones were estimated based on data held by the NPWS; however, this ended up not being required for impact assessment due to a lack of predicted impacts on the relevant species.

5.101 This information, combined with baseline survey results, was used to evaluate each ecological feature identified within the ZoI in terms of its importance at the appropriate geographic scale. This ensures that only those features assessed as being of sufficient importance are carried forward for detailed consideration in the impact assessment.

5.102 For habitats, a slightly different approach is applied. Rather than evaluating each habitat type in isolation, the assessment considers habitat losses and gains across the Proposed Project as a whole. This is consistent with CIEEM (2018) guidance, which recognises that habitats often function as assemblages or mosaics, and that assessing them individually can overlook ecological structure, connectivity and functional relationships. Using a balance-sheet approach therefore provides a more ecologically meaningful representation

57 Department of Housing, Local Government and Heritage & National Parks and Wildlife Service. (2017). *Actions for biodiversity: Ireland's 3rd National Biodiversity Action Plan 2017–2021*. Dublin: Department of Housing, Local Government and Heritage.
58 Oireachtas. (2023) *Wildlife (Amendment) Act 2023*. No. 25 of 2023. Dublin: The Stationery Office.
59 Mayo County Council (2022) Mayo County Development Plan 2022-2028. Available at: https://www.mayo.ie/planning/county-development-plans/2022-2028

of overall habitat change and avoids underestimating effects that arise from alteration of the wider habitat mosaic.

5.103 All ecological features of Local importance or higher are identified as IEFs where they occur within the potential Zone of Influence (ZoI); which is defined below. Features of lower importance are also identified as IEFs where they are protected by law or policy, or otherwise require consideration in the development process. The evaluation of potential effects on these IEFs is undertaken in the subsequent impact assessment stage.

Determining Zone of Influence

5.104 Once Important Ecological Features (IEFs) are identified, the next step establishes the extent to which each may feasibly be affected by the Proposed Project. This requires defining the Zone of Influence (ZoI), which represents the spatial area within which project activities could give rise to direct or indirect effects on those features. In determining the ZoI, ecological pathways are also considered, including hydrological and hydrogeological connections, species movement routes (e.g. flight paths, dispersal corridors), and any other mechanisms through which impacts may be transmitted.

5.105 The ZoI relates to the nature of the development, its likely impacts and the presence of connections or pathways between ecological receptors and the development. Thus, ecological receptors that lack a connection to the development are considered outside the ZoI, even if they occur directly within the Development Site (CIEEM, 2018).[64] Conversely, receptors that are considerably removed from the development can still be considered within the ZoI if a pathway for impacts exists.

5.106 All connections (ecological, hydrological and hydrogeological) which provide pathways for impacts between the Proposed Project and ecological receptors in the surrounding area are identified and described in **Table 5-15**.

5.107 For all ecological features that are not designated nature conservation sites, the initial ZoI for the construction and decommissioning phase is as follows:

- Direct effects: up to a 50 m buffer surrounding proposed permanent and temporary site infrastructure within the Main Wind Farm Development Site (NRA, 2009), and up to a 5 m buffer along the GCR Corridor and at TDR nodes and Over-run Areas, and
- Indirect effects: dependent on the type of works and the published sensitivities of the ecological receptor.

5.108 For all receptors that are not designated nature conservation sites, the ZoI for the operational phase is dependent on the published sensitivities of the ecological receptor, if available, which is detailed in a case by case bases throughout the report and summarised in **Table 5-15**.

5.109 Regarding designated nature conservation sites, the DoEHLG (2010) guidelines suggest that a 15 km study area is adopted as a starting point when assessing the potential for source-receptor connectivity between a project and European sites.[60] Additional considerations were made with respect to ecological pathways including hydrological and hydrogeological connections, species movement routes (e.g. flight paths, dispersal corridors), which extend beyond 15km as appropriate. For example for birds, we used a 20 km study area initially, which is slightly larger than the 15 km recommended in recognition

[60] Department of the Environment, Heritage and Local Government. (2010). *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities* (Revised February 2010). Dublin: Department of the Environment, Heritage and Local Government.

that 20 km is the maximum distance SPA Qualifying Interests (QI) bird species typically travel (NatureScot, 2016).[61] Further considerations were made for marine bird species

Characterisation of Impacts and Effects

5.110 Following CIEEM (2018) and EPA (2022) guidelines,[62] [63] impacts and effects have been described in terms of:

- quality e.g. positive/neutral/negative,
- extent e.g. spatial area,
- context e.g. conform/contrast with baseline conditions,
- magnitude e.g. size/amount/intensity/volume,
- probability e.g. likely/unlikely,
- duration e.g. temporary/short-term/medium-term/long-term/permanent,
- frequency e.g. once/rarely/occasionally/frequently/constantly,
- timing e.g. critical life-stage or season, and
- reversibility e.g. reversible/irreversible.

5.111 The assessment will describe those characteristics that are relevant to understanding the ecological effect and determining the significance, and as such does not need to incorporate all stated effects outlined below.

Significant Effects

5.112 EPA (2022) guidelines state that where possible the concept of significance should follow discipline-specific definitions.[6565] For the purposes of this assessment, CIEEM (2018) guidelines have been used, which states that a 'significant effect' is an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project.[3] In accordance with CIEEM (2018) guidelines, effects can be considered significant at a wide range of scales from international to local.[364] For example, a significant effect on a regionally important population of a species is likely to be of regional significance. In addition, effects on anything that the competent authority must consider because of law or policy, must be included in the assessment, regardless of the CIEEM definition of importance. The MCDP refers to Nelson et al., (2019) and refers to all plant, animal or bird species protected by law. Consequently, effects on species protected by law and policy are also included.

Determining Significant Effects

5.113 To determine whether an effect is significant or not, both direct and indirect impacts have been considered.

[61] NatureScot (formerly SNH). (2016). *Assessing Connectivity with Special Protection Areas (SPAs)* (Version 3). Perth, Scotland: NatureScot.

[63] Environmental Protection Agency. (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports (May 2022 edition). EPA, Ireland.

5.114 Direct impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat occupied by an IEF species during the construction process.

5.115 Indirect ecological impacts are attributable to an action but will affect an ecological receptor via an intermediary ecosystem, process or receptor e.g. the creation of roads which cause hydrological changes, which, in the absence of mitigation, could lead to the drying out of wetland habitats used by IEF species.

5.116 The following have been considered:

Designated nature conservation sites and ecosystems

5.117 Whether the Proposed Project and associated activities is likely to undermine the conservation objectives for the designated site or influence the conservation status of the site or its qualifying habitats/species.

5.118 Whether the Proposed Project is likely to result in a change in ecosystem structure and function.

Habitats and species

5.119 Whether the Proposed Project will influence the extent, structure and function as well as the distribution and composition of a habitat.

5.120 Whether the Proposed Project will affect the abundance and distribution of a species.

5.121 For specific taxonomic groups, there are defined impact assessment methodologies that are to be used for wind farms. These are outlined below.

Birds

5.122 NatureScot (2025) provides guidance for assessing the significance of impacts on bird populations from onshore wind farms that do not affect protected areas.[64] NatureScot guidance is widely recognised as the industry-standard for assessing wind farm impacts on birds in the UK and Ireland and broadly follows the latest CIEEM guidance.

5.123 Disturbance impacts have been assessed with reference to the relevant literature for each avian taxonomic group (Goodship & Furness, 2022; Drewitt & Langston, 2006; Hötker, et al., 2006; Pearce-Higgins et. al, 2009; Rees et al., 2005; Rees, 2012),[65] [66] [67] [68] [69] [70] and the

[64] NatureScot. (2018a). *Assessing the cumulative impacts of onshore wind farms on birds* (Guidance Note). Perth, Scotland: NatureScot.

[65] Goodship, N. M., & Furness, R. W. (2022). *Disturbance distances review: An updated literature review of disturbance distances of selected bird species* (NatureScot Research Report No. 1283). Perth, Scotland: NatureScot.

[66] Drewitt, A. L., & Langston, R. H. W. (2006). *Assessing the impacts of wind farms on birds*. *Ibis, 148*(1), 29–42.

[67] Hötker, H., Thomsen, K.-M., & Jeromin, H. (2006). *Impacts on biodiversity of exploitation of renewable energy sources: the example of birds and bats.* Bergenhusen, Germany: ornithological guidelines for renewable energy development.

[68] Pearce-Higgins, J. W., Stephen, L., Langston, R. H. W., Bainbridge, I., & Bullman, R. (2009). *The distribution of breeding birds around upland wind farms*. Journal of Applied Ecology, 46(6), 1323–1331.

[69] Rees, E. C., et al. (2005). Impacts of wind farms on swans and geese: a review. Wildfowl, 62, 1–25.

[70] Rees, E. C. (2012). *Impacts of wind farms on swans and geese: a review*. *Wildfowl*, *62*, 37–72. Wildfowl & Wetlands Trust.

literature has also been used to identify appropriate disturbance-free buffer zones that will be provided to help prevent breeding failure due to disturbance.

5.124 The standard, random (i.e. non-directional) Band Collision Risk Model (CRM) (Band et al., 2024) was used to estimate collision risk based on recorded target species activity levels and flight behaviour, proposed turbine numbers and specifications, and the relevant species biometrics and flight characteristics.[71] Modelling collision risk under the Band CRM is a two-stage process. Stage 1 estimates the number of birds that fly through the rotor swept disc. Stage 2 predicts the proportion of these birds that have the potential to be hit by a rotor blade. Combining both stages produces an estimate of collision mortality in the absence of any avoidance action/behaviour by birds. Avoidance rates are then applied to generate predicted rates of collision mortality. Further details of the CRM methodology are provided in **Technical Appendix 5.2**.

Bats

5.125 NatureScot (2021) provides guidance for conducting risk assessment for bat species occurring at wind farms and has been followed for this assessment.[36] This involves following a two-stage process:

- Stage 1 assesses the site risk level based on habitat suitability, connectivity, presence of potential roosts, and project size. Habitat and project attributes are scored from low to high risk, generating an indicative site risk category. This step recognises that even upland or seemingly low-suitability sites can experience bat casualties.
- Stage 2 integrates the Stage 1 site risk with the Ecobat tool (Lintott, et al., 2018) activity categories for high-risk species. A matrix assigns an overall risk score by combining site risk and recorded activity levels, allowing identification of sites or species of greatest concern. Both the highest and most frequent Ecobat activity categories are evaluated to avoid overlooking peak activity, as bat data are often highly skewed.

5.126 The resulting overall risk rating (low, medium, or high) informs the need for mitigation and the nature of measures required. The framework ensures that species-specific vulnerability, habitat context and operational activity levels are all considered when determining potential impacts at the population level.

5.127 The Ecobat tool compares data entered by the user with bat survey information collected from similar areas at the same time of year and in comparable weather conditions. It is important to understand all activity levels at the site such as “typical” or *“unusually high”* levels of bat activity at the Main Wind Farm Development Site so potentially important peaks in activity are not overlooked. Thus, bat activity must be examined in terms of both the highest Ecobat activity category and the most frequent activity category for the overall risk assessment. The Ecobat outputs are summarised and contained in the **Technical Appendix 5.3**.

Cumulative Impacts and Effects

5.128 Cumulative effects can result from impacts which on their own are not determined to have significant effects but collectively there may be cumulative or interacting effects that could

[71] Band, W., Madders, M., & Whitfield, D. P. (2024). *Using a collision risk model to assess bird collision risk at onshore wind farms* (NatureScot Commissioned Report No. 909). Inverness: NatureScot.

result in more of a significant cumulative effect then when considered individually. These impacts can be:

- additive/incremental e.g. where multiple activities/projects with potentially insignificant individual effects add together to contribute to a significant effect due to their proximity in time and space. These can be additive or synergistic, or
- associated/connected e.g. where multiple activities forming separate planning applications/consent processes are part of the same overall project.

5.129 Other projects that are considered when establishing cumulative effects include:

- proposals for which consent has been applied but which are awaiting determination,
- projects which have been granted consent, but which have not yet been started, or which have been started but are not yet completed (i.e. under construction),
- proposals which have been refused permission, but which are subject to appeal, and the appeal is undetermined,
- proposals which will be implemented by a public body where no consent from a competent authority is needed,
- constructed developments whose full environmental effects are not yet felt and therefore cannot be accounted for in the baseline.

5.130 For more information please refer to **Chapter 2**.

Residual Effects and the Mitigation Hierarchy

5.131 Where likely significant effects have been identified, mitigation hierarchy has been applied, as recommended in the CIEEM guidelines. The mitigation hierarchy sets out a sequential approach beginning with the avoidance of effects where possible and followed by the application of mitigation measures to minimise unavoidable effects. The remaining effects are termed ‘residual effects’. If significant residual effects remain, then compensation for any remaining impacts may be undertaken.

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

- Avoidance is used where an impact has been avoided, e.g. Through changes in scheme design or embedded mitigation,
- Mitigation is used to refer to measures to reduce or remedy a specific negative impact either through the design of the project or subsequent measures that can be guaranteed – these can be embedded mitigation measures or in situ mitigation measures,
- Compensation describes measures taken to offset residual effects, i.e. Where mitigation in situ is not possible, and
- Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

Description of Existing Environment

Designated nature conservation sites

5.133 **Table 5-7** shows the designated sites were identified using a source–pathway–receptor framework to determine whether ecological connectivity could exist between the Main Wind Farm Development Site and surrounding sites. An initial search radius of 15 km was applied for designated nature conservation sites, extended to 20 km for Special Protection Areas (SPAs) and nationally designated sites for birds, in line with standard ecological assessment practice. However, the Zone of Influence (ZoI) is not defined solely by distance, and potential hydrological pathways and other ecological linkages were also considered when identifying sites for further assessment.

5.134 There are 10 SACs considered in the source-pathway-receptor model for the assessment of likely effects from the Proposed Project (**Table 5-7** and **Figures 5-3a-c**) Of these, only Mullet/Blacksod Bay Complex SAC, Bellacorick Bog Complex SAC and Owenduff/Nephin Complex SAC are identified as having connectivity with the Main Wind Farm Development Site - full details in the associated Natura Impact Statement (NIS).[57]

5.135 SNH Guidance Note 3[72] has been used to consider marine birds from SPAs beyond 20 km as the distances provided in this guidance relates to foraging at-sea ranges. A total of 10 additional SPAs have been considered.

5.136 There were 20 SPAs considered in the source-pathway-receptor model for the assessment of likely effects from the Main Wind Farm Development Site (**Table 5-7** and **Figure 3a-c**). Of these nine have connectivity with the Main Wind Farm Development Site, namely:

- Blacksod Bay/Broad Haven SPA 004037
- Owenduff/Nephin Complex SPA 004098
- Termoncarragh Lake and Annagh Machair SPA 004093
- Inishglora and Inishkeeragh SPA 004084
- Duvillaun Islands SPA 004111
- Inishkea Islands SPA 004004
- Lough Conn and Lough Cullin SPA 004228
- Clare Island SPA 004136 I
- Inner Galway Bay SPA 004031

5.137 A total of three Ramsar sites are located within 20 km of the Main Wind Farm Development Site. These are Blacksod Bay and Broadhaven, Owenduff catchment, and Knockmoyle/Sheskin. All three of these Ramsar sites are considered under SACs and SPAs previously listed.

5.138 There are three NHAs within 15 km of the Main Wind Farm Development Site (**Table 5-7** and **Figure 5-4a-c**). None of these NHAs entirely overlap with SACs and/or SPAs. Tullaghan Bay and Bog NHA partially overlaps with Blacksod Bay/Broad Haven SPA for which the wetland habitat will be considered, thus this NHA will be considered under this designation.

[72] Guidance Note 3: Guidance to support Offshore Wind applications: Marine Birds - Identifying theoretical connectivity with breeding site Special Protection Areas using breeding season foraging ranges | NatureScot. Accessed 10/11/2025

5.139 There is one proposed Natural Heritage Area (pNHA) within 15 km of the Main Wind Farm Development Site, namely Mullet/Blacksod Bay Complex pNHA 000470. This pNHA entirely overlaps with overlaps with Mullet/Blacksod Bay Complex SAC and Blacksod and Bay/Broad Haven SPA and is thus considered under these designations.

Table 5-7: Designated nature conservation sites with potential pathways to the Main Wind Farm Development Site

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
Mullet/Blacksod Bay Complex SAC 000470	0.07 km W	Mudflats and sandflats not covered by seawater at low tide [1140] Large shallow inlets and bays [1160] Reefs [1170] Salicornia and other annuals colonising mud and sand [1310] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) [2150] Machairs (* in Ireland) [21A0] Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation [3150] Alkaline fens [7230] *Lutra lutra* (Otter) [1355] *Petalophyllum ralfsii* (Petalwort) [1395]	This SAC is directly adjacent to the Main Wind Farm Development Site. There are hydrological and hydrogeological pathways present. **Hydrological** Construction/ decommissioning of the Proposed Project - release of suspended solid (and other) pollution into two streams IE_WE_33R010800 and IE_WE_33T070130) that flow into the SAC – alkaline fens and otter. **Hydrogeological** The SAC is located in the same ground waterbody (IE_WE_G_0057, Belmullet) and same sub-catchment (Glencastle_SC_010) as the Proposed Project and therefore they are hydrogeologically connected. **Ecological** Otter Otter have been identified on site. This is a highly mobile species and it is likely that the individuals recorded on site are part of the host population from the SAC. No other ecological pathways are identified.
Bellacorick Bog Complex SAC 001922	Directly Adjacent to Over-run area 2. 2. 5km from the Main Wind Farm Development Site.	Marsh saxifrage (Saxifraga hirculus) [1528] Blanket bogs * if active bog [7130] Depressions on peat substrates of the Rhynchosporion [7150] Alkaline fens [7230] Northern Atlantic wet heaths with Erica tetralix [4010] Geyer`s whorl snail (Vertigo geyeri) [1013], Natural dystrophic lakes and ponds [3160]	There are hydrological and hydrogeological connections present which is directly adjacent to Over-run Area 2 but over 5 km from the Main Wind Farm Development Site. **Hydrological** Construction/ decommissioning of the Proposed Project - release of suspended solid (and other) pollution into two streams IE_WE_33R010800 and IE_WE_33T070130) that flow into the SAC – alkaline fens.

[74] Warkentin, I. G., & Oliphant, L. W. (1990). Habitat use and foraging behaviour of urban Merlins (*Falco columbarius*) in winter. *Journal of Zoology (London)*, 221(4), 539–563.

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
			The other aquatic dependent habitats are all upstream from the Main Wind Farm Development Site. **Hydrogeological** The SAC is located in the same ground waterbody (IE_WE_G_0057, Belmullet) and same sub-catchment (Glencastle_SC_010) as the Proposed Project and therefore they are hydrogeologically connected. It is important to note that, **Chapter 7** of this EIAR does not identify any significant groundwater interactions. **Ecological** Over-run area 2 is the area which is adjacent to this SAC.; Area 2 and comprises this site is an existing access track and a mosaic of habitats which include some species which would be present in the peatland habitats for which this SAC is designated. • Blanket bogs * if active bog [7130], Depressions on peat substrates of the Rhynchosporion [7150], • Alkaline fens [7230], • Northern Atlantic wet heaths with Erica tetralix [4010], However, given the works that will take place at this location are small-scale temporary access track works – it is not likely that these works will have significant effects on the recruitment processes for the habitats. Given the potential hydrological interactions with Alkaline fens however, there are further considerations required in this regard. All other ecological connections are excluded.
Carrowmore Lake Complex SAC 000476	5.9 km NE	Blanket bogs (* if active bog) [7130] Depressions on peat substrates of the *Rhynchosporion* [7150] *Saxifraga hirculus* (Marsh saxifrage) [1528]	**Hydrological** A study of local water courses revealed no hydrological connectivity as the SAC is situated upstream of the nearest potentially connected water course.

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
		Hamatocaulis vernicosus (Slender green feather-moss) [6216]	**Hydrogeological** Carrowmore Lake Complex SAC is located within the same ground water body as the Main Wind Farm Development Site. However, there is considered to be no realistic hydrogeological connection due to the distance between them (>5 km). **Ecological** No ecological connectivity as the designated features are habitats. Therefore, no pathway.
Broadhaven Bay SAC 000472	6.6 km N	Mudflats and sandflats not covered by seawater at low tide [1140] Large shallow inlets and bays [1160] Reefs [1170] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Submerged or partially submerged sea caves [8330]	**Hydrological** A study of local water courses revealed no hydrological connectivity as the SAC is situated upstream of the nearest potentially connected water course. **Hydrogeological** Broadhaven Bay SAC is located within the same ground waterbody as the Main Wind Farm Development Site. However, there is considered to be no realistic hydrogeological connection due to the distance between them (>6 km). **Ecological** No ecological connectivity as the designated features are habitats that do not occur on within the Main Wind Farm Development Site. Therefore, no pathway.
Owenduff/Nephin Complex cSAC 000534	7.7 km SE	Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Natural dystrophic lakes and ponds [3160] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Northern Atlantic wet heaths with *Erica tetralix* [4010] Alpine and boreal heaths [4060] Juniperus communis formations on heaths or calcareous grasslands [5130]	**Hydrological** A study of local water courses revealed no hydrological connectivity as the SAC is situated upstream of the nearest potentially connected water course. **Hydrogeological** Owenduff/Nephin Complex cSAC is located within the same ground waterbody as the Main Wind Farm Development Site. However, there is considered to be no realistic hydrogeological connection due to the distance between them (>7 km). **Ecological**

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
		Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355] *Saxifraga hirculus* (Marsh saxifrage) [1528] *Hamatocaulis vernicosus* (Slender green feather-moss) [6216]	Otter have been identified on site. This is a highly mobile species, and it is possible that the individuals recorded on site are part of the host population from the SAC. Salmon was recorded in the streams and rivers connected to the Main Wind Farm Development Site during baseline aquatic surveys. However, as there is no hydrological connectivity between the Main Wind Farm Development Site and the SAC, the salmon recorded cannot be connected with the SAC. Thus, no ecological connectivity.
West Connacht Coast SAC 002998	8.0 km W	*Tursiops truncatus* (Common bottlenose dolphin) [1349]	**Hydrological** Several streams from within the Main Wind Farm Development Site, including Doolough Stream, discharge into Tullaghan Bay and Blacksod Bay, within which West Connacht Coast SAC is located. However, there is considered to be no realistic hydrological connection given the volume of the water involved. **Ecological** No ecological connectivity as the designated feature, common bottlenose dolphin, is a marine species.
Doogort Machair/Lough Doo SAC 001497	11.0 km SW	Machairs (* in Ireland) [21A0] *Petalophyllum ralfsii* (Petalwort) [1395]	**Hydrological** Several streams from within the Main Wind Farm Development Site, including Doolough Stream, discharge into Tullaghan Bay and Blacksod Bay. However, there is considered to be no realistic hydrological connection given the volume of the water involved. **Hydrogeological** The SAC is located in a different groundwater body to the SAC. Therefore, no hydrogeological connectivity. **Ecological** No ecological connectivity as the designated features are habitats and plant species that do not occur within the Main Wind Farm Development Site. There is also physical separation between the Main Wind Farm Development Site and SAC via Blacksod Bay.

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
Slieve Fyagh Bog SAC 000542	11.3 km NE	Blanket bogs (* if active bog) [7130]	**Hydrological** A study of local water courses revealed no hydrological connectivity as the SAC is situated upstream of the nearest potentially connected water course. **Hydrogeological** Slieve Fyagh Bog SAC is located within the same ground waterbody as the Main Wind Farm Development Site. However, there is considered to be no realistic hydrogeological connection due to the distance between them (>11 km). **Ecological** No ecological connectivity as the designated feature is a habitat. Therefore, no pathway.
Croaghaun/Slievemore SAC 001955	13.7 km SW	Northern Atlantic wet heaths with *Erica tetralix* [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] Blanket bogs (* if active bog) [7130] Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) [8110] Siliceous rocky slopes with chasmophytic vegetation [8220]	**Hydrological** Several streams from within the Main Wind Farm Development Site, including Doolough Stream, discharge into Tullaghan Bay and Blacksod Bay. However, there is considered to be no realistic hydrological connection given the volume of the water and distances involved. **Hydrogeological** The SAC is located in a different groundwater body to the SAC. Therefore, no hydrogeological connectivity. Ecological No ecological connectivity as the designated features are habitats. Therefore, no pathway.
Glenamoy Bog Complex cSAC 000500	13.9 km NE	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Machairs (* in Ireland) [21A0] Natural dystrophic lakes and ponds [3160] Northern Atlantic wet heaths with *Erica tetralix* [4010] Juniperus communis formations on heaths or calcareous grasslands [5130] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140]	**Hydrological** A study of local water courses revealed no hydrological connectivity as the SAC is situated upstream of the nearest potentially connected water course. **Hydrogeological** Glenamoy Bog Complex SAC is located within the same ground waterbody as the Main Wind Farm Development Site. However, there is considered to be no realistic hydrogeological connection due to the distance between them (>13 km).

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
		Depressions on peat substrates of the Rhynchosporion [7150] *Salmo salar* (Salmon) [1106] *Petalophyllum ralfsii* (Petalwort) [1395] *Saxifraga hirculus* (Marsh saxifrage) [1528] *Hamatocaulis vernicosus* (Slender green feather-moss) [6216]	**Ecological** No ecological connectivity as the designated features are habitats and plant species. Therefore, no pathway.
Owenduff/Nephin Complex SPA 004098	Adjacent to Over-run Area 3 and 7.76 km E from the Main Wind Farm Development Site	Merlin (Falco columbarius) [A098] (permanent) Golden plover (Pluvialis apricaria) [A140] (breeding)	**Hydrological** A study of local water courses confirms there is no downstream hydrological connectivity between the Main Wind Farm Development Site and the SPA which is situated upstream of the nearest potentially connected water course. However, the Over-run Areas are directly adjacent to the SPA and hydrological interactions at a small scale could occur. **Hydrogeological** Owenduff/Nephin Complex SPA is located within the same ground waterbody as the Main Wind Farm Development Site. The groundwater vulnerability at the Main Wind Farm Development Site is classed as Moderate (M). The groundwater vulnerability rating at the three Over-run Areas is Low (L). There are no identified karst features within a 2 km zone from the Main Wind Farm Development Site, the three Over-run Areas of the TDR and the GCR. Several clusters of karst features were noted along the nodes of the TDR. There is no Group Water Scheme (GWS) and Public Water Supply (PWS) within a 2 km radius of the Main Wind Farm Development Site, the Over-run Areas or the GCR. Eight water supply schemes are located along the TDR route, six GWS and two PWS. Furthermore, **Chapter 7** of the associated EIAR does not identify any significant groundwater interactions. Therefore, there is no realistic hydrogeological connection for potential effects to the SPA. Furthermore, the SCIs are not groundwater sensitive.

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
			Ecological Golden plover and merlin were recorded in flight within 500 m of the main development area of the wind farm. Breeding golden plover have a core foraging range of 3 km. The SPA is located 7.6 km away from the collision risk area of the main wind farm area and therefore is outside the core foraging range for golden plover and so no realistic ecological connection to the breeding SPA population of golden plover exists. Breeding merlin have a core foraging range of 5 km. There is no clear literature focused on the winter ranging behaviours of Merlin however, a study found that the mean winter range for merlin was approximately 8 km (Warkentin and Oliphant, 1990)[74]. Although it is noted the details of this study are not analogous to the context of the Proposed Project and the ranging behaviours are likely less than this, this is taken as a guide. As the SPA is located 7.6 km away from the main development area of the wind farm and given that the SPA is designated for its permanent population of merlin, there could be a potential ecological connection between the Main Wind Farm Development Site and the SPA, particularly for wintering merlin.
Blacksod Bay/Broad Haven SPA 004037	700 from the Main Wind Farm Development Site and construction works will be further still. 1.4 km from the closest Over-run	Red-throated diver (Gavia stellata) [A001] (wintering) Great Northern diver (Gavia immer) [A003] (wintering) Slavonian grebe (Podiceps auritus) [A007] (wintering) Light-bellied brent goose (Branta bernicla hrota) [A046] (wintering)	**Hydrological** A study of the watercourses confirms there is hydrological connectivity as a result of two streams Bridgetown River which flows into Blacksod Bay – thus connected to the same SPA. as Blacksod Bay/Broad Haven SAC. Hydrogeological The SPA is located in the same ground waterbody (IE_WE_G_0057, Belmullet) and same sub-catchment

[74] Warkentin, I. G., & Oliphant, L. W. (1990). Habitat use and foraging behaviour of urban Merlins (*Falco columbarius*) in winter. *Journal of Zoology (London)*, 221(4), 539–563.

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
	Area (Over-run Area 1).	Common scoter (Melanitta nigra) [A065] (wintering) Red-breasted merganser (Mergus serrator) [A069] (wintering) Ringed plover (Charadrius hiaticula) [A137] (wintering) Sanderling (Calidris alba) [A144] (breeding) Dunlin (Calidris alpina) [A149] (wintering) Bar-tailed godwit (Limosa lapponica) [A157] (wintering) Curlew (Numenius arquata) [A160] (wintering) Sandwich tern (Sterna sandvicensis) [A191] (breeding) Wetland and Waterbirds [A999]	(Glencastle_SC_010) as the Main Wind Farm Development Site and therefore they are hydrogeologically connected. **Ecological** Curlew was recorded within 500 m of the Main Wind Farm Development Site but not in flight. Curlew was also recorded during bioacoustic monitoring. The core winter foraging range for curlew is approximately 500 m (Mander et al. 2022)[75]. Therefore, the potential ecological connection is that the wintering curlew population of the SPA may fly across the Main Wind Development Site. The remaining SCIs were not recorded within the Main Wind Farm Development Site or 500 m buffer during passage surveys and no ecological connection is likely. The closest infrastructure is at least 700 m distant. Goodship and Furness (2022) also state that the majority of waders are not disturbed beyond 500 m. As there is forestry in between the SPA and Main Wind Development Site, the disturbing activities (construction at the main wind farm area) will be screened from any SPA birds. As a result, likely significant disturbance effects on SPA birds can be excluded.
Carrowmore Lake SPA 004052	1.6 km NE of Over-run Area 3 but 5.9 km NE from the Main Wind Farm Development Site	Sandwich tern (Sterna sandvicensis) [A191] (breeding)	**Hydrological & Hydrogeological** No hydrological or hydrogeological connectivity. **Ecological** No sandwich terns were recorded during the surveys in the passage season or breeding seasons. Sandwich tern no longer breed within the SPA and the colony is thought to have moved to an island in Broad Haven Bay. The conservation objective of this species is to restore the population. Sandwich tern typically forages at sea and breeds on beaches and so would not use the Main Wind Farm Development Site because of the unsuitability of the habitat for breeding or

[75] Mander et al. (2022). Individual, sexual and temporal variation in the winter home range sizes of GPS tagged Eurasian Curlews (Humber Estuary). Bird Study. Volume 69. Pages 39-52

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
			foraging. Any movement would predominantly be between Carrowmore Lake/Dereens island and the sea via the shortest route northwest to Broad Haven Bay, which is located away from the Main Wind Farm Development Site. Therefore, there are no sources for impacts with pathways for potential effects to the SPA
Mullet Peninsula SPA 004227	9.6 km NW from the Main Wind Farm Development Site	Corncrake (*Crex crex*) [A122] (breeding)	**Hydrological & Hydrogeological** No hydrological or hydrogeological connectivity as this is a coastal/marine SPA connected to a different river catchment and groundwater body. **Ecological** No corncrake were recorded during surveys. These included extensive passage surveys and bioacoustic monitoring. Therefore, there is no ecological connection to the SPA.
Doogort Machair SPA 004235	11.1 km SW from the Main Wind Farm Development Site	Dunlin (*Calidris alpina schinzii*) [A466] (breeding)	**Hydrology & Hydrogeology** No hydrological or hydrogeological connectivity as this is a coastal/marine SPA connected to a different river catchment and groundwater body. **Ecological** Dunlin was not recorded during any flight activity survey or during the extensive suite of passage surveys (including bioacoustic surveys). This species was recorded during winter surveys at coastal locations nearby. The Main Wind Farm Development Site is not on a direct migratory line from the SPA to the wintering grounds as the Main Wind Farm Development Site is located to the north and west of the SPA, and the breeding population grounds winters in southern Europe and Africa. Therefore, there is no ecological connection.
Termoncarragh Lake and Annagh Machair SPA 004093	13.3 km NW from the Main Wind Farm	Whooper swan (Cygnus cygnus) [A038] (wintering)	**Hydrological & Hydrogeological**

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
	Development Site	Barnacle goose (Branta leucopsis) [A045] (wintering) Corncrake (Crex crex) [A122] (breeding) Lapwing (Vanellus vanellus) [A142] (breeding) Chough (Pyrrhocorax pyrrhocorax) [A346] (wintering) Greenland white-fronted goose (Anser albifrons flavirostris) [A395] (wintering) Dunlin (Calidris alpina schinzii) [A466] (breeding) Wetland and Waterbirds [A999]	No hydrological or hydrogeological connectivity as this is partly a marine SPA connected to a different river catchment and groundwater body. **Ecological** Whooper swan was recorded in flight within 500 m of the Main Wind Farm Development Site. The core winter foraging range of whooper swan is less than 5 km and the SPA is approximately 13.3 km away. Therefore, it is unlikely any realistic ecological connectivity to the SPA population exists. Barnacle goose, lapwing and Greenland white-fronted goose were recorded during bioacoustic monitoring. Barnacle goose and Greenland white-fronted goose were also recorded in flight. As a precaution, lapwing was also assumed to be in flight to provide the worst-case scenario and ensure all potential impacts are considered appropriately. The core winter foraging range of barnacle goose is 15 km and the core winter foraging range for Greenland white-fronted goose is 5 – 8 km. Acoustic monitoring shows presence but not regular use. As the SPA is located approximately 13.3 km away, there is ecological connectivity for barnacle goose but not Greenland white-fronted goose. No corncrake were recorded during surveys. This included extensive passage and bioacoustic surveys and therefore there is no ecological connection to the SPA population. A study in Italy found lapwing have home ranges of c. 56 ha during the breeding season and stay within 207 +/- 153 m from their nests. This equates to a core foraging range of approximately 400-450 m in the breeding season[76], indicating that no realistic ecological connection to the breeding population for this SPA is present.

[76] Cevenini *et al* (2025) Habitat selection of the threatened Northern lapwing (*Vanellus vanellus*) breeding in an intensive agroecosystem. European Journal of Wildlife Research. 71:30

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
			Dunlin was not recorded during any surveys within 500 m of the Main Wind Development Site , although this species was recorded during winter surveys at coastal locations nearby. Collectively, this suggests there is no realistic ecological connection to the breeding population from this SPA.
Inishglora and Inishkeeragh SPA 004084	14.4 km NW from the Main Wind Farm Development Site	Storm petrel (Hydrobates pelagicus) [A014] (breeding) Cormorant (Phalacrocorax carbo) [A017] (breeding) Shag (Phalacrocorax aristotelis) [A018] (breeding) Barnacle goose (Branta leucopsis) [A045] (wintering) Lesser black-backed gull (Larus fuscus) [A183] (breeding) Herring gull (Larus argentatus) [A184] (breeding) Arctic tern (Sterna paradisaea) [A194] (breeding)	**Hydrological & Hydrogeological** No hydrological or hydrogeological connectivity as this SPA is composed of several islands. **Ecological** Cormorant, lesser black-backed gull and herring gull were recorded in flight within 500 m of the Main Wind Farm Development Site. Furthermore, barnacle goose was recorded in flight during bioacoustic monitoring. The core foraging range for breeding cormorant is 33.9 km, 236 km for breeding lesser black-backed gull and 85.6 km for breeding herring gull[77]. These ranges are greater than the distance of the SPA from the Main Wind Farm Development and therefore, there is potential ecological connectivity. The core winter foraging range for barnacle goose is 15 km. As the SPA is 14.4 km away there is potential ecological connectivity. The remaining SCIs were not recorded within the Main Wind Farm Development Site or 500 m buffer and so there is no potential ecological connectivity present. Storm petrel and shag are marine/coastal species and do not occur on or near the Main Wind Farm Development Site.
Duvillaun Islands SPA 004111	15.3 km SW of the Main Wind Farm	Fulmar (Fulmarus glacialis) [A009] (breeding) Storm petrel (Hydrobates pelagicus) [A014] (breeding)	**Hydrological & Hydrogeological** No hydrological or hydrogeological connectivity as this SPA is composed of several marine islands.

[77] https://www.nature.scot/doc/guidance-note-3-guidance-support-offshore-wind-applications-marine-birds-identifying-theoretical Accessed 10/11/2025

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
	Development Site	Barnacle goose (Branta leucopsis) [A045] (breeding)	**Ecological** Barnacle goose was recorded in flight during bioacoustic monitoring. The core winter foraging range for barnacle goose is 15 km The SPA is approximately 15.3 km away from the Main Wind Farm Development Site. Therefore, taking a precautionary approach, barnacle goose recorded at the Main Wind Farm Development Site may be linked to the SPA population. The remaining SCIs were not recorded within the Main Wind Farm Development Site or 500 m buffer. Fulmar and storm petrel are pelagic/coastal species and the habitat on the Main Wind Farm Development Site is not suitable. Therefore, no connectivity.
Inishkea Islands SPA 004004	16.4 km W from the Main Wind Farm Development Site	Shag (Phalacrocorax aristotelis) [A018] (breeding) Barnacle goose (Branta leucopsis) [A045] (wintering) Ringed plover (Charadrius hiaticula) [A137] (wintering & breeding) Sanderling (Calidris alba) [A144] (wintering) Purple sandpiper (Calidris maritima) [A148] (wintering) Turnstone (Arenaria interpres) [A169] (wintering) Common gull (Larus canus) [A182] (breeding)	**Hydrological & Hydrogeological** No hydrological or hydrogeological connectivity as this SPA is composed of several islands. **Ecological** Common gull and herring gull were recorded in flight within 500 m of the Main Wind Farm Development Site where collision risk was assessed. In addition, barnacle goose was recorded in flight during bioacoustic monitoring. The core foraging distances of common gull and herring gull are 50 km and 85.6 km[78], respectively. As the SPA is approximately 16.4 km distant there is potential ecological connectivity with regards to these two bird species. The core winter foraging range for barnacle goose is 15 km (NatureScot, 2016), which is less than the separation distance between the SPA and Main Wind Farm Development Site . However, it is likely that the birds at this SPA are from the

[78] https://www.nature.scot/doc/guidance-note-3-guidance-support-offshore-wind-applications-marine-birds-identifying-theoretical Accessed 10/11/2025

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
		Herring gull (Larus argentatus) [A184] (wintering) Arctic tern (Sterna paradisaea) [A194] (breeding) Little tern (Sterna albifrons) [A195] (breeding) Dunlin (Calidris alpina schinzii) [A466] (breeding & wintering)	same population as at Termoncarragh Lake and Annagh Macahir SPA (10.5 km distance between the two SPAs) so the population is linked to that of another SPA that is within foraging distances of the Main Wind Farm Development Site. Therefore, there is potential indirect ecological connectivity to the Inishkea Island SPA population of barnacle geese. The remaining SCIs were not recorded within the Main Wind Farm Development Site or 500 m buffer and so there is no ecological connectivity present.
Lough Conn and Lough Cullin SPA 004228	17.1 km S from the Main Wind Farm Development Site	Common Scoter (Melanitta nigra) [A065] (breeding), Greenland White-fronted Goose (Anser albifrons flavirostris) [A395] (wintering), Tufted Duck (Aythya fuligula) [A061] (wintering), Wetland and Waterbirds [A999], Common Gull (Larus canus) [A182] (breeding)	**Hydrological & Hydrogeological** No hydrological or hydrogeological connectivity as this is a coastal/marine SPA connected to a different river catchment and groundwater body. **Ecological** Common gull were recorded in flight within 500 m of the Main Wind Farm Development Site where collision risk was assessed. Greenland white-fronted goose were recorded in flight during bioacoustic monitoring. The core foraging range for common gull is 50 km[21], and the core foraging range for Greenland white-fronted goose is 5 – 8 km. The SPA is located approximately 17.1 km away from the Main Wind Farm Development Site i.e. within the core foraging range for common gull but outside the core foraging range for Greenland white-fronted goose. Therefore, there is ecological connectivity for common gull but not Greenland white-fronted goose. The remaining SCIs were not recorded within the Main Wind Farm Development Site or 500 m buffer. Therefore, there is no connectivity for these other SCI species.
Illanmaster SPA 004074	20.4 km NE from the Main Wind Farm Development Site	European storm petrel (Hydrobates pelagicus) [A014] (breeding)	**Hydrological & Hydrogeological** No hydrological or hydrogeological connectivity as this is a coastal/marine SPA connected to a different river catchment and groundwater body.

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
			Ecological Storm petrel was not recorded during any survey. This species is highly pelagic and the terrestrial location of the Proposed Project Site means the habitats on-site are not suitable for this species. Therefore, there is no connection to this SPA.
Killala Bay/Moy Estuary SPA 004036	22.7 km NE from the Main Wind Farm Development Site	Sanderling (Calidris alba) [A144] (wintering), Dunlin (Calidris alpina) [A149] (wintering), Curlew (Numenius arquata) [A160] (wintering), Ringed Plover (Charadrius hiaticula) [A137] (wintering), Bar-tailed Godwit (Limosa lapponica) [A157] (wintering), Redshank (Tringa totanus) [A162] (wintering), Wetland and Waterbirds [A999], Golden Plover (Pluvialis apricaria) [A140] (wintering), Grey Plover (Pluvialis squatarola) [A141] (wintering)	**Hydrology & Hydrogeology** No hydrological or hydrogeological connectivity as this is a coastal/marine SPA connected to a different river catchment and groundwater body. **Ecological** Golden plover were recorded in flight within 500 m of the Main Wind Farm Development Site. Curlew was also recorded during bioacoustic monitoring and during flight activity surveys (on the ground but not flying). The core winter foraging range for curlew is approximately 500 m (Mander et al. 2022). The core winter foraging range for golden plover is approximately 12 km (Gillings, Fuller and Sutherland, 2003). The SPA is located approximately 22.7 km from the Main Wind Farm Development Site, therefore there is no ecological connectivity.
Stags of Broad Haven SPA 004072	23.5 km W from the Main Wind Farm Development Site	Leach's Storm-petrel (Oceanodroma leucorhoa) [A015] (breeding), Storm Petrel (Hydrobates pelagicus) [A014] (breeding)	**Hydrology & Hydrogeology** No hydrological or hydrogeological connectivity as this is a coastal/marine SPA connected to a different river catchment and groundwater body. **Ecological** The SPA is a considerable distance from the Main Wind Farm Development Site. Furthermore, none of SCI species of the SPA were recorded during extensive bird surveys.

