



AA Screening and Natura Impact Statement

Muingmore Wind Farm

RWE Renewables Ireland Limited

Prepared by:

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Basis of Report

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Glossary of terms

Term	Acronym	Definition
Appropriate Assessment	AA	An assessment under Article 6(3) of the Habitats Directive to determine whether a plan or project will adversely affect the integrity of a European site.
Appropriate Assessment Screening	AA Screening	The initial stage of Article 6(3) assessment to determine, based on objective scientific information, whether likely significant effects on a European site can be excluded.
Natura Impact Statement	NIS	A scientific report informing Appropriate Assessment, assessing the implications of a project for European sites in view of their conservation objectives.
Habitats Directive	—	Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (as amended).
Birds Directive	—	Directive 2009/147/EC on the conservation of wild birds (as amended).
European Site	—	A Special Area of Conservation (SAC) or Special Protection Area (SPA), including candidate and proposed sites, designated under the Habitats and Birds Directives.
Special Area of Conservation	SAC	A site designated under the Habitats Directive for the protection of Annex I habitats and Annex II species including a candidate site.
Special Protection Area	SPA	A site designated under the Birds Directive for the protection of bird species listed in Annex I and regularly occurring migratory species including proposed sites.
Qualifying Interests	QIs	Habitats and species for which a SAC is designated.
Special Conservation Interests	SCIs	Bird species and habitats for which a SPA is designated.
Conservation Objectives	—	Site-specific objectives defining the required condition of qualifying interests necessary to maintain or restore site integrity.
Site Integrity	—	The coherence of a European site's ecological structure and function, across its whole area, enabling it to sustain its qualifying interests.
Likely Significant Effect	LSE	Any effect that may undermine a site's conservation objectives, either alone or in combination, and which cannot be excluded on the basis of objective information.
In-Combination Effects	—	Cumulative or synergistic effects arising from a project together with other plans or projects.
Source–Pathway–Receptor Model	SPR	A conceptual framework identifying how a project source may affect a receptor via an ecological or physical pathway.
Zone of Influence	ZoI	The spatial area within which project activities could give rise to effects on environmental receptors, defined case-by-case rather than by fixed distance thresholds.
Best Available Scientific Knowledge	—	The most up-to-date, relevant and reliable scientific information available at the time of assessment.
Competent Authority	—	The public authority responsible for carrying out Appropriate Assessment and determining consent (e.g. An Coimisiún Pleanála or a planning authority).



Term	Acronym	Definition
Collision Risk Model	CRM	A quantitative model used to estimate the risk of bird collisions with wind turbines based on flight activity and turbine parameters.
Conservation Status	—	The overall condition of a habitat or species, assessed in terms of range, structure, function and long-term viability.
Mitigation Measures	—	Measures designed to avoid or reduce adverse effects on European sites; considered at Appropriate Assessment stage, not at screening.
Adverse Effect on Site Integrity	—	An effect that prevents a European site from maintaining or restoring its qualifying interests in a favourable condition.
Construction Environmental Management Plan	CEMP	A document setting out measures to manage and mitigate environmental effects during construction, operation and decommissioning.
Sustainable Drainage Systems	SuDS	Drainage techniques designed to manage surface water runoff in a way that mimics natural processes and protects water quality.





1.0 Introduction

SLR Environmental Consulting (Ireland) Ltd was commissioned by RWE Renewables Ireland Limited to assist with the Appropriate Assessment (AA) Screening process and Natura Impact Statement (NIS) and produce the Appropriate Assessment (AA) Screening Report and NIS to accompany a planning application for the Proposed Development. The Proposed Development comprises the construction of a 13 no. turbine wind farm development. The Proposed Project also includes an 110kV underground Grid Connection Route (GCR) (approx. 25.5 km long) which runs from the substation on Main Wind Farm Development Site to the Bellacorick Substation. The underground GCR will be located entirely within the public roads and while being assessed in this AA Screening and NIS does not form part of the planning application. The NIS has assessed the entire Proposed Project.

1.1 Definition of terms

The following terms (Capitalised) are used within this report.

Proposed Project: Refers to the Proposed Development including the GCR.

Proposed Development: Refers to the elements of the Proposed Project for which planning consent is being sought. This encompasses the wind farm and associated infrastructure (including the 33kV collector cables), Habitat Enhancement Area in the north-west quadrant (NWQ), any development associated with the Turbine Delivery Route (TDR), onsite substation, and battery energy storage system (BESS).

Proposed Development Site: The site where the Proposed Development is located, as defined by the Planning Application Boundary.

Main Wind Farm Development Site: part of the Proposed Development Site which includes the proposed wind turbines and associated infrastructure.

The Northern Cluster of the Main Wind Farm Development Site is comprised of a geographical area to the north of the local road, the L5252. Elements of the Proposed Development which will be located in the Northern Cluster comprise.

- 7 no. turbines (turbine nos. 1-7) and their associated access tracks, hardstandings and foundations.
- 1 no. 110kV substation.
- 1 no. temporary construction compound (TCC1).
- 1 no. BESS.
- 2 no. site access points (AP1 and AP2).
- Internal underground 33kV collector cables which connects both clusters to the onsite substation which is located within the Northern Cluster.
- Habitat Enhancement Area in the north-west quadrant (NWQ).

The Southern Cluster of the Main Wind Farm Development Site is defined by the area to the south of the local road, the L5252. Elements of the Proposed Development which will be located in the Southern Cluster comprise:

- 6 no. turbines (turbine nos. 8-13) and their associated access tracks, hardstandings and foundations.
- 1 no. temporary construction compound (TCC2).
- 1 no. meteorological mast.
- 1 no. site access point (AP3).



- Internal underground 33kV collector cables, connecting to the onsite substation which is located within the Northern Cluster.

Turbine Delivery Route (TDR): Refers to the proposed turbine delivery route from Killybegs Port to the Main Wind Farm Development Site and includes the 3 no. Over-run Areas.

Over-run Areas: Refers to the 3 no. areas (Over-run Areas 1, 2 & 3) along the TDR where temporary accommodation works on private lands are required.

Grid Connection Route (GCR): The designated route for the 110kV Underground Electricity Cable from the Proposed Development onsite substation to the national grid connection point at Bellacorick 110 kV Substation. The GCR will be the subject of a separate planning application.

Habitat Enhancement Area in the (NWQ): An area to the north-west of the Main Wind Farm Development Site which will not include any infrastructure related to the Proposed Project other than that to enhance habitat.

1.2 Relevant Legislation and Policy

The requirement for AA screening and AA is set out in the Habitats Directive (Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, which is transposed into Irish law primarily through the European Communities (Birds and Natural Habitats) Regulations 2011–21, (S.I. 477 of 2011, as amended) (“Birds and Natural Habitats Regulations”) and the Planning and Development Act 2000, (as amended).

The Habitats Directive requires that where a plan or project is likely to have a significant effect on a Natura 2000 Site, either individually or in combination with other plans or projects, while not directly connected with or necessary to the nature conservation management of the site, it will be subject to ‘Appropriate Assessment’ to identify any implications for the Natura 2000 site in view of the site’s Conservation Objectives. Specifically, Article 6(3) of the Habitats Directive states:

‘6(3) Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public’.

Habitats Directive and Birds directives provide legal protection for habitats and species of European importance. In Ireland these protections relate to Special Areas of Conservation (SACs) and Special Protected Area (SPAs) which collectively are referred to as European Sites in the Council Directive 92/43/EEC.

Under the implementing legislation in Ireland, all candidate SACs and potential SPAs are afforded full protections until a formal decision on designation has been reached, therefore for the purpose of this report they are referred to as SACs and SPAs. All designated and proposed SACs and SPAs are classified as ‘European sites’.

Under the implementing legislation in Ireland, the competent authority must carry out a screening for Appropriate Assessment to determine, in view of objective information and the best scientific knowledge, whether a proposed project, either individually or in combination with other plans or projects, is likely to have a significant effect on a European site.

Where likely significant effects cannot be excluded at screening, an Appropriate Assessment is required. The Appropriate Assessment must examine the implications of the proposed



project for the European site(s) in view of their conservation objectives and may only conclude no adverse effects on site integrity where it can be established, beyond reasonable scientific doubt, that such effects will not occur. The provisions of Article 6(3) do not apply where the proposed plan or project is 'connected with or necessary to the management of the site'.

1.3 Report Purpose

This report presents an Appropriate Assessment Screening of the Proposed Project to determine, a preliminary assessment based on objective information and best available scientific knowledge, whether the Proposed Project, either alone or in combination with other plans or projects, could have a significant effect on a European site; in view of the site's conservation objectives.

Where likely significant effects cannot be excluded, the report also includes a Natura Impact Statement, which is based on the best available scientific knowledge assessing the implications of the proposed project for European site(s), in view of their conservation objectives and site integrity.

The report has been prepared to inform the competent authority in carrying out an Appropriate Assessment, as required under Article 6(3) of Council Directive 92/43/EEC (the Habitats Directive).

The information presented will allow the Competent Authority to make their determination regarding likely significant effects on European sites resulting from the Proposed Project, in accordance with and fulfilment of the requirements of Article 6 of the Habitats Directive

1.4 Guidance

The assessment was conducted in accordance with the following guidance:

- European Commission. (2021). Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Commission Notice (2021) Brussels, 28.9.2021 C (2021) 6913 final.
- Environment Heritage and Local Government. (2009, updated 2010). Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Dublin: National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government.
- European Commission. (2019). Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC. Brussels, (2019/C 33/01). OJ C 33, 25.1.2019.
- European Commission. (2013). Interpretation Manual of European Union Habitats. Version EUR 28.
- Office of the Planning Regulator. (2021). OPR Practice Note PN01 Appropriate Assessment Screening for Development Management.