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
			These species are highly pelagic and the terrestrial location of the Main Wind Farm Development Site means the habitats on-site are not suitable. Therefore, there is no ecological connectivity to this SPA.
North-west Irish Sea SPA 004236	Approx. 240 km E from the Main Wind Farm Development Site	Red-throated diver (*Gavia stellata*) [A001] (wintering) Great northern diver (*Gavia immer*) [A003] (wintering) Fulmar (*Fulmarus glacialis*) [A009] (breeding and wintering) Manx shearwater (*Puffinus puffinus*) [A013] (breeding) Cormorant (*Phalacrocorax carbo*) [A017] (breeding) Shag (*Phalacrocorax aristotelis*) [A018] (breeding) Common scoter *(Melanitta nigra*) [A065] (wintering) Black-headed gull (*Chroicocephalus ridibundus*) [A179] (wintering) Common gull *(Larus canus*) [A182] (wintering) Lesser black-backed gull (*Larus fuscus*) [A183] (breeding) Herring gull (*Larus argentatus*) [A184] (breeding and wintering) Great black-backed gull (*Larus marinus*) [A187] (wintering) Kittiwake (*Rissa tridactyla*) [A188] (breeding and wintering)	**Hydrology & Hydrogeology** No hydrological or hydrogeological connectivity as this is a marine SPA connected to a different river catchment and groundwater body. **Ecological** The following species, which are SCI of this SPA, were recorded during surveys at the Main Wind Farm Development Site where collision risk was assessed: cormorant, kittiwake, black-headed gull, great black-backed gull, herring gull, lesser black-backed gull and common tern. The marine core foraging ranges of the aforementioned species during the breeding season are as follows; • cormorant: 33.9 km • kittiwake: 300.6 km • black-headed gull: 18.5 km • great black-backed gull: 73 km • herring gull: 85.6 km • lesser black backed gull 236 km • common tern: 269 km. The direct line distance of the SPA to the Main Wind Farm Development Site is approx. 240 km. Given the location of this SPA on the eastern coast of Ireland the marine distance is considerably greater than the direct line distance. Therefore, the marine distance between the Main Wind Farm Development Site and the SPA is greater than the marine core foraging range of any of the above-mentioned species. Hence, no ecological connection.

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
		Roseate tern (Sterna dougallii) [A192] (breeding) Common tern (*Sterna hirundo*) [A193] (breeding) Arctic tern (*Sterna paradisaea*) [A194] (breeding) Guillemot (*Uria aalge*) [A199] (breeding and wintering) Razorbill (*Alca torda*) [A200] (breeding and wintering) Puffin (*Fratercula arctica*) [A204] (breeding) Little gull *(Hydrocoloeus minutus*) [A862] (wintering) Little tern (*Sternula albifrons*) [A885] (breeding)	
Clare Island SPA 004136	Approx. 32 km S from the Main Wind Farm Development Site	Fulmar (*Fulmarus glacialis*) [A009] (breeding) Shag (*Phalacrocorax aristotelis*) [A018] (breeding) Common gull (*Larus canus*) [A182] (breeding) Kittiwake (*Rissa tridactyla*) [A188] (breeding) Guillemot (*Uria aalge*) [A199] (breeding) Razorbill (*Alca torda*) [A200] (breeding) Chough (*Pyrrhocorax pyrrhocorax*) [A346] (permanent)	**Hydrology & Hydrogeology** No hydrological or hydrogeological connectivity as this is a marine SPA connected to a different river catchment and groundwater body. **Ecological** The following species, which are SCI of this SPA, were recorded during surveys at the Main Wind Farm Development Site: kittiwake and common gull. The marine core foraging ranges of these two species during the breeding season are as follows; • Kittiwake: 300.6 km • Common gull: 50 km The direct line distance of the SPA to the Main Wind Farm Development Site where collision risk was assessed is approx. 32 km. However, the marine distance is identified as

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
			greater than the direct line distance and is c.62 km. Therefore, the marine distance between the Main Wind Farm Development Site and the SPA is greater than the marine core foraging range of common gull. Therefore, with regards to common gull there is no ecological connectivity. One single kittiwake *Rissa tridactyla* was recorded during the 2023 spring passage season. Therefore, there is potential ecological connectivity for kittiwake, as summarised below. *Operating wind farm – collision – kittiwake*
Inner Galway Bay SPA 004031	Approx 109 km S from the Main Wind Farm Development Site	Black-throated diver (*Gavia arctica*) [A002] (wintering) Great northern diver (*Gavia immer*) [A003] (wintering) Cormorant (*Phalacrocorax carbo*) [A017] (breeding) Grey heron (*Ardea cinerea*) [A028] Light-bellied brent goose (*Branta bernicla hrota*) [A046] (wintering) Teal (*Anas crecca*) [A052] (wintering) Red-breasted merganser (*Mergus serrator*) [A069] (wintering) Ringed plover (*Charadrius hiaticula*) [A137] (wintering) Golden plover (*Pluvialis apricaria*) [A140] (wintering) Lapwing (*Vanellus vanellus*) [A142] (wintering) Dunlin (*Calidris alpina*) [A149] (wintering) Bar-tailed godwit (*Limosa lapponica*) [A157] (wintering)	**Hydrology & Hydrogeology** No hydrological or hydrogeological connectivity as this is a marine SPA connected to a different river catchment and groundwater body. **Ecological** The following species, which are SCIs of this SPA, were recorded during surveys at the Main Wind Farm Development Site: cormorant, golden plover, black-headed gull, common gull and common tern The marine core foraging ranges of the aforementioned species during the breeding season are as follows; • cormorant: 33.9 km • black-headed gull: 18.5 km • golden plover: 12 km • common gull: 50 km • common tern: 269 km The direct line distance of the SPA to the Main Wind Farm Development Site is approx. 109 km; however, the marine distance between the Main Wind Farm Development Site is considerably greater than this (c.200 km) and the marine core foraging range of cormorant, black-headed gull, golden plover and common gull. Therefore, there is no ecological connection for these species.

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
		Curlew (*Numenius arquata*) [A160] (wintering) Redshank (*Tringa totanus*) [A162] (wintering) Turnstone (*Arenaria interpres*) [A169] (wintering) Black-headed gull (*Chroicocephalus ridibundus*) [A179] (wintering) Common gull (*Larus canus*) [A182] (wintering) Common tern (*Sterna hirundo*) [A193] (breeding) Wigeon (*Mareca penelope*) [A855] (wintering) Sandwich tern (*Thalasseus sandvicensis*) [A863] (breeding) Wetland and Waterbirds [A999]	However, there is potential ecological connectivity for common tern, as their marine core foraging range is greater than the marine distance between the Main Wind Farm Development Site and the SPA.
Blasket Island SPA 004008	Approx. 224 km S from the Main Wind Farm Development Site	Fulmar (*Fulmarus glacialis*) [A009] (breeding) Manx shearwater (*Puffinus puffinus*) [A013] (breeding) Storm petrel (*Hydrobates pelagicus*) [A014] (breeding) Shag (*Phalacrocorax aristotelis*) [A018] (breeding) Lesser black-backed gull (*Larus fuscus*) [A183] (breeding) Herring gull (*Larus argentatus*) [A184] (breeding) Kittiwake (*Rissa tridactyla*) [A188] (breeding)	**Hydrology & Hydrogeology** No hydrological or hydrogeological connectivity as this is a marine SPA connected to a different river catchment and groundwater body. **Ecological** The following species, which are SCI of this SPA, were recorded during surveys at the Main Wind Farm Development Site was assessed: kittiwake, herring gull and lesser black-backed gull. The marine core foraging ranges of the aforementioned species are as follows; • kittiwake: 300.6 km • herring gull: 85.6 km • lesser black backed gull: 236 km.

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
		Arctic tern (*Sterna paradisaea*) [A194] (breeding) Razorbill (*Alca torda*) [A200] (breeding) Puffin (*Fratercula arctica*) [A204] (breeding) Chough (*Pyrrhocorax pyrrhocorax*) [A346] (breeding)	The direct line distance of the SPA to the Main Wind Farm Development Site where collision risk was assessed is approx. 224 km. However, the marine distance is greater than the direct line distance. Therefore, the marine distance between the Main Wind Farm Development Site and the SPA is greater than the marine core foraging range of all the above-mentioned species. Hence, no ecological connection.
South Dublin and River Tolka Estuary SPA 004024	Approx. 255 km SE from the Main Wind Farm Development Site	Light-bellied brent goose (*Branta bernicla hrota*) [A046] (wintering) Oystercatcher (*Haematopus ostralegus*) [A130] (wintering) Ringed plover (*Charadrius hiaticula*) [A137] (wintering) Grey plover (*Pluvialis squatarola*) [A141] (wintering) Knot (*Calidris canutus*) [A143] (wintering) Sanderling (*Calidris alba*) [A144] (wintering) Dunlin (*Calidris alpina*) [A149] (wintering) Bar-tailed godwit (*Limosa lapponica*) [A157] (wintering) Redshank (*Tringa totanus*) [A162] (wintering) Black-headed gull (*Chroicocephalus ridibundus*) [A179] (wintering) Roseate tern *(Sterna dougallii*) [A192] (concentration) Common tern (*Sterna hirundo*) [A193] (concentration)	**Hydrology & Hydrogeology** No hydrological or hydrogeological connectivity as this is a marine SPA connected to a different river catchment and groundwater body. **Ecological** The following species, which are SCI of this SPA, were recorded during surveys at the Main Wind Farm Development Site: black-headed gull and common tern. The marine core foraging ranges of the aforementioned species during the breeding season are as follows; • black-headed gull: 18.5 km • common tern: 269 km. The direct line distance of the SPA to the Main Wind Farm Development Site is approx. 255 km. Given the location of this SPA on the eastern coast of Ireland the marine distance is considerably greater than the direct line distance. Therefore, the marine distance between the Main Wind Farm Development Site and the SPA is identified as greater than the marine core foraging range of all the above-mentioned species, Hence, no ecological connection.

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
		Arctic tern (*Sterna paradisaea*) [A194] (concentration) Wetland and Waterbirds [A999]	
Rockabill SPA 004014	Approx. 257 km SE from the Main Wind Farm Development Site	Purple sandpiper (*Calidris maritima*) [A148] (breeding) Roseate tern (*Sterna dougallii*) [A192] (breeding) Common tern (*Sterna hirundo*) [A193] (breeding) Arctic tern (*Sterna paradisaea*) [A194] (breeding)	**Hydrology & Hydrogeology** No hydrological or hydrogeological connectivity as this SPA is entirely marine and therefore in a different catchment and groundwater body **Ecological** Common tern were recorded during surveys at the Main Wind Farm Development Site. The marine core foraging ranges of common tern is 269 km. The direct line distance of the SPA to the Main Wind Farm Development Site is approx. 257 km. Given the location of this SPA on the eastern coast of Ireland the marine distance is considerably greater than the direct line distance. No other SCI species were identified at the Main Wind Farm Development Site. Therefore, the marine distance between the Main Wind Farm Development Site and the SPA is identified as greater than the marine core foraging range of common tern. Hence, no ecological connection.
Lambay Island SPA 004069	Approx. 263 km SE from the Main Wind Farm Development Site	Fulmar (*Fulmarus glacialis*) [A009] (breeding) Cormorant (*Phalacrocorax carbo*) [A017] (breeding and wintering) Shag (Phalacrocorax aristotelis) [A018] Greylag goose (*Anser anser*) [A043] (wintering) Lesser black-backed gull (*Larus fuscus*) [A183] (breeding) Herring gull (*Larus argentatus*) [A184]	**Hydrology & Hydrogeology** No hydrological or hydrogeological connectivity as this is a marine SPA connected to a different river catchment and groundwater body. **Ecological** The following species, which are SCI of this SPA, were recorded during surveys at the Main Wind Farm Development Site: cormorant, kittiwake, herring gull and lesser black-backed gull. The marine core foraging ranges of the aforementioned species during the breeding season are as follows:

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
		Kittiwake *(Rissa tridactyla*) [A188] (breeding) Guillemot (*Uria aalge*) [A199] (breeding) Razorbill (*Alca torda*) [A200] (breeding) Puffin (*Fratercula arctica*) [A204] (breeding)	• cormorant: 33.9 km • kittiwake: 300.6 km • herring gull: 85.6 km • lesser black backed gull: 236 km. The direct line distance of the SPA to the Main Wind Farm Development Site is approx. 263 km. Given the location of this SPA on the eastern coast of Ireland the marine distance is considerably greater than the direct line distance. Therefore, the marine distance between the Main Wind Farm Development Site and the SPA is greater than the marine core foraging range of any of the above-mentioned species. Hence, no ecological connection.
Ramsar sites			
Blacksod Bay and Broadhaven, 844	0.07 km W	A composite of diverse marine and coastal habitats that includes vast dune systems and extensive areas of dune grassland with saltmarshes occurring in sheltered bays and inlets. The grasslands are of considerable botanical importance. The site also includes several brackish lakes important to various species of breeding waders, large numbers of wintering waterbirds of various species, and internationally important numbers of Brent geese.	Considered under Mullet/Blacksod Bay Complex SAC and Blacksod Bay/Broad Haven SPA.
Owenduff catchment, 336	14.49 km SE	The site, one of the last intact active blanket bog systems in Ireland and Western Europe, comprises over 13,000 hectares of Atlantic blanket bog and mountainous terrain. It is important for its peatland and upland habitats and for the river and pool systems which lie within and flow through them. The rivers and streams provide critical spawning habitat for	Considered under Owenduff/Nephin Complex SPA and Owenduff/Nephin Complex cSAC.

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
		Atlantic salmon (*Salmo salar*). The site is known to support breeding red grouse (*Lagopus lagopus)* and golden plover (*Pluvialis apricaria*), which depend on its heather for feeding. Greenland white-fronted geese (*Anser albifrons flavirostris)* feed and roost in the blanket bog habitat; however their numbers have been declining in recent years. Two legally protected plants have been recorded: bog orchid (*Hammarbya paludosa*) and marsh clubmoss (*Lycopodiella inundata*).	
Knockmoyle/Sheskin, 372	19.25 km E	The site is part of an extensive area of lowland blanket bog with a remarkably dense network of pools and small acidic lakes. The peat is relatively dry between the water bodies and has a well-developed cover, and the site is rich in flora owing to an absence of burning and grazing. Boreal relict mosses, liverworts and the rare marsh saxifrage (*Saxifraga hirculus*) are characteristic. Willow ptarmigan (*Lagopus lagopus*) depend on the site's heather for feeding, while the golden plover (*Pluvialis apricaria*) benefits from the open blanket bogs with pool systems as feeding grounds.	Considered under Bellacorick Bog Complex SAC.
NHAs			
Tristia bog NHA 001566	Adjacent to NE boundary	Peatlands	The QI peatlands can be a Groundwater Dependent Terrestrial Ecosystem (GWDTE). The NHA is within the same groundwater body as the Main Wind Farm Development Site. Given the proximity of the Main Wind Farm Development Site to the NHA there is likely hydrogeological connectivity.

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features[73]	Ecological Connectivity Pathways
			There are no downstream hydrological connections. There is also no ecological connectivity as the NHA is not designated for any mobile QI species.
Mullet/Blacksod Bay Complex pNHA 000470	0.11 km, NW	Overlaps with Mullet/Blacksod Bay Complex SAC and Blacksod and Bay/Broad Haven SPA; no site synopsis available	Considered under Mullet/Blacksod Bay Complex SAC and Blacksod and Bay/Broad Haven SPA.
Tullaghan Bay and Bog NHA 001567	0.65 km, SE	Peatlands	Considered under Blacksod Bay/Broad Haven SPA.
Ederglen Bog NHA 002446	4.17 km, NE	Peatlands	The QI peatlands can be a GWDTE. The NHA is within the same groundwater body as the Main Wind Farm Development Site. Given the proximity of the Main Wind Farm Development Site to the NHA there is likely hydrogeological connectivity. There are no downstream hydrological connections. There is also no ecological connectivity as the NHA is not designated for any mobile QI species.

Habitats and Flora

5.140 The Main Wind Farm Development Site and surrounding area is typical of this part of west Ireland and comprise a generally flat low-lying landscape with little in the way of undulation. Within the Main Wind Farm Development Site levels range from c. 3 m above ordnance datum (AOD) to 33 m AOD.

5.141 The desktop assessment demonstrated that there is only one area of lands present within the Proposed Development Site or 500 m from the Proposed Development Site boundary[79] that has been previously mapped as Annex I habitat. Specifically, Over-run Area 3 is part of the Article 17 mapped data which forms part of the national Favourable Reference Area for Annex I Blanket Bog. No other areas have been previously mapped as protected or important habitats. Annex I habitat has been identified during survey effort in areas other than Over-run Area 3 within the Proposed Development Site. Please refer to **Table 5-8** below for more information. There is also no previously mapped possible ancient woodland (PAW) or semi-natural grasslands within at least 200 m of the Main Wind Farm Development Site. There are no known semi-natural grasslands within the Main Wind Farm Development Site as per the NPWS data set. Furthermore, there are no records of plant species of conservation concern within the hectad (F72) from the NBDC which the Main Wind Farm Development Site is within. Similarly, there were no floral protection orders or rare/protected bryophytes present in the NPWS datasets.

5.142 Habitat contribution to ecological networks has been assessed by Parker et al. (2016).[80] Those areas that contribute most to ecological networks (i.e. those that contribute to three ecological networks) are considered to have the highest biodiversity value. Most of the land is consistent with the surrounding landscape which is dominated by lowland blanket bogs and scattered conifer plantations.

5.143 Habitat within the Main Wind Farm Development Site predominately consists of cutover lowland blanket bog (PB4) surrounded by conifer plantation. The bog is extensively drained, is subject to scrub encroachment and there is the pervasive presence of invasive species such as rhododendron (*Rhododendron ponteticum*) and prickly heath (*Gaultheria mucronate*). Scrub (WS1), wet grassland (GS4), dry-humid acid grassland (GS3) and two small acid oligotrophic lakes (FL2) are also present. Several buildings, and associated artificial surfaces (BL3), are located to the west of the Main Wind Farm Development Site. Please see **Figure 5-5c** & **Technical Appendix 5.1** for more information. Several small streams are present within the Main Wind Farm Development Site and along the boundaries. The L5252 road bisects the Main Wind Farm Development Site east to west.

5.144 Although mapped as PB4 Cutover Bog and PB3 Lowland Blanket Bog under the Fossitt classification, the peatland present corresponds ecologically with Annex I Blanket Bog as defined in the Interpretation Manual of European Union Habitats (EU-28). Field surveys confirmed the presence of blanket peat deposits across the Main Wind Farm Development Site and vegetation typical of blanket bog systems, including species such as *Calluna vulgaris*, *Eriophorum angustifolium*, *Trichophorum germanicum* and *Molinia caerulea*. The

[79] Ordnance Survey Ireland (OSi). (2023). GeoHive Map Viewer [Online geospatial data portal]. GeoHive, Tailte Éireann.

[80] Parker, N., Medcalf, K., Naumann, E.-K., & Haines-Young, R. (2016). *Place-based ecosystem service mapping and opportunities analysis: Linking habitat contributions to ecological networks* [Conference presentation]. NPWS Workshop on Ecosystem Service Mapping, Ireland.

Main Wind Farm Development forms part of a wider blanket peat landscape and exhibits peatland hydrological characteristics associated with ombrotrophic systems. However, extensive historical drainage and peat cutting have altered hydrological conditions and reduced *Sphagnum* cover, indicating that the habitat represents a degraded form of Annex I Blanket Bog rather than Priority active blanket bog.

Table 5-8: Habitats within the Main Wind Farm Development Site

Habitat	Description	Annex I
BL3 - Buildings and artificial surfaces	A public access road bisects the centre of the Main Wind Farm Development Site, running east-west.	No
ED3 - Recolonising bare ground	This habitat is represented by the numerous trackways that traverse the Main Wind Farm Development Site. Species recorded include *Agrostis capillaris*, *Plantago lanceolata*, *Lolium perenne*, *Jacobaea vulgaris*, *Bellis perennis*, and *Plantago major*.	No
FW1 - Eroding/upland rivers	Eroding/upland river (FW1) habitat is represented by a number of small streams that criss-cross and drain the Main Wind Farm Development Site. A few aquatic species were seen occurring in the streams, including *Fontinalis antipyretic*a, *Nasturtium officinale agg*., and *Potamogeton polygonifolius*. The bryophytes Marchantia polymorpha and *Brachythecium rivulare* were also recorded on wet rocks and soil in and by the streams. It is important to note that the watercourses on site classify as FW1 according to the fossit system – however, they are lower order streams and do not classify as rivers nor do they align with the Annex I habitat criteria.	No
FL8 – Other artificial lakes and ponds	Present at a few locations in the southern half of the Main Wind Farm Development Site. It mainly forms mosaics with other habitats on the pond margins, including transition mire and quaking bog (PF3) and reed and large sedge swamps (FS1).	No
FS1 - Reed and large sedge swamps	At one location at the southern end of the Main Wind Farm Development Site where it occurs in a mosaic with artificial lakes and ponds (FL8) and transition mire and quaking bog (PF3) habitats. This habitat is dominated by *Typha latifolia.*	No
GS3 - Dry-humid acid grassland	Occurs in a mosaic with wet grassland (GS4) along the river at the north-western end of the Main Wind Farm Development Site. Grass species recorded here include *Agrostis capillaris*, *Agrostis stolonifera*, and *Anthoxanthum odoratum.*	No
GS4 – Wet grassland	A common habitat at the Main Wind Farm Development Site, both on its own and in a mosaic with other habitats. There is a large more continuous area of this habitat at the southern end of the Main Wind Farm Development Site.	No
HD1 - Dense bracken	Dense bracken (HD1) is found along the eastern Main Wind Farm Development Site in a mosaic with scrub (WS1) and wet grassland (GS4).	No
PB3 - Lowland blanket bog	Mostly found in small patches around the Main Wind Farm Development Site's boundary, where drainage is less substantial. The dominant species present is *Schoenus nigricans*, an indicator species for this habitat.	Yes - 7130 (not priority)
PB4 - Cutover bog	This habitat represents most of the Main Wind Farm Development Site's interior. *Calluna vulgaris*, *Juncus effusus* and *Sphagnum* spp. are the dominant species present.	Yes – 7130 (not priority)

Habitat	Description	Annex I
PF2 – Poor fen and flush	Present at the north-western end of the Main Wind Farm Development Site in a mosaic with wet grassland (GS4) and cutover bog (PB4) and blanket bog (PB3). The PF2 within these mosaics is dominated by *Sphagnum palustre, Juncus effusus, and Molinia caerulea.*	No
WD4 - Conifer plantation	Dominates the southern and western ends of the Main Wind Farm Development Site and is also found along most of the boundary. The dominant species are *Picea sitchensis* and *Pinus contorta*.	No
WS1 - Scrub	Present in isolated patches widely across the Main Wind Farm Development Site and often in a mosaic with other habitats such as wet grassland (GS4), cutover bog (PB4) and blanket bog (PB3). Characterised by the dominance of *Ulex europaeus* and *Salix cinerea subsp. Oleifolia*.	No

Birds

Bird Desktop Study

5.145 BirdWatch Ireland has created a sensitivity mapping tool, which assesses the potential sensitivity of at-risk bird populations to wind energy developments (McGuinness, et al., 2015).[81] The majority of the areas of the Main Wind Farm Development Site lacked data i.e. there is no prior information to suggest that avian populations in the general area are thought to be particularly sensitive to wind energy developments. A small section of the southern end of the main windfarm area in the Main Wind Farm Development Site is of medium sensitivity. Specifically, barnacle goose and whooper swan could have some sensitivity to wind energy development in this area. The BirdWatch Ireland sensitivity mapping tool does not identify no-go areas of development but quantifies a potential effect of wind energy development on avian populations. Additional sources of data were reviewed such as the NBDC 10 km grid square F72 and were used to collate spatial data for the Main Wind Farm Development Site, whose development footprint is of a similar spatial scale and is entirely contained within this 10 km grid square – these are summarised in Appendix I of the **Technical Appendix 5.2**. These records were reviewed to investigate target species potentially occurring within the Main Wind Farm Development Site and wider area to inform survey design and identify any potential ornithological constraints. Target species generally focus on red and amber-listed BoCCI. Red-listed species are species of highest conservation concern where the population is rapidly declining in abundance or range, has experienced a historic rapid decline (without recovery) or is globally threatened. Amber-listed species are those with unfavourable European status, occur in internationally important numbers or are moderately declining in abundance or range. A species may also be amber-listed if a population occurs in very small numbers.

Bird Field Survey Results

Flight Activity Surveys

5.146 Full details of the flight activity survey results (including figures showing flight lines for primary target species) are provided in **Technical Appendix 5.2**. A total of 33 target species

[81] McGuinness, S., Muldoon, C., Tierney, N., Cummins, S., Murray, A., Egan, S., & Crowe, O. (2015). *Bird sensitivity mapping for wind energy developments and associated infrastructure in the Republic of Ireland* [Technical report]. BirdWatch Ireland.

were recorded during flight activity surveys between April 2021 and May 2024. The following sections present seasonal summaries of flight activity, along with a measure of 'at risk' flight activity within the Collision Risk Zones (CRZ), defined as the areas encompassed by the relevant Wind Farm Polygon (WP) (i.e. the area within 500 m of the outermost turbine blades for each turbine) in accordance with NatureScot (2025) guidance. 'At risk' flights are defined as those crossing the relevant WP at Potential Collision Height (PCH). This was undertaken for three candidate turbines as set out in **Technical Appendix 5.2**, which represent all possible turbine permutations considered. Modelling was subsequently undertaken for each of these turbine permutations.

5.147 **Table 5-9** summarises the number of flights and cumulative number of individuals for the target species recorded during flight activity surveys undertaken during the survey period of April 2021 to May 2024.

Table 5-9: Target Species

Species Name	Period of Analysis	Number of Flight Lines Both Inside and Outside WP	Number of Flights Both Inside and Outside WP	Time at Collision Risk Heights (s) Within WP
Black-headed gull	Breeding_2021	47	50	1576
Black-headed gull	Breeding_2022	6	10	230
Black-headed gull	Non-breeding_2022_2023	3	4	0
Black-headed gull	Breeding_2023	12	13	2993
Black-headed gull	Non-breeding_2023_2024	1	1	11
Buzzard	Breeding_2021	1	1	53
Buzzard	Breeding_2022	6	8	569
Buzzard	Non-breeding_2022_2023	2	2	60
Canada goose	Breeding_2023	1	1	35
Common gull	Breeding_2021	1	2	300
Common gull	Non-breeding_2022_2023	2	3	0
Common gull	Breeding_2023	2	2	108
Common gull	Non-breeding_2023_2024	1	1	0
Common tern	Breeding_2022	2	2	20
Cormorant	Non-breeding_2022_2023	5	5	383
Curlew	Non-breeding_2022_2023	1	2	0
Golden plover	Breeding_2023	1	3	4
Great black-backed gull	Breeding_2021	11	11	573

Species Name	Period of Analysis	Number of Flight Lines Both Inside and Outside WP	Number of Flights Both Inside and Outside WP	Time at Collision Risk Heights (s) Within WP
Great black-backed gull	Non-breeding_2021_2022	10	11	359
Great black-backed gull	Breeding_2022	10	11	302
Great black-backed gull	Non-breeding_2022_2023	13	17	2357
Great black-backed gull	Breeding_2023	17	23	2043
Great black-backed gull	Non-breeding_2023_2024	3	5	271
Greenland white-fronted goose	Non-breeding_2022_2023	1	18	417
Greenshank	Non-breeding_2022_2023	1	1	0
Grey heron	Breeding_2021	7	7	255
Grey heron	Non-breeding_2021_2022	6	8	239
Grey heron	Breeding_2022	7	7	230
Grey heron	Non-breeding_2022_2023	10	10	439
Grey heron	Breeding_2023	1	1	0
Grey heron	Non-breeding_2023_2024	1	1	8
Greylag goose	Non-breeding_2022_2023	1	17	3834
Gull Sp.	Breeding_2022	7	10	381
Gull Sp.	Breeding_2023	1	1	25
Hen harrier	Breeding_2022	2	2	210
Hen harrier	Non-breeding_2022_2023	5	5	626
Hen harrier	Non-breeding_2023_2024	2	2	60
Herring gull	Breeding_2021	16	18	342
Herring gull	Breeding_2022	29	31	396
Herring gull	Non-breeding_2022_2023	3	3	73
Herring gull	Breeding_2023	13	29	640
Herring gull	Non-breeding_2023_2024	2	2	92

Species Name	Period of Analysis	Number of Flight Lines Both Inside and Outside WP	Number of Flights Both Inside and Outside WP	Time at Collision Risk Heights (s) Within WP
Hobby	Breeding_2022	3	3	228
Kestrel	Breeding_2021	48	49	2533
Kestrel	Non-breeding_2021_2022	15	15	387
Kestrel	Breeding_2022	30	43	4902
Kestrel	Non-breeding_2022_2023	35	41	1679
Kestrel	Breeding_2023	33	37	1599
Kestrel	Non-breeding_2023_2024	11	12	243
Kittiwake	Breeding_2023	1	1	40
Lesser black-backed gull	Breeding_2021	53	60	2174
Lesser black-backed gull	Breeding_2022	10	12	197
Lesser black-backed gull	Non-breeding_2022_2023	1	2	224
Lesser black-backed gull	Breeding_2023	12	20	1264
Lesser black-backed gull	Non-breeding_2023_2024	5	5	335
Mallard	Breeding_2021	4	4	29
Mallard	Breeding_2022	8	9	137
Mallard	Non-breeding_2022_2023	2	7	0
Mallard	Breeding_2023	4	8	293
Mallard	Non-breeding_2023_2024	1	2	0
Meadow pipit	Breeding_2022	3	10	82
Meadow pipit	Breeding_2023	4	9	31
Merlin	Non-breeding_2021_2022	1	1	26
Merlin	Non-breeding_2022_2023	1	1	0
Merlin	Breeding_2023	2	2	11
Merlin	Non-breeding_2023_2024	1	1	0
Mistle thrush	Breeding_2023	1	6	148

Species Name	Period of Analysis	Number of Flight Lines Both Inside and Outside WP	Number of Flights Both Inside and Outside WP	Time at Collision Risk Heights (s) Within WP
Peregrine	Non-breeding_2022_2023	9	9	267
Pheasant	Breeding_2021	1	1	12
Raptor Sp.	Breeding_2022	1	1	30
Snipe	Non-breeding_2021_2022	5	5	32
Snipe	Non-breeding_2022_2023	8	50	894
Snipe	Breeding_2023	7	9	30
Snipe	Non-breeding_2023_2024	2	3	68
Sparrowhawk	Breeding_2021	1	1	14
Sparrowhawk	Non-breeding_2021_2022	19	21	526
Sparrowhawk	Breeding_2022	1	1	30
Sparrowhawk	Non-breeding_2022_2023	23	27	3002
Sparrowhawk	Breeding_2023	11	11	90
Sparrowhawk	Non-breeding_2023_2024	1	1	15
Sparrowhawk	Non-breeding_2024_2025	2	2	0
Swift	Breeding_2023	1	1	5
Teal	Breeding_2021	1	1	12
Teal	Non-breeding_2022_2023	1	2	3
Teal	Breeding_2023	1	5	27
Whimbrel	Breeding_2023	1	7	811
Whooper swan	Non-breeding_2021_2022	1	3	80
Whooper swan	Non-breeding_2022_2023	1	5	659
Woodcock	Non-breeding_2021_2022	4	4	28

Breeding Bird Surveys

5.148 Full results of the breeding walkover surveys are presented in **Technical Appendix 5.2**. A summary showing the results for surveys during 2021, 2022 and 2023 for any Annex I, red- or amber-listed bird species is presented in **Table 5-10** below.

Table 5-10: Summary of Species Recorded During Breeding Walkover Surveys during 2021, 2022 and 2023

Species	Peak Counts of Birds within 500 m of Main Wind Farm Development Site	Breeding Status within 500 m Developable Area Buffer
Black-headed gull	6	Not breeding within the 500 m turbine buffer but may breed in wider area (unconfirmed).
Common snipe	11	Snipe were recorded chipping and drumming to the north-west and south-east of the 500 m turbine buffer during the 2021 breeding season and held territories in bog habitat to the south-east of the 500 m turbine buffer during the 2022 and 2023 seasons. At least one territory has been assumed to be present.
Goldcrest	28	Breeding in suitable forestry habitat within the 500 m turbine buffer
Herring gull	1	Not breeding within the 500 m turbine buffer.
House sparrow	2	No breeding behaviours were noted.
Kestrel	4	A breeding pair of kestrels has been confirmed within the existing buildings in the central area of the Main Wind Farm Development Site.
Lesser black-backed gull	5	Not breeding within the 500 m turbine buffer but may breed in wider area (unconfirmed).
Linnet	2	No breeding behaviour was noted.
Mallard	5	Potential breeding in a small waterbody in the west within the 500 m turbine buffer recorded in 2021 but not in 2022 and 2023.
Meadow pipit	56	Breeding in suitable open bog and grassland habitats within the 500 m turbine buffer.
Sand martin	2	Recorded feeding in a pasture in the north-west of the Main Wind Farm Development Site. No breeding colonies were located.
Skylark	26	Breeding in suitable habitat within the 500 m turbine buffer.
Starling	12	No breeding behaviour was recorded.
Swallow	18	Likely breeding in suitable structures in the central part of the Main Wind Farm Development Site within the 500 m turbine buffer and wider area.
Teal	2	Two observations were recorded one in a small waterbody in the west and another in a small waterbody in the south within the 500 m turbine buffer. No breeding site was located.
Willow warbler	53	Breeding in suitable woodland and scrub habitat within the 500 m turbine buffer and wider area.

Breeding Raptor Surveys

5.149 Full results of the breeding raptor surveys undertaken during the 2021, 2022 and 2023 breeding seasons are presented in **Technical Appendix 5.2**. A summary showing the results for any Annex I, red- or amber-listed bird species is presented in **Table 5-11** below.

Table 5-11: Summary of Species Recorded During Breeding Raptor Surveys

Species	Breeding Status
Kestrel	A breeding pair of kestrel was confirmed in the central area of the Main Wind Farm Development Site (c.250 m from any proposed infrastructure) during the 2021, 2022 and 2023 breeding season.

Winter Walkover Surveys

5.150 Full results of the winter walkover survey undertaken during the non-breeding season 2021/22, 2022/23 and 2023/24 are presented in **Technical Appendix 5.2.** A summary showing the results for any Annex I, red- or amber-listed bird species is presented in **Table 5-12** below.

Table 5-12: Summary of Species Recorded During Winter Walkover Surveys

Species	Peak Counts of Birds within 500 m Development Area Buffer
Black-headed gull	2
Common gull	1
Common snipe	20
Goldcrest	28
Grey wagtail	1
Hen harrier	2
House sparrow	3
Kestrel	2
Linnet	5
Mallard	2
Meadow pipit	117
Redwing	3
Teal	5
Whooper swan	12
Woodcock	5

Winter Waterbird Surveys

5.151 Full results of the waterbird distribution surveys conducted between during 2021/22, 2022/23 and 2023/24 non-breeding seasons are presented in **Technical Appendix 5-2**. Only common snipe (peak count 10 birds) and woodcock (peak count five birds) were recorded within 500 m of the Main Wind Farm Development Site.

5.152 Concentrations of waterbirds were observed in coastal, estuarine and wetland habitats associated with the Blacksod Bay/Broad Haven SPA and Carrowmore Lake SPA.

Hen Harrier Roost Searches

5.153 No hen harrier roosts, or individual birds, were recorded during the targeted hen harrier roost searches, and/or during any of the other ornithology surveys undertaken during the 2021/22, 2022/23 and 2023/24 non-breeding season within or adjacent to the 2 km developable area buffer (details in **Table 5-5**).

Bioacoustic Monitoring

5.154 A summary of the species recorded is presented in **Table 5-13** below. Note the relative abundance of calls are the proportion of calls per species as a fraction of the total count of calls recorded. While these recordings indicate the presence of a bird species in the general environment, they do not provide information on abundance or give any meaningful spatial information relative to the proposed infrastructure or collision risk heights.

Table 5-13: Summary of target species recorded during bioacoustics monitoring

Species	Frequency of Calls	Relative Abundance of Calls
Barnacle goose	1	0.001
Common snipe	1255	0.779
Curlew	313	0.194
Grey heron	1	0.001
Lapwing	4	0.002
Mallard	1	0.001
Moorhen	7	0.004
Oystercatcher	1	0.001
Teal	14	0.009
Greenland white-fronted goose	15	0.009

Bats

Desktop Study

5.155 Online satellite images, the Environmental Sensitivity Mapper and the Irish Caves Database showed that there were no caves that could be used by roosting bats within 281.5 m (200 m plus rotor radius of 81.5 m) of the turbine locations[82].

5.156 The mean bat landscapes suitability index for all bat species across the Main Wind Farm Development Site is 20.78 (out of a maximum score of 100). NBDC has no records of bat species within the 10 km grid square (F72) that overlaps the Main Wind Farm Development Site. Full details are provided in **Technical Appendix 5-3**.

5.157 A data request was submitted to Bat Conservation Ireland (BCI) for known roost records within 10 km of the Main Wind Farm Development Site[87]. The closest known roost is

[82] NatureScot (2021) Bats and onshore wind turbines - survey, assessment and mitigation

approximately 3 km from the Proposed Development. Full details are provided in **Technical Appendix 5-3**.

5.158 There are no SACs, NHAs, or pNHAs designated for bats within 10 km of the Main Wind Farm Development Site.

5.159 According to the latest Article 17 report, the location of the Main Wind Farm Development Site is outside the range of all bat species in Ireland. However, the report acknowledges that there is much uncertainty surrounding the ranges presented for each species and could be reflective of survey effort rather than true absence.

Field Surveys

Roost Emergence/Re-entry surveys

5.160 During the bat roosting suitability survey – dates of these surveys are provided in **Table 5-5** - one potential roost was classified as having negligible suitability, four potential roosts were classified as having low suitability and one potential roost was classified as having moderate suitability. The locations of these potential roosts are detailed in **Figure 6, Technical Appendix 5-3**.

5.161 Roost emergence/re-entry surveys were undertaken at each identified potential roost feature. A soprano pipistrelle was recorded emerging and re-entering a shed to the west of the Main Wind Farm Development Site. This roost was shown to be beyond the 300 m buffer from the location of the turbines as described in **Technical Appendix 5.3.** The roost was assessed as suitable to hold small numbers of bats only or be used as a transitional roost.

Activity Surveys – Transect Surveys

5.162 Three species were recorded during transect surveys; soprano pipistrelle, Leisler's bat and *Myotis* sp.. Flight lines showed that bats utilised the forestry edge for commuting.

Activity Surveys – Static Bat Detector Survey

5.163 Six species were recorded during the static bat detector surveys:

- Brown long-eared bat,
- Common pipistrelle Pipistrellus pipistrellus,
- Leisler's bat Nyctalus leisleri,
- Myotis sp.,
- Nathusius' pipistrelle Pipistellus nathusii, and
- Soprano pipistrelle Pipistrellus pygmaeus.

5.164 Most of the species recorded are common and widespread in Ireland, except for Nathusius' pipistrelle, which remains uncommon but is being detected more regularly. EcoBat results indicate low baseline bat activity across the Main Wind Farm Development Site, with only 7 high-activity nights, 11 moderate nights, and the remainder categorised as low to low-moderate. Percentile comparisons with the reference dataset also support this interpretation: soprano pipistrelles showed the highest relative activity but still fell below the 30th percentile. The static-detector outputs similarly demonstrate low levels of use across the site. Accordingly, the EcoBat analysis provides no evidence that the Main Wind Farm Development Site is of elevated importance for bats in a wider context. Full EcoBat outputs for each static location are presented in **Technical Appendix 5-3**.

5.165 The site risk level varied from low to high depending on the species, see **Table 5-14** and **Technical Appendix 5-3** for more information.

Table 5-14: Bat Species within the Main Wind Farm Development Site

Species	Risk assessment[83]	National Population*	Assessment	Value
Brown long-eared bat	Low	62,000 to 97,000	Less common than common/soprano pipistrelle but widespread and relatively numerous.	Local
Common pipistrelle	Medium	1,070,000 to 2,400,000	Numerous and widespread species both locally and nationally.	Local
Daubenton's bat	Low	57,000 to 79,000	Less common than common/soprano pipistrelle but widespread and relatively numerous.	Local
Leisler's bat	High	63,000 to 113,000	Less common than common/soprano pipistrelle but widespread and relatively numerous.	Local
Myotis sp.	Low	n/a	Generally widespread and relatively numerous.	Local
Nathusius' pipistrelle	High	3,000 to 5,000	Low national population.	Regional
Soprano pipistrelle	Medium	500,000 to 1,200,000	Numerous and widespread species both locally and nationally.	Local

** population data taken from Article 17 reporting (NPWS, 2019).*

Terrestrial mammals (excluding bats)

Desktop Study

5.166 The data from the desktop assessment yielded records of two species of rare and/or protected mammals, namely, otter *Lutra lutra* and Irish hare *Lepus timidus subsp. hibernicus.* These records came from the NBDC 10 km grid square F72. There is the potential for these species to be present within the Main Wind Farm Development Site. There is also a record of European rabbit (*Oryctolagus cuniculus)* which is an invasive species.

Field Surveys

5.167 During the terrestrial mammal surveys (details of dates and area surveyed are provided in **Table 5-5**) focus was placed on signs and sightings of the species listed in the paragraphs below.

Red deer

5.168 An adult red deer was recorded in the vicinity of the Main Wind Farm Development Site during habitat surveys. Red deer inhabit both deciduous and coniferous forests providing

[83] Risk assessment is the species vulnerability to wind farms combined with the site risk level.

such areas have adequate undergrowth cover. The gradual reduction in Ireland of mature woodlands has forced this species to migrate to other habitat locations such as peatlands.

Irish hare

5.169 No evidence or live sighting of Irish hare were yielded during surveys. However, the peatland within the Main Wind Farm Development Site may provide potential foraging and breeding habitat.

Red squirrel

5.170 No evidence or live sighting of red squirrel were yielded during surveys. However, the conifer plantation within the Main Wind Farm Development Site and immediate vicinity may provide potential foraging and breeding habitat.

Pine marten

5.171 No evidence or live sighting of pine marten were yielded during surveys. However, the conifer plantation within the Main Wind Farm Development Site and immediate vicinity may provide potential foraging and breeding habitat.

Marsh Fritillary Surveys

5.172 No marsh fritillary larvae were found during the surveys in September 2023, despite dedicated and thorough searches. Using the habitat assessment criteria two subsites were deemed as 'Suitable (undergrazed)'. The remainder of the subsites were deemed as 'Unsuitable Habitat'. Please refer to **Technical Appendix 5-7** for more information.

5.173 A May 2025 data-validity review, undertaken in line with CIEEM 2019[84] confirmed that baseline ecological conditions had not materially changed. While the survey timing was too early for Marsh Fritillary detection, habitat quality and structure were unchanged from earlier assessments. Accordingly, the original survey results remain valid.

5.174 Few butterfly records were recorded during the transect surveys. The following butterfly species were recorded; peacock *Inachis io*, small tortoiseshell *Aglais urticae*, green-veined white *Pieris napi* and red admiral *Vanessa atalanta*.

Other Terrestrial Protected Fauna

Desktop study

5.175 The data search yielded records of common frog and smooth newt.

Field survey

5.176 During the marsh fritillary survey, a lizard skin was recorded. Neither common frog or smooth newt were recorded during surveys. However, suitable habitat is present.

[84] CIEEM (2019) *Advice Note: On the Lifespan of Ecological Reports & Surveys*. April 2019. Winchester: Chartered Institute of Ecology and Environmental Management.

Aquatic and Fisheries Surveys

Desktop study

5.177 The desktop data available for aquatic and fisheries surveys is included in **Technical Appendix 5-4**. A summary is provided below.

5.178 Records for otter were widespread in the respective grid squares, with a concentration of records for the Owenmore River and two records for the Doolough Stream.

5.179 The River Deel, crossed by the proposed TDR supports a significant freshwater pearl mussel Margaritifera margaritifera population, with counts estimated at >100,000 adults by Moorkens & Killeen (2009). Over 1000 mussels were recorded in the vicinity of Crossmolina as part of the River Deel (Crossmolina) Drainage Scheme in 2017 (Ryan Hanley, 2018).

5.180 Given the remote and minor nature of the watercourses within and adjoining the Main Wind Farm Development Site, desktop fisheries data were not available.

Field Survey

5.181 See **Technical Appendix 5-4** of this EIAR for the full aquatic and fisheries ecology survey results. A summary is provided below. The watercourses in the vicinity of the Proposed Project were typically heavily modified lowland channels (straightened, deepened, realigned) draining blanket bog or higher gradient/higher energy upland channels (prone to spate). Significant siltation (primarily from peat escapement), and less so eutrophication, was evident throughout much of the survey area. Over half of the survey sites were evaluated to be of at least **local importance (higher value)** in terms of their aquatic ecology given the presence of fish of high conservation value and / or Q4 (good status) water quality. Further details can be found in the discussion (Section 4) of **Technical Appendix 5-4** of this EIAR.

Habitat

5.182 The Main Wind Farm Development Site is drained by a number of small, heavily modified lowland watercourses (FW2; Fossitt, 2000) and drainage channels (FW4) present in a landscape dominated by lowland blanket bog and coniferous afforestation.[2] Whilst not located within a European site, the watercourses within and adjoining the Main Wind Farm Development Site share hydrological connectivity with the Mullet/Blacksod Bay Complex SAC (000470), Bellacorick Bog Complex SAC (001922) and Blacksod Bay/Broad Haven SPA (004037).

Fisheries

5.183 A fish species assemblage typical of Ireland's north-west – namely Atlantic salmon, brown trout, sea trout, European eel, lamprey *Lampetra* sp., three-spined-stickleback, minnow and flounder - were recorded during the electro-fishing survey of all water courses within the vicinity of the Main Wind Farm Development Site; see **Technical Appendix 5-4 –** specifically **Table 3.2** of the Technical Appendix.

Otter

5.184 Otter signs were recorded on the Doolough Stream and Mhoing Mhór River, which flow along the northern boundary of the Main Wind Farm Development Site, and an unnamed river flowing along the eastern boundary. Signs were absent from all other rivers and low order tributary channels within the Main Wind Farm Development Site and vicinity. Spraint sites and latrines accounted for the majority (87%) of all signs recorded. These were

typically associated with characteristic prominent features including sand bars, grassy promontories, bridges, watercourse confluences and instream boulders.

White-clawed Crayfish

5.185 No white-clawed crayfish were recorded via hand-searching or sweep netting of instream refugia. Furthermore, no crayfish were detected via eDNA sampling of the Doolough Stream or two unnamed watercourses in vicinity of the Main Wind Farm Development Site. These findings are in keeping with the known absence of the species in the wider Owenmore [Mayo]_SC_030 and Glencastle_SC_010 river sub-catchments.

e-DNA Analysis

5.186 In keeping with the known historical distribution of the species in the survey area, no freshwater pearl mussel or white-clawed eDNA was detected in the vicinity of the Main Wind Farm Development Site. However, the invasive pathogen crayfish plague *Aphanomyces astaci* was detected at all 3 no. riverine sampling locations (as stated in Section 4.3 of the **Technical Appendix 5-4**).

5.187 Brown trout and European eel eDNA was detected. Despite some habitat suitability, no smooth newt eDNA was detected.

Invasive Aquatic Species

5.188 Except for crayfish plague, no aquatic invasive species were recorded (as stated in Section 4.4 of the **Technical Appendix 5-4**).

Biological Water Quality (Macro-Invertebrates)

5.189 No rare or protected macro-invertebrate species were recorded in the biological water quality samples taken (as stated in Section 4.5 of the **Technical Appendix 5-4**).

Pond Macro-Invertebrate Communities

5.190 No rare or protected macro-invertebrate species were recorded in the composite sweep samples.

5.191 The pond samples were dominated by a typical assemblage of oligotrophic lacustrine taxa such as damselfly larvae *Coenagrionidae*, lesser water boatman *Corixa punctata*, backswimmers *Notonecta viridis*, phantom midge larvae Chaoboridae and biting midge larvae *Chironomus* spp. (as stated in Section 4.6 of the **Technical Appendix 5-4**).

Evaluation of Ecological Features

5.192 An evaluation of ecological features within the ZoI is provided in **Table 5-15**. Only those evaluated as an IEF are brought forward for impact assessment – i.e. those that get a Yes in the final column of **Table 5-15** below. These include those protected by law or policy.

5.193 All natural habitats recorded within the Proposed Development Site have been brought forward as IEFs to facilitate a full assessment of potential biodiversity change arising from the Proposed Project, in line with the objectives of the EU Biodiversity Strategy and the Irish National Biodiversity Action Plan 2023–2030,[55] [56] which emphasise the need to achieve no net loss of biodiversity.

5.194 The ED3 and BL3 habitats were not identified as IEFs in **Table 5-15** as these represent non-vegetated features associated with built infrastructure and spoil deposits. The majority

of habitats within the Main Wind Farm Development Site comprise cutover bog, blanket bog and conifer plantation, with smaller areas of habitats such as scrub and dry humid acid grassland also present. Most peatland habitats recorded within the Main Wind Farm Development Site correspond ecologically with Annex I blanket bog systems, including areas currently mapped as cutover bog (PB4). Additionally, most of the TDR area was either public roads or at the 3 nodes the dominant habitat types were lowland blanket bog (PB3) and cutover bog (PB4)

Table 5-15: Evaluation of Ecological Features

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
Designated Nature Conservation Sites	Mullet/Blacksod Bay Complex SAC 000470	Protected under the Habitats Directive, derived domestic legislation, and national, regional and local planning policy. The NIS determined a potential hydrological, hydrogeological and ecological connectivity.	International	Part of European Natura 2000 network.	Yes
	Bellacorick Bog Complex SAC 001922	Protected under the Habitats Directive, derived domestic legislation, and national, regional and local planning policy. The NIS determined potential hydrological and hydrogeological connectivity.	International	Part of European Natura 2000 network.	Yes
	Owenduff/Nephin Complex SAC 000534	Protected under the Habitats Directive, derived domestic legislation, and national, regional and local planning policy. The NIS determined potential ecological connectivity.	International	Part of European Natura 2000 network.	Yes
	Blacksod Bay/Broad Haven SPA 004037	Protected under the Habitats Directive, derived domestic legislation, and national, regional and local planning policy.	International	Part of European Natura 2000 network.	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		The NIS determined a potential hydrological, hydrogeological and ecological connection.			
	Owenduff/Nephin Complex SPA 004098	Protected under the Habitats Directive, derived domestic legislation, and national, regional and local planning policy. The NIS determined a potential ecological connection.	International	Part of European Natura 2000 network.	Yes
	Termoncarragh Lake and Annagh Machair SPA 004093	Protected under the Habitats Directive, derived domestic legislation, and national, regional and local planning policy. The NIS determined a potential ecological connection.	International	Part of European Natura 2000 network.	Yes
	Inishglora and Inishkeeragh SPA 004084	Protected under the Habitats Directive, derived domestic legislation, and national, regional and local planning policy. The NIS determined a potential ecological connection.	International	Part of European Natura 2000 network.	Yes
	Duvillaun Islands SPA 004111	Protected under the Habitats Directive, derived domestic legislation, and national, regional and local planning policy. The NIS determined a potential ecological connection.	International	Part of European Natura 2000 network.	Yes
	Inishkea Islands SPA 004004	Protected under the Habitats Directive, derived domestic	International	Part of European Natura 2000 network.	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		legislation, and national, regional and local planning policy. The NIS determined a potential ecological connection.			
	Lough Conn and Lough Cullin SPA 004228	Protected under the Habitats Directive, derived domestic legislation, and national, regional and local planning policy. The NIS determined a potential ecological connection.	International	Part of European Natura 2000 network.	Yes
	Clare Island SPA 004136	Protected under the Habitats Directive, derived domestic legislation, and national, regional and local planning policy. The NIS determined a potential ecological connection.	International	Part of European Natura 2000 network.	Yes
	Inner Galway Bay SPA 004031	Protected under the Habitats Directive, derived domestic legislation, and national, regional and local planning policy. The NIS determined a potential ecological connection.	International	Part of European Natura 2000 network.	Yes
	Tristia bog NHA	Protected under local planning policy. There is a potential ecological connection between the Main Wind Farm Development Site and this NHA.	National	Non-statutory designated Irish conservation site.	Yes
	Ederglen Bog NHA	Protected under local planning policy. There is a potential hydrogeological connection	National	Non-statutory designated Irish conservation site.	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		between the Main Wind Farm Development Site and this NHA.			
Habitats	PB3, PB4 and PF3	See **Table 5-8** for more details	County/Regional	These Peatland Habitats are locally abundant but internationally rare – as such they align with Annex I type for Blanket Bog. These habitats provide important corridors/habitats for other receptors.	Yes
	FW1, FL8, FS1, GS3, GS4, HD1 and PF2		Local	Habitats are of natural or semi-natural and of value for biodiversity.	Yes
	BL3 and ED3		Site	Habitats are either artificial or of low value for biodiversity.	No
Birds	Barnacle goose	Annex I Birds Directive; BoCCI 4: Amber list; ROI population: 6,667 wintering individuals (2016/17: (Fitzgerald, Burke, & Lewis, 2021));[85] County Mayo population: 2,711 (I-WeBS) and 441 (estimated) wintering individuals; Baseline surveys:	Local (winter season)	Amber Listed. It is difficult to calculate the importance of barnacle goose quantitatively due to a lack of count data. A single recording was made in March 2024. On this basis, the population is likely of local importance in the context of the EIAR; this is based on the results of the surveys.	Yes

[85] Fitzgerald, N., Burke, B., & Lewis, L. J. (2021). Irish Wetland Bird Survey: Results of waterbird monitoring in Ireland in 2016/17 and 2017/18. BirdWatch Ireland, Wicklow.

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		Bioacoustic monitoring: a single recording was made in March 2024 (possibly nocturnal migration).			
	Black-headed gull	BoCCI 4: Amber list; ROI population; 20,197 wintering individuals (2016/17: (Fitzgerald, Burke, & Lewis, 2021)) and 9,318 breeding pairs (2010-2012: (NPWS, 2022)); [93] [86] County Mayo population: 957 (I-WeBS) and 1,337 (estimated) wintering individuals and 617 breeding pairs (estimated); Baseline surveys: Flight activity surveys: wintering peak count one individual and breeding peak count three individuals.	Local (winter and breeding season)	Amber Listed. The winter season peak count (N=1) is not significant within the context of the ROI (<0.1%) and County Mayo population (0.07 – 0.1%). The breeding season peak count (N=3) is not significant within the context of the ROI (0.02%) and County Mayo population (0.24%).	Yes
	Common gull	BoCCI 4: Amber list; ROI population: 8,032 wintering individuals (2016/17: (Fitzgerald, Burke, & Lewis, 2021)) and 1,927 breeding pairs (2012: (NPWS, 2022)); [93] [94] County Mayo population: 2,409 (I-WeBS) and 532 (estimated)	Local (winter and breeding season)	Amber Listed. The winter season peak count (N=2) is not significant within the context of the ROI (0.02%) and County Mayo population (0.08 – 0.38%). The breeding season peak count (N=2) is not significant within the	Yes

[86] National Parks and Wildlife Service. (2022). *Irish Wetland Bird Survey (I-WeBS) Trends Report 1994–2020* [Report]. NPWS in partnership with BirdWatch Ireland. Retrieved from https://www.npws.ie/news/irish-wetland-bird-survey-i-webs-trend-report-1994-2020

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		wintering individuals and 128 breeding pairs (estimated); Baseline surveys: Flight activity surveys: winter season peak count of two individuals and breeding season peak count of two individuals.		context of the ROI (0.05%) and County Mayo population (0.78%).	
	Common snipe	BoCCI 4: Red list; ROI population: 8,550 wintering individuals (2016/17: (Fitzgerald, Burke, & Lewis, 2021)) and 4,275 breeding pairs (2008: (NPWS, 2022.[93] [94].The winter population estimate is likely to be an underestimate due to the winter I-WeBS survey methodology, which is notoriously poor at detecting this cryptic species. Consequently, we have assumed that the true winter population is likely to be the same as the breeding population i.e. 8,550 individuals; County Mayo population: 107 (I-WeBS) and 566 (estimated) wintering individuals and 283 breeding pairs (estimated); Baseline surveys: Flight activity surveys: wintering peak count two individuals and breeding peak count two individuals;	County (winter and breeding season)	Red Listed. The winter season peak count (N=20) is not significant within the context of the ROI (0.23%) but is significant in the context of the County Mayo population (3.53 – 18.69%). The breeding season peak count (N=11) is not significant within the context of the ROI (0.13%) but is significant in terms of the County Mayo population (1.94%).	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		Breeding walkover surveys: Peak count of 11 individuals. Snipe were recorded chipping and drumming to the north-west and south-east of the 500 m turbine buffer; Winter walkover surveys: peak count 20 birds.			
	Common tern	Annex I Birds Directive; BoCCI 4: Amber list; ROI population: 4,189 individuals (1995: (All Ireland Tern Survey 1995))[87] County Mayo population: 277 (estimated) individuals (estimated); Baseline surveys: Flight activity surveys: breeding season peak count one individual. Not recorded during the winter season.	Local (breeding season)	Amber Listed. The breeding season peak count (N=1) is not significant within the context of the ROI (0.02%) and County Mayo population (0.36%).	Yes
	Cormorant	BoCCI 4: Amber list; ROI population; 2,987 wintering individuals (2016/17 (Fitzgerald, Burke, & Lewis, 2021)) and 4,366 breeding pairs (2012: (NPWS, 2022) [93] [94]	Local (winter season)	Amber Listed. The winter season peak count (N=1) is not significant within the context of the ROI (0.03%) and County Mayo population (0.51%).	Yes

[87] Hannon, C., Berrow, S. D., & Newton, S. F. (1997). The status and distribution of breeding Sandwich (*Sterna sandvicensis*), Roseate (*S. dougallii*), Common (*S. hirundo*), Arctic (*S. paradisaea*), and Little (*S. albifrons*) Terns in Ireland in 1995. *Irish Birds*, 6(2), 163–174

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		County Mayo population: 466 (I-WeBS) and 198 (estimated) wintering individuals and 289 breeding pairs (estimated); Baseline surveys: Flight activity surveys: peak count one individual during the winter season. Not recorded during the breeding season.			
	Curlew	BoCCI 4: Red list; ROI population: 14,994 wintering individuals (2016/17: (Fitzgerald, Burke, & Lewis, 2021)) and 98 breeding pairs (2008: (NPWS, 2022)); [93] [94] County Mayo population: 1,689 (I-WeBS) and 993 (estimated) wintering individuals, and 6 breeding pairs (estimated); Baseline surveys: Flight activity surveys: wintering peak count two individuals. No flights were recorded during the breeding season. Curlew were also recorded during bioacoustic monitoring making up 19% of calls.	Local (winter season)	Red Listed. The winter season peak count (N=2) is not significant within the context of the ROI (0.01%) and County Mayo population (0.2%).	Yes
	Goldcrest	BoCCI 4: Amber list;	Local (breeding season)	Amber Listed. The breeding season peak count (N=28) is not significant within the	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		ROI population: 601,806 individuals (2011-2016: (Lewis, et al., 2019)); [88] County Mayo population: 39,834 individuals (estimated); Baseline surveys: Breeding bird surveys: Goldcrest were recorded breeding in suitable forestry habitat within the 500 m turbine buffer. Peak count 28 individuals.		context of the ROI (<0.01%) and County Mayo population (0.07%).	
	Golden plover	Annex I Birds Directive; BoCCI 4: Red list; ROI population: 80,707 wintering individuals (2016/17; (Fitzgerald, Burke, & Lewis, 2021)) and 84– 98 breeding pairs (2002-2004; (NPWS, 2022)); [93] [94] County Mayo population: 1,719 (I-WeBS) and 5,343 (estimated) wintering individuals, and 8-10 breeding pairs; Baseline surveys: Flight activity surveys: breeding season peak count three	ROI (breeding season)	Red Listed. The breeding season peak count (N=3) is significant within the context of the ROI (1.79%) and County Mayo population (27%); although no breeding was detected.	Yes

[88] Lewis, L. J., Coombes, D., Burke, B., O'Halloran, J., Walsh, A., Tierney, T. D., & Cummins, S. (2019). Countryside Bird Survey: Status and trends of common and widespread breeding birds 1998–2016 (Irish Wildlife Manuals No. 115). National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		individuals. Not recorded during the winter season.			
	Greenland white-fronted goose	BoCCI 4: Amber list; Annex I Birds Directive; ROI population: 9,500 wintering individuals (2016/17; (Fitzgerald, Burke, & Lewis, 2021)); [93] County Mayo population: 25 (I-WeBS); Baseline surveys: Flight activity surveys: winter season peak count 18 individuals. Greenland white-fronted goose was also recorded during bioacoustic monitoring making up approximately 0.009% of calls.	County (winter season)	Amber Listed. The winter season peak count (N=2) is not significant within the context of the ROI (0.2%) but is significant in terms of the County Mayo population (2.86 – 72%).	Yes
	Grey wagtail	BoCCI 4: Red list; ROI population: 50,768 individuals (2011-2016: (Lewis, et al., 2019)); [93] County Mayo population: 3,360 individuals (estimated); Baseline surveys: Winter walkover surveys: peak count of one individual.	Local (winter season)	Red listed. The winter season peak count (N=1) is not significant within the context of the ROI (<0.01%) and County Mayo population (0.03%).	Yes
	Greylag goose	BoCCI4: Amber list; ROI population: 1,954 wintering individuals;	County (winter season)	Amber Listed. The winter season peak count (N=17) is not significant within the context of the ROI (0.87%) but is	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		County Mayo population: 129 (estimate) – 461 (I-WeBs) wintering individuals; Baseline surveys: Flight activity surveys: winter season peak count 17 individuals.		significant in the context of the County Mayo population (3.69 – 13.14%).	
	Hen harrier	Annex I Birds Directive; BoCCI 4: Amber list; ROI population: 85 – 106 breeding pairs (Ruddock, et al., 2024) and 373 resident individuals (NPWS, 2021);[89] [94] County Mayo population: 14 resident individuals (estimated) (these birds are not part of regional population of hen harrier according to Ruddock et al. 2024);[97] Baseline surveys: Flight activity surveys: wintering peak count one individual and breeding peak count one individual; Breeding raptor surveys: no breeding was recorded;	County (winter and breeding season)	Amber Listed. The winter season peak count (N=1) is not significant within the context of the ROI (0.27%) but is significant in the context of the County Mayo population (4.05%). The breeding season peak count (N=1) is not significant within the context of the ROI (0.59%) but is significant in the context of the County Mayo population (8.89%).	Yes

[89] Ruddock, M., Wilson-Parr, R., Lusby, J., Connolly, F., J. Bailey, & O'Toole, L. (2024). The 2022 National Survey of breeding Hen Harrier in Ireland. Report prepared by Irish Raptor Study Group (IRSG), BirdWatch Ireland (BWI), Golden Eagle Trust (GET) for National Parks & Wildlife Service (NPWS). Irish Wildlife Manuals, No. 147. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		Hen harrier winter roost surveys: no evidence of roosting was recorded.			
	Herring gull	BoCCI4: Amber list; ROI population: 11,254 wintering individuals and 2,319 pairs (NPWS, 2021; County Mayo population: 709 (I-WeBS) and 745 (estimated) wintering individuals and 307 breeding individuals (estimated); Baseline surveys: Flight activity surveys: breeding season peak count of five individuals and winter season peak count of one individual.	Local (winter season) County (breeding season)	Amber Listed. The winter season peak count (N=1) is not significant within the context of the ROI (0.01%) and County Mayo population (0.13 – 0.14%). The breeding season peak count (N=5) is not significant within the context of the ROI (0.11%) but is significant in terms of the County Mayo population (1.63%).	Yes
	House sparrow	BoCCI 4: Amber list; ROI population: 2,266,646 individuals (2011-2016: (Lewis, et al., 2019)); [96] County Mayo population: 150,033 individuals (estimated); Baseline surveys: Breeding bird surveys: peak count of three birds. No breeding activity recorded.	Local (breeding)	Amber Listed. The breeding season peak count (N=3) is not significant within the context of the ROI (<0.01%) and County Mayo population (<0.1%).	Yes
	Kestrel	BoCCI 4: Red list; ROI population: 36 territorial pairs (Wilson-Parr & O'Brien, 2019) but this is likely to represent a massive	Local (winter and breeding season)	Red Listed. The winter season peak count (N=2) is not significant within the	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		underestimate as the Countryside Bird Survey 2011-2016 (Lewis, et al., 2019) estimates an ROI population of 13,500 individuals, so 6,750 pairs is the more likely estimate; [90] [96] County Mayo population: 447 pairs (estimated); Baseline surveys: Flight activity survey: breeding season peak count of four individuals (two adults and two juveniles) and winter season peak count of two individuals. Breeding bird surveys: A breeding pair of kestrel was confirmed in a building in the central area of the Main Wind Farm Development Site.		context of the ROI (0.01%) and County Mayo population (0.22%). The breeding season peak count (N=4) is not significant within the context of the ROI (0.03%) and County Mayo population (0.45%).	
	Kittiwake	BoCCI 4: Red list; ROI population: 49,000 pairs (Seabird 2000); County Mayo population: 4,258 pairs (Seabird 2000); Baseline surveys: Flight activity surveys: summer season peak count of one individual (very unusual record in	Local (breeding season)	Red Listed. The breeding season peak count (N=1) is not significant within the context of the ROI (<0.01%) and County Mayo population (0.02%).	Yes

[90] Wilson-Parr, R., & O'Brien, I. (Eds.) (2019). Irish Raptor Study Group Annual Review 2018. Irish Raptor Study Group.

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		the area and is presumed to be a disoriented bird).			
	Lapwing	BoCCI 4: Red list; ROI: 69,823 wintering individuals (2016/17: (Fitzgerald, Burke, & Lewis, 2021)) and 2,000 breeding pairs (2008: (NPWS, 2022) [96] [94] County Mayo population: 1,548 (I-WeBS) and 4,622 (estimated) wintering individuals and 132 breeding pairs (estimated); Flight activity surveys: winter season peak count of three individuals. Not recorded during the breeding season. Lapwing was also recorded during bioacoustic monitoring making up 0.002% of calls.	Local (winter season)	The winter season peak count (N=3) is not significant within the context of the ROI (<0.01%) and County Mayo population (0.06 – 0.19%).	Yes
	Lesser black-backed gull	BoCCI 4: Amber list; ROI population; 11,842 wintering individuals (NPWS, 2022)) and 4,239 breeding pairs (2012: (NPWS, 2022[94] County Mayo population: 77 (I-WeBS) and 784 (estimated) (wintering individuals and 281 breeding pairs (estimated); Baseline surveys: Flight activity surveys: breeding season peak count of five	County (winter season) Local (breeding season)	Amber Listed. The winter season peak count (N=2) is not significant within the context of the ROI (0.02%) but is significant in light of the County Mayo population (2.6%; I-WeBS estimate). The breeding season peak count (N=5) is not significant within the context of the ROI (0.06%) and County Mayo population (0.89%)	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		individuals and winter season peak count of two individuals. Breeding bird surveys: Peak count of five. One potential breeding territory within the 500 m turbine buffer			
	Linnet	BoCCI 4: Amber list; ROI population: 459,892 individuals (2011-2016: (Lewis, et al., 2019)); [96] County Mayo population: 30,441 individuals (estimated); Baseline surveys: Breeding bird surveys: Peak count of five. No observations of breeding behaviour.	Local (breeding season)	Amber Listed. The breeding season peak count (N=5) is not significant within the context of the ROI (<0.01%) and County Mayo population (0.02%).	Yes
	Mallard	BoCCI 4: Amber list; ROI population; 18,810 wintering individuals (2016/17: (Fitzgerald, Burke, & Lewis, 2021)) and 15,400 breeding pairs (2008-2011; (NPWS, 2022)); [96] [94] County Mayo population: 1,119 (IWeBS) and 1,245 (estimated) wintering individuals and 1,019 breeding pairs (estimated); Baseline surveys: Flight activity surveys: breeding season peak count of four	Local (winter and breeding season)	Amber Listed. The winter season peak count (N=4) is not significant within the context of the ROI (0.02%) and County Mayo population (0.32 – 0.36%). The breeding season peak count (N=5) is not significant within the context of the ROI (0.02%) and County Mayo population (0.25%).	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		individuals. Winter season peak count of four individuals. Breeding bird surveys: peak count of five individuals. Likely breeding in a small waterbody in the west within the 500 m turbine buffer. Winter walkover surveys: peak count of two individuals. Mallard was also recorded during bioacoustic monitoring, making up approximately 0.001% of calls.			
	Meadow pipit	BoCCI 4: Red list; ROI population: 1,351,995 individuals (2011-2016: (Lewis, et al., 2019)); [96] County Mayo population: 89,491 individuals (estimated); Baseline surveys: Flight activity surveys: breeding season peak count of seven individuals. Not recorded during the winter season. Breeding bird surveys: peak count of 56 individuals. Breeding in suitable habitat within the 500 m turbine buffer. Winter walkover surveys: peak count of 117 individuals.	Local (breeding season)	Red Listed. The breeding season peak count (N=7) is not significant within the context of the ROI (<0.01%) and County Mayo population (0.01%).	Yes
	Merlin	BoCCI 4: Amber list;	County (winter and breeding season)	Amber Listed.	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		ROI population: 11 territorial pairs (Wilson-Parr & O'Brien, 2019) but this is likely to represent an underestimate as the Article 12 report (NPWS, 2022) estimates an ROI population of 200 - 400 pairs, so 200 pairs have been assumed here [94] County Mayo population: 13 pairs (estimated); Baseline surveys: Flight activity surveys: breeding season peak count of one individual and winter season peak count of one individual. Not recorded during breeding raptor surveys.		The winter and breeding season peak count (N=1) is not significant within the context of the ROI (0.25%) but is significant in the context of the County Mayo population (3.78%).	
	Oystercatcher	BoCCI 4: Red list; ROI population: 48,275 wintering individuals (2016/17; I-WeBS summary report 2016/17 and 2017/18), and 2,316 – 3,087 breeding pairs (2008 – 2011 (NPWS, 2022));[94] County Mayo population: 1,451 (I-WeBS) and 3,196 (estimated) wintering individuals and 78 – 103 breeding pairs; Baseline surveys: a single oystercatcher call was recorded	Local (winter season)	Red listed It is difficult to calculate the importance of oystercatcher quantitatively due to a lack of count data. A single call of this species was recorded during bioacoustic monitoring. On this basis, the population is likely of local importance only.	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		during bioacoustic monitoring in March 2024.			
	Peregrine falcon	Annex I Birds Directive: BoCCI 4: Green list; ROI population: 89 territorial pairs (Wilson-Parr & O'Brien, 2019) but this is likely to represent a massive underestimate as the Article 12 report (NPWS, 2022) estimates an ROI population of 425 pairs, so this has been assumed here; [98] [94] County Mayo population: 28 pairs; Baseline surveys: Flight activity surveys: winter season peak count of one individual. Not recorded during the breeding season. Breeding raptors surveys: no breeding birds were recorded.	County (winter season)	The winter season peak count (N=1) is not significant within the context of the ROI (0.12%) but is significant in terms of the County Mayo population (1.47%) (based on the Irish breeding population figures).	Yes
	Redwing	BoCCI 4: Red list; ROI population: no reliable estimates are available (2011-2016: (Lewis, et al., 2019)); [96] County Mayo population: no reliable estimates are available; Baseline surveys: Winter walkover surveys: peak count of three individuals.	Local (winter) season	Red Listed. It is difficult to assess the value of the winter population in the context of the ROI and County Mayo population, as there are currently no reliable redwing population estimates for Ireland. This species favours open fields in lowland areas. While some of the Main Wind Farm Development Site contains similar habitat, it is unlikely they	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
				represent important winter habitat for this species. Based on the above, the population within the study area is of local importance for the winter season as a precaution.	
	Sand martin	BoCCI 4: Amber list; ROI population: 460,223 individuals (2011-2016: (Lewis, et al., 2019));[96] County Mayo population: 30,463 individuals (estimated); Baseline surveys: Breeding bird surveys: peak count of two individuals. No observations of breeding activity.	Local (breeding season)	Amber Listed. The breeding season peak count (N=2) is not significant within the context of the ROI (<0.01%) and County Mayo population (0.01%).	Yes
	Skylark	BoCCI 4: Amber list; ROI population: 301800 individuals (2011-2016: (Lewis, et al., 2019));[96] County Mayo population: 19,976 individuals (estimated); Baseline surveys: Breeding bird surveys: peak count of 26 individuals. Breeding in suitable habitat within the 500 m turbine buffer.	Local (breeding season)	Amber Listed. The breeding season peak count (N=26) is not significant within the context of the ROI (0.01%) and County Mayo population (0.13%).	Yes
	Starling	BoCCI 4: Amber list; ROI population: 2,066,904 individuals (2011-2016: (Lewis, et al., 2019));[96]	Local (breeding season)	Amber Listed. The breeding season peak count (N=12) is not significant within the	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		County Mayo population: 136,812 individuals (estimated); Baseline surveys: Breeding bird surveys: peak count of 12 individuals. No breeding behaviour was recorded.		context of the ROI (<0.01%) and County Mayo population (0.01%).	
	Swallow	BoCCI 4: Amber list; ROI population: 4,936,488 individuals (2011-2016: (Lewis, et al., 2019));[96] County Mayo population: 326,756 individuals (estimated); Baseline surveys: Breeding bird surveys: peak count of 18 individuals. No breeding behaviour was recorded.	Local (breeding season)	Amber Listed. The breeding season peak count (N=18) is not significant within the context of the ROI (<0.01%) and County Mayo population (0.01%).	Yes
	Swift	BoCCI 4: Red list; ROI population: 51,728 individuals (2011-2016: (Lewis, et al., 2019));[96] County Mayo population: 3,423 individuals (estimated); Baseline surveys: Flight activity surveys: breeding season peak count of one individual. Not recorded during the winter season.	Local (breeding season)	Red Listed. The breeding season peak count (N=1) is not significant within the context of the ROI (<0.01%) and County Mayo population (0.03%).	Yes
	Teal	BoCCI 4: Amber list; ROI population: 27,644 wintering individuals (2016/17 (Fitzgerald,	Local (winter season) County (breeding season)	Amber Listed. The winter season peak count (N=2) is not significant within the	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		Burke, & Lewis, 2021)) and 531 breeding pairs (2008 (NPWS, 2022); [93] [94] County Mayo population: 1,074 (I-WeBS) and 1,830 (estimated) wintering individuals (IWeBS) and 70 breeding pairs (estimated); Baseline surveys: Flight activity surveys: breeding season peak count of five individuals and winter season peak count of two individuals. Breeding bird surveys: peak count of five individuals. No breeding activity recorded. Teal was also recorded during bioacoustic monitoring, making up approximately 0.009% of calls.		context of the ROI (0.01%) or the County Mayo population (0.11 – 0.19%). The breeding season peak count (N=5) is not significant within the context of the ROI (0.47%) but it is in the context of the County Mayo population (7.11%).	
	Whooper swan	BoCCI 4: Amber list; ROI population: 14,467 wintering individuals (Burke et al., 2021);[91] County Mayo population: 785 (I-WeBS) and 957 (estimated) wintering individuals (IWeBS); Baseline surveys:	County (winter season)	Amber Listed. The winter season peak count (N=12) is not significant within the context of the ROI (0.08%) but is significant in terms of the County Mayo population (1.25 – 1.53%).	Yes

[91] Burke, B., McElwaine, J. G., Fitzgerald, N., Kelly, S. B. A., McCulloch, N., Walsh, A. J., & Lewis, L. J. (2021). Population size, breeding success and habitat use of Whooper Swan Cygnus cygnus and Bewick's Swan Cygnus columbianus bewickii in Ireland: Results of the 2020 International Swan Census. Irish Birds, 43, 57–70.

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		Flight activity surveys: winter season peak count of five individuals. Winter walkover surveys: peak count of 12 birds flying over the Main Wind Farm Development Site.			
	Willow warbler	BoCCI 4: Amber list; ROI population: 1,721,483 individuals (2011-2016: (Lewis, et al., 2019));[96] County Mayo population: 113,948 individuals (estimated); Baseline surveys: Breeding bird surveys: peak count of 53 individuals. Breeding in suitable woodland and scrub habitat within the 500 m turbine buffer and wider area.	Local (winter season)	Amber Listed. The winter season peak count (N=52) is not significant within the context of the ROI (<0.01%) and County Mayo population (0.05%).	Yes
	Woodcock	ROI population: 27,434 breeding males (O'Neill, 2024);[92] therefore, 54,868 individuals. County Mayo population: 3,632 individuals (inferred).	Local (winter season)	Red listed. The winter season peak count (N=5) was not significant within the context of the ROI (0.01%) and County Mayo population (0.14%).	Yes

[92] O'Neill, J. B. (2024). The spatial ecology and conservation of an important game bird in Ireland: the Eurasian woodcock. PhD Thesis, University College Cork

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		Flight activity surveys: winter season peak count of one individual. Winter walkover surveys: peak count of five individuals.			
	All other bird species	Green-listed, so detailed population level data is not presented.	Site	Green-listed and/or not listed under Nelson et al. (2019) (as referred to by the MCDP) so does not require further assessment.	No
Bats	Brown long-eared bat	Annex IV Habitats Directive; Wildlife Act (1976 and as amended, 2000);[4] [5] Red list: Least Concern; ROI population: 64,000 – 115,000 individuals (Marnell, Looney, & Lawton, 2019);[93] County Mayo population: 4,236 – 7,612 individuals (estimated); Baseline surveys: This species was not recorded during transect surveys. Recorded by ground-level detectors across all seasons. No roosts were recorded.	Local	Low levels of activity and no evidence the habitats represent important foraging or commuting features for this species. Based on the above, the population within the study area is of local importance.[4] [5]	Yes
	Common pipistrelle	Annex IV Habitats Directive; Wildlife Act (1976 and as amended, 2000); [4] [5] Red list: Least Concern;	Local	Low levels of activity and evidence that linear habitats were used for foraging and commuting. No roosts recorded. Based on the	Yes

[93] Marnell, F., Looney, D., & Lawton, C. (2019). *Ireland Red List No. 12: Terrestrial Mammals* [Red Lists]. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Dublin, Ireland.

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		ROI population: 1 – 2 million individuals (Marnell, Looney, & Lawton, 2019));[101] County Mayo population: 66,192 -13,2384 individuals (estimated); Baseline surveys: This species was not recorded during transect surveys. Recorded by ground-level detectors across all seasons. Common pipistrelle was the second most active species at the Main Wind Farm Development Site. No roosts were recorded for this species.		above, the population within the study area is of local importance.	
	Daubenton's bat	Annex IV Habitats Directive; Wildlife Act (1976 and as amended, 2000); [4] [5] Red list: Least Concern; ROI population: 81,000 – 103,000 individuals (Marnell, Looney, & Lawton, 2019);[101] County Mayo population: 5,362 – 6,818 individuals (estimated); Baseline surveys: this species was not recorded during transect surveys. Recorded by ground-level detectors across all seasons. No roosts were recorded.	Local	Low levels of activity– no evidence the habitats represent important foraging or commuting features for this species. Based on the above, the population within the study area is of local importance.	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
	Leisler's bat	Wildlife Act (1976 and as amended, 2000); [4] [5] Red list: Least Concern; ROI population: 81,000 – 103,000 individuals (Marnell, Looney, & Lawton, 2019));[101] County Mayo population: 5,362 – 6,818 individuals (estimated); Baseline surveys: recorded during transect surveys. Recorded by ground-level detectors, No roosts were recorded.	Local	Low levels of activity– no evidence the habitats represent important foraging or commuting features for this species. Based on the above, the population within the study area is of local importance.	Yes
	Myotis sp.	Wildlife Act (1976 and as amended, 2000); [4] [5] Red list: Least Concern; ROI population: n/a County Mayo population: n/a Baseline surveys: recorded during transect surveys. Recorded by ground-level detectors. No roosts were recorded.	Local	Low levels of activity– no evidence the habitats represent important foraging or commuting features for this species. Based on the above, the population within the study area is of local importance.	Yes
	Nathusius' pipistrelle	Wildlife Act (1976 and as amended, 2000); [4] [5] Red list: Least Concern; ROI population: 10,000 – 18,000 individuals (Marnell, Looney, &	County / Regional	Very low levels of activity. No evidence linear habitats were used for foraging or commuting. No roosts recorded. Based on the above, the population within the study area is of county / regional importance.	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		Lawton, 2019) or 100 x 1 km^2 cells (NPWS, 2019);[101] [94] County Mayo population: 662– 1,191 individuals (estimated); Baseline surveys: this species was not recorded during transect surveys. With regards to ground-level detectors there were a total of two records of Nathusius' pipistrelle; one at D.08 during the spring deployment in 2022, the other at D.04 during the summer deployment in 2023. No roosts were recorded.			
	Soprano pipistrelle	Annex IV Habitats Directive; Wildlife Act (1976 and as amended, 2000); [4] [5] Red list: Least Concern; ROI population: 0.54 – 1.2 million individuals (Marnell, Looney, & Lawton, 2019));[101] County Mayo population: 35,744 – 79,430 individuals (estimated); Baseline surveys: recorded during transect surveys. Forestry edge habitat is used for commuting.	Local	Overall, low - moderate levels of activity and evidence that linear habitats were used for commuting. A roost was confirmed within the Main Wind Farm Development Site. Based on the above, the population within the study area is of local importance.	Yes

[94] National Parks and Wildlife Service. (2019). *The status of EU-protected habitats and species in Ireland. Volume 3: Species assessments*. NPWS, Department of Housing, Local Government and Heritage, Dublin.

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		Recorded by ground-level detectors. Soprano pipistrelle was the most active species within the Main Wind Farm Development Site. A soprano pipistrelle roost was recorded within a shed to the west of the Main Wind Farm Development Site. The roost was assessed as suitable to hold small numbers of bats only or be used as a transitional roost.			
Other protected terrestrial fauna	Red deer	Wildlife Act (1976 and as amended, 2000); [4] [5] Red list: Least Concern; ROI population: there is no population estimate available (Marnell, Looney, & Lawton, 2019);[101] County Mayo population: no estimate available; Baseline surveys: a red deer for recorded within the vicinity of the Main Wind Farm Development Site.	Local	A single adult red deer was recorded incidentally in the vicinity of the Main Wind Farm Development Site. The peatland and conifer plantation, both within the Main Wind Farm Development Site and wider area, provided suitable habitat for this species. This species is of Least Concern. Based on the above, the population within the Main Wind Farm Development Site is of local importance.	Yes
	Irish hare	Wildlife Act (1976 and as amended, 2000); [4] [5] Red list: Least Concern; ROI population: 223,000 individuals (Marnell, Looney, & Lawton, 2019);[101]	Local	None recorded during surveys. Suitable foraging and breeding habitat is present within the Main Wind Farm Development Site area in the form of peatland with scrub present. Much of this habitat is also present within the	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		County Offaly population: 14,761 individuals (estimated); Baseline surveys: none recorded during surveys, but both desktop records and suitable habitat present.		wider landscape. This species is of Least Concern i.e. is common and widespread. Based on the above, the population within the Main Wind Farm Development Site is of local importance.	
	Red squirrel	Wildlife Act (1976 and as amended, 2000); [4] [5] Red list: Least Concern; ROI population: 40,000 individuals (Marnell, Looney, & Lawton, 2019);[101] County Westmeath population: 2,648 individuals; Baseline surveys: none recorded during surveys, but suitable habitat present.	Local	None recorded during surveys. Suitable foraging and breeding habitat is present within the Main Wind Farm Development Site and surrounding area in the form of conifer plantation. This species is of Least Concern i.e. is common and widespread. Based on the above, the population within the Main Wind Farm Development Site is of local importance.	Yes
	Otter	Annex II and IV Habitats Directive; Wildlife Act (1976 and as amended, 2000); [4] [5] Red list: Least Concern; ROI population: 16,000-22,000 individuals (Marnell, Looney, & Lawton, 2019);[101] County Mayo population: 1059–1456 individuals (estimated); Mullet/Blacksod Bay Complex SAC population: no information available;	County/Regional	Otter signs were recorded along the Main Wind Farm Development Site boundaries. This species is a QI of Mullet/Blacksod Bay Complex SAC and Owenduff/Nephin Complex SAC and it is likely that ex-situ populations are present along the Doolough Stream, Mhoing Mhór River and unnamed river flowing along the eastern Main Wind Farm Development Site boundary.	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		Owenduff/Nephin Complex SAC no information available; Baseline surveys: otter signs were recorded on the Doolough Stream and Mhoing Mhór River flowing along the northern Main Wind Farm Development Site boundary and an unnamed river flowing along the eastern Main Wind Farm Development Site boundary. Spraint sites and latrines accounted for the majority (87%) of all signs recorded. Suitability for otter holting was low in the survey area and no holts were identified within the Main Wind Farm Development Site or along the downstream connecting watercourses.		Otter is protected under Annex II and IV of the Habitats Directive. Based on the above, the population within the Main Wind Farm Development Site is of county/regional importance.	
	Pine marten	Annex V Habitats Directive; Wildlife Act (1976 and as amended, 2000); [4] [5] Red list: Least Concern; ROI population: 3,000 individuals (Marnell, Looney, & Lawton, 2019) but thought to be significantly underestimated;[101] County Westmeath population: 199 individuals (but likely underestimated); Baseline surveys: none recorded during surveys, but suitable habitat is present.	Local	No pine martens, or signs of this species, was recorded during surveys. However, suitable habitat is present within the Main Wind Farm Development Site and wider area in the form of conifer plantation. This species is of Least Concern i.e. is common and widespread. Based on the above, the population within the Main Wind Farm Development Site is of local importance.	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
	Common frog	Annex V Habitats Directive; Wildlife Act (1976 and as amended, 2000); [4] [5] Red list: Least Concern; ROI population: 150,000,000 (King, et al., 2011);[95] County Mayo population: 9,928,809; Baseline surveys: not recorded during surveys; however, the drainage ditches, small lakes and damp peatland habitat afford breeding and foraging opportunities for this species.	Local	While no frogs were recorded during surveys, the drainage ditches and damp peatland habitat afford breeding and foraging opportunities. This species is of Least Concern. Based on the above, the population within the Main Wind Farm Development Site is of local importance.	Yes
	Smooth newt	Wildlife Act (1976 and as amended, 2000); [4] [5] Red list: Least Concern; ROI population: no estimates available but thought to be stable (King, et al., 2011); County Mayo population: no estimates available; Baseline surveys: not recorded during surveys, however, the drainage ditches, small lakes and damp peatland habitat afford	Local	Not recorded during surveys. However, the drainage ditches, small lakes and damp peatland habitat afford breeding and foraging opportunities for this species. This species is of Least Concern. Based on the above, the population within the Main Wind Farm Development Site is of local importance.	Yes

[95] King, J. L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J. M., FitzPatrick, Ú., Gargan, P. G., Kelly, F. L., O'Grady, M. F., Poole, R., Roche, W. K., & Cassidy, D. (2011). *Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		breeding and foraging opportunities for this species.			
	Common lizard	Annex V Habitats Directive; Wildlife Act (1976 and as amended, 2000); [4] [5] Red list: Least Concern; ROI population: None available. County Mayo population: None available. Baseline surveys: one lizard shed recorded during surveys.	Local	Common lizard presence was recorded during surveys. Furthermore, the damp peatland habitats afford breeding and foraging opportunities for this species. This species is of Least Concern. Based on the above, the population within the Main Wind Farm Development Site is of local importance.	Yes
Aquatic and Fisheries	Atlantic salmon	Annex II and V of Habitats Directive; Red list status: Vulnerable; ROI population: 250,000 individuals (King, et al., 2011) and 25,315 x occupied 1 km^2 cells (NPWS, 2019):[103] [102] County Mayo population: 16,548 individuals or 1676 x 1 occupied km^2 cells (estimated); Baseline surveys: recorded at the following site in the vicinity of the Main Wind Farm Development Site: B6.	Site	If the number of aquatic survey sites with salmon presence represents a likely estimate of the population at the Main Wind Farm Development Site (N=1), then this salmon population is not significant in the context of the ROI population (<0.1%) or County Mayo population (<0.01%). Based on the above, the population of the Main Wind Farm Development Site is of Site level importance.	No
	Brown trout	Red list status: Least Concern; ROI population: no estimates available (King, et al., 2011);[103]	Site	This species is of Least Concern. Brown trout were relatively widespread in the survey area.	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		County Mayo population: no estimate available; Baseline surveys: recorded at the following sites in the vicinity of the Main Wind Farm Development Site; B4, B5, B6, C2, C4 and C5. eDNA recorded at pond sites P1, P3 and P4. Sites B4, B5, B6, C4 and C5 are downstream of the Main Wind Farm Development Site.		This species was recorded in high abundance at three aquatic survey sites, and very high abundance at one aquatic survey site. Please refer to **Technical Appendix 5-4** for more details. Brown trout also act as host species for pearl mussel species. However, there were no pearl mussels recorded in the catchment. There is no population data at the Regional and County scale for this species. Therefore, from a precautionary perspective, based on the above information, brown trout in the vicinity of the Main Wind Farm Development Site are considered to be of county / regional importance.	
	European eel	Red list status: Endangered; ROI population: no estimates available (King, et al., 2011); County Mayo population: no estimate available; Baseline surveys: recorded at the following sites in the vicinity of the Main Wind Farm Development Site A2, B6, C2 and C4. eDNA recorded at pond sites P1, P2 and P3.	County/ Regional	This species has a very poor conservation status and is downstream of the Main Wind Farm Development Site. As a catadromous species, coastal rivers are especially important to eels as part of their migration. Given that the Main Wind Farm Development Site is located close to the coast, it is	Yes

Feature Type	Feature	Feature Information	Value	Justification for Evaluation	Important Ecological Feature? Yes/No
		Sites A2, B6, C2 and C4 are downstream of the Main Wind Farm Development Site.		likely that eel populations are of county / regional level importance.	
	Lamprey (*Lampetra* sp.)	Annex II of Habitats Directive (brook lamprey) Red list status: near threatened (river lamprey), vulnerable (sea lamprey) and threatened (brook lamprey); ROI population: no estimates available (King, et al., 2011);[103] County Mayo population: no estimate available; Baseline surveys: recorded from a single site, D3, in the vicinity of the Main Wind Farm Development Site. Site D3 is upstream of the Main Wind Farm Development Site.	Site	*Lampetra sp.* was only recorded from a single site upstream of the Main Wind Farm Development Site. Given that this species was only recorded at a single site that can't be impacted by surface water pollution generated by the Proposed Development it is considered that *Lampetra* sp. populations are of Site level importance.	No
	Three-spined-stickleback, minnow and flounder	Red-list status for three-spined stickleback, minnow and flounder is of 'Least Concern'	Site	This species is of Least Concern i.e. widespread and common, so do not require further assessment	No

Potential effects on biodiversity

Future Baseline scenario

5.195 The Main Wind Farm Development Site currently comprises commercial conifer plantation and areas of cutover blanket bog. In the absence of the Proposed Project, the site would likely continue to be managed for commercial forestry and associated access infrastructure. The existing drainage network within areas corresponding to Annex I blanket bog (including areas mapped as cutover bog PB4) and within the conifer plantation on peaty soils would remain in place, maintaining artificially lowered water tables. The GCR would continue to function as the standard public road network road.