1.5 Sources of Information

Sources of information for the assessment of the project /plan 'alone' and in combination with other plans and projects consists of the following:

- Environmental Protection Agency (EPA) (on-line map-viewer including the Appropriate Assessment Tool)¹;

¹ <https://gis.epa.ie/EPAMaps>, accessed 30 January 2025



- Geological Survey Ireland (GSI) Spatial Resources²;
- Department of Housing, Planning, and Local Government- EIA Portal³;
- National Planning Database for information on other projects and plans⁴;
- National Parks and Wildlife Service – online European site network information, including site conservation objectives⁵;
- National Parks and Wildlife Service – Information on the status of EU protected habitats and species in Ireland (including Article 17 and Article 12 Reports);
- National Biodiversity Data Centre⁶
- Fitzgerald Ecology (2024) Habitat survey of Muingmore Wind Farm, Co. Mayo;
- Fitzgerald Ecology (2023) Marsh Fritillary Survey – Muingmore Wind Farm, Co. Mayo;
- Triturus (2024) Fisheries assessment of the proposed Muingmore Wind Farm, Co. Mayo (**Appendix 3**);
- Triturus (2024) Aquatic baseline report for the proposed Muingmore Wind Farm, Co. Mayo (**Appendix 3**);
- Woodrow (2024) Ornithology Results Reports for Muingmore Wind Farm, Co. Mayo 2021-24 (**Appendix 2**); and
- Muingmore Wind Farm, Environmental Impact Assessment Report, especially Chapters 2, 5 and 7.

Sources of information for the plans and projects for the “in combination” assessment were as above and consists of:

- Mayo County Council Online Planning Portal⁷
- Mayo County Development Plan 2022 - 2028⁸;
- National Biodiversity Action Plan⁹; and
- Regional Spatial and Economic Strategy 2020-2032 (RSES)¹⁰
- Sustainable Energy Authority of Ireland Wind Energy Mapping¹¹;
- National Planning Database for project data¹².

² <https://dceir.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228>, accessed 22 December 2025

³ <https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1>, accessed 22 December 2025

⁴ <https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de>, accessed 22 December 2025

⁵ www.npws.ie, accessed 22 December 2025

⁶ www.biodiversityireland.ie, accessed 22 December 2025

⁷ [Search For Planning- Mayo County Council](#) Accessed 10/11/2025

⁸ [VOL-1-Book_2.pdf \(mayo.ie\)](#) Accessed 10/11/2025

⁹ <https://www.npws.ie/sites/default/files/publications/pdf/National%20Biodiversity%20Action%20Plan%20English.pdf> Accessed 10/11/2025

¹⁰

[https://www.nwra.ie/rses/#:~:text=Regional%20Spatial%20and%20Economic%20Strategy%202020%2D2032%20\(RSES\)&text=The%20RSES%20introduces%20the%20concept.we%20need%20effective%20regional%20planning](https://www.nwra.ie/rses/#:~:text=Regional%20Spatial%20and%20Economic%20Strategy%202020%2D2032%20(RSES)&text=The%20RSES%20introduces%20the%20concept.we%20need%20effective%20regional%20planning). Accessed 10/11/2025

¹¹ <https://gis.seai.ie/wind/> Accessed 30/03/2022

¹² <https://data.gov.ie/dataset/national-planning-applications> Accessed 10/11/2025



1.6 Methodological Approach to Article 6(3) Assessment (Screening and Appropriate Assessment)

The methodological framework described below applies to both stages of the Article 6(3) process. At Stage 1, the information presented is used to support the competent authority in screening for Appropriate Assessment. Where likely significant effects cannot be excluded, the same framework is applied in greater detail at Stage 2 through the preparation of a Natura Impact Statement to inform the Appropriate Assessment carried out by the competent authority.

The assessment of potential effects on European sites is an iterative process informed by a Source–Pathway–Receptor (SPR) model and is based on best available scientific knowledge. This report identifies and examines potential SPR linkages associated with the proposed project in order to provide objective scientific information to support the competent authority in determining whether likely significant effects on European sites, either alone or in combination with other plans or projects, can be excluded at screening stage, or, where required, to inform the Appropriate Assessment of the project’s implications for European sites in view of their conservation objectives and site integrity.

For an effect to occur, a source, a pathway and a receptor must all be present. Where one or more of these elements is demonstrably absent, the report provides evidence to support the exclusion of a potential effect. Where all elements are present, the potential for effects is examined in greater detail having regard to the sensitivity of the receptor, the characteristics of the pathway, and the nature and scale of the source.

In the context of this assessment:

- Sources are any identifiable elements of the Proposed Project that may interact with the receiving environment, such as physical disturbance, emissions, resource use or operational activities;
- Pathways are any ecological, hydrological or functional connections by which a source may affect a receptor; and
- Receptors are the Qualifying Interests of Special Areas of Conservation and the Special Conservation Interests of Special Protection Areas, as well as ecological features known to support those interests. The term qualifying features is used in this report to collectively refer to these interests.

The assessment commences with a description of the Proposed Project and the receiving environment, including relevant baseline conditions. Potential sources of impact associated with the Proposed Project are identified having regard to the nature, scale, duration and timing of the project and its constituent activities. These sources are used to define the Zone of Influence (Zoi) of the Proposed Project, representing the geographical area over which the project could reasonably give rise to effects on the receiving environment (See Section 3.3.2.2. for further details).