5.196 Under this scenario, the ecological condition of peatland habitats within the Main Wind Farm Development Site would likely continue to decline due to ongoing drainage effects, continued scrub encroachment and the unmanaged spread of invasive species such as *Rhododendron ponticum*. These pressures would be expected to further degrade peatland structure and function over time, including impacts on hydrology, vegetation composition and peat-forming processes. In contrast, the Proposed Project incorporates measures for peatland restoration and hydrological rehabilitation which would not occur under the do-nothing scenario.

5.197 Taking the above into account, the likely significant effects are described in the following sections.

Potential Construction Phase Effects

5.198 The construction phase will mainly result in habitat loss/disturbance to facilitate construction of infrastructure including excavation of cabling trenches during the installation of the GCR (although it is noted the GCR will be along the existing road network so losses in this regard will be minimal). Clearing of vegetation – which includes felling of forestry - will also be undertaken to implement turbulence and bat mitigation buffers around turbines.

5.199 Timing of construction works affects the level and type of impact, especially if undertaken during a critical life stage or season for an ecological feature.

5.200 The duration of any construction effects for non-habitat features is likely to be no greater than short-term as the construction phase is anticipated to take 24 months.

5.201 Likely sources of direct and indirect effects during construction phase are as follows:

5.202 Sources of direct effects:

- Clearance of vegetation, soil and rock for access roads, hardstands and turbine bases;
- Clearance and/or trimming of woodland, treelines and hedgerows to facilitate site infrastructure and turbulence/bat mitigation buffers;
- Creation of temporary infrastructure e.g. construction compounds, blade set-down areas and crane pads;
- Excavation of trenches for cable ducting; and
- Placement of materials required for infrastructure works.

5.203 Sources of indirect effects:

- Stockpiling of materials on-site;

- Dust and changes in air quality;
- Collection/drainage of surface water runoff;
- Pollution and changes in hydrology;
- Spreading non-native/invasive plants; and
- Construction activity (including noise, light, and the presence of construction workers) disturbing birds and mammals.

Designated Sites & Ramsar Sites

5.204 SACs (both cSAC and full) and SPAs are considered fully in the Natura Impact Statement (NIS) also which has been submitted as part of with this Planning Application. The same is true for Blacksod Bay and Broadhaven Ramsar site, which overlaps with the SPA and SAC of the same name. The NIS submitted with the planning application confirmed that, with mitigation measures, the Proposed Project, either alone or in combination with any other plan or project, will not undermine the conservation objectives or have an adverse effect on the integrity of any Natura 2000 site.

5.205 A total of three Ramsar sites are located within 20 km of the Main Wind Farm Development Site. These are Blacksod Bay and Broadhaven, Owenduff catchment, and Knockmoyle/Sheskin. All three of these Ramsar sites are considered under SACs and SPAs previously listed. The Owenduff catchment Ramsar site is indirectly hydrologically connected to the Proposed Development over 38 km away in linear distance with the hydrological pathway being considerably larger. The Owenduff catchment is also hydrologically connected to the Owenduff/Nephin Complex SPA and Owenduff/Nephin Complex cSAC. There is an indirect hydrological pathway and considerable dilution effects introduced by the pathway. Furthermore, all materials likely to be mobilised into the waterways around the Main Wind Farm Development Site will be inert in nature from earthworks etc. Nonetheless mitigation measures have been developed to minimise potential impacts to water quality.

5.206 There are three NHAs within 15 km of the Main Wind Farm Development Site (**Table 5-9 and Figure 5-4**). None of these NHAs entirely overlap with SACs and/or SPAs. Tullaghan Bay and Bog NHA partially overlaps with Blacksod Bay/Broad Haven SPA for which the wetland habitat will be considered. As the NHAs overlap with European sites the considerations related to their protection are covered more holistically in the NIS. It is important to note that the NIS and EIAR were progressed in tandem.

5.207 There is one proposed Natural Heritage Area (pNHA) within 15 km of the Main Wind Farm Development Site, namely Mullet/Blacksod Bay Complex pNHA 000470. This pNHA entirely overlaps with Mullet/Blacksod Bay Complex SAC and Blacksod and Bay/Broad Haven SPA; therefore, it has been considered in the NIS.

Direct Effects

5.208 The Main Wind Farm Development Site is not located within any nationally designated site (NHA or pNHA). However, Tristia Bog NHA is directly adjacent to the Main Wind Farm Development Site along the NE boundary. This is separated by a flowing peatland drainage ditch. As the NHA is an ombrotrophic bog, receiving water and nutrients exclusively from atmospheric precipitation rather than groundwater or streams, any ground or surface water pollution generated from the Proposed Project will not impact this NHA.

5.209 Any differences between the range of turbine permutations assessed will result in no changes to direct effects for designated nature conservation sites. This is because the location of the turbines is independent from the range of turbine permutations assessed.

Indirect Effects

5.210 The indirect effects to designated nature conservation sites and Ramsar sites identified above relate to hydrological connectivity and potential pollution events, mainly associated with construction of the Proposed Project. A reduction in water quality could occur via acidification due to the presence and felling of conifers, because the soils from conifer plantations pose a greater risk to aquatic life than ordinary soils (Ormerod, Donald and Brown 1989). Water quality may also be impacted via the release of toxic hydrocarbons and cement or concrete from construction activities, which could poison riparian habitats, plants and animals. In the absence of mitigation and without consideration of dilution effects, construction activities could result in continuous, low-level sedimentation/pollution and/or larger scale sedimentation/pollution incidents could occur. Reduction in water quality could occur via sedimentation, which can smother fish eggs or reduce the suitability of spawning locations. Thus, in the absence of mitigation, construction works could result in significant, negative indirect sediment/pollution-mediated effects on water quality and the general functioning of the river system which is indirectly connected to Trista Bog NHA.

5.211 Additionally, there are potential interactions with collision risk species which are connected to the Main Wind Farm Development Site. These have been screened above with reference to the known home ranges of each of the species considering the SPAs and Ramsar site distances. As such, there are only a few sites which may have interactions in this regard. The NIS fully considers the population effects of each of the SPAs.

5.212 With regard specifically to the Tristia Bog NHA which is directly adjacent to the Main Wind Farm Development Site there is potential for indirect effects from dust and debris if works were undertaken across the full extent of the site. The excavation works will not encompass the full extent of the site boundary, and all earth works will be more than 240 m from the NHA. Therefore, there are no indirect effects identified in this regard. The flow direction of the drainage ditch flows SW – therefore there is no hydrological pathway for indirect effects on Trista Bog NHA.

5.213 It is unlikely any of the invasive species recorded during surveys could be spread to any designated site due to the dispersal pathways of Rhododendron and Prickly Heath. The construction works will not interact with the NHA. Furthermore, the HMP accounts for potential spread of invasive species. Any differences between the range of turbine permutations assessed will result in no changes to the indirect effects predicted for designated nature conservation sites.

Habitats and Flora

5.214 Construction of wind farm infrastructure will result in permanent habitat loss where hardstands (noting that approximately half of the total area of crane hardstands will be decommissioned and removed following completion of construction, but 100% loss of the full area has been assumed to be lost as a conservative assessment) , turbine bases and access routes occupy land that cannot be reinstated. Additional areas will be subject to temporary habitat loss associated with construction compounds and TDR Over-run Areas. Habitats within the Proposed Development (Main Wind Farm Development Site and the three Over-run Areas) consist predominantly of peatland habitats mapped as PB4 Cutover Bog under the Fossitt classification, alongside planted conifer woodland, treelines, patches of dry/humid grassland, and small waterbodies. The calculations within the Biodiversity Net Gain Calculations within the **Technical Appendix 5.5** address all habitats on site. This includes locally important habitats as detailed in **Table 5-15;** namely Eroding/Upland River (FW1), Dystrophic Lake (FL8), Reed and Large Sedge Swamp (FS1), Dry-humid Acid Grassland (GS3), Wet Grassland (GS4), Dense Bracken (HD1), Poor Fen and Flush (PF2). While peatland habitats (PB4 Cutover Bog) comprise the majority of the site and therefore

account for most of the predicted habitat interactions, potential effects on all identified habitats are assessed in this chapter. The extent of habitat loss associated with the other habitat types listed above is limited and localised, and the significance of effects is considered in the relevant impact assessment sections below.

5.215 Peatland habitats within the Main Wind Farm Development Site are mapped as PB4 Cutover Bog under the Fossitt classification. However, based on vegetation composition, peat depth, hydrological conditions and landscape context recorded during field surveys, these areas correspond ecologically with Annex I Lowland Blanket Bog as defined in the Interpretation Manual of European Union Habitats (EU-28). Further detail supporting this classification is provided in the baseline ecology section.

5.216 Extensive historical drainage and peat cutting have altered the structure and species composition of these habitats, resulting in reduced Sphagnum cover (below 40%) and other indicators of degradation. Consequently, while the habitats correspond with Annex I Lowland Blanket Bog, they are identified as degraded condition and do not meet the criteria for Priority Annex I blanket bog. As Annex I habitats are of international conservation importance under the EU Habitats Directive, they are treated as Important Ecological Features (IEFs) in this assessment. Other habitats present within the Main Wind Farm Development Site may have ecological importance at regional, local or site level and are also brought forward as IEFs in accordance with the assessment framework outlined in **Section 5.193**.

5.217 The habitat loss calculations focus primarily on peatland habitats as these represent the dominant habitat type within the Main Wind Farm Development Site and account for the majority of the predicted habitat interactions. Other habitats present on site (e.g. grassland, scrub and waterbodies) occur only in small, localised areas and the extent of direct habitat loss associated with these habitats is minimal. These habitats are nonetheless considered as Important Ecological Features (IEFs) within the assessment, and any potential effects are addressed qualitatively within this chapter and quantitatively within the Biodiversity Net Gain calculations presented in **Technical Appendix 5.5**.

5.218 Calculations have been completed to determine the area of habitat loss on both the Main Wind Farm Development Site and on TDR Over-run Areas 1 and 3 where ecologically important peatland habitat is present. Over-run area 2 did not contain peatland habitats, the habitats within this area were Buildings and Artificial Surfaces and a mosaic of grasslands, scrub and heathland.

Table 5-16: Summary of blanket bog habitat loss estimates

Habitat	Total Area (ha)	Direct loss (ha)	Indirect loss (ha)	Total loss (ha)
PB3 (moderate condition)	22.55	0	0.01	0.01
PB4 (moderate condition)	119.11	12.85	4.23	17.08
PB4 (poor condition)	114.43	13.06	3.28	16.34
Total	256.09	25.91	7.52	33.43

5.219 Construction of the Proposed Project will lead to a total loss of peatland habitat of 30 ha and c 36 ha of other habitats (predominantly commercial forestry (between 27 and 31ha[96] of the 36ha stated). The rest of the habitat area to be lost is conifer plantation habitat which

[96] Depending on which of the three possible turbines is installed at the Main Wind Farm Development Site.

has low ecological value and would be felled in rotation independently of the Proposed Project. Therefore, the focus was placed on the habitats of higher value for biodiversity at the Main Wind Farm Development Site.

5.220 As the GCR will be almost entirely buried underground within the existing roads, only a minimal amount of bounding habitat will be lost. There are some areas of peatland within the GCR– however, the habitat is likely to recover post installation, therefore it will only have temporary effects for birds. At the Proposed Substation site, only low value improved agricultural grassland GA1 and a small amount of higher value hedgerow WL1 habitats will be lost. There is not predicted to be any permanent habitat loss at the TDR nodes as the works will return lands to their original state, consisting almost entirely of trimming and/or temporary removal of street furniture. However, it is important to note that the TDR does contain Annex I peatland habitats which will result in temporary loss at two Over-run Areas where works will take place that are not along the existing road network.

5.221 Without mitigation, the loss of these habitats would be significant because Annex I habitats are of international importance and support distinctive peatland flora and fauna, even when in degraded condition. It is important to note that the Annex I Blanket Bog [7130] present on site is in poor condition. Proposed restoration measures are described in **Section 5.631** onwards which will ensure that there is an overall improvement in the condition of the Annex I habitat on the Main Wind Farm Development Site. Details of habitat loss for each habitat type are provided in **Technical Appendix 5.6**.

5.222 Habitat loss calculations include both permanent habitat loss associated with turbine bases, hardstands and access tracks, and potential indirect loss arising from localised desiccation effects within a defined buffer around hard infrastructure. Temporary habitat disturbance associated with construction activities (e.g. construction compounds and turbine delivery route Over-run Areas) has not been included in the habitat-loss calculations as these areas will be reinstated following construction. The habitats affected comprise peatland habitats corresponding to Annex I Blanket Bog, although these areas are degraded due to historical drainage and peat cutting.

Birds

Direct Effects

5.223 Potential direct construction effects consist of nest damage or destruction, habitat loss and disturbance/displacement.

Nest damage or destruction

5.224 A pair of kestrels were confirmed nesting within a building within the Main Wind Farm Development Site c.250 m from any proposed infrastructure. Goldcrest, meadow pipit, skylark, willow warbler and snipe were recorded breeding in suitable habitats within 500 m of the Main Wind Farm Development Site. Mallard, swallow and lesser black-backed gull are also likely breeding within 500 m of the Main Wind Farm Development Site.

5.225 Damage or destruction to active bird nests could contravene Section 22 of the Wildlife Act 1976 (as amended).[4,5] Therefore, mitigation measures are required to ensure no direct impacts on nesting birds occur.

Habitat loss

5.226 Please refer to the ‘Habitats and Flora’ section above for more information on habitat loss due to the Proposed Development.

5.227 Based on the results of the baseline ornithology surveys, none of the habitats due to be lost are of particular importance for sensitive IEF bird groups such as raptors, waders or wintering wildfowl because:

- No aggregations of swans or geese were recorded within the Main Wind Farm Development Site,
- Other wildfowl, wader and raptor species were generally recorded in low numbers, preferring to use other habitat available in the wider area,
- No hen harrier or merlin were recorded roosting during surveys, and
- No evidence was recorded of breeding raptors, waders, or wildfowl near proposed infrastructure, except for those described below.

5.228 There was evidence of confirmed breeding for the following sensitive IEF bird species:

- Kestrel has been recorded breeding within a building approximately 250 m from the proposed substation – outside the redline boundary,
- Meadow pipit was recorded breeding throughout suitable open bog and grassland habitats within the 500 m survey buffer,
- Goldcrest was recorded breeding throughout forestry habitats within the 500 m survey buffer,
- Skylark was recorded breeding in grassland habitats within the 500 m survey buffer,
- Snipe were recorded breeding consistently in bog habitats to the southeast of the 500 m survey buffer (likely one territory), and
- Willow warbler were recorded breeding in suitable woodlands and scrublands within the 500 m survey buffer.

5.229 Therefore, the species close enough to the development footprint that could suffer direct habitat loss are breeding goldcrest, meadow pipit, skylark, snipe and willow warbler (loss of conifer plantation, open peatland habitats). The building which has breeding kestrel will not be removed therefore no direct effects. However, in the absence of mitigation measures, the loss of breeding habitat could have *significant, long-term effects* on breeding Goldcrest, Kestrel, Meadow pipit, Skylark and Willow warbler at the *county* and *local scale*, respectively.

Disturbance / displacement

5.230 Potential effects of noise and visual disturbance could lead to temporary displacement or disruption of foraging/roosting/breeding birds. The significance of the effect depends on the timing of potentially disturbing activities, the extent of spatial/temporal displacement and the availability of suitable displacement habitats in the surrounding area. Behavioural sensitivity to disturbance also varies between species.

5.231 Significant disturbance/displacement effects are unlikely to occur along the GCR or Proposed Substation, with underground cables proposed to be buried within existing roads, and the Proposed Substation to be located within heavily modified cultivated habitat. Any disturbance/displacement from construction activities while the cable is being buried within the road is unlikely to be significantly greater than that from typical traffic levels. The GCR Corridor passes adjacent to Blacksod Bay / Broad Haven SPA (c.180 m separation distance) and Owenduff / Nephin Complex SPA (c.35 m separation distance). Both SPAs are separated from the GCR Corridor by the Oweniny River, which acts as a physical barrier between the SPAs and any proposed works.

5.232 Potential effects due to the Main Wind Farm Development Site itself and the Over-run Areas are likely to be greatest during the breeding season (predominantly between March and August, depending on the species under consideration). However, significant effects for most IEF bird species are unlikely. This is because they were not recorded breeding (or probably breeding) within the relevant ZoI, all were recorded in low numbers and all the habitats found within the Main Wind Farm Development Site occur frequently in the wider area.

5.233 To avoid disturbing the following bird species, buffers are required:

- Common snipe: a buffer of 400 m is required in the breeding season (Pearce-Higgins et el., 2009),[67] and
- Common kestrel: a buffer of 200 m is required (Goodship & Furness, 2022).[67]

5.234 Disturbance/displacement of breeding common kestrel may occur due to increased haulage traffic on road adjacent to the nest site. In addition, a proposed underground electrical cable encroaches within the 200 m buffer zone around the kestrel nest site. Excavation activities generate noise, vibration and increased human activity, all of which could cause disturbance and/or displacement of breeding common kestrel.

5.235 For common snipe, there is evidence of confirmed breeding nearer to the Main Wind Farm Development Site than the recommended disturbance buffers detailed above. Thus, without mitigation, there could be significant, short-term effects of construction-related disturbance to breeding common snipe at the local scale.

5.236 Many of the other breeding IEF bird species are not sensitive to construction related disturbance (goldcrest and willow warbler) or breed in open habitats away from where most construction activity will occur (meadow pipit and skylark).

5.237 Disturbance to foraging and roosting wintering birds is considered even less likely due to the low numbers of sensitive birds recorded within and surrounding the Main Wind Farm Development Site (e.g. high activity of waterbirds relates to the wider area, beyond 1 km from the Main Wind Farm Development Site).

5.238 The potential effects associated with construction activities are only likely to occur for as long as the construction phase continues and are thus generally short-term in nature. The exception is if the local population becomes extinct during the period of disturbance and replacement through recruitment or re-colonisation does not occur. None of the species recorded with breeding populations are rare enough for this to be a risk.

5.239 Based on the above, unmitigated disturbance/displacement effects during construction are unlikely to be significant for the following IEF bird species: black-headed gull, common gull, common snipe, common tern, cormorant, curlew, goldcrest, golden plover, Greenland white-fronted goose, golden plover, grey wagtail, hen harrier, herring gull, house sparrow, kestrel, kittiwake, lapwing, lesser black-backed gull, linnet, mallard, meadow pipit, merlin, oystercatcher, peregrine, redwing, sand martin, skylark, starling, swallow, swift, teal, whooper swan, willow warbler and woodcock. The exception is for common snipe during the breeding season, as mentioned above.

5.240 The range of turbine permutations assessed will not result in any qualitative differences regarding disturbance or displacement effects on birds. i.e. the same construction processes will take place regardless. While there might be small differences in the dimensions the differences between the range of turbine permutations assessed will result in negligible changes to the direct disturbance/displacement effects predicted for IEF birds.

Indirect Effects

5.241 If the construction of the Proposed Project led to pollution of wetland habitats and/or dewatering of groundwater-dependent habitats within nearby designated nature conservation sites for birds, it could result in indirect habitat loss for qualifying bird species. The same is true for wetland sites that could be used by bird species from nearby designated nature conservation sites, even if those wetland sites are not designated themselves.

5.242 Mitigation measures are required to safeguard the water quality of the local open water sources which are connected to wider protected areas – particularly for wetland birds. Independent of mitigation measures it is likely that indirect effects will occur.

5.243 Any differences between the range of turbine permutations assessed will result in negligible changes to the indirect effects assessment for IEF birds i.e. differences in the range of turbine permutations will not significantly affect the amount of potential pollution or dewatering that could occur.

Terrestrial Mammals (Excluding Bats)

Direct Effects

5.244 Potential direct effects on mammals during construction of the Main Wind Farm Development Site include effects on dwellings (resting, hibernating or breeding sites), where the dwelling could be destroyed and/or both adults and juveniles could be killed or injured. Tree/vegetation removal could affect arboreal species (e.g. pine marten and red squirrel) and ground works such as excavation or piling could affect ground-dwelling species (e.g. badger and hedgehog).

5.245 No mammal dwellings were recorded within 100 m of the works footprint, so there is unlikely to be disturbance during sensitive periods. The ZoI for significant effects is 50 m for red squirrel dreys (NatureScot, 2020),[97] 100 m for pine marten dens (NatureScot, 2024) and 30 m for active badger setts (NatureScot, 2020).[98] [99] Therefore, there are no likely direct effects for badger, red squirrel or pine marten.

5.246 Irish hares do not inhabit single dwellings, but rest in 'forms' (VWT, 2023).[100] Young hares hide in long grass in the day and are fed at dusk. As construction will be undertaken during daylight hours, the risk of disturbance is limited to physical disturbance of the young, rather than the mother. As young hares can move freely, it is unlikely they will suffer mortality from construction activities. Direct effects on Irish hare are assessed as not significant.

[97] NatureScot. (2020). Standing Advice for Planning Consultations – Protected Species: Red Squirrel (Species-specific guidance). Inverness: NatureScot.

[98] NatureScot. (2024). Standing Advice for Planning Consultations – Protected Species: Pine Marten [Species-specific guidance]. Inverness: NatureScot

[99] NatureScot. (2020). Standing Advice for Planning Consultations – Protected Species: Badger. Inverness: NatureScot.

[100] Vincent Wildlife Trust. (2023). *Irish hare (Lepus timidus hibernicus)*. Retrieved from Vincent Wildlife Trust website

5.247 Hedgehogs hibernate under whatever materials and hiding places they can find, using dead leaves, twigs, feathers and log piles (VWT, 2023).[101] During hibernation, hedgehogs enter a state of torpor from October/November to March/April. This immobility makes them very vulnerable to disturbance. Significant direct effects to hedgehogs could occur at the local scale via destruction of hibernacula and direct mortality, if construction takes place during the winter months (i.e. in the absence of mitigation).

5.248 There are only very small differences between the range of turbine permutations assessed regarding the amount of habitat due to be lost, so there will not be any significant differences regarding destruction of mammal breeding or resting places. Therefore, any differences between the range of turbine permutations assessed will result in negligible changes to the direct effects predicted for IEF mammals (excluding bats).

Indirect Effects

5.249 Indirect effects on mammals during construction could result in the loss of potential foraging, commuting and sheltering habitat.

5.250 Tree removal may reduce habitat availability for arboreal pine marten and red squirrels but could offer new foraging opportunities for badger, Irish hare and hedgehog. It is unlikely that the loss of conifer plantation or plantation-type will result in significant effects on pine marten and red squirrel. Significant effects are only likely if the populations are at carrying capacity and use conifer plantation and plantation-type mixed broadleaved woodlands preferentially over other woodland habitats in the area. Pine marten hunt over a large area and there are abundant displacement habitats available both within and outside the study area, and it is likely the PAW habitats are preferred foraging areas, as they are more diverse and more likely to support more prey. There are also abundant woodland habitats for red squirrel as well. Other habitats used by badger, hedgehog and Irish hare are also widespread and common in both the study area and the surrounding landscape.

Bats

Direct Effects

5.251 Potential direct effects on bats during construction of the Proposed Project consist of vegetation removal, which could result in a loss of potential roost sites. It is important to note the works will not result in the loss of any buildings or manmade structures.

5.252 No potential bat roost features were identified within the redline boundary. One roost was confirmed outside of the redline boundary in an existing building (F.6) close to the Main Wind Farm Development Site, in use by one bat with multiple emergences during July and during September. It was assessed as suitable to hold small numbers of bats only or to be used as a transitional roost and was assessed as a low suitability potential roost feature (PRF). From the results it can be determined that this building is used consistently as a bat roost for soprano pipistrelle. This roost will not be destroyed as a result of the Proposed Development. Given the distance to the Main Wind Farm Development Site – there are no direct effects to the roost identified.

5.253 Along the GCR Corridor, cables will be laid within existing road network, with only the area at the Proposed Substation requiring excavation outside of this. Where cables will go over bridges, there is the potential for bats to be disturbed at aquatic surveys sites; however, no

[101] Vincent Wildlife Trust. (2023). *Hedgehog (Erinaceus europaeus)*. Retrieved from Vincent Wildlife Trust website

roosts were identified and so no direct effects on potential bat roosts are likely. No other potential bat roosts are located within the works footprint along the GCR Corridor.

5.254 Along the TDR, the only accommodation works that could potentially affect bat roosts is the trimming of trees. No structures with bat roost potential will be affected. There are no trees requiring trimming along the TDR that were classed as having potential bat roost features. Additionally, bats avoid roads, and most of the works will be along roadside edges and where the works go beyond roadside, these are within open habitats with no PRFs. Again, no direct effects on bat roosts are likely.

5.255 The differences in the range of turbine permutations assessed will only give rise to small differences in the total amounts of habitats lost. As there are no predicted losses to bat roosts for the worst-case scenario, any differences between the range of turbine permutations assessed will result in negligible changes to the direct effects predicted for IEF bats.

Indirect Effects

5.256 Indirect effects could include the loss of foraging/commuting habitats or features. If lighting is used for night-time working, this could also disturb roosting and foraging bats. However, very infrequent night-time working is proposed as part of embedded mitigation measures, so disturbance is not likely in this regard – details of the lighting plan which are embedded mitigation are contained in **Chapter 2**. Further, the species utilising the Main Wind Farm Development Site most (common pipistrelle and soprano pipistrelle) are less sensitive to light pollution than the less commonly recorded species including brown long-eared bat and Myotis species. Leisler's had a low occurrence rate also and are not a light sensitive species.

5.257 Surveys confirmed that linear features such as forest edges, hedgerows, treelines and watercourses were used by commuting and foraging bats but they were only used regularly by common pipistrelle and soprano pipistrelle. The removal of such features could disrupt connectivity significantly throughout the Main Wind Farm Development Site.

5.258 In the absence of mitigation, vegetation removal has the potential for significant indirect effects on common pipistrelle and soprano pipistrelle at the local scale.

5.259 As the range of turbine permutations assessed will result in very small differences in the total amounts of habitat lost and will not result in qualitative differences in e.g. light pollution, any differences between the range of turbine permutations assessed will result in negligible changes to the indirect effects predicted for IEF bats.

Other Protected Fauna

Direct Effects

5.260 Direct effects on amphibians such as common frog and smooth newt include destruction of breeding sites and mortality from construction activities.

5.261 Smooth newts were not recorded breeding within the Main Wind Farm Development Site. Small lakes, that may offer suitable breeding habitat, are located outside the works footprint. Therefore potential smooth newt breeding habitat will not be destroyed. It is unlikely there will be significant mortality effects for adult smooth newt.

5.262 Breeding marsh fritillary could be directly affected if their breeding sites are destroyed, or they suffer mortality from construction activities. However, no webs or records of breeding were identified within the Main Wind Farm Development Site. Therefore, it is unlikely that any significant negative direct effects will occur for this species.

5.263 Any differences between the range of turbine permutations assessed will result in negligible changes to the direct effects predicted for IEF 'other protected fauna' because the same separation distance will be enforced for marsh fritillary regardless of the turbine permutation chosen and there will only very small differences in the amounts of wet habitats predicted to be lost between the range of turbine permutations assessed.

Indirect effects

5.264 Spawning common frog could be affected when breeding opportunistically in wet habitats due to dust effects on water quality as a result of earth works. In the absence of mitigation, significant negative effects for spawning common frog could occur at the local scale. It is unlikely there will be significant mortality effects for adult common frog as this is a mobile species. Indirect effects on amphibians and marsh fritillary could also include loss of foraging habitats. For amphibians, habitats that could be used for foraging include drainage ditches FW4, eutrophic ponds FL5 and wetter parts of dry humid grasslands and wet grasslands GS4. All these habitats are widely available in the study area and wider landscape. Adult marsh fritillary butterfly can feed on a variety of flowering plants, so a wide variety of abundant displacement habitats are available. Therefore, it is unlikely that any significant negative effects will occur for common frog, smooth newt or marsh fritillary butterfly.

5.265 Any differences between the range of turbine permutations assessed will result in negligible changes to the indirect effect assessment for IEF 'other protected fauna' because there will only be very small differences in the amounts of habitats predicted to be lost between the range of turbine permutations assessed.

Fisheries and Aquatic Ecology

Direct Effects

5.266 Direct effects include the loss of natural watercourses due to watercourse crossings and the placement of culverts, water quality degradation, the diversion of natural watercourses, increased suspended solids/hydrocarbons/cement leachate within watercourses inside the Main Wind Farm Development Site and the loss of freshwater habitats due to removal or blockage of watercourses. It is important to note that there are no provisions to remove or block existing watercourses. The watercourses in the vicinity of the Proposed Project were typically heavily modified lowland channels (straightened, deepened, realigned) draining blanket bog or higher gradient/higher energy upland channels (prone to spate). Significant siltation (primarily from peat escapement), and less so eutrophication, was evident throughout much of the survey area. Over half of the survey sites were evaluated to be of at least **local importance (higher value)** in terms of their aquatic ecology given the presence of fish of high conservation value and or Q4 (good status) water quality. Sites P1, P2, P3 and P4 were evaluated as **county importance** given the presence of Annex I aquatic habitats. Sites E2 on the River Deel and E3 on the Ballisodare River were evaluated as **international importance** given their locations within the River Moy SAC (002298) and Unshin River SAC (001898), respectively. None of these features were directly on site or adjacent to the Main Wind Farm Development Site.

5.267 There are no IEF aquatic features located within the Main Wind Farm Development Site and so direct effects on brown trout and European eel are unlikely.

5.268 There are no otter holts within 150 m of any aquatic survey site, so no direct effects of disturbance to breeding/resting otters are predicted.

5.269 Any differences between the range of turbine permutations assessed will result in negligible changes to the direct effect assessment for IEF fish and aquatic ecology as the turbine

locations and the rest of the Main Wind Farm Development Site will stay the same regardless of the turbine permutation chosen.

Indirect effects

5.270 Indirect effects include the release of suspended solids (which could be acidic due to presence of conifer plantation), hydrocarbons or cement leachate, which could reach downstream receptors such as brown trout and European eel via hydrological connections. This could reduce the water quality, which could have negative effects on aquatic receptors.

5.271 No whiteclaw crayfish were found in any of the records.

5.272 Salmonids require very high levels of water quality to complete their life cycles. High levels of suspended solids can increase turbidity (inhibits respiration) and siltation (affects riverbed substrate composition, reducing spawning and fry survival). Suspended solids typically contain phosphorous or hydrocarbons that can lead to eutrophication and reduced oxygen levels (a cause of death for all salmonid and lamprey life stages). The release of even small amounts of hydrocarbons (e.g. fuel spills) can reduce oxygen levels, affecting salmonid and lamprey populations. Acidification of streams because of conifer plantations and associated forestry operations (Ormerod, Donald and Brown 1989) can also result in the reduction of invertebrate (Ormerod, Rundle, et al. 1993), and fish populations (Harrison, et al. 2014).[102] [103] [104]

5.273 Habitat availability and quality are linked with survival rates of salmon fry and parr (Kalleberg, 1958),[105] with small amounts of debris entering a watercourse important for vulnerable life stages of salmon and lamprey potentially leading to negative impacts on juvenile survival and habitat use.

5.274 Accidental fuel spills, which could occur during construction, can release hydrocarbons, which can bioaccumulate in salmonids (McCain, et al., 1990),[106] leading to loss of condition. As salmonids are known to avoid areas containing hydrocarbons (Maynard & Weber, 1981),[107] fuel spills can lead to effective loss of habitat and/or migration routes. Fuel spills are unlikely to occur, and even if one did occur, it is unlikely to be a scale which would have an appreciable effect on salmonid habitats. However, this risk cannot be completely

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[102] Ormerod, S. J., Donald, A. P., & Brown, S. J. (1989). The influence of plantation forestry on the pH and aluminium concentration of upland Welsh streams: A re-examination. Environmental Pollution, 62, 47–62.

[103] Ormerod, S. J., Rundle, S. D., Lloyd, E. C., & Douglas, A. A. (1993). The influence of riparian management on the habitat structure and macroinvertebrate communities of upland streams draining plantation forests. *Journal of Applied Ecology, 30*(1), 13–24.

[104] Harrison, S., Langan, S., Redding, J., & Charman, E. (2014). Impacts of forestry management on fish populations and aquatic biodiversity: A review. *Freshwater Biology, 59*(8), 1656–1671.

[105] Kalleberg, H. (1958). Observations in a stream tank of territoriality and factors affecting growth and survival of Atlantic salmon fry and parr. In Proceedings of the International Congress of Game Biology

[106] McCain, B. B., Malins, D. C., Krahn, M. M., Brown, D. W., Gronlund, W. D., Moore, L. K., & Chan, S.-L. (1990). Uptake of aromatic and chlorinated hydrocarbons by juvenile Chinook salmon (*Oncorhynchus tshawytscha*) in an urban estuary. *Archives of Environmental Contamination and Toxicology, 19*(1), 10–16.

[107] Maynard, D. J., & Weber, D. D. (1981). Avoidance reactions of juvenile **coho salmon** (*Oncorhynchus kisutch*) to monocyclic aromatic hydrocarbons. *Canadian Journal of Fisheries and Aquatic Sciences, 38*(6), 772–778.

discounted, and mitigation measures are outlined in the Mitigation and Monitoring section of this report.

5.275 Acidification of watercourses could also occur if felling of conifer plantation occurs near watercourses. Changes in pH could lead to fish kills and a reduction in recruitment, leading to population declines.

5.276 A decrease in fish stocks can also lead to reduced prey availability to otter.

5.277 Unmitigated secondary effects are therefore likely to be significant at the county / regional scale for brown trout, European eel, and otter.

5.278 Any differences between the range of turbine permutations assessed will result in negligible changes to the indirect effects predicted for IEF fish and aquatic ecology, as the effects described above are independent from the turbine permutation chosen.

Potential Operational Phase Effects

5.279 No additional habitat loss is predicted during the operational phase. Infrastructure will be confined to the footprint established during construction and no further vegetation clearance or peat disturbance will occur.

5.280 Direct effects are likely to occur due to the operation of the Proposed Development. Bat mitigation buffers will act a source of operational phase impacts. Bat mitigation buffers areas surrounding certain turbines which must be kept free from any forestry / woodland / hedgerows / treelines throughout the entire operational phase.

5.281 The GCR will be buried underground and avoids sensitive IEFs. Once installed, there are no likely significant operational impacts from the GCR.

5.282 The proposed lifespan of the Proposed Project is 35 years and so operational effects will be long-term.

5.283 Potential effects resulting from the operational phase are as follows.

5.284 Direct effects:

- Collision with turbines and barotrauma for bats, and
- Collision with turbines for birds.

5.285 Indirect effects:

- Collection/drainage of surface water runoff,
- Disturbance effects due to operational activities and servicing (a few visits per year with a small number of personnel),
- Displacement effect of operating turbines, and
- Displacement effects of Proposed Substation lighting
- Loss of forestry/woodland/hedgerows/treelines due to implementation of bat mitigation buffers

Designated nature conservation sites

Direct Effects

5.286 Operational phase impacts on SAC and SPAs are considered fully in the Natura Impact Statement (NIS) also submitted with this Planning Application. The NIS confirmed that, with mitigation measures, the Proposed Project, either alone or in combination with any other

plan or project, will not undermine the conservation objectives or have an adverse effect on the integrity of any Natura 2000 site.

5.287 The Tristia Bog NHA is the only protected site which is directly adjacent to the Main Wind Farm Development Site along the NE. This is separated by a flowing peatland drainage ditch. The NHA is an ombitrophic bog. As the operational phase will have only minor works taking place there are no potential sources for impacts to the wider environment – except through collision risk which could impact bird species for which some of the Ramsar, NHA and pNHA sites are designated. As these sites all overlap with SPAs these have been considered with the NIS. The mitigation measures below regarding collision risk reflect the impact avoidance reduction for the protected sites.

Indirect Effects

5.288 The operational phase elements of the Proposed Project will not have any long-term impact on water quality due to the lack of construction potentially generating ground and surface water pollution. The only pathways identified between the Proposed Project and the protected sites identified were hydrological connectivity and collision risk. These are both covered in other elements of the report and mitigation measures are provided in this regard.

Habitats and Flora

Direct and Indirect Effects

5.289 The continued operation of the Proposed Project will not have any effects on habitats and flora within or in the immediate vicinity either directly or indirectly. Additionally, the long-term habitat management plan will have benefits to the environment – these are considered in relation to the direct loss from the construction phase above.

Birds

Direct Effects

5.290 Potential direct effects include:

- Disturbance / displacement and barrier effects, and
- Collision with wind turbines.

5.291 There is no statistical model available for the assessment of collision mortality of birds with guyed meteorological (met) masts. However, as there is only a single met mast within the project and low avian flight activity levels, the turbines themselves are likely to represent the key source of collision mortality for birds. The Proposed Substation will also be a low, stationery object and so is considered to present a negligible source of collision to birds. The remaining Proposed Project elements are considered in further detail below.

Disturbance / displacement and barrier effects

5.292 The operation of wind turbines and associated human activities for maintenance purposes (including maintenance of vegetation-free areas surrounding turbines as part of the mitigation for potential operational effects on bats) both have the potential to cause disturbance and displace birds from the Main Wind Farm Development Site. Disturbance effects during the operational phase may be less than during the construction phase, as species may become habituated to wind turbines and disturbance due to human activities would be considerably reduced.

5.293 Studies have shown that, in general, species are not displaced beyond 500 m to 800 m from wind turbines (e.g. Drewitt & Langston, 2006; Goodship & Furness, 2022), and

references therein; Pearce-Higgins et al., 2009; Hötker et al., 2006) and in some cases, birds do not appear to have been displaced at all (e.g. Devereux et al., 2008; Douglas et al., 2011; Fielding & Haworth, 2013; Whitfield et al., 2010).[68] [67] [70] [69] [67] [108] [109] [110] [111]

5.294 Individual turbines, or the wind farm as a whole, may present a barrier to the movement of birds, restricting or displacing birds from much larger areas. The effect this would have on a population, if affected, could be subtle, and may be difficult to predict. If birds regularly must fly over or around obstacles or are forced into suboptimal habitats, this may result in greater energy expenditure. By implication, this will reduce the efficiency with which they accumulate reserves, potentially affecting their survival or breeding success. However, logically, barrier effects can only be possible if there is clear evidence birds are regularly flying through a site, or regularly using the habitats within a site, which are optimal for foraging, breeding or roosting.

5.295 Disturbance/displacement and barrier effects during operation may affect species in the breeding season or roosting and foraging species outside of the breeding season, within the relevant parts of the study area, i.e. close to the proposed wind turbines. Disturbance relating to the Proposed Substation and access tracks is less likely to be significant during operation.

5.296 As such, the assessment concentrates on common snipe and kestrel, which have been identified breeding within the Main Wind Farm Development Site, although beyond the redline boundary. Whilst other IEF bird species may suffer some disturbance/displacement from wind turbines whilst foraging, effects are not likely to be significant given the wide availability of more optimal, alternative foraging habitats located outside the Main Wind Farm Development Site, the fact that relatively small numbers are within 'the displacement zone' and the lack of breeding and/or communal roosting within or nearby the Main Wind Farm Development Site.

5.297 No other species identified as IEFs (black-headed gull, common gull, common tern, cormorant, curlew, goldcrest, golden plover, Greenland white-fronted goose, golden plover, grey wagtail, hen harrier, herring gull, house sparrow, kittiwake, lapwing, lesser black-backed gull, linnet, mallard, meadow pipit, merlin, oystercatcher, peregrine, redwing, sand martin, skylark, starling, swallow, swift, teal, whooper swan, willow warbler and woodcock) are likely to experience significant effects and are therefore not considered in further detail here.

5.298 Any differences between the range of turbine permutations assessed will result in negligible changes to the direct disturbance/displacement and barrier effects assessment for IEF birds.

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[108] Devereux, C. L., Francis, C. M., & Gill, J. A. (2008). Minimal effects of wind turbines on the distribution of wintering farmland birds. *Journal of Applied Ecology, 45*(3), 1686–1694.

[109] Douglas, D. J. T., Whitfield, D. P., & Fielding, A. H. (2011). No evidence for displacement of Golden Plover around Scottish wind farms. *Bird Study, 58*(2), 129–134.

[110] Fielding, A. H., & Haworth, P. F. (2013). Breeding bird responses to wind farms in upland Scotland: a long-term BACI study. *Journal of Applied Ecology, 50*(5), 1145–1153.

[111] Whitfield, D. P., Madders, M., & McLeod, D. R. A. (2010). Raptor responses to wind farms: A critical review. *Bird Study, 57*(3), 264–280.

Common snipe and kestrel

5.299 In the absence of mitigation, there are likely significant, negative, long-term disturbance/displacement effects at the county and local scale for foraging common snipe and kestrel, respectively. This is a precautionary assumption, as even though displacement is likely to occur – there are alternate resources and habitats which are suitable for the species in the wider landscape – it is recognised however, that these may be less suitable than those within the Main Wind Farm Development Site.

5.300 Also of importance are the potential impacts of disturbance/displacement on nesting common snipe and kestrel.

5.301 While no confirmed nests were recorded during surveys, common snipe were recorded drumming (breeding display flight) consistently in an area located within the 500 m survey buffer in bog habitats to the southeast.

5.302 Kestrel have bred in existing buildings which are outside the redline boundary c.250 m from the Proposed Substation.

5.303 As mentioned before, there is an evidence-based upper limit of 400 m for displacement to nesting common snipe (Pearce-Higgins et al., 2009) and 200 m for kestrel (Goodship & Furness, 2022).[70] [67] Thus, disturbance/displacement of breeding common snipe could occur, as breeding activity was located inside the ZoI for disturbance from operational activities. However, the same is not true for kestrel, with the nest located outside the ZoI for disturbance from operational activities. In the absence of mitigation, there could be negative, long-term effects at the county scale for common snipe only due to disturbance/displacement.

5.304 Hötker et al. (2006) found that ten out of 13 wind farm studies assessed had evidence for a barrier effect on wader movements, although this was statistically non-significant.69 They also showed that three out of five studies assessed had evidence for a barrier effect on kestrel movements. The flight lines recorded for common snipe at the Main Wind Farm Development Site are infrequent. Consequently, common snipe does not seem to be making regular flights across the Main Wind Farm Development Site. The flight lines recorded for kestrel seem to be focused near the Proposed Substation and BESS and not near turbines. Also, the layout of the turbines at the Main Wind Farm Development Site indicates that the energetic costs for avoiding turbines will be minimal. Overall, this suggests that it is unlikely that barrier effects will occur for common snipe and kestrel. If these species start breeding elsewhere within the Main Wind Farm Development Site, then barrier effects could occur, although they are likely to be only negligible and at the local scale, as the turbine layout is dispersed and not oriented in a linear fashion, and so any energetic costs that could be incurred are likely to be minimal.

5.305 Whilst acknowledging that there are knowledge gaps regarding disturbance/displacement and barrier effects in the scientific community generally, considering the habitats present and the patterns of flights activity, it is likely that any barrier effects on common snipe and kestrel during the operation of the Proposed Project will not be significant.

5.306 Any differences between the range of turbine permutations assessed will result in negligible changes to the direct disturbance/displacement and barrier effects assessment for IEF common snipe and kestrel as it is the presence of the turbines themselves that could give rise to such effects, rather than the precise turbine permutation chosen

Collision with wind turbines

5.307 Collision of a bird with turbine rotors is almost certain to result in the death of the bird. In low density populations (e.g. raptors) this could have a greater negative effect on the local population than in higher density populations (e.g. passerines) because a higher proportion

of the local population would be affected in a low-density population (Beston et al., 2016).[112] Larger birds such as raptors also live longer and have much slower reproductive rates than passerines, which can also increase the significance of the impact of collisions on the relevant population. The frequency and likelihood of a collision occurring depends on several factors which include aspects of the size and behaviour of the bird (including their use of a site), the nature of the surrounding environment, and the structure and layout of the wind turbines.

5.308 Collision risk is perceived to be higher for birds that spend much of the time in the air, such as foraging raptors and those that have regular flight paths between feeding and breeding/roosting grounds (e.g. wildfowl). The risk of bird collisions at wind farms is greatest in areas where large concentrations of birds are present (such as on major migration routes), and in poor flying conditions, such as rain, fog, strong winds that affect birds' ability to control flight manoeuvres, or on dark nights when visibility is reduced (Langston & Pullan, 2003; Drewitt & Langston, 2006) and references therein).[113] [68] Birds may also be more susceptible if the wind farm is in an area of high prey density. For diurnal foraging raptors, the proximity of structures on which to perch can increase the likelihood of collision with wind turbines (e.g. Percival, 2005, and references therein).[114]

5.309 It should be noted that operational disturbance / displacement and collision risk effects are mutually exclusive in a spatial sense i.e. a bird that avoids the Main Wind Farm Development Site due to disturbance cannot be at risk of collision with the turbine rotors at the same time. However, they are not mutually exclusive in a temporal sense i.e. a bird may initially avoid the wind farm but habituate to it and would then be at risk of collision.

5.310 It is also recognised that habitat changes due to the Proposed Project and ongoing forestry management can change levels of risk e.g. birds of open ground may colonise recently felled areas and birds which favour old growth forests will colonise if there is no felling.

5.311 Passerines nesting within a wind farm site would be expected to be regularly flying between wind turbines and could therefore be expected to be most at risk of collision. However, passerines tend to fly below Potential Collision Height (PCH) and evidence suggests that passerines collide with wind turbines relatively infrequently compared to other groups. Moreover, most of the passerine species' populations concerned are of low or negligible conservation value or are relatively large and have high reproductive rates (i.e. a 'fast' life history). Collision is therefore mainly considered in relation to species of high sensitivity, e.g. target raptor species, and species not particularly manoeuvrable in flight, such as geese and swans. Moreover, populations of birds which have a favourable conservation status (stable or increasing) are likely to be able to compensate for small increases in mortality due to improved survival or reproductive success in the remaining population (known as density dependent factors). For such populations, mortality from a wind farm may have no effect on the breeding population size the following year. The converse is true for species with unfavourable conservation status.

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[112] Beston, J.A., J.E. Diffendorfer, S.R. Loss, and D.H. Johnson. (2016). Prioritizing avian species for their risk of population-level consequences from wind energy development. PLOS ONE 11 (3): e0150813.

[113] Langston, R. H. W., & Pullan, J. D. (2003). The collision risk of offshore wind turbines and other artificial obstacles to birds. In T. & A.D. Poyser (Ed.), Bird Migration and Wind Power: Management and Research Annals of the New York Academy of Sciences, Vol. 9. International Council for Bird Preservation/Bern Convention Publications.

[114] Percival, S. M. (2005). Birds and windfarms: What are the real issues? British Birds, 98(4), 194–204.

5.312 Species with flight lines intersecting the collision risk zone are considered at risk of collision with the proposed wind turbines at the Main Wind Farm Development Site. IEF bird species that were subject to CRM are as follows:

- black-headed gull,
- common gull,
- common tern,
- cormorant,
- golden plover,
- Greenland white-fronted goose,
- greylag goose,
- hen harrier,
- herring gull,
- common kestrel,
- kittiwake,
- lesser black-backed gull,
- mallard,
- merlin,
- peregrine falcon,
- snipe,
- teal,
- whooper swan, and
- woodcock.

5.313 Due to the lack of regular flight lines across the viewsheds a random (bird occupancy method) CRM was considered suitable (Band et al., 2024) and used for all IEF birds subject to modelling.[73]

5.314 To account for nocturnal activity (including potential nocturnal migration), diurnal flight activity was multiplied by the relevant correction factors outlined in Band et al., 2024.

5.315 The results of the CRM are described below for each of the species modelled, along with an assessment of whether predicted collision rates are likely to be significant. Further information about predicted collision rates used and other detailed species-specific information is provided in the avian CRM report (**Technical Appendix 5-8**).

5.316 Note that the Peatland Restoration (PRP) and Habitat Management Plan (HMP) (see **Technical Appendix 5-5**) aims to restore and enhance the quality of the bog habitats present. This is unlikely to attract sensitive bird species such as waders and wildfowl near operational turbines, thus increasing collision risk beyond what is reported here, because by the time the Habitat Management Plan has taken effect, the turbines will be operational and acting as a constant source of disturbance (collision risk and disturbance / displacement are mutually exclusive in the sense that you cannot have collision risk if birds have been displaced from an area). While it is acknowledged that some level of habituation may occur, avoidance of the collision risk zone should prevent an appreciable increase in collision risk.

Thus, the collision risk estimates presented below apply to the lifespan of the Proposed Project.

Rationale for prediction of effect

5.317 Without application of methods such as Population Viability Analysis (PVA) it is not fully known to what extent the populations of target species can sustain additional levels of mortality. It has been assumed that in accordance with Percival (2003) that any impact not increasing adult mortality by more than 1% of the existing background mortality rate is insignificant. It should be noted that this method is highly precautionary when applied to non-breeding populations, as it uses the highest survival rates (i.e. for adult birds) for context.

5.318 Where survival rates are high, a smaller number of collisions with turbines are needed for the excess mortality to be >1% of the background levels i.e. the threshold for a likely significant effect. Using adult survival rates (which are higher than juvenile survival rates), makes it more likely to identify a potentially significant effect on turbine collisions on the avian population under consideration. Similarly, all flight lines within 500 m of the blade tips of the turbines are considered for modelling, which is likely to produce an overestimate of the true collision risk. Avoidance rates used are highly precautionary and the default 98% avoidance rate used is not based on empirical evidence. Again, this is likely to produce an overestimate of true collision risk.

5.319 Where excess mortality is predicted to be >1% of background levels, we have presented the predicted mortality over the 35-year lifespan of the Proposed Project in the context of each species' population size, recent population trends and ecology, as well as empirically documented cases of collision in accordance with NatureScot (2018).66 Significant negative effects are only likely where the number of predicted deaths due to the Proposed Project are likely to result in appreciable differences to projected rates of population decline or recovery.

5.320 Note that recent background trends may not continue over the lifespan of the Proposed Project, even if the Proposed Project did not go ahead. This is because population declines or increases may eventually plateau, depending on the drivers for the population trend. However, in absence of detailed population modelling, we have assumed that the recent trend will continue.

5.321 Empirically documented cases of collision are provided in a pan-European spreadsheet collated by Dürr (2025)[115]. This spreadsheet documents all the reported avian collisions between 2002-2024. While the Dürr spreadsheet clearly does not perfectly reflect reality (not all wind farm projects and countries carry out post-construction monitoring in the same way, with the same intensity, with the same level of detail and with the same degree of honesty), it represents the best estimate we have of the empirical effects of collision on European birds. Somewhat confusingly, the spreadsheet has collated results from both the UK and Ireland in one column (collectively called 'GB' in the database) e.g. data from Carnsore Point in Co. Wexford are given for gannet in the 'GB' column. In addition, the RAPTOR protocol (NPWS, 2019) has also been consulted for additional cases of collision for raptors in Ireland.[102] This document details all raptor collisions recorded in Ireland between 2007-2019.

5.322 The results of the CRM gave statistically significantly higher results for the Nordex N163 candidate turbine model (mean = 0.15 collisions/year, standard deviation = 0.09) vs. the

[115] Dürr, T. 2025. Vogelverluste an Windenergieanlagen / bird and bat fatalities at wind turbines in Europe. http://www.lfu.brandenburg.de/cms/detail.php/bb1.c.312579.de.2

Nordex N149 or Vestas V150 model (mean = 0.12 collisions/year, standard deviation = 0.07) when examined via a paired t-test (one-tailed; t(17) = 2.18, p=0.02).

5.323 Therefore, CRM outputs have been presented for both the N163 and N149 candidate turbine models (the N149 and V150 candidate turbine models gave nearly completely identical CRM outputs).

5.324 The full results are presented in **Technical Appendix 5.8** Collision Risk Model Results.

Black-headed gull

5.325 Seven hundred and eighty-seven black-headed gull collisions have been reported at European wind farms between 2002-2025, with 12 in GB (none in Ireland) (Dürr, 2025)[120]. Therefore, although there may be other, unpublished reports of collisions of this species, black-headed gull collisions nevertheless appear to be a relatively uncommon event compared to all recorded bird collisions in Europe (3.8%) and only represents a very small percentage (0.03%) of the black-headed gull population in Europe (BirdLife International, 2025).

5.326 Collision risk analysis has been carried out on flight activity data from the 2021, 2022 and 2023 breeding seasons and 2023/24 non-breeding season i.e. where flight activity data for this species are present.

5.327 Assuming an avoidance rate of 98.0%, there was a mean annual collision rate of 0.06 - 0.08 collisions (approximately one collision every 16.67 - 13.33 years) predicted, depending on the turbine model considered.

5.328 This has been assessed in the context of the ROI and county populations (there are no designated nature conservation sites within the ZoI for black-headed gull). For information on the populations see **Table 5-15**.

5.329 If realised, the predicted collision rates of 0.06 – 0.08 birds per year would result in a 0.003 - 0.004% increase on background mortality for both breeding and wintering ROI populations.

5.330 If realised, the predicted collision rates of 0.06 – 0.08 birds per year would result in a 0.07 - 0.08% increase on background mortality for both breeding and wintering county populations.

5.331 Therefore, collision would not have an appreciable effect on the breeding or wintering population of black-headed gull at the national or county scale, and so no significant effects are likely.

Common gull

5.332 Ninety-one common gull collisions have been reported at European wind farms between 2002-2024, with none in GB or Ireland (Dürr, 2025)120. Therefore, although there may be other, unpublished reports of collisions of this species, common gull collisions nevertheless appear to be a relatively uncommon event compared to all recorded bird collisions in Europe (0.4%), and only represents a very small percentage (0.007%) of the common gull population in Europe (BirdLife International, 2025).

5.333 Collision risk analysis has been carried out on flight activity data from the 2021 and 2023 breeding seasons.

5.334 Assuming an avoidance rate of 98.0%, there was a mean annual collision rate of 0.04 – 0.05 collisions (approximately one collision every 26.67 – 22.22 years) predicted, depending on the turbine model considered.

5.335 This has been assessed in the context of the ROI and county breeding and wintering populations, as well as the population for Inishkea Island SPA. For information on the populations see **Table 5-15**.

5.336 If realised, the predicted collision rates of 0.04 – 0.05 birds per year would result in a 0.003 - 0.004% increase on background mortality for both breeding and wintering ROI populations.

5.337 If realised, the predicted collision rates of 0.04 – 0.05 birds per year would result in a 0.01% increase on background mortality for both breeding and wintering county populations (i.e. the same for all candidate turbine models).

5.338 If realised, the predicted collision rates of 0.04 – 0.05 birds per year would result in a 0.28 - 0.34% increase on background mortality for the breeding Inishkea Islands SPA populations.

5.339 Therefore, collision would not have an appreciable effect on the breeding and wintering population of common gull at the national or county scale, as well as for the Inishkea Island SPA, and so no significant effects are likely.

Common kestrel

5.340 Nine hundred and twenty-eight common kestrel collisions have been reported at European wind farms between 2002-2024, with two in GB (none in Ireland) (Dürr, 2025)[120]. The Irish R.A.P.T.O.R report (NPWS, 2019) also has records of two kestrel collisions in Ireland between 2007-2019.102

5.341 Therefore, although there may be other, unpublished reports of collisions of this species, common kestrel collisions appear to be a relatively common event compared to all recorded bird collisions in Europe (4.5%); however, it only represents a very small percentage (0.0011%) of the common kestrel population in Europe (BirdLife International, 2025).

5.342 Collision risk analysis has been carried out on flight activity data from the 2021, 2022 and 2023 breeding seasons, and 2021/22, 2022/23, 2023/24 winter seasons.

5.343 Assuming an avoidance rate of 95.0%, there was a mean annual collision rate of 1.05 – 1.19 collisions (approximately one collision every 0.95 – 0.84 years) predicted, depending on the turbine model considered.

5.344 This has been assessed in the context of the ROI and county breeding and wintering populations (there are no designated nature conservation sites within the ZOI for common kestrel). For information on the populations see **Table 5-15**.

5.345 If realised, the predicted collision rates of 1.05 – 1.19 birds per year would result in a 0.03% increase on background mortality for both breeding and wintering ROI populations (i.e. same for all candidate turbines).

5.346 If realised, the predicted collision rates of 1.05 – 1.19 birds per year would result in a 0.4% increase on background mortality for both breeding and wintering county populations (i.e. same for all candidate turbines).

5.347 Therefore, collision would not have an appreciable effect on the breeding and wintering population of common kestrel at the national or county scale, and so no significant effects are likely.

Common snipe

5.348 Nineteen common snipe collisions have been reported at European wind farms between 2002-2024, with one in GB (none in Ireland) (Dürr, 2025)[120]. Therefore, although there may be other, unpublished reports of collisions of this species, common snipe collisions nevertheless appear to be a relatively uncommon event compared to all recorded bird

collisions in Europe (0.009%), and only represents a very small percentage (0.0004%) of the common snipe population in Europe (BirdLife International, 2025).

5.349 Collision risk analysis has been carried out on flight activity data from the 2023 breeding season, and 2021/22, 2022/23, 2023/24 winter seasons.

5.350 Assuming an avoidance rate of 98.0%, there was a mean annual collision rate of 0.07 – 0.09 collisions (approximately one collision every 0.95 – 0.84 years) predicted, depending on the turbine model considered.

5.351 This has been assessed in the context of the ROI and county breeding and wintering populations (there are no designated nature conservation sites within the ZOI for common snipe). For information on the populations see **Table 5-15**.

5.352 If realised, the predicted collision rates of 0.07 – 0.09 birds per year would result in a 0.03% increase on background mortality for both breeding and wintering ROI populations (i.e. same for all candidate turbines).

5.353 If realised, the predicted collision rates of 0.07 – 0.09 birds per year would result in a 0.4% increase on background mortality for both breeding and wintering county populations (i.e. same for all candidate turbines).

5.354 Therefore, collision would not have an appreciable effect on the breeding and wintering population of common snipe at the national or county scale, and so no significant effects are likely.

Common tern

5.355 One hundred and sixty-nine common tern collisions have been reported at European wind farms between 2002-2024, with none in GB or Ireland (Dürr, 2025)[120]. Therefore, although there may be other, unpublished reports of collisions of this species, common tern collisions nevertheless appear to be a relatively uncommon event compared to all recorded bird collisions in Europe (0.84%), and only represents a very small percentage (0.03%) of the common tern population in Europe (BirdLife International, 2025).

5.356 Collision risk analysis has been carried out on flight activity data from the 2022 breeding season.

5.357 Assuming an avoidance rate of 98.0%, there was a mean annual collision rate of 0 collisions for every turbine model considered.

5.358 Therefore, collision would not have an appreciable effect on the breeding season population of common tern at the national or county scale, and so no significant effects are likely.

Eurasian teal

5.359 Twelve Eurasian teal collisions have been reported at European wind farms between 2002-2024, with none in GB or Ireland (Dürr, 2025)[120]. Therefore, although there may be other, unpublished reports of collisions of this species, Eurasian teal collisions nevertheless appear to be a relatively uncommon event compared to all recorded bird collisions in Europe (0.06%), and only represents a very small percentage (0.001%) of the Eurasian teal population in Europe (BirdLife International, 2025).

5.360 Collision risk analysis has been carried out on flight activity data from the 2021 and 2023 breeding seasons, and 2022/23 winter season.

5.361 Assuming an avoidance rate of 98.0%, there was a mean annual collision rate of 0.02 collisions (approximately one collision every 50 – 44 years) predicted, depending on the turbine model considered.

5.362 This has been assessed in the context of the ROI and county breeding and wintering populations (there are no designated nature conservation sites within the ZOI for Eurasian teal). For information on the populations see **Table 5-15**.

5.363 If realised, the predicted collision rates of 0.02 birds per year would result in a 0.00005% increase on background mortality for both breeding and wintering ROI populations (i.e. same for all candidate turbines).

5.364 If realised, the predicted collision rates of 0.02 birds per year would result in a 0.001% increase on background mortality for both breeding and wintering county populations (i.e. same for all candidate turbines).

5.365 Therefore, collision would not have an appreciable effect on the breeding and wintering season population of Eurasian teal at the national or county scale, and so no significant effects are likely.

Eurasian woodcock

5.366 Twenty-three Eurasian woodcock collisions have been reported at European wind farms between 2002-2024, with none in GB or Ireland (Dürr, 2025)[120]. Therefore, although there may be other, unpublished reports of collisions of this species, Eurasian woodcock collisions nevertheless appear to be a relatively uncommon event compared to all recorded bird collisions in Europe (0.11%), and only represents a very small percentage (0.0002%) of the Eurasian woodcock population in Europe (BirdLife International, 2025).

5.367 Collision risk analysis has been carried out on flight activity data from the 2021/22 winter season.

5.368 Assuming an avoidance rate of 98.0%, there was a mean annual collision rate of 0 collisions predicted for all turbine models considered.

5.369 Therefore, collision would not have an appreciable effect on the resident population of Eurasian woodcock at the national or county scale, and so no significant effects are likely.

European golden plover

5.370 Forty-seven European golden plover collisions have been reported at European wind farms between 2002-2024, with none in GB or Ireland (Dürr, 2025)[120]. Therefore, although there may be other, unpublished reports of collisions of this species, European golden plover collisions nevertheless appear to be a relatively uncommon event compared to all recorded bird collisions in Europe (0.23%), and only represents a very small percentage (0.004%) of the European golden plover population in Europe (BirdLife International, 2025).

5.371 Collision risk analysis has been carried out on flight activity data from the 2023 breeding season.

5.372 Assuming an avoidance rate of 98.0%, there was a mean annual collision rate of 0 collisions predicted for all turbine models considered.

5.373 Therefore, collision would not have an appreciable effect on the breeding population of European golden plover at the national or county scale, or those from Owenduff / Nephin Complex SPA, and so no significant effects are likely.

Great cormorant

5.374 Thirty-two great cormorant collisions have been reported at European wind farms between 2002-2024, with one in GB (none in Ireland) (Dürr, 2025)[120]. Therefore, although there may be other, unpublished reports of collisions of this species, great cormorant collisions nevertheless appear to be a relatively uncommon event compared to all recorded bird collisions in Europe (0.15%), and only represents a very small percentage (0.004%) of the great cormorant population in Europe (BirdLife International, 2025).

5.375 Collision risk analysis has been carried out on flight activity data from the 2022/23 winter season.

5.376 Assuming an avoidance rate of 98.0%, there was a mean annual collision rate of 0.02 collisions (approximately one collision every 60 – 42.86 years) predicted, depending on the turbine model considered.

5.377 This has been assessed in the context of the ROI and county wintering populations. While great cormorant is an SCI for Inishglora and Inishkeeragh SPA, it is designated for its breeding population, and as only birds in the non-breeding season were considered for collision risk at the Main Wind Farm Development Site, there can be no effects on the SPA breeding population. There is no risk to this species during the breeding season. For information on the populations see **Table 5-15**.

5.378 If realised, the predicted collision rates of 0.02 birds per year would result in a 0.005 - 0.007% increase on background mortality for wintering ROI populations.

5.379 If realised, the predicted collision rates of 0.02 birds per year would result in a 0.03 - 0.04% increase on background mortality for wintering county populations.

5.380 Therefore, collision would not have an appreciable effect on the wintering population of great cormorant at the national or county scale, or on the breeding population at Inishglora and Inishkeeragh Islands SPA, and so no significant effects are likely.

Greenland white-fronted goose

5.381 Six white-fronted goose collisions have been reported at European wind farms between 2002-2024, with none in GB or Ireland (Dürr, 2025)[120]. Therefore, although there may be other, unpublished reports of collisions of this species, Greenland white-fronted goose collisions nevertheless appear to be a relatively uncommon event compared to all recorded bird collisions in Europe (0.03%), and only represents a very small percentage (0.001%) of the Greenland white-fronted goose population in Europe (BirdLife International, 2025).

5.382 Collision risk analysis has been carried out on flight activity data from the 2022/23 winter season.

5.383 Assuming an avoidance rate of 99.8%, there was a mean annual collision rate of 0.04 – 0.05 collisions (approximately one collision every 25 – 21.43 years) predicted, depending on the turbine model considered.

5.384 This has been assessed in the context of the ROI and county wintering populations. It has not been assessed for the Termoncarragh Lake and Annagh Machair SPA population, because there is no ecological connectivity between the Proposed Project and the SPA, as the SPA is 13.3 km from the Main Wind Farm Development Site and the core foraging range for Greenland white-fronted goose is 5-8 km. For information on the populations see **Table 5-15**.

5.385 If realised, the predicted collision rates of 0.04 – 0.05 birds per year would result in a 0.002% increase on background mortality for wintering ROI populations (i.e. same for all candidate turbines).

5.386 If realised, the predicted collision rates of 0.04 – 0.05 birds per year would result in a 0.6 - 0.7% increase on background mortality for wintering county populations.

5.387 Therefore, collision would not have an appreciable effect on the wintering population of Greenland white-fronted goose at the national or county scale, and on the wintering population at Termoncarragh Lake and Annagh Machair SPA, and so no significant effects are likely.

Greylag goose

5.388 Thirty-six greylag goose collisions have been reported at European wind farms between 2002-2024, with none in GB or Ireland (Dürr, 2025)[120]. Therefore, although there may be other, unpublished reports of collisions of this species, greylag goose collisions nevertheless appear to be a relatively uncommon event compared to all recorded bird collisions in Europe (0.17%), and only represents a very small percentage (0.007%) of the greylag goose population in Europe (BirdLife International, 2025).

5.389 Collision risk analysis has been carried out on flight activity data from the 2022/23 winter season.

5.390 Assuming an avoidance rate of 99.8%, there was a mean annual collision rate of 0.48 – 0.65 collisions (approximately one collision every 2.1 – 1.55 years) predicted, depending on the turbine model considered.

5.391 This has been assessed in the context of the ROI and county wintering populations. For information on the populations see **Table 5-15**.

5.392 If realised, the predicted collision rates of 0.48 – 0.65 birds per year would result in a 0.08 - 0.1% increase on background mortality for wintering ROI populations (i.e. same for all candidate turbines).

5.393 If realised, the predicted collision rates of 0.48 – 065 birds per year would result in a 0.3 - 0.4% increase on background mortality for wintering county populations.

5.394 Therefore, collision would not have an appreciable effect on the wintering population of greylag goose at the national or county scale, and so no significant effects are likely.

Hen harrier

5.395 Thirty hen harrier collisions have been reported at European wind farms between 2002-2024, with five in GB and one in Ireland (Dürr, 2025)[120.] Therefore, although there may be other, unpublished reports of collisions of this species, hen harrier collisions nevertheless appear to be a relatively uncommon event compared to all recorded bird collisions in Europe (0.14%), and only represents a very small percentage (0.03%) of the hen harrier population in Europe (BirdLife International, 2025).

5.396 Collision risk analysis has been carried out on flight activity data from the 2022 breeding season, and 2022/23 and 2023/24 winter season.

5.397 Assuming an avoidance rate of 99%, there was a mean annual collision rate of 0 collisions predicted for all turbine model considered.

5.398 Therefore, collision would not have an appreciable effect on the breeding and wintering population of hen harrier at the national or county scale, and so no significant effects are likely.

Kittiwake

5.399 Twenty-three black-legged kittiwake collisions have been reported at European wind farms between 2002-2024, with none in GB or Ireland (Dürr, 2025)[120], with most at offshore wind farms. Therefore, although there may be other, unpublished reports of collisions of this species, black-legged kittiwake collisions nevertheless appear to be a relatively uncommon event compared to all recorded bird collisions in Europe (0.06%), and only represents a very small percentage (0.0003%) of the black-legged kittiwake population in Europe (BirdLife International, 2025).

5.400 Collision risk analysis has been carried out on flight activity data from the 2023 breeding season.

5.401 Assuming an avoidance rate of 98.0%, there was a mean annual collision rate of 0 collisions predicted for all turbine models considered.

5.402 Therefore, collision would not have an appreciable effect on the breeding and wintering population of kittiwake at the national or county scale, and so no significant effects are likely.

Herring gull

5.403 One thousand two hundred and three herring gull collisions have been reported at European wind farms between 2002-2024, with 51 in GB and one in Ireland (Dürr, 2025)[120]. Therefore, although there may be other, unpublished reports of collisions of this species, herring gull collisions nevertheless appear to be a relatively common event compared to all recorded bird collisions in Europe (5.79%); however, this only represents a very small percentage (0.1%) of the herring gull population in Europe (BirdLife International, 2025).

5.404 Collision risk analysis has been carried out on flight activity data from the breeding 2021, 2022 and 2023 seasons, and 2021/22, 2022/23 and 2023/24 winter seasons.

5.405 Assuming an avoidance rate of 98%, there was a mean annual collision rate of 0.12 – 0.15 collisions (approximately one collision every 8.11 – 6.49 years) predicted, depending on the turbine model considered.

5.406 This has been assessed in the context of the ROI and county breeding and wintering populations, as well as Inishglora and Inishkeeragh SPA breeding population, and Inishkea Islands SPA breeding population. For information on the populations see **Table 5-15**.

5.407 If realised, the predicted collision rates of 0.12 – 0.15 birds per year would result in a 0.01% increase on background mortality for both breeding and wintering ROI populations (i.e. same for all candidate turbines).

5.408 If realised, the predicted collision rates of 0.12 – 0.15 birds per year would result in a 0.1 - 0.2% increase on background mortality for both breeding and wintering county populations.

5.409 If realised, the predicted collision rates of 0.12 – 0.15 birds per year would result in a 0.7 – 0.8% increase on background mortality for Inishglora and Inishkeeragh SPA breeding populations.

5.410 If realised, the predicted collision rates of 0.12 – 0.15 birds per year would result in a 0.6 - 0.8% increase on background mortality for Inishkea Islands SPA breeding populations.

5.411 Therefore, collision would not have an appreciable effect on the breeding and wintering population of herring gull at the national or county scale, or on the breeding populations at Inishglora and Inishkeeragh SPA, and Inishkea Islands SPA, and so no significant effects are likely.

Lesser black-backed gull

5.412 Three hundred and seventy-two lesser black-backed gull collisions have been reported at European wind farms between 2002-2024, with one in GB (none in Ireland) (Dürr, 2025)[120]. Therefore, although there may be other, unpublished reports of collisions of this species, lesser black-backed gull collisions nevertheless appear to be a relatively uncommon event compared to all recorded bird collisions in Europe (1.8%), and only represents a very small percentage (0.47%) of the lesser black-backed gull population in Europe (BirdLife International, 2025).

5.413 Collision risk analysis has been carried out on flight activity data from the breeding 2021, 2022 and 2023 seasons, and 2022/23 and 2023/24 winter seasons.

5.414 Assuming an avoidance rate of 98%, there was a mean annual collision rate of 0.15 – 0.18 collisions (approximately one collision every 6.67 – 5.50 years) predicted, depending on the turbine model considered.

5.415 This has been assessed in the context of the ROI and county breeding and wintering populations, as well as Inishglora and Inishkeeragh SPA breeding population. For information on the populations see **Table 5-15**.

5.416 If realised, the predicted collision rates of 0.15 – 0.18 birds per year would result in a 0.01 - 0.02% increase on background mortality for both breeding and wintering ROI populations.

5.417 If realised, the predicted collision rates of 0.15 – 0.18 birds per year would result in a 0.3 - 0.4% increase on background mortality for both breeding and wintering county populations.

5.418 If realised, the predicted collision rates of 0.15 – 0.18 birds per year would result in a 1.3 – 1.6% increase on background mortality for Inishglora and Inishkeeragh SPA breeding populations.

5.419 If realised, the predicted collision rate of 0.15 – 0.18 birds per year would result in a likely maximum of 5.25 – 6.3 deaths over the 35-year lifespan of the Proposed Project.

5.420 Based on current population trends for breeding lesser black-backed gull (-43% decline between 2020 to 2023; Harris et al, 2024),[116] the Inishglora and Inishkeeragh SPA breeding population could be smaller by scores of birds over the next 35 years under a 'future baseline scenario' i.e. without the Proposed Project.

5.421 Thus, the likely maximum number of deaths due to the Proposed Project would only result in a marginal increase in the rate of population decline for this species within the Inishglora and Inishkeeragh SPA and would not hinder any conservation actions undertaken for the recovery of the population.

5.422 Therefore, collision would not have an appreciable effect on the breeding and wintering population of herring gull at the national or county scale, or on the breeding populations at Inishglora and Inishkeeragh SPA, and so no significant effects are likely.

Mallard

5.423 Four hundred and nine mallard collisions have been reported at European wind farms between 2002-2024, with none in GB or Ireland (Dürr, 2025)[120]. Therefore, although there may be other, unpublished reports of collisions of this species, mallard collisions nevertheless appear to be a relatively common event compared to all recorded bird collisions in Europe (2%); however, it only represents a very small percentage (0.007%) of the mallard population in Europe (BirdLife International, 2025).

5.424 Collision risk analysis has been carried out on flight activity data from the breeding 2021, 2022 and 2023 seasons.

5.425 Assuming an avoidance rate of 98%, there was a mean annual collision rate of 0.05 – 0.06 collisions (approximately one collision every 20 – 16.67 years) predicted, depending on the turbine model considered.

5.426 This has been assessed in the context of the ROI and county breeding and wintering populations (there are no designated nature conservation sites for mallard within the ZoI). For information on the populations see **Table 5-15**.

[116] Harris, S.J., Baker, H., Balmer, D.E., Bolton, M., Burton, N.H.K., Caulfield, E., Clarke, J.A.E., Dunn, T.E., Evans, T.J., Hereward, H.R.F., Humphreys, E.M., Money, S. and O'Hanlon, N.J. 2024. Seabird Population Trends and Causes of Change: 1986–2023, the annual report of the Seabird Monitoring Programme. BTO Research Report 771. British Trust for Ornithology, Thetford.

5.427 If realised, the predicted collision rates of 0.15 – 0.18 birds per year would result in a 0.00007 - 0.0009% increase on background mortality for both breeding and wintering ROI populations.

5.428 If realised, the predicted collision rates of 0.15 – 0.18 birds per year would result in a 0.01% increase on background mortality for both breeding and wintering county populations (i.e. same for all candidate turbine models).

5.429 Therefore, collision would not have an appreciable effect on the breeding and wintering population of mallard at the national or county scale, and so no significant effects are likely.

Merlin

5.430 Four merlin collisions have been reported at European wind farms between 2002-2024, with none in GB or Ireland (Dürr, 2025)120. There are no records of merlin collisions in Ireland between 2007-2019 within the Irish R.A.P.T.O.R report (NPWS, 2019).

5.431 Therefore, although there may be other, unpublished reports of collisions of this species, merlin collisions appears to be a relatively uncommon event compared to all recorded bird collisions in Europe (0.02%) and only represents a very small percentage (0.01%) of the merlin population in Europe (BirdLife International, 2025).

5.432 Collision risk analysis has been carried out on flight activity data from the 2023 breeding seasons, and 2021/22 winter seasons.

5.433 Assuming an avoidance rate of 98%, there was a mean annual collision rate of 0 collisions predicted for all turbine models considered.

5.434 Therefore, collision would not have an appreciable effect on the breeding and wintering population of merlin at the national or county scale, or in Ownenduff / Nephin Complex SPA, and so no significant effects are likely.

Peregrine falcon

5.435 Forty-eight peregrine falcon collisions have been reported at European wind farms between 2002-2024, with one in GB (none in Ireland) (Dürr, 2025)[120]. There are no records of peregrine collisions in Ireland between 2007-2019 within the Irish R.A.P.T.O.R report (NPWS, 2019).102

5.436 Therefore, although there may be other, unpublished reports of collisions of this species, merlin collisions appears to be a relatively uncommon event compared to all recorded bird collisions in Europe (0.23%) and only represents a very small percentage (0.15%) of the peregrine population in Europe (BirdLife International, 2025).

5.437 Collision risk analysis has been carried out on flight activity data from the 2022/23 winter seasons.

5.438 Assuming an avoidance rate of 98%, there was a mean annual collision rate of 0 – 0.01 collisions (approximately one collision every 300 – 150 years) predicted, depending on the turbine model considered.

5.439 This has been assessed in the context of the ROI and county wintering populations (there are no designated nature conservation sites for peregrine falcon within the ZoI). For information on the populations see **Table 5-15**.

5.440 If realised, the predicted collision rates of 0 – 0.01 birds per year would result in a 0.002 - 0.004% increase on background mortality for both breeding and wintering ROI populations.

5.441 If realised, the predicted collision rates of 0 – 0.06 birds per year would result in a 0.03 - 0.01% increase on background mortality for both breeding and wintering county populations.

5.442 Therefore, collision would not have an appreciable effect on the wintering population of peregrine falcon at the national or county scale, and so no significant effects are likely.

Whooper swan

5.443 Ten whooper swan collisions have been reported at European wind farms between 2002-2024, with none in GB or Ireland (Dürr, 2025)[120]. Therefore, although there may be other, unpublished reports of collisions of this species, whooper swan collisions nevertheless appear to be a relatively uncommon event compared to all recorded bird collisions in Europe (0.05%), and only represents a very small percentage (0.02%) of the whooper swan population in Europe (BirdLife International, 2025).

5.444 Collision risk analysis has been carried out on flight activity data from the 2021/22 and 2022/23 winter seasons.

5.445 Assuming an avoidance rate of 99.5%, there was a mean annual collision rate of 0.13 – 0.15 collisions (approximately one collision every 7.69 – 6.25 years) predicted, depending on the turbine model considered.

5.446 This has been assessed in the context of the ROI and county wintering populations. It has not been assessed for the Termoncarragh Lake and Annagh Machair SPA population, because there is no ecological connectivity between the Main Wind Farm Development Site and the SPA, as the SPA is 13.3 km from the Main Wind Farm Development Site and the core foraging range for whooper swan is 5 km. For information on the populations see **Table 5-15**.

5.447 If realised, the predicted collision rates of 0.04 – 0.05 birds per year would result in a 0.005% increase on background mortality for wintering ROI populations (i.e. same for all candidate turbines).

5.448 If realised, the predicted collision rates of 0.04 – 0.05 birds per year would result in a 0.1% increase on background mortality for wintering county populations (i.e. same for all candidate turbines).

5.449 Therefore, collision would not have an appreciable effect on the wintering population of whooper swan at the national or county scale, and on the wintering population at Termoncarragh Lake and Annagh Machair SPA, and so no significant effects are likely.

Collision and aviation lighting

5.450 Aviation lighting is dictated by the requirements of the Irish Aviation Authority (IAA) and the Department of Defence (DOD). Therefore, for the purposes of collision risk it is assumed static lights will be present on the turbines as part of this assessment and collision related effects on birds have been assessed in this context and the Applicant has committed to installing lighting in accordance with their requirements.

5.451 According to NatureScot (2024) the effect of wind turbine lighting on birds is not well understood, although studies at communication towers and other structures show that lighting can attract birds (phototaxis) and in some circumstances result in significant collision mortality.[105]

5.452 There are a few limited situations which give rise to increased collision risk including where turbines are proposed on or adjacent to protected areas that host large concentrations of wintering waterbirds, and in particular, burrow nesting seabirds (i.e. petrels, shearwater and Atlantic puffin) (NatureScot, 2024). The guidance goes on to say that nocturnally migrating passerines may also be at risk of collision; however, for all other species, there is little published evidence which suggests that lights on turbines are likely to present an existential risk to the viability of species populations, at any spatial scale.

5.453 Blacksod Bay/Broad Haven SPA is located approximately 0.07 km from the Main Wind Farm Development Site and is designated for wetland and waterbirds. Other SPAs designated for waterbirds are also present in the wider area as detailed in **Table 5-15**. Therefore, there is potential for aviation lighting at the Main Wind Farm Development Site to result in increased collision risk; however, no burrow nesting seabirds or passerines are listed as special conservation interests for any SPAs in close proximity.

5.454 The nearest SPAs where either of these groups are listed as special conservation interests are Inishglora and Inishkeeragh SPA (14.4 km) and Duvillaun Islands SPA (15.3 km), which both have storm petrel listed as a special conservation interest. Given the distances between the two SPAs and the Main Wind Farm Development Site, it is unlikely that aviation lighting would be sufficiently visible to attract storm petrel and raise collision risk for this species.

Nocturnal migration and collision risk

5.455 As recommended by NatureScot (2025) and (2024) guidance, nocturnal migration was accounted for in the collision risk modelling by assuming additional levels of nocturnal flight activity for species with diurnal flights.[19] [105]

5.456 Nocturnal flight activity could not be modelled for species with no recorded diurnal flights, i.e. where bioacoustics monitoring recorded evidence of the species but they were not recorded during diurnal flight activity surveys. These species included IEF birds barnacle goose, lapwing and oystercatcher.

5.457 However, it is very unlikely that nocturnal collision risk will have any appreciable effects on the populations for these species since the number of calls were one, four and one, respectively. Assuming these call numbers represented numbers of individual birds, the levels of flight activity would be so low, that any effects of collision risk would be negligible.

Indirect Effects

5.458 If hydrocarbon spills during the operation of the Proposed Project lead to pollution of wetland habitats and/or dewatering of groundwater-dependent habitats within nearby designated nature conservation sites for birds, it could result in indirect habitat loss for qualifying bird species. The same is true for wetland sites that could be used by bird species from nearby designated nature conservation sites, even if those wetland sites are not designated themselves.

5.459 Any differences between the range of turbine permutations assessed will result in negligible changes to the indirect effects assessment for IEF birds, as the potential for hydrocarbon spills or dewatering is independent from the turbine permutation chosen.

Bats

Direct Effects

5.460 The bat activity survey data – autumn 2023, and spring and summer 2024 recorded high risk species within the Main Wind Farm Development Site as determined by the NatureScot, 2021 guidelines[36] namely:

- Common pipistrelle, and
- Soprano pipistrelle.

5.461 Direct effects are assessed for all bat species recorded within the Main Wind Farm Development Site.Potential direct effects include:

- collision with wind turbines; and

- barotrauma (injuries to internal air cavities and blood vessels caused by sudden changes in air pressure behind a moving blade).

5.462 Bat species likely to be at risk from these two effects relates to the likelihood that the species will fly at PCHs in an open landscape. The probability of direct impacts is higher when a turbine is located near a habitat feature such as a hedgerow, treeline or forest edge. NatureScot (2021) guidance requires that vegetation is cleared to reduce the proximity of such habitat features to operational wind turbines, reducing the probability of direct effects on bats.[36] This will be undertaken for the Proposed Development. The potential for any likely effects has been considered within the context of this 'good-practice' mitigation. Felling will take place in the construction phase, with smaller scale vegetation removal required throughout the operational phase (see below for indirect effects on bats).