The identification of relevant European sites within the Zoi is informed by the guidance set out in the European Commission Notice on the assessment of plans and projects in relation to Natura 2000 sites (2021), including consideration of:

- European sites that overlap with, are adjacent to, or are located within the Zoi of the proposed project;
- European sites that could be indirectly affected by the project, including through the use of natural resources or the emission of substances or energy; and
- European sites whose ecological connectivity or functional relationships could be affected by the project.



The Zol is established on a case-by-case basis using the SPR framework and is not defined by arbitrary distance thresholds. Potential pathways linking identified sources to European sites and their qualifying features are examined to determine whether ecological or functional connectivity exists.

The potential for in-combination effects with other plans or projects is considered by examining whether overlapping sources, pathways or receptors could give rise to cumulative or synergistic effects on European sites.

In accordance with the precautionary principle, as articulated by the European Commission, the absence of complete scientific certainty cannot be relied upon to exclude the possibility of effects where a risk to European sites remains. Where likely significant effects cannot be excluded based on objective scientific information, the project is required to be subject to Appropriate Assessment. Further detail on how the likelihood of significant effects is defined, interpreted and considered in the context of this report is provided in section 3.4.

The consideration of mitigation measures and the assessment of effects on site integrity are addressed at Appropriate Assessment stage and are not applied at screening stage.

This report is based on best available scientific knowledge and professional ecological judgement. It draws on published scientific literature, available data from the National Parks and Wildlife Service, including site-specific conservation objectives, and other relevant environmental information; as listed above. The authors have the appropriate scientific qualifications and experience to support the works undertaken as set out in section 1.6 below.

1.7 Statement of Scientific Competence

Kathryn Robson

This report has been written by Kathryn Robson BSc Hons, MSc. 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

Andrew Torsney BSc, MRes, PhD, ACIEEM provided oversight in the project direction as well as technical review of this report. The Annex I habitat condition assessment survey was also conducted by Andrew. Andrew has undertaken AAs for several national regional and local plans as well as project level assessments. Andrew has experience undertaking technical assessments of largescale wind farms on projects such as Carrownaglough, Coomatalin and Dublin Array. Andrew is a technical specialist in AA processes and has undertaken review processes for competent authorities such as the Department of Public Expenditure and Reform and County Councils such as Dun Laoghaire Rathdown and Kilkenny. Andrew has also delivered training on the role of county councils in the AA process as well as having authored NIS reports for a variety of project types.

Jonathon Dunn

The collision risk modelling report was written by Jonathon Dunn MA (Cantab.) MSc PhD MCIEEM, and he also provided additional technical review. Jonathon also undertook the initial site walkover and survey of the grid route and turbine delivery route. Jonathon has worked in the environmental sector since 2014 and joined SLR Consulting in 2021. Prior to working in environmental consultancy, he used to undertake 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

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, 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

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, 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

The 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, 2007), Annex I habitat classification, Irish Vegetation Classification (IVC), National Parks and Wildlife Service ‘Uplands Manual’ habitat classification and Flora (Protection) Order, 2022 species identification and conservation.

Woodrow Personnel

Baseline ornithology data were provided by Woodrow and the relevant specialisms of the personnel can be found in **Appendix 2**.

1.8 Consultation

A scoping request in relation to the Proposed Project was sent to various consultees in April 2024. A total of 12 biodiversity-related consultees were contacted, of which three provided responses. (see **Chapter 3** for more information). A summary of the responses relating to biodiversity and how they have been addressed are also provided in **Table 1-1** below.

Table 1-1: 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. Two meetings were held with NPWS (6 th March 2024 and 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	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



Prescribed Body	Comment Summary	Response
	<p>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.</p> <p>It was noted that offshore bird species and developments should be considered in cumulative assessment.</p> <p>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.</p> <p>Ongoing communication was undertaken with NPWS in relation to the Annex I habitats and approach being taken. It was agreed in a meeting on the 16th of September 2025 that the following was required.</p> <ul style="list-style-type: none"> • Apply Irish Vegetation Classification (IVC) alongside existing habitat classification systems. • 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. <p>Establish appropriate long-term monitoring metrics for habitat condition.</p>	<p>process as the analysis was undertaken as the final year of data was being collected.</p> <p>Appropriate reference populations have been selected for communication with NPWS which include those specified related to Merlin and Golden Plover.</p> <p>Offshore bird species were considered extensively regarding offshore windfarms and ranging patterns. Particularly regarding SPAs.</p> <p>Detailed restoration plans and BNG assessments have been undertaken.</p> <p>The annex I condition assessments have been undertaken for the all the peatland habitats – which includes IVC classifications Appendix 4 Habitat Condition Assessment Report. This data was then used to model the outcomes and calculate the overall habitat loss areas and inform the net gain assessment. The details of which were used to create the Habitat Management Plan (HMP) has been written and is included as part of the Peatland Restoration Plan (Appendix A) in Appendix 7 of this NIS 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.</p>
Irish Peatland Conservation Council (IPCC)	<p>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.</p> <p>The hydrology of an industrial wind farm site has to be continually managed, the fragmentation from the roadways 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.</p>	<p>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 within the Peatland Restoration Plan which can be found as part of the Peatland Restoration Plan (Appendix A) in Appendix 7 of this NIS. This plan is to ensure the improvement of the condition of the cutover blanket bog within the Main Wind Farm Development Site.</p>
Minister for Rural and Community Development	No comment was made specifically with regard to the AA process.	No comment was made specifically with regard to the AA process.