5.463 Bat activity within the Main Wind Farm Development Site is, as expected, highest in proximity to habitat features that are assessed as being suitable for foraging and commuting bats, i.e. forestry edge habitat.

5.464 The results from the EcoBat assessment shows that low baseline for bat activity was observed across the Main Wind Farm Development Site, with just 7 high-activity nights, 11 moderates, and the remainder low to low-moderate. The percentile comparisons against reference data further support this, with soprano pipistrelles showing the highest activity levels, though still <30%. The static detector breakdowns are also clear and informative. Therefore, the EcoBat analysis does not provide any indication that the Main Wind Farm Development Site is of any particular importance for bats in a broader context. Full details of the EcoBat results per static location and overall can be found in **Technical Appendix 5.3**.

5.465 An assessment of direct effects is provided for each bat species recorded during surveys below.

5.466 Any differences between the range of turbine permutations assessed will result in negligible changes to the direct collision effects assessment for IEF bats. This is because the differences in potential collision heights are very small.

Common and soprano pipistrelle

5.467 Common pipistrelle and soprano pipistrelle populations are thought to be at high risk of direct effects from operational turbines (NatureScot, 2021).[36] Both species typically use woodland/plantation edge, scrub, treelines and hedgerows for foraging and commuting. Some of the proposed infrastructure is close to or involves the removal or trimming of these features. In Europe, 3,401 and 494 fatalities were recorded for common pipistrelle and soprano pipistrelle between 2002-2023, respectively, with 46 and 52 recorded in the UK (Dürr, 2023). Therefore, relative to all recorded bat collisions in Europe, common and soprano pipistrelle collisions are relatively uncommon (0.37% and 0.41%, respectively). Mathews et al. (2016) found that both pipistrelle species were most recorded as fatalities at operational wind farms in the UK (34.59% and 39.1% of total fatalities, respectively).[117]

5.468 The overall risk was calculated based on species' population vulnerability to wind farms and the site risk level (based on habitat features present and the size of the Proposed Project).

5.469 Overall, common pipistrelle and soprano pipistrelle populations are classified as having 'medium vulnerability' to wind farm developments, which is assumed to be equivalent to

[117] Mathews, F., Richardson, S. M., Wray, S., Spann, N., Gillings, S., Aughney, T., & Jones, N. (2016). The National Bats & Wind Turbines Project: Bat activity at wind turbines and collision risk in Britain. Natural England Commissioned Reports No. 204.

Ecobat activity category of 'moderate – 3'. Combined with a site risk level of 'high - 4', this gave an overall risk assessment of 'medium - 12' for common pipistrelle and soprano pipistrelle.

5.470 Some of the infrastructure proposed for the Proposed Project is close to or overlaps with features used for foraging and commuting.

5.471 Soprano pipistrelle calls dominated each of the survey seasons, particularly at detector locations D.02, D.03, D.04, D.10 and D.11 during spring, D.04 and D.10 in the summer and D.04, D.07 and D.10 in the autumn. Please refer to **Technical Appendix 5-3** for a map of the detector locations. It is considered that these bats are utilising the forestry edge habitat and wetland areas at these locations as a foraging resource and there appears to be connectivity along these linear features to the known roost and to the wider area. Soprano pipistrelles feed in habitats associated with water, either over open water or along the edges of lakes and rivers. Location D.10 returned the highest level of activity during spring and autumn. This could be used as a route to commute from hibernation to maternity roost inland to the east. During spring there were 85 social calls identified of which 77 were the soprano pipistrellus. Social calls associated with foraging competition have been observed in *Pipistrellus spp*. (Barlow and Jones, 1997; Corcoran and Conner, 2014; Wright et al., 2014) and the use of in-flight social calls is also used to attract mates as has been observed in *Pipistrellus pipistrellus* (Lundberg and Gerell, 1986).[118] [119] [120] [121]

5.472 As mentioned above, soprano pipistrelles were recorded across the Main Wind Farm Development Site, during all deployments in 2024 and were the most active species within the Main Wind Farm Development Site. There were a total of 12,610 soprano pipistrelles calls in 2024 detected throughout the three deployments. Common pipistrelles were the third most active species at the Main Wind Farm Development Site with a total of 147 calls in 2024 this is the total recorded throughout the three deployments. Common pipistrelles are known to forage frequently the same habitat types as soprano with the soprano favouring the water features and the common favouring trees and woodland.

5.473 **Technical Appendix 5.3.** The data analysis indicates that soprano pipistrelles were recorded as having low to moderate activity levels across all deployments except for D.10 which indicated high activity both during the spring and autumn season.[123] The moderate activity is at the following locations:

- Spring: D.02, D.03, D.04 and D.11.
- Summer: D.03 and D.10.
- Autumn: D.4 and D.07.

5.474 A common mean activity occurrence happens at D.03 and D.04 on all three deployments. The area at D.03 has a dense Sitka spruce forestry alongside a drainage ditch, while the

[118] Barlow, K. E., & Jones, G. (1997). Function of *Pipistrellus pipistrellus* social calls: field data and a playback experiment. *Animal Behaviour, 53*(5), 991–999.

[119] Corcoran, A. J., & Conner, W. E. (2014). Bats jamming bats: food competition through sonar interference? *Science, 346*(6210), 745–747.

[120] Wright, G. S., Wilkinson, G. S., & Moss, C. F. (2014). Social calls predict foraging success in big brown bats (*Eptesicus fuscus*). *Current Biology, 24*(8), 910–914.

[121] Lundberg, K., & Gerell, R. (1986). Territorial advertisement and mate attraction in the bat *Pipistrellus pipistrellus*. *Ethology, 71*(2), 115–124.

area at D.04 also has Sitka spruce forestry running along the forestry track (i.e. linear edge habitat) these areas would be of moderate foraging and commuting potential as per Collins *et al.* (2016), which explains the constant mean activity of Sopranos in these areas.[122]

5.475 Common pipistrelles had low activity levels overall with a slight increase during the autumn season at D.04. The male bats usually roost singly or in small groups through the summer months however during the main mating period from July to early September, common pipistrelle males defend individual territories as mating roosts. They attract females by making repeated 'song flights' around their roost and singing social calls. See **Technical Appendix 5.3** for further details.

5.476 Without mitigation, operational phase impacts are likely to have significant effects on common and soprano pipistrelle populations at the local level.

Leisler's

5.477 Leisler's bat activity was low during all deployments and at all locations and no Leisler's were recorded during the emergence surveys. Leisler's bats frequently fly at heights greater than all other species and are also less reliant on the use of linear features thereby increasing their risk of turbine collision. Turbine locations at D.03 and D.13 recorded greatest Leisler's bat activity throughout the 2024 deployment. Leisler's like to forage above the tree canopy, in the open spaces their prey consists mainly of medium-small swarming insects, particularly dung flies. The presence of cattle within the Main Wind Farm Development Site supports an environment suitable for dung fly eggs which once hatched provide a steady flow of food production for the Leisler's to feed on.

5.478 Without mitigation, operational phase impacts are unlikely to have significant effects on Leisler bat populations, given the very low levels of flight activity at the Main Wind Farm Development Site.

Myotis species

5.479 During the 2024 survey period a total of 458 calls were recorded for Myotis sp. across the total three deployment periods. They were mainly of low activity at all the detector locations during each of the three seasons. Myotis species include Daubenton's bats, the Natterer's bats and the whiskered bats. Daubenton's bats are strongly associated with river catchments, particularly lowland rivers. Natterer's bats prefer semi-natural broadleaved woodland and are considered a "cluttered habitat" species but also use open pasture. Whiskered bats prefer riparian mixed woodlands (Roche and Torsney, 2021).[123] The Owenmore River with an ecological status value as good lies approximately 3 km west of the Main Wind Farm Development Site and approximately 7 km northeast lies the Carrowmore Lake complex Special Area of Conservation (SAC) and southeast another rich wetland habitat (River Moy SAC). The proximity and wide range of freshwater habitats rich in resources of higher foraging potential and shelter compared to Main Wind Farm Development Site is most likely attracting and sustaining the Myotis sp.

5.480 Without mitigation, operational phase impacts are unlikely to have significant effects on Myotis species populations, given the very low levels of flight activity at the Main Wind Farm Development Site.

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[122] Collins, J. (Ed.). (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd ed.). London: Bat Conservation Trust.

[123] Roche, N., & Torsney, A. (2021). *Identification Guide to Ireland's Bats*. Wexford, Ireland: National Biodiversity Data Centre. 60 pp. ISBN 978-1-911172-13-0

Brown long-eared bat

5.481 It is acknowledged that accurately monitoring brown long-eared activity can prove quite difficult as this species is known to make low amplitude calls and frequently forage using their eyes or ears rather than echolocation (Collins, 2016 and Russ, 2012).[128] [124] As a result, brown long-eared bats are frequently underrepresented in surveys which rely on the use of bat detectors. The brown long eared bats preferred habitat is in old buildings such as churches with large attic spaces and the species also make use of broadleaf trees as summer roosts, brown long eared bats are loyal to the one roost and return year after year (Roche and Torsney, 2021).[129] While brown long-eared bats prefer to feed in woodland areas, they will also feed in scrub habitats, along treelines/hedgerows (Russ and Montgomery, 2002) however, there were low numbers recorded of this species on the Main Wind Farm Development Site with relatively few building structures of which none would be suitable for the brown long-eared bat species[125]. There were no records of brown long-eared bats during emergence surveys. This, coupled with the moderate suitability indicated in NBDC records and the low county-wide activity reported from the species-specific three-year monitoring programme (Aughney, Langton, & Roche, 2011)[126] suggests the species is likely to be present only at low levels in the study area. Without mitigation, operational phase impacts are unlikely to have significant effects on brown long-eared bat populations, given the very low levels of flight activity at the Main Wind Farm Development Site.

Indirect Effects

5.482 Indirect effects due to operational lighting could disturb or displace roosting or foraging bats. However, lighting on the turbines themselves will be minimal. There will be lighting poles at the Proposed Substation, which could displace light-sensitive bat species, although this is likely to affect only those foraging along hedgerows. This, coupled with the absence of any nearby light-sensitive roosts, means the overall risk of displacement is low. The only roost identified is 300m from the site for soprano pipistrelle which are not light sensitive.

5.483 Leisler's bat, and common and soprano pipistrelle, are less sensitive to light disturbance than the other species of bat recorded at the Main Wind Farm Development Site (Myotis species and brown long-eared bat). Common and soprano pipistrelles were the most frequently recorded bats.

5.484 Overall, indirect effects on bats are unlikely to be significant.

Terrestrial Mammals (Excluding Bats)

Direct Effects

5.485 Inappropriately timed vegetation removal for bat mitigation buffers could result in direct impacts on breeding or resting sites for arboreal (red squirrel and pine marten) or ground-dwelling mammals (badger and hedgehog). As shown in **Section 5.248** onwards, there were no mammal breeding or resting sites recorded during the surveys within or in any

[124] Russ, J. (2012). *British Bat Calls: A Guide to Species Identification*. Exeter, UK: Pelagic Publishing.

[125] Russ, J. M., & Montgomery, W. I. (2002). Habitat associations of bats in Northern Ireland: implications for conservation. *Biological Conservation, 108*(1), 49–58.

[126] Aughney, T., Langton, S., & Roche, N. (2011). *Brown long-eared bat roost monitoring scheme for the Republic of Ireland: Synthesis report 2007–2010* (Irish Wildlife Manuals No. 56). National Parks & Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin.

proximity to the bat mitigation buffers. If vegetation within the buffers requires removal (e.g. re-vegetation of Sitka spruce saplings), then it is unlikely that it will be suitable for breeding Irish hare, which prefer grassland or bracken habitats.

5.486 Therefore, it is unlikely there will be any significant direct effects on badger, red squirrel, pine marten or hedgehog.

5.487 Any differences between the range of turbine permutations assessed will result in negligible changes to the direct effects predicted for IEF mammals, as the timing of vegetation removal is independent from the turbine permutation chosen.

Indirect Effects

5.488 Badgers are tolerant of operational wind farms, with little disturbance/displacement, from the turbines themselves or personnel, because they are nocturnal and most personnel are active during the day, thereby avoiding direct contact. Similarly, many mammals, such as pine marten, red squirrel and Irish hare are thought to habituate to low levels of noise from operational turbines (Helldin et al., 2012).[127]

5.489 Of more importance is vegetation removal for bat mitigation buffers, which could result in short-term displacement of foraging, commuting, or sheltering mammals in any adjacent areas. However, given the fact that PAW habitats are likely to be preferentially used (and will not be felled), plus an abundance of suitable displacement habitats in the wider area, this is unlikely to occur.

5.490 Hibernating hedgehogs could be disturbed by vegetation removal activities, causing them to wake from hibernation prematurely. This could cause mortality, especially if sufficient food is unavailable. For hedgehog, there could be significant indirect effects due to disturbance at the local scale. For badger, pine marten, red squirrel and Irish hare, no significant effects are likely.

5.491 Any differences between the range of turbine permutations assessed will result in negligible changes to the indirect effects predicted for IEF mammals as there are likely no significant differences in the levels of noise, levels of personnel present or amount of foraging/commuting/sheltering habitat predicted to be lost regardless of the turbine permutation chosen.

Other Protected Fauna

Direct and Indirect Effects

5.492 No direct or indirect impacts on common frog, smooth newt and marsh fritillary butterfly are predicted during the operational phase. This is because proposed infrastructure has been deliberately located to avoid the marsh fritillary butterfly breeding area and so no effects of habitat loss due to maintenance of bat felling buffers will occur. No known common frog and smooth newt breeding areas are located within the Main Wind Farm Development Site.

5.493 Any differences between the range of turbine permutations assessed will result in no changes to the direct and indirect effect assessment for IEF ‘other fauna’.

[127] Aughney, T., Langton, S., & Roche, N. (2011). *Brown long-eared bat roost monitoring scheme for the Republic of Ireland: Synthesis report 2007–2010* (Irish Wildlife Manuals No. 56). National Parks & Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin

Fisheries and Aquatic Ecology

Direct Effects

5.494 No IEF aquatic habitats or species are located within the Main Wind Farm Development Site, therefore it is unlikely there will be any significant direct effects during the operational phase.

5.495 Any differences between the range of turbine permutations assessed will result in no changes to the direct effect assessment for IEF fish and aquatic ecology.

Indirect effects

5.496 Potential indirect effects include release of suspended solids or hydrocarbons into watercourses, which could travel downstream to IEFs including brown trout, European eel, and otter. The same secondary effects therefore apply as described for the construction phase.

5.497 In the absence of mitigation, there could be significant effects on brown trout, European eel, and otter at the county/regional scale.

5.498 Any differences between the range of turbine permutations assessed will result in negligible changes to the indirect effects predicted for IEF fish and aquatic ecology, as the potential accidental release of pollutants into watercourses is independent from the turbine permutation chosen.

Potential Decommissioning Phase

5.499 Decommissioning will involve removal of above-ground infrastructure and reinstatement of disturbed areas. As such, no additional permanent habitat loss is anticipated during this phase.

5.500 Some effects are predicted to be similar to the effects described for the construction, including, disturbance or displacement to IEF birds, bats and mammals via increased noise levels/light levels/presence of construction workers, ground clearance works and reinstatement. This is due to similar activities taking place as for the construction phase. Surface water quality could also be affected via ground disturbance, refuelling and accidental release of hazardous materials stored onsite, which could affect IEF designated nature conservation sites and fish/aquatic ecology. Invasive plants could also be spread, which could affect habitats.

5.501 Other effects are also predicted to be like the construction phase (as similar activities will take place) but of slightly lower magnitude, for instance, there will be no excavation of turbine foundations they will be left in situ, which will be left in situ and covered with soil for reinstatement, which will result in a smaller area of habitats being lost. Building materials will not be required and access tracks will also remain, subject to planning permission.

5.502 For brevity, a full list of effects is given in the Potential Construction Phase Effects section and it is assumed that the decommissioning phase will have similar effects to those identified during the construction phase.

5.503 Any differences between the range of turbine permutations assessed will result in negligible changes to the effects assessed for all IEF receptors during the decommissioning phase, as set out for the construction phase, because any differences in habitat loss, disturbance or displacement, or accidental pollution will be very small between the range of turbine permutations.

Cumulative Effects

5.504 A desktop-based planning search spanning 10 years within a radius of 20 km of the Main Wind Farm Development Site was undertaken. A 20 km search area was used in recognition that 20 km is the maximum distance SPA QI bird species typically travel (NatureScot, 2016) and is also recommended by the Irish Wind Energy Association (IWEA)[128]. This distance was extended to search for any offshore wind farms off the west coast of Ireland. It is important to note that this was undertaken because of the coastal nature of the Main Wind Farm Development Site and the approach was supported by the NPWS in our formal consultation processes. Please refer to Consultations section, including **Table 5-3** for more information.

5.505 Sources consulted consisted of the EIA portal, SEAI Wind Atlas, An Coimisiún Pleanála and Mayo County Council planning list. This formed our cumulative list of developments. Further refinement was undertaken to ascertain developments within this list. These refinements, which have the potential to give rise to significant cumulative effects, included:

- All onshore wind farms and cable route planning applications within 20 km where the planning status is known to be at consultation stage, submitted or granted.
- All offshore wind farms and cable route planning applications along the west coast of Ireland from Galway to Donegal which extends beyond 200 km where the planning status is submitted or granted, it is noted that 20 km is that standard distance used for considering wind farms, but a larger distance was used to account for offshore wind farms considering the coastal nature of the Main Wind Farm Development Site.
- All infrastructural projects which are known to be proposed, submitted, granted, or operational and utilising the same road networks that are proposed by the Proposed Project.
- All quarries and solar farms within 2 km of the Main Wind Farm Development Site red line boundary which are known to be proposed, submitted or granted.
- All Strategic Infrastructure and Strategic Housing Developments which are known to be proposed, submitted or granted within 20 km where the same road network would be utilised, and
- All Strategic Housing Development and Large-Scale Residential Developments which are known to be proposed, submitted or granted within 5 km of the Main Wind Farm Development Site.

5.506 There are a number of wind farm projects identified in the area surrounding the Main Wind Farm Development Site, the closest of which is the Bunnahowen Onshore Wind Farm 3.8 km northeast of the Main Wind Farm Development Site. Oweninny Wind Farm and Sheskin Onshore Wind Farm are 17 km and 20 km from the Main Wind Farm Development Site(respectively). In addition, an extension application for Sheskin Wind Farm has also been submitted. Sceirde (Skerd) Rocks offshore Wind Farm off the coast of Galway is noted to have a capacity of 450 MW however, its status is currently ‘dormant’ and recently,

[128] NatureScot. (2016). Assessing connectivity with Special Protection Areas (SPAs) in the context of wind farm developments: Guidance on defining search areas for bird species. NatureScot, Scottish Natural Heritage.

Fuinneamh Sceirde Teoranta (FST) confirms that it will no longer proceed with the development of Sceirde Rocks Wind Farm. This site is over 126 km SW of the Main Wind Farm Development Site and therefore there are no cumulative impacts identified due to the distance between the sites combined with the fact the development will no longer proceed. All of these are detailed with their planning reference number in **Table 5-17**; with further breakdown of the environmental considerations below per project.

5.507 It is noted that the closest offshore wind turbine is a proposed single turbine at the Atlantic Marine Energy Test Site which is approximately 6 km NW of the Main Wind Farm Development Site with a potential capacity of 10 MW. This is a concept wind farm and is at the early stages of planning.

Table 5-17: Projects considered for Cumulative Impacts

Applicant / Development name	Planning Register Reference	Development description	Status
Bunnahown Wind Farm	Mayo County Council Reg. Ref. 081997 and amendments 18873	Wind farm consisting of 3 no. wind turbines and associated ancillary infrastructure	Operational
Sheskin Wind Farm (Phase 1)	Mayo County Council Reg. Ref. 15825	Wind farm consisting of 8 no. wind turbines and associated ancillary infrastructure	Operational
Sheskin South Wind Farm	An Bord Pleanála Case reference PA16.315933	Proposed wind farm consisting of 18 no. wind turbines and associated ancillary infrastructure	Granted permission March 2024
Lackan Wind Farm	Planning reference: ABP PL21.203388 Extension to life planning reference: ABP PL21.315917.	Wind farm consisting of 3 no. wind turbines and associated ancillary infrastructure	Operational
Burtonport Harbour Single Turbine	No planning reference available on Planning Portal.	Single turbine	Operational
Oweninny Wind Farm (Phase 1) and 2)	Mayo County Council Reg. Ref. 012542 and An Bord Pleanála Case reference PA16.PA0029	Wind farm consisting of 60 no. wind turbines and associated ancillary infrastructure	Operational
Oweninny Wind Farm (Phase 3)	An Bord Pleanála Case reference PA16.316178	Proposed wind farm extension consisting of 18 no. wind turbines and associated ancillary infrastructure	To be determined
Bellacorrick Wind Farm	Unknown (wind farm was constructed in 1992 and thus outdates planning application searches).	Wind farm consisting of 18 no. wind turbines and associated ancillary infrastructure	Decommissioned
Corvoderry Wind Farm	Mayo County Council Reg. Ref. 11/838	Consented wind farm consisting of 10 no. wind turbines and associated ancillary infrastructure	Permitted - Not Operational
Dooleeg More Wind Farm	Mayo County Council Reg. Ref. 092590	Single turbine	Permitted - Not Operational

Potential Construction Phase Cumulative Impacts

5.508 Likely cumulative effects resulting from the construction phase consist of water quality changes to watercourses draining the Proposed Development and disturbance/displacement of nesting common kestrel.

5.509 With regards to changes in water quality, other existing or proposed projects could have an additive or incremental effect on water quality over the short term. In the absence of mitigation, these effects have the potential to be significant for both downstream nature conservation sites (e.g. the Blacksod Bay and Broadhaven, Owenduff catchment) and aquatic receptors (e.g., brown trout, European eel, and otter).

5.510 There are no operational, consented or proposed projects with direct hydrological connectivity to the Proposed Development. Although some hydrogeological connections are present, these are remote and weakly coupled, and therefore unlikely to give rise to any meaningful interaction with groundwater associated with the Proposed Project – furthermore It is important to note that, **Chapter 7** of this EIAR does not identify any significant groundwater interactions.

5.511 The main sources of effects on water quality due to the Proposed Development are likely to be due to run-off from bare ground exposed by felling to create bat mitigation buffers. Any effects are likely to be short-term, as the areas will re-vegetate. If any infrastructure is poorly designed, engineered or constructed, increased runoff and sedimentation could occur from turbine hardstands and access tracks. Similarly, if reinstatement works along the GCR Corridor are not undertaken correctly, then they could pose a risk to watercourses and aquatic receptors. Service vehicles could also accidentally spill small volumes of hydrocarbons when accessing the operational Proposed Project.

5.512 Without mitigation the Proposed Development alone could potentially have significant negative effects on downstream designated nature conservation sites (Mullet/Blacksod Bay Complex SAC and Blacksod Bay/Broad Haven SPA) and receptors including otter and salmon. The same is true when considered in combination with other projects or plans.

5.513 European sites are considered fully in the NIS submitted with the planning application. The conclusion of the NIS is that, with mitigation, there will not be an adverse effect on the integrity of any European sites because of the Proposed Project in combination with all other projects and plans. In EIA terms, this means there are no likely significant cumulative effects on European sites.

5.514 The projects considered most likely to be constructed at the same time as the Proposed Project are those in the planning system that are not yet consented.

5.515 Potential direct effects include the loss of natural watercourses due to watercourse crossings and the placement of culverts, water quality degradation, the diversion of natural watercourses, increased suspended solids/hydrocarbons/cement leachate within watercourses inside the Proposed Development and the loss of freshwater habitats due to removal or blockage of watercourses. The watercourses in the vicinity of the Proposed Project (inclusive of the GCR & TDR) are typically heavily modified lowland channels (straightened, deepened, realigned) draining blanket bog or higher gradient/higher energy upland channels (prone to spate). Significant siltation (primarily from peat escapement), and less so eutrophication, was evident throughout much of the survey area. Over half of the survey sites were evaluated of at least **local importance (higher value)** in terms of their aquatic ecology given the presence of fish of high conservation value and or Q4 (good status) water quality. Sites P1, P2, P3 and P4 were evaluated as **county importance** given the presence of Annex I aquatic habitats. Sites E2 on the River Deel and E3 on the

Ballisodare River were evaluated as being of **international importance** given their locations within the River Moy SAC (002298) and Unshin River SAC (001898), respectively. None of these features were directly on site or adjacent to the Main Wind Farm Development Site.

5.516 There are no Section 4 discharges to water linked to the watercourses that drain from the Main Wind Farm Development Site within a 40 km instream distance.

5.517 There are also no sites with an Industrial Emissions (IE) licence that drain to watercourses that drain from the Main Wind Farm Development Site within a 40 km instream distance.

5.518 Overall, considering the existing effects of diffuse water pollution and in the absence of mitigation for the Proposed Project, secondary cumulative effects on freshwater ecology are likely to be significant for brown trout, European eel, and otter at the county / regional scale.

5.519 In accordance with standard EIA practice, the potential significance of cumulative effects is first considered in the absence of mitigation to establish baseline risk. Under this theoretical scenario, concurrent construction of other consented or proposed projects could give rise to significant negative cumulative effects on water quality. However, this scenario does not represent the expected outcome, as required mitigation measures will be implemented by each project (including the Proposed Project), and with such measures in place, no significant cumulative effects are predicted.

5.520 With regards to nesting common kestrel, other proposed, consented or existing projects could also cause disturbance and/or displacement to this species. Nesting common kestrel were not identified at any of the projects for cumulative impact listed in **Table 5-17.** Therefore, cumulative impacts with regards to nesting common kestrel cannot occur.

Potential Operational Phase Cumulative Impacts

5.521 Operational impacts may occur because of the turbines, hardstands, access track and Proposed Substation. As the GCR will be located underground, there will be no operational impacts due to underground cabling/ducting.

5.522 The proposed lifespan of the Proposed Project is 35 years, therefore for ornithology and bat receptors, the duration of effects is likely to be long-term. As the footprint of the Proposed Development is within a landscape highly modified by agriculture and forestry, any effects due to habitat loss are fully reversible, as most habitats due to be lost are also highly modified i.e. Cutover heavily drained peatlands and conifer plantations.

5.523 In the absence of mitigation, possible cumulative impacts from the operational phase consist of:

- collision risk and barrier effects on sensitive bird populations, and
- collision risk impacts on bat populations.

Birds

5.524 Likely significant cumulative effects on birds are limited to those occurring due to the Proposed Development and other wind farms. These effects are:

- displacement,
- collision, and
- barrier effect.

Bunnahowen Wind Farm

5.525 Bunnahowen Wind Farm is a three-turbine wind farm located approximately 3.8 km northeast of the Main Wind Farm Development Site. It became operational in 2018.

5.526 According to the EIAR written in 2008 no bird surveys were undertaken.

5.527 In terms of collision risk no quantitative assessment was undertaken, so no quantitative cumulative collision risk assessment is possible.

5.528 Nonetheless there is the potential for significant cumulative effects to occur in combination with the Proposed Development for bird species that are present both at the Proposed Development Bunnahowen – the species identified in our CRM are therefore considered.

5.529 Given the separation distance, there is no realistic potential for significant in-combination barrier effects or operational displacement upon IEF bird species.

Oweninny Windfarm Phase 1 and 2

5.530 Oweninny Wind Farm (Phase 1 and 2) (Planning reference: ABP: PA0029) comprises a total of 60 wind turbines (29 in Phase 1 and 31 in Phase 2).

5.531 The EIAR for the project provides detail of the ecological context – particularly the suitability for bird species. It details that the site supports an important diversity of bird species that is characteristic of western blanket bog, wetland habitats and forest/scrub: 29 birds of conservation importance, 21 are amber list; many occur in small numbers and on an occasional basis. The EIAR prepared for the project describes the wider ecological context of the site, including its suitability for a range of bird species associated with blanket bog, wetland and scrub habitats. While this information is relevant in establishing baseline ecological conditions, the Appropriate Assessment focuses specifically on those bird species that have been screened in to Stage 2 on the basis of potential effects on European sites. The overlapping species between the Proposed Development and the other project are:

- Greenland white-fronted goose (Anser albifrons flavirostris).
- Common gull (Larus canus).
- Merlin (Falco columbarius).

5.532 Accordingly, the Stage 2 assessment is confined to those SCI species for which pathways for effect have been identified and assessed in detail within this NIS, including species potentially susceptible to collision risk, disturbance, displacement or barrier effects in relation to relevant SPAs. Species not screened in to Stage 2, including hen harrier, are therefore not considered further in the context of the integrity assessment, as no plausible pathways for adverse effects on European sites have been identified for these receptors.

5.533 The ABP Inspectors report concluded the following:

"the likely residual effects of the project on flora and fauna would not be significant".

5.534 The Oweninny Wind Farm is located approximately 17 km from the Proposed Development, placing it at the outer edge of the spatial scale at which cumulative effects might reasonably be considered. However, significant in-combination effects are not predicted as operational displacement of SCI bird species is not anticipated at the Main Wind Farm Development Site. Baseline surveys indicate that the site does not support important foraging, roosting or breeding habitat for SCI species, and usage by species such as common gull, Greenland white-fronted goose and merlin was low and infrequent. As such, the Proposed Development is not expected to result in displacement of these species from habitats of

importance. In the absence of displacement effects, there is no mechanism by which cumulative impacts could arise for species recorded at both sites.

Oweninny Phase 3

5.535 Oweninny Phase 3 is a proposed wind farm extension consisting of 18 turbines.

5.536 According to the EIAR, the following target bird species, which are also considered for CRM in the current assessment, were recorded during flight activity surveys: kestrel, golden plover, lesser black-backed gull and whooper swan.

5.537 Collision risk modelling yielded the following predictions:

- Kestrel: 0.09 collisions/year.
- Golden plover: 5.29 collisions/year.
- Lesser black-backed gull: 0.03 collisions/year.
- Whooper swan: 0.11 collisions/year.

5.538 Therefore, there is the potential for significant cumulative effects to occur in combination with the Proposed Development for bird species that are present both at the Proposed Development and Oweninny Phase 3 Wind Farm as a result of collision (kestrel, golden plover, lesser black-backed gull and whooper swan).

Sheskin Wind Farm

5.539 Sheskin Wind Farm is an eight-turbine wind farm located approximately 20 km northeast of the Proposed Development. It became operational in 2023 (Planning reference: 15825).

5.540 Given the separation distance, there is no realistic potential for significant in-combination barrier effects or operational displacement upon IEF bird species.

5.541 According to the EIS written in 2015 to support the planning application, the following target SCI bird species, which are also considered at stage 2 of the current assessment, were recorded during flight activity surveys: Greenland white-fronted goose, cormorant, curlew, lesser black-backed gull and merlin. In terms of collision risk no quantitative assessment was undertaken, so no quantitative in-combination collision risk assessment is possible.

5.542 The EIS stated that:

> *'the risk of significant fatalities of birds at the operational wind farm is extremely low' and that 'very limited swan and geese activity has been recorded', which translated into 'a low risk of collision'.*

5.543 This chapter also stated:

> *"However, despite the low risk there is potential and the impact could result in fatality."*

5.544 Therefore, there is the potential for significant cumulative effects to occur in combination with the Proposed Development for bird species that are present both at the Main Wind Farm Site and Sheskin Wind Farm as a result of collision (whooper swan, Greenland white-fronted goose, cormorant, golden plover, curlew, snipe, teal, lesser black-backed gull, peregrine falcon, kestrel and merlin).

Sheskin South Wind Farm

5.545 Sheskin South Wind Farm is a proposed 21-turbine extension to the operational Sheskin Wind Farm, location just over 20 km northeast.

5.546 Given the separation distance, there is no realistic potential for significant cumulative barrier effects or operational displacement upon IEF bird species.

5.547 According to the EIAR written in 2023 to support the planning application, the following target bird species, which are also considered in the current assessment, were recorded during flight activity surveys: kestrel, merlin and snipe.

5.548 Collision risk modelling yielded the following predictions:

- Kestrel: 0.037 collisions/year (long-term slight negative effect);
- Merlin: 0.002 collisions/year (imperceptible effect); and
- Snipe: 0.037 collisions/year (long-term slight negative effect).

5.549 Therefore, there is the potential for significant cumulative effects to occur in combination with the Proposed Development for bird species that are present both at the Proposed Development and Sheskin South Wind Farm as a result of collision (common kestrel, common snipe and merlin).

Lackan Wind Farm

5.550 Lackan Wind Farm is an operational three-turbine wind farm, located just over 53 km northeast (Planning reference: ABP PL21.203388). This application was for an extension of life application to keep the project powered.

5.551 Given the separation distance, there is no realistic potential for significant in-combination barrier effects or operational displacement upon IEF bird species which have been identified to have collision risk from the Proposed Development alone. Moreover, the primary reason significant in-combination displacement effects are not predicted is that no operational displacement of IEF bird species is anticipated at the Main Wind Farm Development Site. In the absence of displacement effects, there is no mechanism by which cumulative displacement impacts could arise for species recorded at both sites.

5.552 The original documents were not available for the project but in the extension of like EIAR written in 2022 by Keohane Geological and Environmental Consultancy to support the planning application, the following target bird species, which are also considered for CRM, in the current assessment, were recorded during flight activity surveys: kestrel, cormorant, herring gull and lesser black-backed gull.

5.553 Carcass searches carried out from 2007 to 2022 found no evidence of collisions for any bird species.

5.554 Therefore, there is no potential for cumulative impacts occurring with the Proposed Development.

Burtonport Harbour Single Turbine

5.555 There is no planning information for this single turbine and no data available on whether any target bird IEF species were recorded in the vicinity of the same. Given the large separation distance between the turbine and Proposed Development (c. 131 km direct-line distance) and that it is only a single turbine, there is no potential for cumulative impacts occurring with the Proposed Development.

Bellacorrick Wind Farm

5.556 Bellacorick Wind Farm is located on Oweninny Bog near Bellacorick, County Mayo, approximately 20 km east of the Proposed Development. It was Ireland's first commercial wind farm and comprised of 21 turbines. It is a decommissioned former operational

development, with decommissioning finalised in January 2026. Therefore, there is no potential for cumulative effects.

Corvoderry Wind Farm

5.557 Corvoderry Wind Farm is a planning-consented wind farm development located on Oweninny Bog approximately 20 km east of the Proposed Development. Planning permission was granted under Mayo County Council Reg. Ref. 11/838 for 10 wind turbines. This permission expired in October 2022 and the project has not been constructed to date. It forms part of the Oweninny WF development detailed above instead.

Dooleeg More Wind Farm

5.558 Dooleeg Moore Wind Farm is a proposed single-turbine wind energy development located approximately 25 km southeast of the Proposed Development (Planning reference: Mayo County Council Reg. Ref. 092590). The development has not been constructed therefore is not operational. Therefore, there is no potential for cumulative effects.

Cumulative collision risk

5.559 Where collision risk has been analysed quantitatively, the number of collisions per year can be summed together to obtain an estimate of cumulative collision risk. This is the most usable approach for assessing cumulative collision risk and is recommended by NatureScot (2018) guidance;[66] however, it may not reflect biological realism and can leave to individual errors being compounded (Humphreys et al., 2016).[129]

5.560 The approach of summing together the number of collisions has been undertaken in below in **Table 5-18** for IEF birds present at the Main Wind Farm Development Site where collision risk modelling has been undertaken. It must be acknowledged that these cumulative estimates are likely to over-represent collision risk, as all flights within 500 m of the turbines were included for collision risk modelling. Similarly, assessment is based on adult rather than juvenile survival (lower survival rates mean that any deaths due to collision with turbines is likely to have less of an effect on a population) and so the realised risk to avian populations is likely to be less. Avoidance rates used are highly precautionary and the default 98% avoidance rate used (see **Technical Appendix 5.8** Collision Risk Model Results) is not based on empirical evidence. Again, this is likely to produce an overestimate of true collision risk.

5.561 For all the avian IEFs mentioned above (common kestrel, common snipe and merlin), it is unlikely there will be any cumulative significant effects due to the operation of the Proposed Project, based on the results set out in **Table 5-18** below. Consequently, with respect to all bird species, the Proposed Project would not be contrary to Ireland's obligations under the Birds Directive, Regional Policy Objective 7.22 (targets for, inter alia, protected species), nor the MCDP policies such as Policy NEP - 4 (To conserve and enhance the county's biodiversity and ecological connectivity identified areas of local biodiversity importance (Local Biodiversity Areas) in the town and villages in Mayo) and NEO – 4 (To protect and enhance biodiversity and ecological connectivity in County Mayo, including woodlands, trees, hedgerows, seminatural grasslands, rivers, streams, natural springs, wetlands, stone

[129] Humphreys, E.M., Masden, E.A., Cook, A.S.C.P. & Pearce-Higgins, J.W. (2016) *Review of Cumulative Impact Assessments in the context of the onshore wind farm industry*. Scottish Windfarm Bird Steering Group Commissioned Report number 1505. 75pp

- walls, geological and geo-morphological systems, other landscape features and associated wildlife where these form part of the ecological network).

5.562 Cumulative effects on SPAs are fully considered within the NIS submitted with the planning application. The conclusion from the NIS was that, with mitigation, there would not be an adverse effect on the integrity of any European sites because of the Proposed Project in combination with all other projects and plans. In EIA terms, this means there are no likely significant cumulative effects on European sites.

5.563 Any differences between the range of turbine permutations assessed will result in negligible changes to the direct cumulative collision effects assessment for IEF birds. This is because the differences in potential collision heights are very small.

Table 5-18: Cumulative Collision Risk for Birds

Species	Modelled Collisions per Year				Significance for Cumulative Collision Risk
	Proposed Project	Oweninny Phase 3	Sheskin South Wind Farm	Cumulative	
Golden plover	0	5.29	n/a	5.29	The Proposed Development predicts an annual collision risk of 0 birds per year. Therefore, collision risk can't be significant as a result of the Proposed Project.
Kestrel	1.05 – 1.19	0.09	0.037	1.18 – 2.127	Not significant at any scale
Lesser black-backed gull	0.15 – 0.18	0.03	n/a	0.18 – 0.21	Not significant at any scale
snipe	0.07 – 0.09	n/a	0.037	0.11 - 0.13	Not significant at any scale
Merlin	0	n/a	0.002	0	Not significant at any scale
Whooper swan	0.13 – 0.15 collisions per year	0.11	n/a	0.24 – 0.26	Not significant at any scale

Bats

5.564 Without mitigation, the additive effects of the Proposed Development in combination with other wind farms and single turbines in the surrounding area could increase collision risk for some bat species, particularly high collision-risk species such as common pipistrelle and soprano pipistrelle. Although Leisler's bat and Nathusius' pipistrelle are also considered higher collision-risk species, both were recorded at low levels during baseline surveys.

5.565 Any differences between the range of turbine permutations assessed will result in negligible changes to the direct cumulative collision effects assessment for IEF bats. This is because the differences in potential collision heights are very small.

5.566 Predicting bat behaviour around turbines post-construction is inherently uncertain (Richardson et al., 2021)[133]. Predicting bat behaviour around turbines post-construction is inherently uncertain (Richardson et al., 2021). However, multi-year monitoring at the Main Wind Farm Development Site indicates that bat activity is dominated by soprano pipistrelle, with occasional records of Myotis spp., Leisler's bat, brown long-eared bat and common pipistrelle. Activity levels across the site are generally low and are concentrated primarily along plantation edges, treelines and other linear vegetated features, while open bog habitats record markedly lower activity. In the absence of mitigation, there remains a risk that individual bats could collide with turbines. Given the relatively low levels of activity

recorded across the site, the dominance of common species and the limited occurrence of higher collision-risk species, any resulting mortality would be unlikely to affect the viability or conservation status of local bat populations. On this basis, the cumulative effect on local bat populations is predicted to be **not significant in EIA terms**.

Potential Decommissioning Phase Cumulative Impacts

5.567 These will be like the construction phase and/or of lower magnitude.

Mitigation and Monitoring

5.568 Potential cumulative impacts during the decommissioning phase would be similar in nature to those identified for the construction phase but are expected to be of lower magnitude and shorter duration. Cumulative impacts could arise where decommissioning activities coincide with other projects or land uses within the surrounding area, such as operational wind farms. Potential cumulative effects may include temporary increases in construction traffic, noise and disturbance, temporary habitat disturbance associated with removal of infrastructure, and potential sediment release during ground works. However, decommissioning activities will be temporary and localised, and the scale of ground disturbance will be substantially less than during the construction phase. As such, the potential for cumulative impacts during the decommissioning phase is considered limited.

Mitigation by Avoidance

5.569 The Proposed Development has undergone design iterations and evolution in response to the constraints identified as part of the baseline studies and field studies so as to avoid potential effects on receptors where possible.

5.570 In identifying and avoiding IEFs, the Proposed Development has implemented 'avoidance of impact' measures, also known as embedded mitigation. Mitigation by avoidance is viewed as part of the 'Reasonable Alternatives' outlined in **Chapter 3**.

Mitigation Measures During Construction Phase

Designated Nature Conservation Sites, Fisheries and Aquatic Ecology

5.571 Mitigation measures to prevent adverse effects on downstream European sites during construction are provided in full in the NIS submitted with the planning application and are the same as those outlined below (also submitted with this Planning Application). These will ensure no deterioration in the quality of water entering the Mullet/Blacksod Bay Complex SAC, Owenduff/Nephin Complex SAC, Blacksod Bay/Broad Haven SPA, Owenduff/Nephin Complex SPA, Termoncarragh Lake and Annagh Machair SPA, Inishglora and Inishkeeragh SPA, Duvillaun Islands SPA and Inishkea Islands SPA and will ensure there will be no impacts on any of the habitats to support the QIs and SCI species. The same is true for IEF non-QI aquatic habitats and species.

5.572 Consequently, with respect to all downstream European sites and aquatic ecology receptors, the Proposed Development will not be contrary to Ireland's obligations under the Habitats and Birds Directives, nor the Mayo County Development Plan Policy CPO 12.1, 12.4, 12.13, 12.24, 12.48, 12.51, 12.54 and 12.58, and MCDP HER Pol 28, 32, 35 and Obj 35, or give rise to any significant effects due to hydrology impacts.

5.573 To mitigate potential impacts during the construction phase, best practice construction methods will be implemented to prevent water (surface water and groundwater) pollution. Examples of these measures are the storage of potentially polluting materials in fully

bunded tanks and controlling / reducing runoff from hardstand areas. Good practice measures will be applied in relation to pollution risk, sediment management and management of surface runoff rates and volumes. These measures are expanded upon below.

5.574 A CEMP (**Technical Appendix 2-1** found in Volume 3 of this EIAR) has been developed for the Proposed Development to ensure adequate protection of the environment. All personnel working on the Proposed Development will be responsible for the environmental control of their work and will perform their duties in accordance with the requirements and procedures of the final CEMP.

5.575 During the construction phase, all works associated with the construction of the Proposed Development will be undertaken in accordance with the guidance contained within CIRIA Document C741 'Environmental Good Practice on Site' (CIRIA, 2015). Any groundwater encountered will be managed and treated in accordance with CIRIA C750, 'Groundwater control: design and practice' (CIRIA, 2016).

Mitigation Measures Addressing Identified Sources of Effects During Construction

5.576 The mitigation below is structured to directly address the identified direct and indirect sources of ecological effects. Hydrology and water-quality measures are implemented through **Chapter 7** and the CEMP (**Technical Appendix 2-1** found in Volume 3 of this EIAR); only the elements with ecological relevance are summarised here.

Vegetation Clearance, Earthworks and Excavations

5.577 To minimise habitat loss, fragmentation and disturbance the CEMP details specific measures to address the following:

- Vegetation clearance will be limited to the minimum footprint required.
- Woodland, treeline and hedgerow trimming will follow seasonal constraints to protect nesting birds and roosting bats.

5.578 Root protection zones and exclusion fencing will be implemented to prevent unnecessary encroachment into retained habitats.

- Excavations for cables and turbine bases will incorporate silt fences, cut-off drainage and rapid reinstatement to prevent sediment release to watercourses.
- Stockpiles and construction zones will be fenced to avoid accidental overspill into adjacent habitats.

Bird Specific Construction Control Measures

5.579 To avoid widespread disturbance to birds, access will be restricted to the footprint of the proposed works corridor. Mitigation measures proposed in **Section 5.580** onwards will prevent deterioration of water quality and adverse effects on any birds relying on downstream habitats.

5.580 The following mitigation measures will be implemented to avoid damage and destruction (and disturbance to sensitive species) to occupied bird nests:

- clearance of woodlands and uncultivated vegetation i.e. trees and hedgerows (including vegetation removal for creation/maintenance of bat mitigation buffers), will be undertaken outside the main breeding season from March to September inclusive,

- if other site clearance and construction activities are required to take place during the main breeding bird season, pre-commencement confirmatory survey work will be undertaken to ensure that nest destruction and disturbance is avoided. This will include the implementation of disturbance-free buffers,
- once vegetation has been removed from the works corridor, these areas will be retained in a condition that limits suitability for nesting birds for the remainder of the construction phase. Cover for ground nesting species will be made unsuitable by cutting vegetation or tracking over with an excavator,
- implementation of a 30 km/h134 speed limit within the 200 m buffer zone for nesting kestrel during the breeding season,
- haulage vehicles will not drive within the 200 m buffer zone for nesting kestrel during dawn and dusk, which are key hunting periods for this species, during the breeding season, and
- a suitably experienced ECoW will be employed for the duration of the construction period to make contractors aware of the ornithological sensitivities of the Proposed Development and to undertake confirmatory surveys for nesting birds throughout the construction period, enforcing exclusion areas as required.

5.581 Consequently, with respect to all bird species, the Proposed Project would not be contrary to Ireland's obligations under the Birds Directive, Regional Policy Objective 7.22 (targets for, inter alia, protected species), nor the MCDP policies such as Policy NEP - 4 (To conserve and enhance the county's biodiversity and ecological connectivity identified areas of local biodiversity importance (Local Biodiversity Areas) in the town and villages in Mayo), nor NEO – 4. (To protect and enhance biodiversity and ecological connectivity in County Mayo, including woodlands, trees, hedgerows, seminatural grasslands, rivers, streams, natural springs, wetlands, stone - walls, geological and geo-morphological systems, other landscape features and associated wildlife where these form part of the ecological network).

Temporary Construction Infrastructure

5.582 Temporary works areas will be sited on previously disturbed or low-value habitats where possible and reinstated post-construction. Drainage controls, settlement measures and buffers will prevent runoff from entering sensitive habitats. Lighting will be directional and time-limited to reduce disturbance to bats and birds.

Stockpiling and Material Handling

5.583 To prevent sediment entrainment and habitat degradation the CEMP (**Technical Appendix 2-1** found in Volume 3 of this EIAR) details specific measures to address the following:

- Stockpiles will be stored >50 m from watercourses and stabilised by covering or seeding.
- Silt fencing will be installed at the downslope edges of stockpiles.
- Fine sediment handling will avoid periods of heavy rainfall.
- Material placement will be managed to avoid compaction of sensitive habitats and prevent encroachment beyond the defined working area.

Dust, Air Quality and Deposition

5.584 Dust suppression measures will be implemented consisting of water misting, covering loads and restricting vehicle speeds which will protect vegetation, prevent smothering of bryophytes and lichens, and reduce the risk of dust entering aquatic systems.

Surface Water Runoff, Hydrology and Pollution Control

5.585 The following measures will be implemented:

- SuDS-based drainage to attenuate and treat runoff.
- Full separation of clean and dirty water.
- Settlement lagoons, silt traps, check dams, diffusion drainage.
- Controlled refuelling, bunded storage and designated washout areas.
- Groundwater level monitoring and protective measures near GWDTEs.

5.586 These mitigation measures prevent sediment release, hydrocarbon contamination, alkaline leachate from concrete, and altered hydrological pathways that could impact aquatic habitats, fish spawning areas, macroinvertebrate communities, peatland vegetation and downstream designated nature conservation sites.

Risk of Spread of Invasive Species

5.587 A dedicated PRP and HMP has been prepared (**Technical Appendix 5-5**) which provides details on how all invasive species will be managed throughout the lifespan on the project. This includes the control of Rhododendron and Prickly Heath which were identified on site. Additionally, the CEMP details how the spread will be prevented during construction with measures such as strict plant and machinery clean-down procedures (high-pressure wash, disinfect, dry), a check-clean-dry protocol to prevent crayfish plague, and biosecurity controls for material importation. See CEMP for further details.

Disturbance from Construction Activity

5.588 Works will follow best practice to minimise unnecessary noise and avoid lighting spill. Lighting will be shielded, directional and used only when required. Construction activity will be constrained where necessary to avoid sensitive periods for birds (breeding, overwintering) and bats. The ECoW will advise on timing to minimise disturbance to mammals, birds and aquatic fauna.

Oversight, Monitoring and Adaptive Management

5.589 A comprehensive programme of ecological oversight will ensure effective implementation:

- The Ecological Clerk of Works (ECoW) will conduct daily inspections of watercourses, habitats and mitigation measures.
- The Water Quality Monitoring Plan (for further detail see Chapter 7) will provide baseline, during-construction and post-construction data on water chemistry and ecological indicators (fish, macroinvertebrates).
- The Private Water Supply Action Plan protects local receptors through monitoring, communication and contingency supply (part of the CEMP).

- Any deviation from expected trends will trigger inspection, corrective action and reporting under the Environmental Incident and Emergency Response Plan Environmental Incident Response Plan (part of the CEMP).

Additional construction phase measures

5.590 In addition to the biodiversity-specific measures outlined above, a wider suite of construction-phase controls is set out in **Chapter 7** and the CEMP (**Technical Appendix 2-1**). The CEMP details a range of good practice measures will be implemented to mitigate pollution prevention measures (as set out in Section 6 of the CEMP) and Drainage and Surface Water Management (as set out in Section 7 of the CEMP). These measures involve protocols related to environmental incident and emergency response plans, re-fuelling and spillage procedures, siltation avoidance measures etc. Including the maintenance and monitoring of silt traps etc.

5.591 These include detailed provisions for fluvial flood management, groundwater protection, drainage design, and construction-phase water control. While primarily hydrological in function, these measures also contribute positively to ecological protection by maintaining natural flow regimes, preventing hydromorphological change, safeguarding GWDTEs, and reducing the potential for downstream effects on aquatic habitats. The biodiversity assessment relies on these measures as part of the embedded mitigation framework for the project.

Post Construction Works Restoration – Habitat and Species Management plan

Habitat And Species Management Plan

5.592 The Habitat and Species Management Plan (HMP), provided as **Technical Appendix 5-5**, sets out a restoration-led mitigation and compensation strategy focused on degraded blanket bog systems. It aims to offset habitat loss associated with the Proposed Project while delivering measurable biodiversity and carbon gains. The approach is based on hydrological restoration, vegetation recovery, and long-term ecological management, supported by adaptive monitoring over the operational lifespan of the development (35 years).

5.593 The plan prioritises re-wetting and functional recovery of peatlands, recognising hydrology as the key driver of ecosystem condition, alongside targeted measures for species protection and invasive species control. A range of integrated, site-scale interventions are proposed. These include peatland hydrological restoration through drain blocking, ditch infilling, and zipping techniques to raise water tables and restore natural flow pathways, with target water levels close to the surface to support peat-forming conditions.

5.594 Peatland restoration is further supported by reprofiling and surface works, including hag reprofiling to stabilise exposed peat faces and ground smoothing to restore natural microtopography, particularly in former forestry areas. Excavated peat will be re-used on site for restoration and reinstatement, minimising peat loss and associated carbon emissions.

5.595 Vegetation management measures include scrub clearance and ongoing control of scrub and conifer regeneration to maintain open bog conditions, alongside reliance on natural regeneration of peatland vegetation, with targeted re-vegetation applied only where

necessary. Invasive alien plant species will be removed using mechanical or, where required, chemical methods, supported by appropriate biosecurity and follow-up treatment to prevent re-establishment.

5.596 The plan also provides for habitat reinstatement following construction, including the restoration of temporary working areas using stored peat and natural regeneration, and the re-establishment of habitat mosaics using locally appropriate seed mixes and planting, with the objective of returning habitats to baseline or improved condition.

Mitigation Measures for Works within Annex I Habitats

5.597 The Habitat and Species Management Plan (HMP), provided as **Technical Appendix 5-5**, includes a comprehensive programme of mitigation and compensation measures specifically targeted at Annex I blanket bog habitats, which are identified as the most ecologically sensitive receptors within the site. These measures focus on the restoration and enhancement of degraded PB4 cutover bog and associated peatland habitats (including PB3 blanket bog, transition mire and flush systems) through hydrological and ecological recovery. Key actions include drain blocking and infilling, zipping of artificial drainage channels, ground smoothing of former forestry areas, and reprofiling of peat cutting faces, all of which are designed to raise and stabilise the water table, reinstate natural peat-forming processes, and promote the recovery of characteristic vegetation such as *Sphagnum* mosses. In addition, scrub clearance and ongoing control of regeneration are implemented to prevent drying and succession to woodland, while invasive species removal reduces competitive pressures on native bog communities.

5.598 Collectively, these measures are intended not only to offset the direct loss of c. 30 ha of bog habitat but to deliver large-scale restoration (c. 200 ha) resulting in a measurable net gain in habitat condition and extent, with associated benefits for biodiversity, carbon sequestration, and hydrological regulation. The restoration of Annex I habitats is also expected to support bog-associated fauna, including breeding birds (e.g. snipe, skylark, meadow pipit) and bat species, through improved habitat quality and prey availability. Overall, the approach represents a process-based, long-term mitigation strategy, where successful re-establishment of peatland function is expected to enhance ecosystem resilience and contribute to wider landscape-scale connectivity of blanket bog habitats.

Birds Reduction in habitat suitability

5.599 The species assessed most likely to move into the newly felled bat mitigation buffer areas putting it at risk of collision with operational turbines is common kestrel.

5.600 Mitigation to limit common kestrel foraging activity around turbines will deter kestrel to ensure no significant effects from collision on this species. This will include the following measures to reduce prey availability in an area of 91.43 m to 105.5 m surrounding each turbine for conifer and 72.1 m to 90.4 m for scrub (this range reflects the dimensions of the turbine permutations assessed):

- creation of uniformly short vegetation heights via infrequent mowing or trimming of vegetation,
- removal of timber/brash from felling and chipping of tree stumps to ground level,
- spread and compaction of chipped wood and spoil to create a flat surface to prevent rapid colonisation of new vegetation, and
- piping/filling over of open field/forestry drains.

Invasive Plants

5.601 A Habitat Management Plan will be used to prevent the spread of invasive and non-native species and is contained in **Technical Appendix 5.5**. These measures will ensure that Rhododendron and Prickly heath will not be spread during construction works.

5.602 A pre-construction confirmatory walkover survey of the works corridor will confirm the presence of any invasive/non-native species that may have escaped into the area since the baseline surveys were conducted. The HMP will be updated if there are any changes to baseline condition.

5.603 The Habitat Management Plan includes a site-wide programme for the eradication and control of invasive alien plant species, recognising the risk of their spread during construction and their capacity to outcompete native vegetation and undermine peatland restoration. Target species include *Rhododendron ponticum*, *Gunnera tinctoria* and *Gaultheria mucronata*, among others. Control measures are primarily based on mechanical removal (pulling, cutting or digging), with all plant material, including roots and contaminated soils, removed from site to prevent re-establishment. Clearance is undertaken prior to flowering/seed set to minimise dispersal, with herbicide treatment applied where necessary for more persistent infestations.

5.604 The approach is supported by ongoing monitoring and follow-up treatment to address regeneration, with the objective of achieving a site free of invasive species over the lifetime of the development. Measures are also implicitly linked to construction-phase management to reduce spread via machinery and soil disturbance. Overall, the strategy aligns with best practice for peatland restoration, although its effectiveness will depend on consistent implementation, biosecurity, and long-term management commitment.

Rare Flora

5.605 No rare flora were recorded during surveys and so no mitigation measures are required.

Terrestrial Mammals (Excluding Bats)

5.606 No mitigation measures are required for mammals as there were no likely significant effects identified.

Bats

5.607 No mitigation measures are required for bats as there were no likely significant effects identified during the construction phase. There will be works undertaken during construction to reduce operational phase impacts – these are detailed in the subsequent section.

Other Protected Fauna

5.608 Amphibian-proof fencing close to any ponds/pools will be used to prevent frogs or smooth newts from accessing any parts of the Main Wind Farm Development Site most hazardous to amphibians during the construction phase.

5.609 Consequently, with respect to other protected fauna, the Main Wind Farm Development Site would not be contrary to Ireland's obligations under the Habitats Directive, Regional Policy Objective 7.22 (targets for, inter alia, protected species), nor the MCDP.

Mitigation Measures During Operational Phase

5.610 For the operational phase elements, the only mitigation measures required relate to long term water quality maintenance and collision risk/species displacement. The long-term impacts on habitats are discussed under construction phase mitigation measures with the long-term HMP plan in **Technical Appendix 5.5** providing the 35-year long term active management strategy.

Designated Nature Conservation Sites, Fisheries and Aquatic Ecology

5.611 Mitigation measures to protect water quality are described in **Chapter 7** of this EIAR and in **Technical Appendix 5.4**. Maintenance of the Proposed Project drainage system will ensure the system is operating effectively and will be undertaken following the CIRIA C697 SuDS and Maintenance Manual. The following mitigation measures will be implemented:

- site access will be restricted by gates to prevent illegal dumping, use by off road vehicles etc., and
- as during construction, any stockpiled material will be within the proposed site compound or a minimum of 50 m from any surface water drainage.

5.612 This will prevent any negative effects on downstream aquatic receptors and designated nature conservation sites. Consequently, with respect to all downstream European sites and aquatic ecology receptors, the Proposed Project would not be contrary to Ireland's obligations under the Habitats and Birds Directives, nor the MCDP.

Birds

Turbine curtailment

5.613 Turbine curtailment will be implemented for birds; this will also be supplemented by ongoing monitoring to ensure the curtailment is having the required impact avoidance regarding significant effects on bird populations.

5.614 Curtailment will be implemented via a system of adaptive management; where appropriate, during 'at-risk' time periods.

5.615 Curtailment for birds is different to curtailment for bats and would involve downtime of the actual turbine. It is possible that technological advances may have identified other options to reduce collision risk and any such measures would also be considered at that time, as appropriate.

5.616 The effectiveness of any adaptive measures will be reviewed against monitoring results and refined as necessary in agreement with NPWS.

5.617 It is important to reiterate that the implementation of curtailment will be amended further where the results of post-commissioning monitoring demonstrate a significant, adverse effect on IEF birds; which is not anticipated as the predicted impact levels are not identified to be significant post curtailment. This would be demonstrated via an assessment of recorded mortality in the light of changes in current conservation status at the time of the monitoring survey, indicating that the Proposed Project is contributing to the decline or hindering restoration efforts for the relevant species.

5.618 Consequently, with respect to all bird species, the Proposed Project would not be contrary to Ireland's obligations under the Birds Directive, Regional Policy Objective 7.22 (targets for, inter alia, protected species), nor the MCDP policies such as Policy NEP - 4 (To

conserve and enhance the county's biodiversity and ecological connectivity identified areas of local biodiversity importance (Local Biodiversity Areas) in the town and villages in Mayo) and NEO – 4 (To protect and enhance biodiversity and ecological connectivity in County Mayo, including woodlands, trees, hedgerows, seminatural grasslands, rivers, streams, natural springs, wetlands, stone - walls, geological and geo-morphological systems, other landscape features and associated wildlife where these form part of the ecological network.).

Surface Water Run Off

345. The initial design for the surface water run off detailed attenuation tanks which would be wetted. However, this would provide an attraction risk for wading birds. Therefore, embedded mitigation measures have been designed such that there are now surface water basins which are peated and vegetated to remove the attraction potential.

346. Surface water runoff from impermeable surfaces will be managed via attenuation basins, designed as functional industrial infrastructure rather than permanent water bodies. These basins will provide the required storage for runoff within their respective compounds while also providing treatment of the water prior to discharge. To mitigate the risk of attracting protected bird species into the turbine sweep path, the basins are designed to be dry-bottomed features with no permanent standing water. The basins will only temporarily store surface water runoff up to a maximum peak depth of 500mm following substantial and prolonged rainfall. The basins will also comprise a minimum 300mm freeboard above the peak water depth. Following such an event, the basins will gradually discharge at a controlled rate over a 24 to 48-hour period until fully emptied. To facilitate this full drainage cycle, the basin outlet will be positioned at the base level to ensure no permanent volume of water is retained. To prevent groundwater interaction, the basins will be lined with a combination of the geosynthetic clay liner (GCL) and natural clay liner and topped with a 300mm soil protection layer. This layer will be seeded to maintain a vegetated dry bank that blends with the surrounding landscape while remaining unattractive as a foraging or nesting habitat for aerial fauna

Bats

5.619 Bat mitigation buffers refers to the felling of vegetation around turbines to make the environment less attractive to bats. This measure will help avoid collision and barotrauma by removing habitat features used by commuting and foraging bats in proximity of turbines.

5.620 NatureScot (2021) guidelines state that a 50 m distance from the blade tips of the turbine to the nearest habitat feature must be maintained free of trees and shrubs for the duration of wind farm operation. The following formula is used:[36]

$$b = \sqrt{(50 + bl)2 - (hh - fh)2}$$

5.621 Where b = buffer radius, bl = blade length, hh = hub height, fh = feature height (all in metres).

5.622 Thus, the buffer radius is given as the horizontal distance from the turbine tower and relates to both the habitat feature height, the turbine hub height and the blade length. Taller habitat features require a larger horizontal buffer radius. Note that feature heights were assumed as the maximum height that could be obtained over the lifespan of the Proposed Project. For conifer and broadleaved plantation habitats and treelines, this height was assumed to be 20 m based on the heights of the conifer plantation during surveys. For scrub, this height was 3 m based on surveys.

5.623 It is important to note that the proposed project has a design flexibility approach with potential for variable turbine diameter and height – all three options stated in **Chapter 2** of this EIAR were considered. In the context of bats – the largest turbine dimension would result in the largest buffer – and therefore the largest potential effect regarding felling etc. For the turbine dimensions, a worst-case scenario was adopted with dimensions from the Nordex 163 candidate turbine adopted i.e. a blade length of 81.5 m and a hub height of 98.5 m. This corresponds to a conifer plantation buffer of 105.5 m, and a scrub buffer radius of 90.4 m. This is a worst-case scenario because it assumes the largest bat felling buffer radiuses i.e. all other permutations within the turbine range will require a smaller buffer radius because of their dimensions.

Turbine curtailment and feathering

5.624 It is predicted that bat mitigation buffers will limit bat activity near turbines, reducing potential collision risk.

5.625 In addition, the following operational mitigation measures for bats will be:

- Feathering of Blades: there is evidence that bat casualties at wind farms are reduced by pitching the blades out of the wind ("feathering") to reduce rotation speeds below 2 r.p.m. while idling. As such, the feathering of blades to prevent 'idling' during low wind speeds is proposed for all turbines based on the results of the post-construction monitoring programme. Feathering will be implemented via a system of adaptive management. Thus, if any significant effects are recorded during post-construction monitoring, feathering will be implemented at the relevant turbines during the bat activity season (April-October) or where temperatures are optimal for bat activity, and
- Curtailment: this involves raising the cut-in speed with associated loss of power generation in combination with reducing the blade rotation below the cut-in speed, as above. This will only occur where feathering below cut-in normal speed (above) will not provide sufficient reduction in risk to bats. The curtailment is achieved by feathering (not the actual braking of the turbine) so that the blades continue to rotate slowly (at ~2 r.p.m. or less). If feathering is not providing sufficient mitigation, curtailment will be implemented via a system of adaptive management. Thus, if any significant effects on bats due to turbine strike are still being recorded during post-construction monitoring following feathering of blades, cut-in speeds will be increased at the relevant turbines during the bat activity season (April-October) or where temperatures are optimal for bat activity.

5.626 The above operational phase measures (feathering of blades or curtailment) will augmented further where the results of post-commissioning monitoring demonstrate notable adverse effect on bats; the monitoring programme is proposed to provide certainty that the above measures have been successful. This would be demonstrated via an assessment of recorded mortality in the light of changes in current conservation status at the time of the monitoring survey, indicating that the Proposed Project is contributing to the decline or hindering restoration efforts for the relevant species.

5.627 It is the conclusion of this assessment that, with the removal of vegetation within the above-referenced buffer zones, that the characteristics of the Proposed Project, for bats, will be highly altered and the turbine locations are unlikely to be suitable for bat activity. Consequently, it is assessed that the implementation of the buffer zones will ensure the avoidance of significant effects on bats and the monitoring programme will ensure any residual collision risk is minimised through curtailment. In the unlikely event of notable fatalities, a further suite of measures will be implemented as set out above.

5.628 Consequently, with respect to all bat species, the Proposed Project would not be contrary to Ireland's obligations under the Habitats Directive, Regional Policy Objective 7.22 (targets for, inter alia, protected species), nor the MCDP.

Mitigation Measures During Decommissioning Phase

5.629 Mitigation measures for decommissioning will be similar to those for the construction phase, however the magnitude required will be less, as track and turbine installation will not be required.

Restoration Measures

Birds

5.630 One common snipe territory could be lost because of the Proposed Project.

5.631 The bog restoration work will create multiple wet flushes and better available habitat to support snipe. Details of this are shown in **Technical Appendix 5-5** found in Volume 3 of this EIAR.

Biodiversity Enhancement Measures

5.632 Enhancement measures are included in the HMP in **Technical Appendix 5-5** found in Volume 3 of this EIAR. The habitat management will have incremental positive impacts on the overall ecological functioning of the site – and there are no works proposed within this HMP that are likely to have negative impacts on the receiving environment. These include:

- Install kestrel nest boxes on site to support breeding opportunities. Boxes will be mounted 4–6 m above ground, ideally on isolated trees, poles, or suitable structures that offer clear flight access. The entrance should face east or southeast to avoid prevailing winds and excessive rain exposure while providing morning warmth. Boxes must be positioned with an open outlook over existing peatland – or open grassland - away from high disturbance areas and maintained to ensure continued suitability.

5.633 More broadly, the HMP incorporates long-term monitoring and adaptive management for birds and bats, including breeding bird surveys, activity monitoring, and collision risk assessment. These measures provide an evidence base to inform additional interventions where required (e.g. vegetation management or operational mitigation), ensuring that species populations are maintained in line with baseline conditions. Collectively, these actions represent a proactive enhancement approach, supporting species resilience alongside the wider habitat restoration programme.

Monitoring

General Pre-Construction Confirmation Surveys

5.634 To prevent accidental disturbance to resting places of mammals (badgers, red squirrel, pine marten, otter and hedgehog), a confirmatory ecological walkover survey will be undertaken prior to any construction activities within the Main Wind Farm Development Site.

5.635 Trees and structures within the works corridor will be re-assessed for bat roosting potential prior to any construction activities with any inspections or emergence surveys carried out as required under licence.

5.636 Confirmatory checks for nesting birds will be carried out prior to the commencement of any construction activities during the bird breeding season. If nests are recorded, ongoing

monitoring and appropriate exclusion zones will be implemented to determine when and where works can proceed. If exclusion zones cannot be implemented, NPWS will be contacted and based on their advice, additional mitigation will be implemented, with relevant licences applied for if required – although at this point it is important to note that no licences are required based on the results of the surveys.

Water Quality (During and Post-Construction)

5.637 Water quality monitoring will be undertaken as outlined in **Chapter 7**. This will check the efficacy of mitigation measures.

Birds (Post-Construction)

5.638 Based on current best-practice guidelines (SNH, 2009) and in accordance with EC Recommendation (C/2022/3219), post-construction monitoring will be undertaken to verify the effectiveness of the proposed mitigation measures, including turbine curtailment. A targeted programme of flight activity surveys and collision monitoring (carcass searching) will be undertaken during both the breeding and non-breeding seasons in Years 1, 2 and 3 following construction.

5.639 Six hours of survey per vantage point per month will be undertaken for flight activity surveys, and one round of carcass searches per turbine per month will be carried out. These surveys will be undertaken by suitably qualified ecologists.

5.640 The results of each year of monitoring will be reported to the competent authority and the National Parks and Wildlife Service (NPWS). The monitoring programme will assess whether the implemented mitigation measures are effective in avoiding significant adverse effects on Important Ecological Feature (IEF) bird species.

5.641 If monitoring indicates that collision risk remains higher than predicted or that mitigation measures are not performing as expected, adaptive management measures will be implemented, which may include refinement of turbine curtailment regimes or additional mitigation. Monitoring will continue as required to confirm that the implemented measures are effective in avoiding significant effects on IEF bird species, subject to agreement with the competent authority and NPWS.

Bats (Post-Construction)

5.642 Post-construction monitoring is required in line with commitments made in respect of the Proposed Project and in accordance with EC Recommendation (C/2022/3219). The purpose of the monitoring programme is to verify the effectiveness of the proposed mitigation measures, including operational mitigation and habitat management measures, and to allow adaptive management if required.

5.643 The post-construction monitoring programme will consist of:

- Static detector surveys: these surveys will allow for a valid comparison of bat activity and Proposed Project usage with pre-construction levels. Following NatureScot (2021) guidance, the surveys are to be conducted during years 1, 2 and 3 post construction to allow for annual variation and cumulative effects.36 Reports will be submitted to the competent authority and NPWS following each year of surveys. Surveys will follow baseline survey methods, as outlined in NatureScot (2021) guidance.36 After three years of post-construction surveys, the monitoring programme may be extended or halted based on the results and following agreement with the competent authority and NPWS.

- Fatality monitoring: if this is determined to be required following the additional year of pre-construction monitoring (i.e. due to high levels of bat activity), this will initially be conducted during years 1, 2 and 3 post construction to allow for annual variation and cumulative effects. The comprehensive fatality monitoring programme for birds as described above will be extended and duplicated to bats for the first three years per the post-construction monitoring requirements recommended by NatureScot (2021).36 After three years of post-construction surveys, the monitoring programme may be extended or halted following agreement with the competent authority and NPWS.

5.644 The results of the post-construction monitoring surveys will be used to evaluate the effectiveness of the implemented mitigation measures. If monitoring indicates that bat mortality or turbine interaction rates exceed predicted levels, adaptive management measures will be implemented. This may include refinement of turbine curtailment regimes or additional mitigation measures to ensure that significant adverse effects on bats are avoided.

5.645 Bat mitigation buffers will be inspected and monitored during Years 1, 2 and 3 following construction to confirm that vegetation clearance and management measures have achieved the intended habitat conditions. Once established, these conditions will be maintained for the duration of the operational phase.

Habitat Monitoring Plan

5.646 There will be monitoring processes undertaken for habitats which are included in **Technical Appendix 5-5** found in Volume 3 of this EIAR.

- The Habitat Management Plan includes a comprehensive, long-term monitoring framework designed to evaluate restoration success and support adaptive management throughout the operational life of the development. Monitoring is initiated pre-construction to establish an updated baseline and continues post-restoration, with annual surveys in the first three years, followed by longer-term checks (e.g. years 5 and 10) and periodic review thereafter. Key indicators include water table levels (monitored via dipwells), vegetation composition and structure, habitat extent and condition, peat accumulation, and the presence of scrub and invasive species. Botanical surveys (including quadrat-based assessments) are used to track recovery towards target bog communities, particularly the development of peat-forming species such as Sphagnum.

5.647 The monitoring programme also includes specific checks on restoration measures, such as ditch block integrity, ground smoothing effectiveness, and peat face reprofiling, alongside broader ecosystem indicators relating to function and resilience. Data are collected using standardised, repeatable methods and stored within a central database to ensure consistency over time and between practitioners. The results are reviewed against defined targets and objectives, with a formal adaptive management approach in place to implement corrective measures (e.g. additional drain blocking, scrub control, or invasive species treatment) where monitoring indicates that restoration is not progressing as intended.

Residual Effects

5.648 A summary of the effects, mitigation, and residual effects, considering cumulative effects, is set out at **Table 5-19**

Table 5-19: Summary of Residual effects

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
Designated nature conservation sites						
Blacksod Bay, Knockmoyle /Sheskin and Broadhaven are the protected sites within the Owenduff catchment.	Construction & Decommissioning	Direct: none Indirect: short-term deterioration in water quality due to pollution or suspended solids	Risk slightly increased due to other projects and plans.	Significant effects to hydrological condition	**Chapter 7** and the CEMP (**Technical Appendix 2-1**) of this EIAR detail the measures to ensure adequate buffers and protection measures for water quality.	Not significant
	Operation	General maintenance will be small in scale and not likely to have ongoing effects.	No cumulative effects identified.	None	None	Not significant
Habitats – Within Main Wind Farm Development Site boundary						
Key habitats include Annex I blanket bog – but also conifer plantation, agricultural grassland, grassy verges etc.	Construction and Decommissioning	Direct effects: habitat loss	Risk unchanged by other wind farms, projects and plans in the area.	Significant effects of smothering to Annex I blanket bog at the county / regional scale.	No mitigation measures are proposed for loss of low-value, highly modified or artificial habitats.	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
				Additionally, at a local scale hedgerows, treelined (and mosaics), grassy verges, wet grassland, and scrub.	For the peatland habitats which are all high value, as previously identified in this report, a full HMP has been developed (**Technical Appendix 5-5**) which will ensure the remaining habitat is enhanced to a higher ecological condition than the status. The HMP also contains control measures for invasive species. The area to be managed for enhancement far exceeds the area to be lost because of the Proposed Project.	

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
		Indirect effects: smothering due to sediment washout, compaction, and excavation of soil adjacent to hedgerows and tree lines, smothering by dust on hedgerows and tree lines, and spread of non-native, such as rhododendron or prickly heath.	Risk unchanged by other wind farms, projects and plans in the area.	Significant effects of smothering to Annex I blanket bog at the county / regional scale. Significant effects of soil compaction / excavation, and dust smothering on hedgerows or tree lines at county / regional scale. Significant effects of spreading invasive and non-native species on hedgerows, amenity grassland, tree lines and conifer plantation habitats at the local scale.	No mitigation measures are proposed for loss of low-value, highly modified or artificial habitats. For the peatland habitats which are all high value, as previously identified in this report, a HMP has been developed (**Technical Appendix 5-5**) which will ensure the remaining habitat is enhanced to a higher ecological condition than the status. The HMP also contains control measures for invasive species. The area to be managed for enhancement far	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
					exceeds the area to be lost because of the Proposed Project. The Habitat Management Plan details measures for the control and removal of the invasive species found on site.	
	Operation	Direct: loss of habitat due to maintenance of bat mitigation buffers (detailed above in construction phase).	Risk unchanged by other wind farms, projects and plans in the area.	Significant at the local scale.	These areas are in areas of low ecological value with no important habitats. The areas are therefore not identified to have significant residual effects.	Not significant
Habitats – Turbine Delivery Route Over-run Areas						
Key habitats include Annex I blanket bog	Construction and Decommissioning	Direct effects: habitat loss	Risk unchanged by other wind farms, projects and	Significant effects of smothering to Annex I blanket	No mitigation measures are proposed for loss of low-value, highly	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
			plans in the area.	bog at the county / regional scale. No other important habitats were identified in these areas.	modified or artificial habitats. For the peatland habitats which are all high value, as previously identified in this report, previously id entified in this report, a full HMP has been developed (**Technical Appendix 5-5**) which will ensure the remaining habitat is enhanced to a higher ecological condition than the status. The HMP also contains control measures for invasive species. The area to be managed for enhancement far exceeds the area to be	

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
					lost because of the Proposed Project.	
		Indirect effects: smothering due to sediment washout, compaction, and excavation of soil adjacent to hedgerows and tree lines, smothering by dust on hedgerows and tree lines, and spread of non-native, such as rhododendron or prickly heath.	Risk unchanged by other wind farms, projects and plans in the area.	Significant effects of smothering to Annex I blanket bog at the county / regional scale. No other important habitats were identified in these areas.	No mitigation measures are proposed for loss of low-value, highly modified or artificial habitats. For the peatland habitats which are all high value, as previously identified in this report, previously id entified in this report, a full HMP has been developed (**Technical Appendix 5.5**) which will ensure the remaining habitat is enhanced to a higher ecological condition than the status. The HMP also contains control measures for invasive species.	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
					The area to be managed for enhancement far exceeds the area to be lost because of the Proposed Project.	
	Operation	The habitat will naturally regenerate over time but there will be residual effects and some of the rarer species such as Sphagnum may struggle to re-establish due to the peat compaction and draining effects of the works.	Risk unchanged by other wind farms, projects and plans in the area.	Significant effects of smothering to Annex I blanket bog at the county / regional scale. No other important habitats were identified in these areas.	No mitigation measures are proposed for loss of low-value, highly modified or artificial habitats. For the peatland habitats which are all high value, as previously identified in this report, previously id entified in this report, a full HMP has been developed (**Technical Appendix 5-5**) which will ensure the remaining habitat is enhanced to a higher ecological condition than the current status.	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
					The HMP also contains control measures for invasive species. The area to be managed for enhancement far exceeds the area to be lost because of the Proposed Project.	
IEF Birds Primary Target Species						
Avian assemblage (primary target species as a collective)	Construction and Decommissioning	Direct nest damage or destruction	Risk unchanged by other wind farms, projects and plans in area.	Not significant due to embedded mitigation.	Embedded mitigation	Not significant
		Habitat loss leading to indirect disturbance / displacement. Especially breeding snipe and Eurasian woodcock. Also,	Risk unchanged by other wind farms, projects and plans in area.	Significant at county / regional scale for common snipe and Eurasian woodcock, and at local scale for yellowhammer, sk	Restricted access to footprint of works corridor. Clearance of woodland and uncultivated vegetation to be undertaken outside	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
		for yellowhammer, skylark and meadow pipit.		ylark and meadow pipit.	main breeding bird season. Pre-construction confirmatory surveys and use of disturbance-free buffers during breeding season to avoid habitat loss leading to disturbance / displacement of breeding birds. Measures to ensure cleared areas remain unsuitable for breeding birds for remainder of construction phase. Use of ECoW to make contractors aware of ornithological sensitivities, enforce exclusion zones and undertake surveys.	

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
		Disturbance/displacement of breeding kestrel	Risk unchanged by other wind farms, projects and plans in area	Significant at county / regional scale	Construction activities will not take place within the 200 m buffer zone during the breeding season. A 30 km/h speed limit will be implemented within the 200 m buffer zone during the breeding season Haulage vehicles will not drive within the 200 m buffer zone during dawn and dusk, which are key hunting periods for this species, during the breeding season. A suitably experienced ECoW will be employed for the duration of the construction period to make contractors aware	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
					of this ornithological sensitivity.	
	Operation	Barrier effect	No elevated risk due to presence of other projects or plans.	Not significant	None	Not significant
Barnacle goose	Operation	Direct mortality due to collision	Additional mortality could occur to populations due to other wind farms in area.	Not significant at national or county / regional scale for wintering population.	Turbine curtailment will be implemented as the primary mitigation measure to reduce collision risk. Post-construction monitoring will then be undertaken to confirm the effectiveness of these measures. If monitoring indicates that collision rates exceed predicted levels, the curtailment regime will be refined in consultation with the Planning Authority and NPWS to ensure that significant effects are avoided.	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
Common snipe	Operation	Direct mortality due to collision	Additional mortality could occur to populations due to other wind farms in area.	Not significant at county / regional scale for wintering population only.	Turbine curtailment will be implemented as the primary mitigation measure to reduce collision risk. Post-construction monitoring will then be undertaken to confirm the effectiveness of these measures. If monitoring indicates that collision rates exceed predicted levels, the curtailment regime will be refined in consultation with the Planning Authority and NPWS to ensure that significant effects are avoided.	Not significant
Curlew	Operation	Direct mortality due to collision	Additional mortality could occur to populations due to other wind farms in area.	Not significant at national or county / regional scale for resident population.	Turbine curtailment will be implemented as the primary mitigation measure to reduce collision risk. Post-construction monitoring	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
					will then be undertaken to confirm the effectiveness of these measures. If monitoring indicates that collision rates exceed predicted levels, the curtailment regime will be refined in consultation with the Planning Authority and NPWS to ensure that significant effects are avoided.	
Grey heron	Operation	Direct mortality due to collision	Additional mortality could occur to populations due to other wind farms in area.	Not significant at national and county / regional scale for breeding or wintering population only.	Turbine curtailment will be implemented as the primary mitigation measure to reduce collision risk. Post-construction monitoring will then be undertaken to confirm the effectiveness of these measures. If monitoring indicates that collision rates exceed predicted levels, the	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
					curtailment regime will be refined in consultation with the Planning Authority and NPWS to ensure that significant effects are avoided.	
Lapwing	Operation	Direct mortality due to collision	Additional mortality could occur to populations due to other wind farms in area.	Not significant at the national or county / regional scale.	Turbine curtailment will be implemented as the primary mitigation measure to reduce collision risk. Post-construction monitoring will then be undertaken to confirm the effectiveness of these measures. If monitoring indicates that collision rates exceed predicted levels, the curtailment regime will be refined in consultation with the Planning Authority and NPWS to ensure that significant effects are avoided.	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
Mallard	Operation	Direct mortality due to collision	Additional mortality could occur to populations due to other wind farms in area.	Not significant at national or county / regional scale for resident population.	Turbine curtailment will be implemented as the primary mitigation measure to reduce collision risk. Post-construction monitoring will then be undertaken to confirm the effectiveness of these measures. If monitoring indicates that collision rates exceed predicted levels, the curtailment regime will be refined in consultation with the Planning Authority and NPWS to ensure that significant effects are avoided.	Not significant
Moorhen	Operation	Direct mortality due to collision	Additional mortality could occur to populations due to other wind farms in area.	Not significant at national or county / regional scale for resident population.	Turbine curtailment will be implemented as the primary mitigation measure to reduce collision risk. Post-construction monitoring	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
					will then be undertaken to confirm the effectiveness of these measures. If monitoring indicates that collision rates exceed predicted levels, the curtailment regime will be refined in consultation with the Planning Authority and NPWS to ensure that significant effects are avoided.	
Oystercatcher Teal	Operation	Disturbance/displacement and barrier effects	Risk increased slightly due to proximity of other wind farms, projects and plans in area.	Not significant at national or county / regional scale for resident population.	Turbine curtailment will be implemented as the primary mitigation measure to reduce collision risk. Post-construction monitoring will then be undertaken to confirm the effectiveness of these measures. If monitoring indicates that collision rates exceed predicted levels, the	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
					curtailment regime will be refined in consultation with the Planning Authority and NPWS to ensure that significant effects are avoided.	
		Direct mortality due to collision	Additional mortality could occur to populations due to other wind farms in area.	Not significant at national or county / regional scale for resident population.	Turbine curtailment will be implemented as the primary mitigation measure to reduce collision risk. Post-construction monitoring will then be undertaken to confirm the effectiveness of these measures. If monitoring indicates that collision rates exceed predicted levels, the curtailment regime will be refined in consultation with the Planning Authority and NPWS to ensure that significant effects are avoided.	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
Greenland white-fronted goose	Operation	Disturbance / displacement and barrier effects.	Risk increased slightly due to proximity of other wind farms, projects and plans in area.	Not significant at national or county / regional scale for resident population.	Turbine curtailment will be implemented as the primary mitigation measure to reduce collision risk. Post-construction monitoring will then be undertaken to confirm the effectiveness of these measures. If monitoring indicates that collision rates exceed predicted levels, the curtailment regime will be refined in consultation with the Planning Authority and NPWS to ensure that significant effects are avoided.	Not significant
		Direct mortality due to collision	Additional mortality could occur to populations due to other wind farms in area.	Not significant at national or county / regional scale for resident population.	Turbine curtailment will be implemented as the primary mitigation measure to reduce collision risk. Post-construction monitoring	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
					will then be undertaken to confirm the effectiveness of these measures. If monitoring indicates that collision rates exceed predicted levels, the curtailment regime will be refined in consultation with the Planning Authority and NPWS to ensure that significant effects are avoided.	
IEF Mammals (Non-Bat)						
Mammals	Construction / decommissioning	Direct destruction of dens / mortality	No risk	Not significant	No mitigation measures are required for mammals as there were no significant effects identified.	Not significant
		Indirect loss of foraging, commuti	No risk	Not significant	No mitigation measures are required for	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
		ng and sheltering habitat			mammals as there were no significant effects identified.	
	Operation	Direct loss of breeding/resting sites during vegetation clearance to maintain bat mitigation buffers.	No risk	Not significant	No mitigation measures are required for mammals as there were no significant effects identified.	Not significant
		Indirect disturbance/displacement	No risk	Not significant	No mitigation measures are required for mammals as there were no significant effects identified.	Not significant
IEF Bats						
Bat assemblage	Construction / decommissioning	Direct destruction / disturbance of roost sites.	No risk	Not significant as no roosts were recorded in works footprint of Main Wind Farm Development Site	Pre-construction confirmatory inspection of trees and structures within the works area by a suitably qualified bat ecologist.	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
					Any trees or structures with roost potential will be retained where possible. If a roost is identified and requires removal, derogation under licence from NPWS will be obtained and exclusion will be carried out under licence. Timing of works will avoid sensitive roosting periods. Replacement planting of any hedgerows/treelines lost with like-for-like native species mix. Provision of bat boxes as enhancement measure.	
	Operation	Indirect disturbance / displacement due to lighting.	No risk	Not significant as most recorded bat species (common and soprano pipistrelle and Leisler's bat) are less sensitive to	Embedded mitigation and good practice will avoid effects on bats; cowled lighting will also be used as a precaution	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
				light disturbance; other species only recorded very infrequently.		
		Indirect loss of foraging / commuting features and disturbance by night-time working.	No risk	Significant at local scale for species recorded using foraging/commuting features (common and soprano pipistrelle, and Leisler's bat).	No night working is proposed as part of embedded mitigation but if necessary, cowled lighting will be used to minimise any disturbance effects. Design of Proposed Project designed to avoid disrupting connectivity to landscape.	Not significant
Common, Nathusius' and soprano pipistrelle, and Leisler's bat	Operation	Direct collision with turbines or barotrauma.	Additional mortality could occur to populations due to other wind farms in area.	Significant at local scale for all but Nathusius' pipistrelle, which is not significant.	Bat buffers will be implemented to reduce collision risk. Turbine curtailment will be implemented as the primary mitigation measure to reduce collision risk. Post-	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
					construction monitoring will then be undertaken to confirm the effectiveness of these measures. If monitoring indicates that collision rates exceed predicted levels, the curtailment regime will be refined in consultation with the Planning Authority and NPWS to ensure that significant effects are avoided.	
Myotis species and brown long-eared bat	Operation	Direct collision with turbines or barotrauma	Additional mortality could occur to populations due to other wind farms in area	Not significant due to low activity and collision risk	Bat buffers will be implemented to reduce collision risk. Turbine curtailment will be implemented as the primary mitigation measure to reduce collision risk. Post-construction monitoring will then be undertaken to confirm the	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
					effectiveness of these measures. If monitoring indicates that collision rates exceed predicted levels, the curtailment regime will be refined in consultation with the Planning Authority and NPWS to ensure that significant effects are avoided.	
Common pipistrelle and soprano pipistrelle	Operation	Direct effects (collision and barotrauma)	Medium	Potentially significant at local level	Vegetation clearance around turbine bases to maintain ≥50 m buffer between blade sweep and key linear features, as per NatureScot (2021). Turbine layout avoids siting directly adjacent to forestry edge or wetland foraging areas. Operational monitoring to verify bat activity.	Not significant (with mitigation)

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
	Operation	Indirect disturbance/displacement due to lighting	Low	Not significant	Turbine lighting will be limited to statutory aviation requirements only. Substation lighting will be cowled, downward-directed, and motion-activated. Lighting design follows *Bat Conservation Trust & ILP (2018)* guidance.	Not significant
Common pipistrelle, soprano pipistrelle, and Leisler's bat	Operation	Indirect loss or disturbance of foraging/commuting features	Localised high activity recorded near forestry edge (esp. D.03, D.04, D.10)	Significant at local scale (without mitigation)	No night-time working proposed. Design of the Proposed Project maintains key connectivity corridors along forestry edge and drainage lines. Limited vegetation removal; habitat reinstatement post-construction. Cowled lighting if any operational night works required.	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
Leisler's bat	Operation	Collision risk	Low (very low activity recorded at D.03 and D.13)	Not significant	Embedded mitigation as above; ongoing vegetation management to maintain open conditions around turbines. Bat buffers will be implemented to reduce collision risk. Turbine curtailment will be implemented as the primary mitigation measure to reduce collision risk. Post-construction monitoring will then be undertaken to confirm the effectiveness of these measures. If monitoring indicates that collision rates exceed predicted levels, the curtailment regime will be refined in consultation with the Planning Authority and NPWS to ensure that	Not significant

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
					significant effects are avoided.	
Myotis species and brown long-eared bat	Operation	Disturbance or displacement	Very low (infrequent activity and no roosts recorded)	Not significant	No specific mitigation required beyond general embedded measures and lighting control.	Not significant
IEF Other Fauna						
Amphibian	Construction / decommissioning	Potential interactions with species in settlement ponds which could be dangerous for amphibians resulting in mortality.	None	Moderate risk of mortality which would be a significant impact.	Amphibian-proof fencing close to any ponds/pools will be used to prevent frogs or smooth newts from accessing any parts of the Proposed Project most hazardous to amphibians during the construction phase.	Not significant
	Operation	No potential effects identified.	None	None	None	Not significant
IEF Fisheries and Aquatic Ecology						

Ecological Feature	Phase	Likely Stand Alone Impacts	Likely Cumulative Impacts	Significance Pre-Mitigation	Proposed Mitigation / Enhancement	Significance of Residual Impacts
Fisheries and Aquatic Ecology	Construction / decommissioning	Hydrological interactions such as increased dust and debris being mobilized into the surface water. Additionally, risk of spills and instances with hazardous materials etc.	Risk slightly increased due to other developments within the catchment.	Significant effects to hydrological condition at a local Scale.	**Chapter 7** and the CEMP (**Technical Appendix 2-1** found in Volume 3 of this EIAR detail the measures to ensure adequate buffers and protection measures for water quality.	Not significant
	Operation	No potential effects identified.	None	None	None	Not significant

Statement of Significance / Conclusion

5.649 This chapter comprehensively assesses all scenarios within the range of the three proposed candidate turbines which is described throughout. The likely significant effects that could arise from the Proposed Project during the construction, operational and decommissioning phases are set out in this conclusion.