2.0 Proposed Project



2.1 Detailed Description of Proposed Project

The Proposed Project will primarily consist of a wind farm of 13 No. wind turbine generators (WTGs), meteorological mast, 110kV substation compound along with ancillary civil and electrical infrastructure, BESS, and 3 no. temporary Overrun Areas along the TDR. Construction of two temporary construction compounds will be required, with associated temporary site offices, parking areas, welfare facilities and security fencing.

The total installed capacity of the Proposed Development is estimated to be between 74.1 to 91 MW¹³.

The exact turbine will be subject to a competitive procurement process that will only commence if the Proposed Development receives consent. The proposed turbines will be detailed by the turbine manufacturer at award of the contract.

As such the proposed turbines will be within the following specifications:

- The turbines will be three bladed, horizontal axis type.
- The turbines will have a height range of 179-180m from top of foundation (at ground level) to blade tip height.
- The rotor diameter of the proposed turbines will be within the range of 149-163m.
- The hub height will be within the range of 98.5 to 105m.
- Foundation diameters will either be gravity or piled foundations.

A 33kv collector cable will run between the Northern and Southern Clusters of the Proposed Development.

The associated GCR will consist entirely of an underground cable route. This GCR has been assessed in the EIAR but does not form part of the Proposed Development. This chapter does include details of the Proposed Development and the Proposed Project.

Construction methodologies provided in this Chapter of the EIAR are based on initial site investigations and intended to enable a robust assessment of the potential impacts of the Proposed Project. Further details are provided in the Construction Environmental Management Plan (CEMP).

The CEMP will be updated prior to commencement of construction activities to address the requirements of any relevant planning conditions, including any additional measures which are conditioned and will be submitted to the planning authority for written approval.

2.2 Temporary Construction Compounds

Two temporary construction compounds will be provided, one each within the Northern and Southern clusters. The compound boundaries will be set out and marked prior to any works commencing. Any significant surface undulations or irregularities will be trimmed and the removed peat placed in designated peat storage areas for reuse or reinstatement, subject to ECoW approval. Otherwise, surface vegetation is to remain intact to increase founding strength.

Where the fibrous top layer is weak or saturated, a geotextile or geocomposite material will be placed directly upon the ground surface to improve load distribution, separation, filtration and drainage.

¹³ Note: the MW output is stated here based on turbines of between 5.7 MW and 7 MW output only for the purposes of assessment of benefits towards climate as set out in **Chapter 8**.



A base geosynthetic layer, to be specified pending the specific site conditions identified at the pre-construction stage, will be installed across the full compound footprint. Overlaps, anchorage, and tensile orientation will conform to manufacturer requirements.

Imported well-graded granular fill will be tipped incrementally across the compound footprint, progressing outward from the floating access track, and spread by a wide tracked dozer. The initial stone layer will be compacted through a contractor specified method that minimises vibration and excessive loading such as tracking or dead rolling.

Where required, an intermediate geogrid layer will be installed. This will be placed upon the first stone layer and will be overlapped and tensioned in accordance with the manufacturer's specification.

A second layer of granular fill will be placed upon the intermediate geogrid to the designed thickness. Where very low CBR values are encountered, a third geogrid layer may be required.

A final compacted wearing layer of appropriately graded stone will be installed to accommodate construction traffic and pedestrian use.

Where necessary, pressure berms (stabilising berms) will be constructed around the perimeter of the compounds to enhance stability and reduce lateral displacement.

Ongoing consolidation and localised settlement of the compound surface should be expected throughout the construction period. The Contractor will be responsible for maintaining the compound to required standards, including remediation of rutting, settlement, or lateral spread using additional granular fill and localised geogrid repairs where appropriate.

Shallow drainage ditches will be excavated at a safe offset from the compound to prevent undercutting of peat. Existing field drains will be connected where appropriate and protected using silt-management measures such as silt fences or settlement features.

Once all construction works are complete, the work areas will be reinstated with excavated soil and either seeded out with native species, allowed to vegetate naturally, or reinstated with excavated grass turves and will be restored to their original condition. This work will be carried out in consultation with the landowner and in line with any relevant measures outlined in the planning application, CEMP and planning conditions.

2.3 Turbines

2.3.1 Candidate Turbines

Whilst the exact make and model of the turbine will be dictated by a competitive tender process it is envisaged at this time that it will meet with the parameters as set out in **Table 2-1**.

Table 2-1: Turbine Details

Turbine Type	Tip Height (m)	Hub Height (m)	Rotor Diameter (m)
Vestas V150	180	105	150
Nordex N163	180	98.5	163
Nordex N149	179	104.5	149



2.3.2 Turbine Layout

The Northern Cluster consists of seven turbines (nos. 1-7) with 4 no. turbines (or associated buffer areas) located in forested areas (nos. 1-3 and 7). The remaining 3 no. (nos. 4-6) turbines are located in open areas of peatland.

The Southern Cluster comprises 6 no. turbines (nos. 8-13), with a further 4 turbines (or associated buffer areas) within forested areas (nos. 10, 11, 12 and 13) with the remainder located in open areas of peatland.

The Main Wind Farm Development Site layout reflects the outcome of an iterative design process. The turbines referenced from T1-T13 and coordinates in Irish Transverse Mercator [ITM] are detailed in **Table 2-2**.

Table 2-2: Proposed Turbine Coordinates

Turbine ID	X (ITM)	Y (ITM)
1	475806	823891
2	476156	824041
3	476506	823991
4	477006	823091
5	476998	823635
6	477564	823173
7	477624	823705
8	476357	822557
9	476464	822151
10	476198	821592
11	476576	821830
12	477164	821788
13	477072	822318

2.3.3 Turbine Foundations

An access track will be constructed to the turbine location where the turbine location, foundation footprint and associated working area shall be set out and marked prior to commencement of works.

A temporary working area shall be established at the end of the track using geogrid(s) and granular stone to provide a stable platform for excavators, piling rigs and ancillary construction plant. The bases of the turbine foundations will be excavated to a competent-bearing stratum or founded on piles. Ground investigations to date have provided an outline indication of the possible ground conditions expected to be encountered at the proposed turbine locations. Deep peat (greater than 1m) was encountered at the majority (12 of 13) of turbine locations. Hence, based on the available ground investigation data it is assumed that turbine foundations will utilise a piled solution, with the potential for a small number to be gravity foundations based on depths to competent strata. Shallow surface water drains will be excavated around the working area to prevent surface water runoff into it.



Where peat is present, subject to its depth, water ingress and stability conditions, excavation support shall be provided through one of the following methods:

- Sheet Pile, Rock or Modular Cofferdam - Used where peat is saturated or unstable. A method will be chosen based on ground conditions with sheet piled and modular cofferdams being temporary and rock cofferdams being left in situ.
- Benched Excavation - Used where peat has sufficient shear strength to maintain stable slopes, subject to geotechnical approval and slope toe support where required.

A designed piling pad will be constructed at formation layer consisting of geogrid and stone build up to the specified requirement based on the piling rig used.

The final pile type and installation method shall be determined by detailed ground investigation results, accounting for peat characteristics, underlying strata and environmental constraints. Piling methods may include:

- Bored Piles with Temporary Casing - Suitable in saturated or unstable peat to prevent ingress or instability.
- Continuous Flight Auger - Typically used where bore stability can be maintained and groundwater inflow is manageable.

Piles shall be installed to a competent bearing layer. After installation, a blinding layer shall be placed across the foundation footprint to provide a level, clean surface for the foundation reinforcement installation.

A large reinforcement cage, with a central anchor cage, will be prepared for all foundations and complete with cable routing.

Once temporary formwork has been placed, a high strength, specified concrete is poured in a continuous operation and completed through a site-specific methodology. After concrete has been cured, backfilling of the excavation, with engineered fill, and surface grading is completed, leading to the final stages of preparation to install the turbine tower upon the foundation plinth.

Based upon the proposed tip height and ground conditions, it is estimated a typical gravity foundation design will require 1,000m³ of concrete in the turbine foundation. Where piled foundations are required, reduced quantities of concrete will be needed. This assessment is based on 1,000m³ of concrete for each turbine foundation and as such reflects a worst case scenario. Foundations range from circular to hexagonal and square, depending on the requirements of the final turbine supplier.

Following the completion and quality assurance of the turbine foundation, the crane pad and full hardstand footprint will be marked out for construction. The footprint will consist of, but not be limited to, the crane pad, access track, blade laydown, assembly area, storage area and auxiliary crane pads.

2.3.4 Crane Pad Hardstands

Each turbine will have a hardstanding area constructed at its base to provide a stable surface for the main installation crane, which will be used to erect the turbine. The dimensions of the main crane hardstandings can be utilised to a maximum of 82m by 35m. The dimensions of the designated blade laydown areas are 90m x 25m. Interchangeable dimensions and extra storage room has been incorporated into the design to provide sufficient area of hardstanding to cover any of the possible three candidate specifications.

Turbine crane hardstands will consist of up to 1,000mm of hardcore placed on top of a base geotextile layer with additional geotextiles installed subject to ground conditions. There are two construction methodologies, one for hardstands to be founded on competent bearing strata and one for deep peat.



The construction methodology for the crane pad and hardstand on competent bearing strata will be as follows:

- Topsoil and unsuitable material within the hardstand footprint will be stripped to the required depth and stockpiled or disposed of. Subgrade preparation will include proof-rolling, localised excavation of soft spots, and replacement with engineered fill where necessary.
- Where ground conditions require improvement, a base geogrid layer will be installed.
- Stone placement upon the excavated formation level will be carried out in layers with each layer being suitable compacted until specified thickness is achieved.
- The crane pad will be constructed to the design platform level and bearing capacity specified by final crane model.
- Peripheral drainage, such as shallow ditches, will be formed around the hardstand to intercept surface water runoff and to prevent water ingress.
- Surplus topsoil will be placed along the side of the hard standing and dressed to blend in with surrounding landscaping.