5.650 It is important to note that the Proposed Project has a design flexibility approach with potential for variable turbine diameter and height – all three options stated in **Chapter 2** of this EIAR were considered relative to biodiversity. There are slight changes to the operational effects on IEF habitats, birds and bats associated between hub height 98.5 m and rotor diameter 163 m compared to hub height 104.7 m and rotor diameter 149 m but there will be no change to the overall significance conclusion.

5.651 A proposed mitigation scheme for the construction, operational and decommissioning phases is described in this chapter, and if the Proposed Project is consented, these mitigation measures will be implemented in full for the turbine selected within the turbine range. Assuming that the mitigation measures in the Chapter are adopted in full, there is no likely significant residual effect on important ecological features both alone and cumulatively.

Figures

Technical Appendices (Volume 3)

Technical Appendix 5-1	Technical Habitat Survey Report
Technical Appendix 5-2	Bird Survey Report
Technical Appendix 5-3	Bat Survey Report
Technical Appendix 5-4	Triturus Ltd Aquatic Baseline & Fisheries Assessment
Technical Appendix 5-5	Peatland Restoration Plan & Habitat Management Plan
Technical Appendix 5-6	Habitat Condition Assessment Report
Technical Appendix 5-7	Marsh Fritillary Survey Report
Technical Appendix 5-8	Avian Collision Risk Model Report

(Refer to EIAR Volume 3 for Technical Appendices)

460000 470000 480000 490000 500000

840000

830000

820000

OVER-RUN AREA 1

Figure 5-1b

Figure 5-1c

Figure 5-1d

Figure 5-1e

OVER-RUN AREA 3

OVER-RUN AREA 2

N

0 10 20

Kilometres

LEGEND

- Proposed Development Site Boundary
- Bellacorick 110 kv Substation
- Proposed Grid Connection Route (Subject to Separate Planning Application)
- Proposed Over-run Area Location

Note
The Proposed Development Site Boundary acted as Survey Area for the Habitat Fossit Survey

RWE

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TERRESTRIAL ECOLOGY SURVEY AREAS

FIGURE 5-1a

Scale 1:150,000 @ A3

Date APRIL 2026

402.064443.00001.0101.0 Ecological Survey Area

473000 474000 475000 476000 477000 478000 479000 480000

825000 824000 823000 822000 821000

N

Doolough

Tristia

Gweesalia

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 T13

1 2 3

TCC1 TCC2

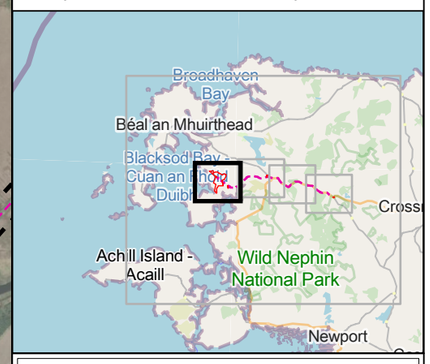
0 1 2

Kilometres

LEGEND

- Proposed Development Site Boundary
- Proposed Turbine Location
- Proposed Site Access Location
- Proposed Met Mast Location
- Proposed New Access Track
- Proposed Upgraded Access Track
- Proposed Grid Connection Route (Subject to Separate Planning Application)
- Proposed Crane Pad
- Proposed Substation
- Proposed Battery Energy Storage System (BESS) Compound
- Proposed Temporary Construction Compound (TCC)
- Proposed Attenuation Basin
- Terrestrial Ecology Survey Area (Proposed Grid Connection Route 50 m Buffer)

Note
The Proposed Development Site Boundary acted as Survey Area for the Habitat Fossit Survey



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TERRESTRIAL ECOLOGY SURVEY AREAS

FIGURE 5-1b

Scale 1:25,000 @ A3

Date APRIL 2026

402.064443.00001.0101.0 Ecological Survey Area

481000 482000 483000 484000 485000 486000 487000 488000

826000 825000 824000 823000 822000

N

R313

Bangor

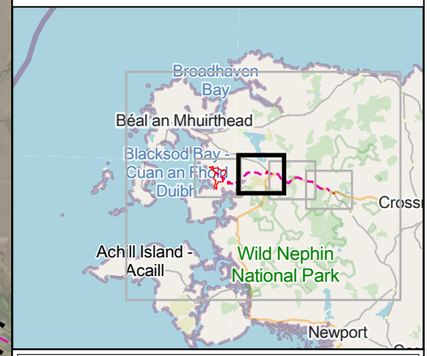
0 1 2

Kilometres

LEGEND

- Proposed Development Site Boundary
- Proposed Grid Connection Route (Subject to Separate Planning Application)
- Terrestrial Ecology Survey Area (Proposed Grid Connection Route 50 m Buffer)

Note
The Proposed Development Site Boundary acted as Survey Area for the Habitat Fossit Survey



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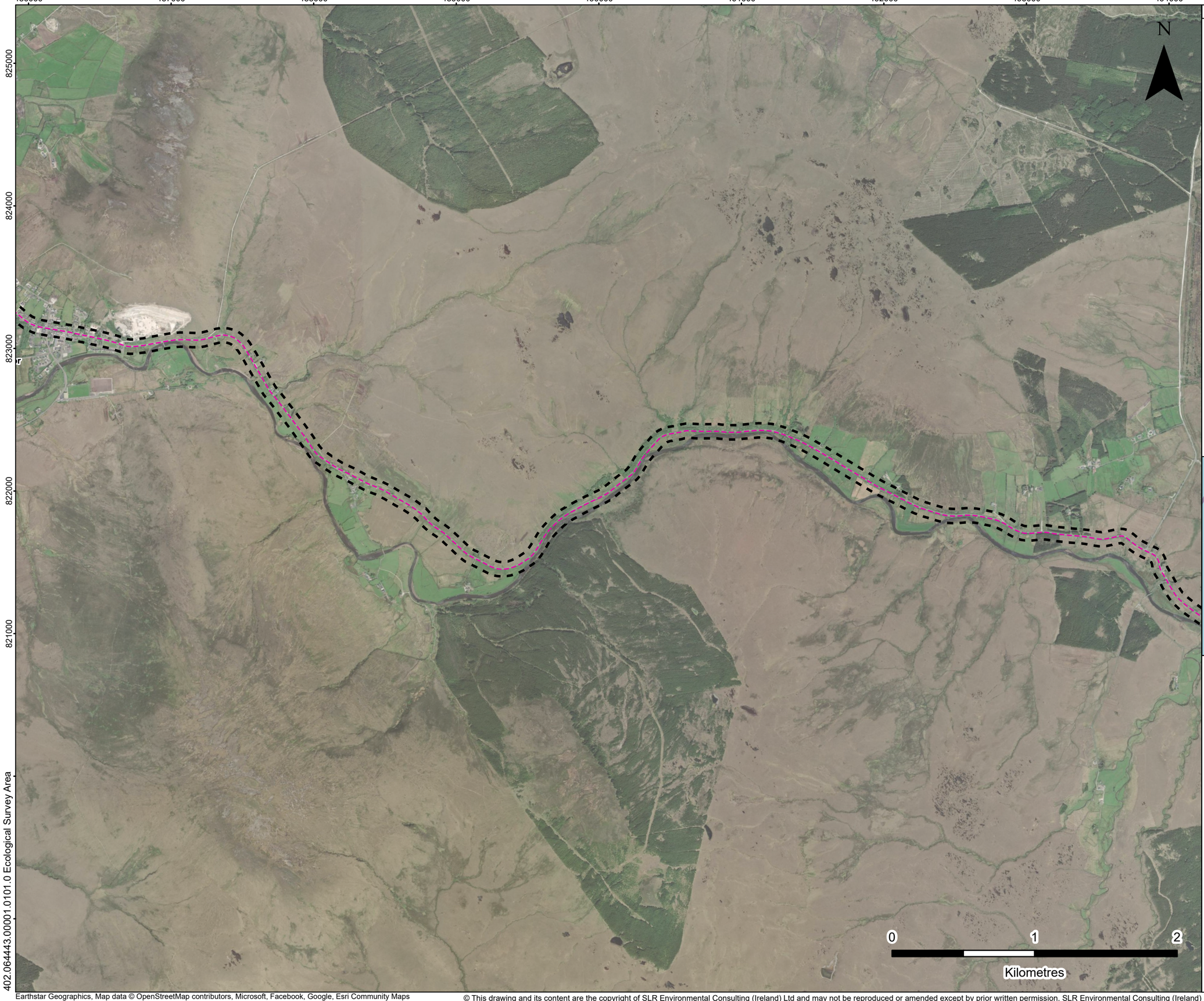
TERRESTRIAL ECOLOGY SURVEY AREAS

FIGURE 5-1c

Scale 1:25,000 @ A3

Date APRIL 2026

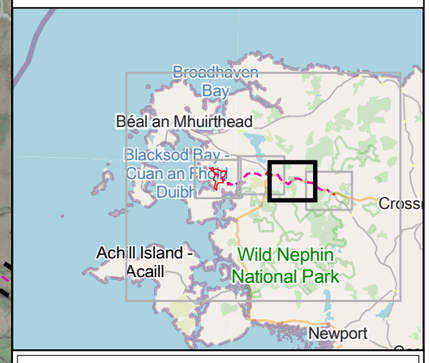
402.064443.00001.0101.0 Ecological Survey Area



LEGEND

- Proposed Grid Connection Route (Subject to Separate Planning Application)
- Terrestrial Ecology Survey Area (Proposed Grid Connection Route 50 m Buffer)

Note
The Proposed Development Site Boundary acted as Survey Area for the Habitat Fossit Survey



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TERRESTRIAL ECOLOGY SURVEY AREAS

FIGURE 5-1d

Scale	Date
1:25,000 @ A3	APRIL 2026

493000 494000 495000 496000 497000 498000 499000 500000

823000 822000 821000 820000 819000

N

R312

0 1 2
Kilometres

LEGEND

- Proposed Development Site Boundary
- Bellacorick 110 kv Substation
- Proposed Grid Connection Route (Subject to Separate Planning Application)
- Terrestrial Ecology Survey Area (Proposed Grid Connection Route 50 m Buffer)

Note
The Proposed Development Site Boundary acted as Survey Area for the Habitat Fossit Survey

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TERRESTRIAL ECOLOGY SURVEY AREAS

FIGURE 5-1e

Scale	Date
1:25,000 @ A3	APRIL 2026

402.064443.00001.0101.0 Ecological Survey Area

460000 465000 470000 475000 480000 485000 490000 495000 500000 505000

840000 835000 830000 825000 820000 815000 810000 402.064443.00001.0102.0 Aquatic Survey Area

Broadhaven Bay

Béal an Mhuirthead

Blacksod Bay - Cuan an Fhóid Duibh

Loch na Gealtrún Móire

Achill Island - Acaill

Keel Beach

Wild Nephin National Park

N59

OVER-RUN AREA 1

OVER-RUN AREA 2

OVER-RUN AREA 3

Figure 5-2b

Figure 5-2c

Figure 5-2d

Figure 5-2e

N

0 5 10

Kilometres

LEGEND

- Proposed Development Site Boundary
- Bellacorick 110 kv Substation
- Proposed Grid Connection Route (Subject to Separate Planning Application)
- Proposed Over-run Area Location
- Watercourse
- Waterbody

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AQUATIC ECOLOGY SURVEY AREA

FIGURE 5-2a

Scale 1:150,000 @ A3

Date APRIL 2026

474000 476000 478000 480000

824000 822000

N

L1205 L1205 L1205 L1205

Lough Nahelly

AN_TSRA/TH 33 BUN_AN_MHUILINN LOUGHNAHELLY DOOLOUGH (STREAM) GOOLAMORE AN_MHOING_MHÓR DUMHA_LOCHA DOOYORK TRISTIA 33

C5* C4 C2 C1 C3 C5*

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 T13

TCC1 TCC2

1 2 3

P1† P2† P3† P4†

A1 A2*

B1 B2 B3 B4 B5 B6*

D1

Geesala Cemetery

0 1 2

Kilometres

402.064443.00001.0102.0 Aquatic Survey Area

LEGEND

- Proposed Development Site Boundary
- Proposed Turbine Location
- Proposed Site Access Location
- Proposed Met Mast Location
- Proposed New Access Track
- Proposed Upgraded Access Track
- Proposed Grid Connection Route (Subject to Separate Planning Application)
- Proposed Crane Pad
- Proposed Substation
- Proposed Battery Energy Storage System (BESS) Compound
- Proposed Temporary Construction Compound (TCC)
- Proposed Attenuation Basin
- Watercourse
- Waterbody
- Aquatic Ecological Survey Location
- eDNA Sample Location

Note

* eDNA sampling for freshwater pearl mussel, white-clawed crayfish & crayfish plague
† eDNA sampling for brown trout, European eel & smooth newt

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AQUATIC ECOLOGY SURVEY AREA

FIGURE 5-2b

Scale 1:25,000 @ A3

Date APRIL 2026

LEGEND

- Proposed Development Site Boundary
- Proposed Grid Connection Route (Subject to Separate Planning Application)
- Watercourse
- Waterbody
- Aquatic Ecological Survey Location
- eDNA Sample Location

Note

* eDNA sampling for freshwater pearl mussel, white-clawed crayfish & crayfish plague
† eDNA sampling for brown trout, European eel & smooth newt

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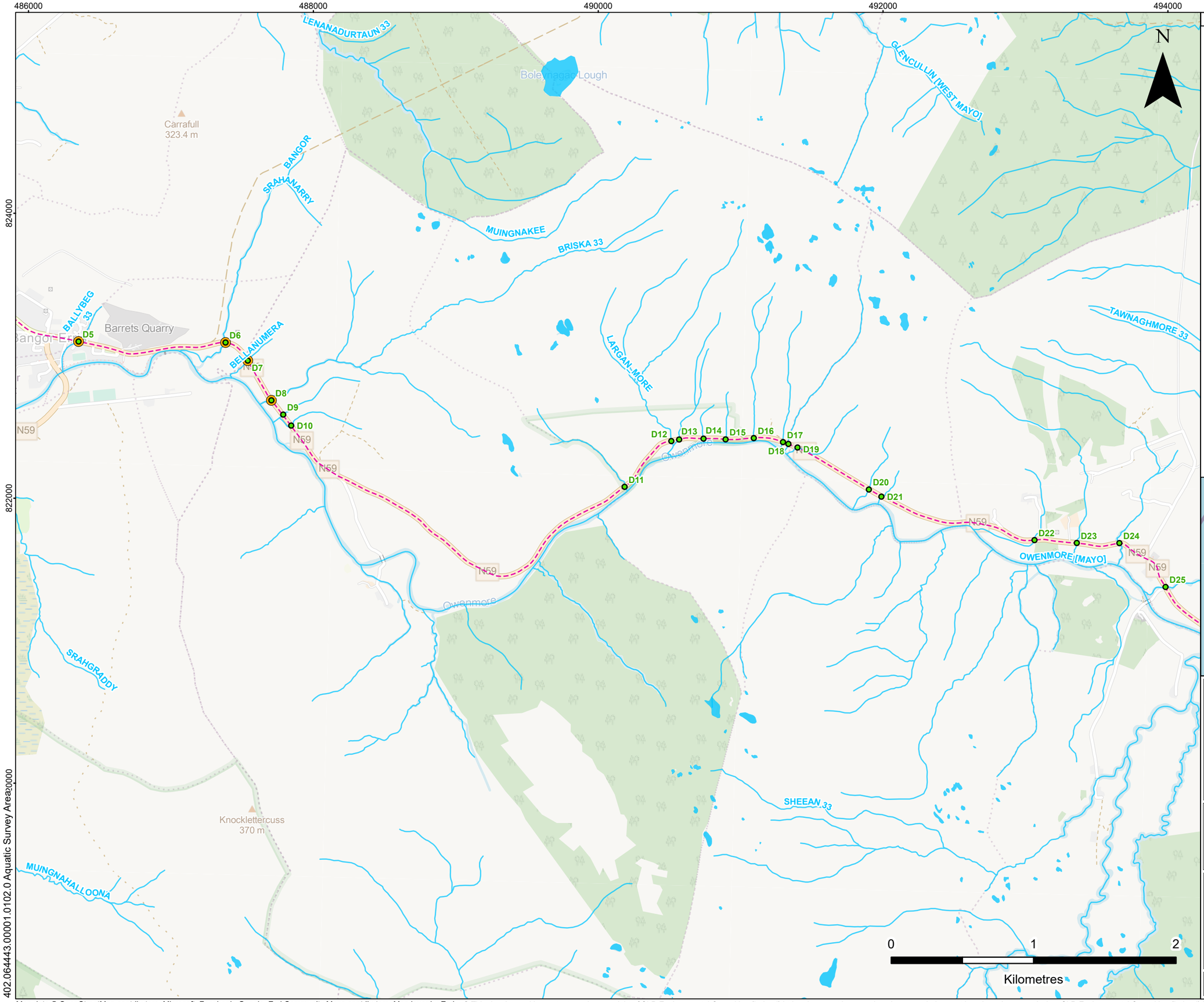
AQUATIC ECOLOGY SURVEY AREA

FIGURE 5-2c

Scale 1:25,000 @ A3

Date APRIL 2026



494000 496000 498000 500000

822000 820000

N

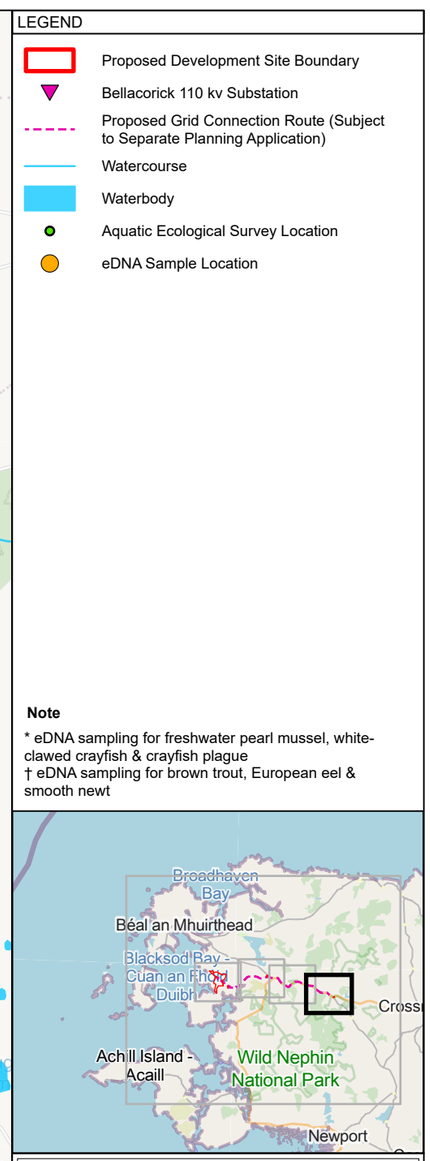
TAWNAGHMORE 33
SHESKIN (STREAM)
Shranakilla 110kV Substation
CROAGHAUN_WEST
Lough Nagappul
KILSALLAGH 33
OWENMORE [MAYO]
N59
D22 D23 D24 D25
D26 D27 D28 D29 D30
Owenmore
BELLACORICK
Bellacorick 110kV Substation
Bellacorrick AGI
MUING
Lough Derrybaun
E1
R312
MONEYNIERIN
ALTNABROCKY 33
SHEEAN 33
DERRY LOWER
MUINGAGHEL
0 1 2
Kilometres

LEGEND

- Proposed Development Site Boundary
- Bellacorick 110 kv Substation
- Proposed Grid Connection Route (Subject to Separate Planning Application)
- Watercourse
- Waterbody
- Aquatic Ecological Survey Location
- eDNA Sample Location

Note

* eDNA sampling for freshwater pearl mussel, white-clawed crayfish & crayfish plague
† eDNA sampling for brown trout, European eel & smooth newt



RWE

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AQUATIC ECOLOGY SURVEY AREA

FIGURE 5-2e

Scale 1:25,000 @ A3

Date APRIL 2026

402.0644443.00001.0102.0 Aquatic Survey Area

450000 455000 460000 465000 470000 475000 480000 485000 490000 495000 500000 505000

845000 840000 835000 830000 825000 820000 815000 810000

N

Erris Head SAC
Illanmaster SPA
Termoncarragh Lake and Annagh Machair SPA
Broadhaven Bay SAC
Inishglora and Inishkeeragh SPA
Mullet Peninsula SPA
Glenamoy Bog Complex SAC
Carrowmore Lake SPA
Bellacorick Iron Flush SAC
Slieve Fyagh Bog SAC
West Connacht Coast SAC
OVER-RUN AREA 1
Figure 5-3b
Inishkea Islands SPA
Blacksod Bay/Broad Haven SPA
Carrowmore Lake Complex SAC
Inishkea Islands SAC
OVER-RUN AREA 3
Lough Dahybaun SAC
Duvillaun Islands SPA
Mullet/Blacksod Bay Complex SAC
N59
OVER-RUN AREA 2
Duvillaun Islands SAC
Owenduff/Nephin Complex SAC
Doogort Machair/Lough Doo SAC
Croaghaun/Slievemore SAC
Owenduff/Nephin Complex SPA
Doogort Machair SPA
Achill Island - Acaill
Wild Nephin National Park
Achill Head SAC
Lough Gall Bog SAC
Bellacragher Saltmarsh SAC
Clew Bay
0 5 10
Kilometres

LEGEND

- Proposed Development Site Boundary
- Study Area (Main Wind Farm Development Site Boundary 20 km Buffer)
- Proposed Over-run Area Location
- Proposed Turbine Location
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)

Achill Island - Acaill
Wild Nephin National Park
Clew Bay

RWE

SLR

MUINGMORE WIND FARM

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SACS AND SPAS WITHIN 20 KM OF THE MAIN WIND FARM DEVELOPMENT SITE

FIGURE 5-3a

Scale 1:180,000 @ A3

Date APRIL 2026

402.064443.00001.0103.0 SAC and SPA 20km

474000
476000
478000
824000
822000
402.064443,00001,0103,0 SAC and SPA 20km

DOOLOUGH (STREAM)
DOOLOUGH (STREAM)
AN_MHOING_MHÓR
TRISTIA 33
L1205
L1206
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
T13
Mullet/Blacksod Bay Complex SAC
Blacksod Bay/Broad Haven SPA
Saint Colmcille's Church
Clew Bay
Achill Island - Acaill
Wild Nephin National Park

N

0 1 2
Kilometres

LEGEND

- Proposed Development Site Boundary
- Proposed Turbine Location
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Watercourse
- Potential Hydrological Connection
- Waterbody

RWE

SLR

MUINGMORE WIND FARM

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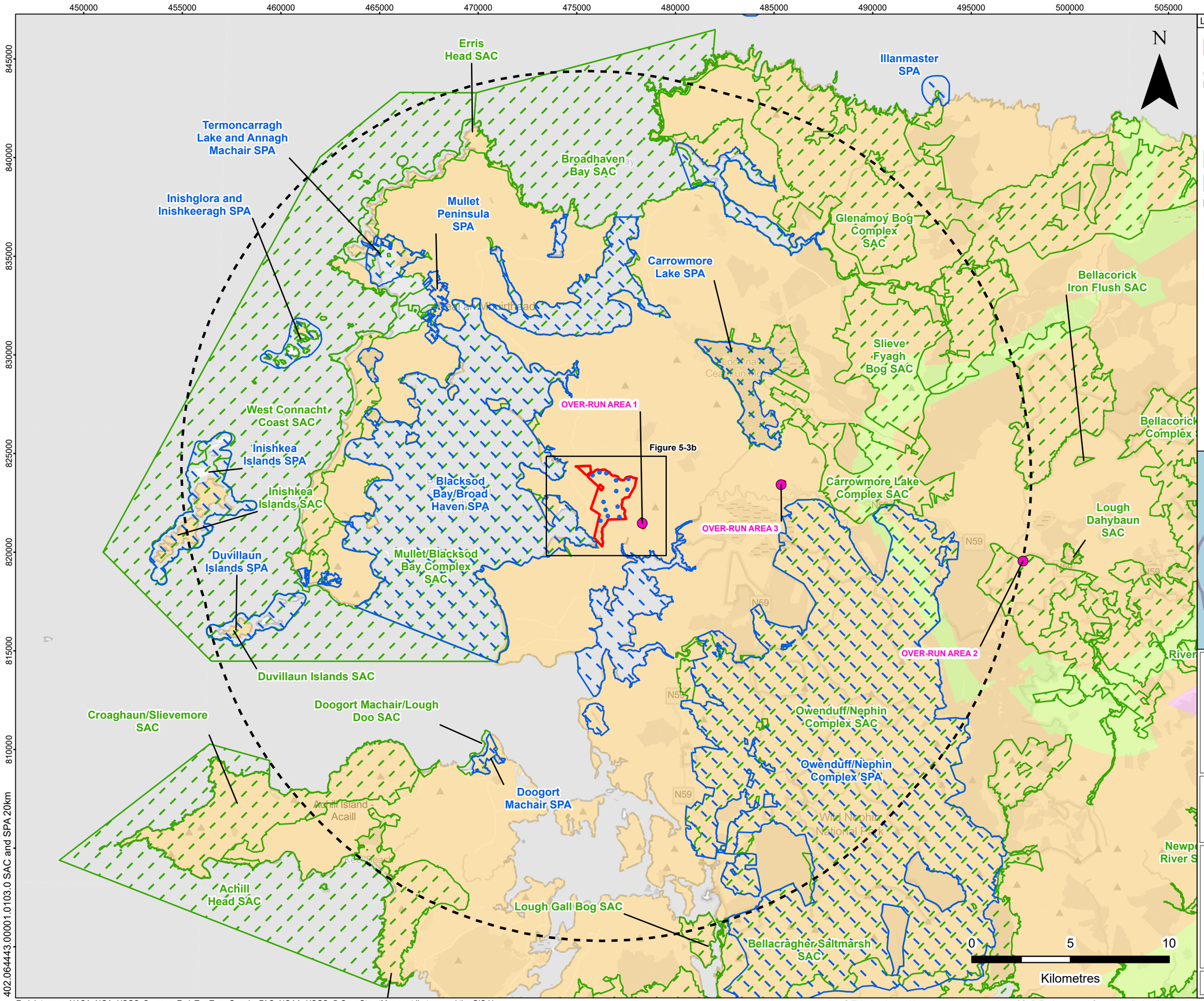
SACS AND SPAS WITHIN 20 KM OF THE MAIN WIND FARM DEVELOPMENT SITE

FIGURE 5-3b

Scale 1:18,000 @ A3

Date APRIL 2026



RWE

SLR

MUINGMORE WIND FARM

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SACS AND SPAS WITHIN 20 KM OF THE MAIN WIND FARM DEVELOPMENT SITE

FIGURE 5-3c

Scale 1:180,000 @ A3

Date APRIL 2026

450000 455000 460000 465000 470000 475000 480000 485000 490000 495000 500000 505000

845000 840000 835000 830000 825000 820000 815000 810000

402.064443.00001.0104.0 NAH and pNAH 20km

N

Eagle Island pNHA
Erris Head pNHA
Broadhaven Bay
Glenamoy Bog Complex pNHA
Benaderre Cliffs pNH
Inishglora & Inishkeeragh pNHA
Béal an Mhuirthead
Broadhaven Bay pNHA
Pollatomish Bog NHA
Slieve Fyagh Bog pNHA
Glenturk More Bog NHA
Loch na Mainrun Moire
Tristia Bog NHA
Ederglen Bog NHA
Carrowmore Lake Complex pNHA
OVER-RUN AREA 1
Mullet/Blacksod Bay Complex pNHA
Inishkea Islands pNHA
Blacksod Bay - Cuan an Fhóid Duibh
Bellacorick Iron Flush pNHA
OVER-RUN AREA 3
N59
Bellacorick Bog Complex pNHA
Tullaghan Bay and Bog NHA
Duvillaun Islands pNHA
OVER-RUN AREA 2
Owenduff/Nephin Complex pNHA
Corraun Point Machair/Dooreel Creek pNHA
Doogort Machair/Lough Doo pNHA
Altaconey Bog pNHA
Drumlee Lough pN
Achill Island - Acaill
Croaghaun/Slievemore pNHA
Wild Nephin National Park
Doogort East Bog NHA
Bellacragher Saltmarsh pNHA
Keel Machair/Menaun Cliffs pNHA
Inishgalloon pNHA
Lough Gall Bog pNHA

0 5 10
Kilometres

LEGEND

- Proposed Development Site Boundary
- Study Area (Main Wind Farm Development Site Boundary 20 km Buffer)
- Proposed Over-run Area Location
- Proposed Turbine Location
- Natural Heritage Area (NHA)
- Proposed Natural Heritage Area (pNHA)

RWE

SLR

MUINGMORE WIND FARM

BIODIVERSITY

NHA AND PNHA WITHIN 20 KM OF THE MAIN WIND FARM DEVELOPMENT SITE

FIGURE 5-4a

Scale 1:180,000 @ A3

Date APRIL 2026

474000
476000
478000
824000
822000
402.064443,00001.0104.0 NAH and pNAH 20km

DOOLOUGH (STREAM)
DOOLOUGH (STREAM)
L1205
L1205
L1205
L1205
L1205
L1205
L1206
L1206
L1206
L1206
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
T13
Tristia Bog NHA
AN MHOING MHÓR
TRISTIA 33
Tullaghan Bay and Bog NHA
Mullet/Blacksod Bay Complex pNHA
Saint Concille's Church
Achill Island - Acaill
Wild Nephin National Park
Clew Bay
N
0
1
2
Kilometres

LEGEND

- Proposed Development Site Boundary
- Proposed Turbine Location
- Natural Heritage Area (NHA)
- Proposed Natural Heritage Area (pNHA)
- Watercourse
- Potential Hydrological Connection
- Waterbody

RWE

SLR

MUINGMORE WIND FARM

BIODIVERSITY

NHA AND PNHA WITHIN 20 KM OF THE MAIN WIND FARM DEVELOPMENT SITE

FIGURE 5-4b

Scale	Date
1:18,000 @ A3	APRIL 2026

450000 455000 460000 465000 470000 475000 480000 485000 490000 495000 500000 505000

845000 840000 835000 830000 825000 820000 815000 810000

402.064443.00001.0104.0 NAH and pNAH 20km

N

Eagle Island pNHA
Erris Head pNHA
Broadhaven Bay
Glenamoy Bog Complex pNHA
Benaderre Cliffs pNH
Inishglora & Inishkeeragh pNHA
Béal an Mhuirthead
Broadhaven Bay pNHA
Pollatomish Bog NHA
Slieve Fyagh Bog pNHA
Glenturk More Bog NHA
Loch na Mónadh Mór
Tristia Bog NHA
Ederglen Bog NHA
OVER-RUN AREA 1
Carrowmore Lake Complex pNHA
Mullet/Blacksod Bay Complex pNHA
Inishkea Islands pNHA
Blacksod Bay - Cuan an Fhóid Duibh
Bellacorick Iron Flush pNHA
OVER-RUN AREA 3
N59
Bellacorick Bog Complex pNHA
Tullaghan Bay and Bog NHA
Duvillaun Islands pNHA
OVER-RUN AREA 2
Owenduff/Nephin Complex pNHA
Corraun Point Machair/Dooreel Creek pNHA
Doogort Machair/Lough Doo pNHA
Altaconey Bog pNHA
Drumlee Lough pN
Achill Island - Acaill
Croaghaun/Slievemore pNHA
Wild Nephin National Park
Keel Beach
Doogort East Bog NHA
Bellacragher Saltmarsh pNHA
Keel Machair/Menaun Cliffs pNHA
Inishgalloon pNHA
Lough Gall Bog pNHA

0 5 10
Kilometres

LEGEND

- Proposed Development Site Boundary
- Study Area (Main Wind Farm Development Site Boundary 20 km Buffer)
- Proposed Over-run Area Location
- Proposed Turbine Location
- Natural Heritage Area (NHA)
- Proposed Natural Heritage Area (pNHA)

EPA Groundwater Body Description

- Gravel
- Karstic
- Poorly Productive Bedrock
- Productive Fissured Bedrock

RWE

SLR

MUINGMORE WIND FARM

BIODIVERSITY

NHA AND PNHA WITHIN 20 KM OF THE MAIN WIND FARM DEVELOPMENT SITE

FIGURE 5-4c

Scale 1:180,000 @ A3

Date APRIL 2026

474000 476000 478000

824000 822000 402.064443.00001.0105.0 Invasive Species

N

Doolough

Tristia

Gweesalia

2 GS4/GS3 32 PB3 28 PB4 3 GS4/PF2/HH3 1 FW1 1 PB3 10 GS4 6 FW1 33 GS4/ED3/WS1 4 FW1 9 GS4 8 GS4 7 WD4 21 WD4 3 FW1 4 GS4/WS1 5 WD4 11 WS1/GS4 6 WD4 67 WD4 9 FW1 70 FW1 22 WD4 47 PB4 29 GS4/WS1/HD1 13 ED3 50 PB4/WS1 14 ED3 69 BL3 30 WS1 17 BL3 46 PB4 34 WS1 25 PB3 43 PB4 45 PB4 27 FL2 56 GS3 35 GS4 48 WS1 7 BL3 44 PB4 66 PB4/WS1 51 PB4/WS1 59 FS1 12 FW1 54 PB4/WS1 52 PB4/WS1 11 FW1 57 BL3 24 GS4 49 WS1 41 PB4 37 PB4 42 PB4 8 FW1 26 GS4/HH3/WS1 39 PB4 19 GS4 40 PB4 20 PB3 64 FS1 55 FL2 65 FS1 18 HD1/WS1/GS4 16 ED3 36 GS4 58 WS1 53 PB4/WS1 38 PB4 15 ED3 61 FS1 60 FL8 23 PF3 16 WD4/ED3/GS4 17 PF3 31 FL8 63 FS1 62 PF3 15 WS1/GS4/HH3 14 PB3 12 PB3 13 WS1/GS4

0 1 2 Kilometres

LEGEND

- Proposed Development Site Boundary

Fossit Habitats (Linear)

- BL3 - Buildings and Artificial Surfaces
- ED3 - Recolonising Bare Ground
- FW1 - Eroding / Upland Rivers

Fossit Habitats (Areas)

- BL3 - Buildings and Artifical Surfaces
- FL2 - Acid Oligotrophic Lake
- FL8 - Other Artifical Lakes and Ponds
- FS1 - Reed and Large Sedge Swamps
- GS3 - Dry-humid Acid Grassland
- GS4 - Wet Grassland
- GS4/ED3/WS1 - Wet Grassland / Recolonising Bareground / Scrub
- GS4/GS3 - Wet Grassland / Dry-humid Acid Grassland
- GS4/HH3/WS1 - Wet Grassland / Wet Heath / Scrub
- GS4/PF2/HH3 - Wet Grassland / Poor Fen and Flush / Wet Heath
- GS4/WS1 - Wet Grassland / Scrub
- GS4/WS1/HD1 - Wet Grassland / Scrub / Dense Bracken
- HD1/WS1/GS4 - Dense Bracken / Scrub / Wet Grassland
- PB3 - Lowland Blanket Bog
- PB4 - Cutover Bog
- PB4/WS1 - Cutover Bog / Scrub
- PF3 - Transition Mire and Quaking Bog
- WD4 - Conifer Plantation
- WD4/ED3/GS4 - Conifer Plantation / Recolonising Bareground / Wet Grassland
- WS1 - Scrub
- WS1/GS4 - Scrub / Wet Grassland
- WS1/GS4/HH3 - Scrub / Wet Grassland / Wet Heath

RWE

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HABITATS OF THE MAIN WIND FARM DEVELOPMENT SITE

FIGURE 5-5a

Scale 1:18,000 @ A3

Date APRIL 2026

474000
476000
478000
824000
822000
402.064443.00001.0105.0 Invasive Species

N

LEGEND

Proposed Development Site Boundary

Invasive Species Record

Invasive Species Record Location

2
3
6
5
4
7
8
10
9

Doolough

Tristia

Gweesalia

0 1 2
Kilometres

RWE

SLR

MUINGMORE WINDFARM

BIODIVERSITY

INVASIVE PLANTS OF THE MAIN WIND FARM DEVELOPMENT SITE

FIGURE 5-5b

Scale 1:18,000 @ A3

Date APRIL 2026

474000 476000 478000

824000 822000

N

Doolough

Tristia

Gweesalia

Kilometres 0 1 2

LEGEND

- Proposed Development Site Boundary
- Proposed Turbine Location
- Proposed Site Access Location
- Proposed Met Mast Location
- Proposed New Access Track
- Proposed Upgraded Access Track
- Proposed Grid Connection Route (Subject to Separate Planning Application)
- Proposed Crane Pad
- Proposed Substation
- Proposed Battery Energy Storage System (BESS) Compound
- Proposed Attenuation Basin

Fossit Habitats (Linear)

- BL3 - Buildings and Artificial Surfaces
- ED3 - Recolonising Bare Ground
- FW1 - Eroding / Upland Rivers

Fossit Habitats (Areas)

- BL3 - Buildings and Artifical Surfaces
- FL2 - Acid Oligotrophic Lake
- FL8 - Other Artifical Lakes and Ponds
- FS1 - Reed and Large Sedge Swamps
- GS3 - Dry-humid Acid Grassland
- GS4 - Wet Grassland
- GS4/ED3/WS1 - Wet Grassland / Recolonising Bareground / Scrub
- GS4/GS3 - Wet Grassland / Dry-humid Acid Grassland
- GS4/HH3/WS1 - Wet Grassland / Wet Heath / Scrub
- GS4/PF2/HH3 - Wet Grassland / Poor Fen and Flush / Wet Heath
- GS4/WS1 - Wet Grassland / Scrub
- GS4/WS1/HD1 - Wet Grassland / Scrub / Dense Bracken
- HD1/WS1/GS4 - Dense Bracken / Scrub / Wet Grassland
- PB3 - Lowland Blanket Bog
- PB4 - Cutover Bog
- PB4/WS1 - Cutover Bog / Scrub
- PF3 - Transition Mire and Quaking Bog
- WD4 - Conifer Plantation
- WD4/ED3/GS4 - Conifer Plantation / Recolonising Bareground / Wet Grassland
- WS1 - Scrub
- WS1/GS4 - Scrub / Wet Grassland
- WS1/GS4/HH3 - Scrub / Wet Grassland / Wet Heath

RWE

SLR

MUINGMORE WINDFARM

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HABITATS OF THE MAIN WIND FARM DEVELOPMENT SITE WITH SITE INFRASTRUCTURE

FIGURE 5-5c

Scale 1:18,000 @ A3

Date APRIL 2026

402.064443.00001.0105.0 Invasive Species

474000
476000
478000
824000
822000
402.064443.00001.0106.0 Mammals

N

T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
T13
TCC1
TCC2
1
2
3
Doolough
Tristia
Gweesalia

0
1
2
Kilometres

LEGEND

- Proposed Development Site Boundary
- Proposed Turbine Location
- Proposed Site Access Location
- Proposed Met Mast Location
- Proposed New Access Track
- Proposed Upgraded Access Track
- Proposed Grid Connection Route (Subject to Separate Planning Application)
- Proposed Crane Pad
- Proposed Substation (Indicative Size and Location)
- Proposed Battery Energy Storage System (BESS) Compound (Indicative Size and Location)
- Proposed Temporary Construction Compound (TCC)
- Proposed Attenuation Basin

Incidental Species Observation

- Red Deer

Note
No Target Mammal Species were Recorded

RWE

SLR

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MAMMALS RECORDED AT THE MAIN WIND FARM DEVELOPMENT SITE

FIGURE 5-6

Scale 1:18,000 @ A3

Date APRIL 2026