Crane pads will be constructed to facilitate the installation of turbine components. Their location and orientation have been optimised to utilise the existing topography, minimise land take and avoid environmental constraints where applicable.

The construction methodology for the crane pads located in deep peat will be as follows:

- Temporary geosynthetic-reinforced working platforms, or piling pads, for piling rigs shall be constructed on top of the ground surface to a specified requirement based on the piling rig proposed. The platforms will consist of geogrid(s) and granular stone.
- The specified piling method shall be carried out across the crane pad area in accordance with the specified number, spacing, and arrangement of piles as indicated in the design documentation.
- The piling type and installation method will have piles installed to a competent bearing layer.
- The piles will receive a reinforcement cage and specified concrete.
- Once cured, each pile will be cut down to specified elevation to create a uniform cap level and cleaned prior to pile caps being constructed.
- High-strength specified geogrids will be installed over the set pile caps to the manufacturer's specification and quantity. A well-graded granular material will be placed and compacted in controlled layers over the geogrids to completion.
- Blade laydowns, assembly areas, and temporary storage areas will generally be constructed as floating hardstands. These will consist of a designed stone depth with interchangeable geosynthetic quality and quantity based on ground conditions.
- The Contractor will be responsible for maintaining the hardstands to required standards, including remediation of rutting, settlement, or lateral spread using additional granular fill and localised geogrid repairs where appropriate.
- Peripheral, shallow drainage ditches will be formed around the hardstand to intercept surface runoff and protect peat stability.

Crane pads will remain in place for the operational life of the Proposed Development, with stored topsoil and peat being used to restore the edges, blade laydowns and jib assembly areas.



2.4 Turbine Erection

The turbine components will be delivered to the Main Wind Farm Development Site where they will be placed on prepared hardstanding storage and laydown areas prior to assembly. The components include the turbine towers (which will be delivered in sections), nacelle, hub and individual turbine blades (which will be delivered one by one). Once all components are available, and there is suitable weather, each turbine will be assembled.

The tower of a turbine is a conical steel tube, with a corrosion resistant paint finish. Tower sections are generally transported to the Main Wind Farm Development Site in 4 to 5 sections. The base section is lifted by crane and bolted to the foundation anchor cage with upper sections bolted to their lower section in ascending order. The base of the tower is 4m to 5m in diameter, tapering to between 3m and 4m, where it is attached to the nacelle. The base is accessed by a galvanised steel staircase and a steel hatch door which will be kept locked except during maintenance.

The size and configuration of the turbine foundations will vary depending on the selected turbine model, site-specific ground conditions and the detailed geotechnical and structural design. Where piled foundations are required, they will comprise of reinforced concrete caps of diameter of 22m. Where gravity foundations are suitable, they will consist of a foundation diameter of 27m.

Each turbine will take approximately a week to erect, weather dependent, and will require two cranes in the assembly process. The turbines will then be commissioned and tested.

2.4.1 Turbine Blades

The blades of a modern turbine comprise glass fibre reinforced polyester. The turbine blades rotate between five and 15 revolutions per minute, dependent on wind speed and turbine manufacturer make and model. A turbine begins generating electricity at a wind speed of approximately 3 to 4 m/s depending on the turbine type, with rated power generation at wind speeds of approximately 12 to 14 m/s.

Turbines are usually shut down at wind speeds greater than 25m/s, although some machines are designed to operate up to 30m/s. The yaw mechanism, controlled by a wind vane, turns the nacelle and blades into and out of the wind. Blades are pitched to match the wind conditions.

Operational safeguards against the effects of extreme temperatures will be incorporated into the design in the form of anti-vibration sensors to detect any imbalance resulting from ice formation on the blades and delay the turbine's operation until the blades have been de-iced.

2.4.2 Turbine Transformer

The turbine will have a transformer located within the tower. The turbine transformer steps up the voltage of the electricity generated by the turbine to approximately 33kV to reduce the electrical loss on the internal collector cabling that connects to the onsite substation.

2.4.3 Power Output

The Proposed Development will have an estimated installation capacity of between 74.1 MW to 91 MW depending on the final turbine technology installed. Turbines of the exact same make, model and dimensions can have different power outputs depending on the capacity of the electrical generator installed in the turbine nacelle. Rated capacity of 74.1-91 MW has been used below to calculate the power output of the Proposed Development. Assuming installed capacity of 74.1 MW to 91MW, the Proposed Development has the potential to produce approximately 226,884 to 279,006 MWh (megawatt hours) of electricity per year, based on the following calculation:



- $A \times B \times C$ = megawatt hours of electricity produced per year

Where:

- A = the number of hours in a year: 8,760 hours.
- B = the capacity factor, which takes into account the intermittent nature of wind, the availability of wind turbines and array losses. The capacity factor of 0.35 is applied here based on the turbines operating 35% of the time.
- C = rated capacity of the proposed turbines: 74.1 MW-91 MW.

The 226,884 to 279,006 MWh of electricity produced by the Proposed Development will be sufficient to supply approximately 54,020 to 66,430 Irish households with electricity per year, based on the average Irish household using 4.2 MWh of electricity¹⁴.

According to the 2022 Census of Ireland, there are a total of 52,114 private households within County Mayo. Based on a capacity factor of 35%, the Proposed Development will produce enough electricity for the equivalent of 104% to 127% of all households in County Mayo as per the Housing stock of the 2022 Census.

2.4.4 Turbine Colour

Turbines have multiple painted coatings which protect against corrosion. They are coloured light grey to blend into the sky background. The colour of the turbines minimises visual impact, as recommended by the following guidelines on wind energy developments:

- Draft Wind Energy Development – Planning Guidelines (2019)¹⁵.
- Wind Energy Development – Planning Guidelines (2006)¹⁶.
- The Influence of Colour on The Statics of Wind Turbine Generators – ETSU W/14/00533/00/00¹⁷.
- PPG 22, Department of The Environment – Welsh Office¹⁸.
- Technical Advice Note 8, Welsh Assembly, 2005¹⁹.

2.5 Turbine Delivery Route

A turbine delivery route selection and assessment was carried out to identify the optimum delivery route to the Main Wind Farm Development Site. The nodes relate to minor works within the public carriageway. In addition, there are three over-run areas where temporary tracks will be constructed to avoid pinch points. Turbine delivery will be from Killybegs Port to the Main Wind Farm Development Site. Leaving Killybegs, the TDR continues via the R263 to merge with the N56 north of Killybegs and then along the N56 south through Dunkineely, Mountcharles Bypass, and onto the Donegal Bypass. At this point it merges onto the N15, following it for approximately 65 km through Ballyshannon, Bundoran, before merging onto the N4 at Sligo. The route continues on the N4 southbound to junction S1, then

¹⁴ March 2017 Commission for Energy Regulation Review of Typical Domestic Consumption CER/17042 (still in use in renamed Commission for Regulation of Utilities most recent Estimated Annual Bills <https://www.cru.ie/publications/28025/>)

¹⁵ Department of Housing, Planning and Local Government (2019) Draft Revised Wind Energy Development Guidelines <https://www.gov.ie/en/department-of-housing-local-government-and-heritage/publications/draft-revised-wind-energy-development-guidelines-december-2019/>

¹⁶ Department of the Environment, Heritage and Local Government (2006) Wind Energy Development Guidelines <https://www.gov.ie/en/department-of-housing-local-government-and-heritage/publications/wind-energy-development-guidelines-2006/>

¹⁷ Department of Trade and Industry and Energy Technology Support Unit (2021) The Influence of Colour on the Aesthetics of Wind Turbine Generators W/14/00533/00/00

¹⁸ Department of the Environment - Welsh Office (1993) Planning Policy Guidance Note 22: Renewable Energy

¹⁹ Welsh Assembly Government (2005) Planning Policy Wales Technical Advice Note 8: Planning for Renewable Energy



onto the N59 through Ballysadare. From here it follows the N59 through Dromore west, turning south to Ballina. Continuing on the N59 through Crossmolina to Bangor Erris. At Bangor Erris, the TDR follows the R313 before branching onto the L1206. Following the L1206 to the local access road the L5252 to the Main Wind Farm Development Site.

2.6 Meteorological Mast

Meteorological conditions will be monitored by a permanent, free standing anemometry mast with a height of up to 100m. The design will be of a steel lattice type and the mast will be left in situ for the operational period.

2.7 Onsite Electricity Substation

It is proposed to construct one onsite electricity substation within the Proposed Development Site. This substation will provide a connection point between the Main Wind Farm Development Site and the national grid, via the proposed GCR which will connect to the Bellacorick 110kV ESB Station.

The dimensions of the proposed 110kV substation compound will be 84.5m wide on the southwest width and 82m wide on the northeast width by 149m long on the northwest length and 147.5m on the southeast length,. The substation compound will incorporate a connected Independent Power Producer (IPP) compound area measuring 84.5m wide on the southwest width and 82m wide on the northeast width by 38.5m on the northwest length and 36.5m on the southeast length. The compounds will be surrounded by a 2.6m high steel palisade fence and will include two buildings along with electrical components necessary to export electricity generated from the Main Wind Farm Development Site to the National Grid. Internal fences will be provided to segregate different areas within the compounds.

The proposed Transmission System Operator (TSO) control building (the 'Eirgrid Building) will be operated and maintained by EirGrid. It will measure 27m x 20m and will have an overall height of 7.85m. It will contain a control room, associated electrical equipment and apparatus and will also include storage and welfare facilities.

The IPP Building will measure 22.1m x 12.m and will have an overall height of 6.17m. It will house switchgear, associated electrical equipment and apparatus, storage and welfare facilities.

Staff welfare facilities will introduce a small water requirement for occasional toilet flushing and hand washing. It is proposed to install a rainwater harvesting system as the source of water for toilet facilities and this rainwater harvesting tank will be installed adjacent to the control buildings. It is proposed to manage wastewater from the staff welfare facilities in the control buildings by means of a sealed storage tank, with all wastewater being tankered off-site by a permitted waste collector to a wastewater treatment plant. The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying.

The compound will also include associated outdoor electrical equipment, including a 110 kV transformer and an internal access track. A 110 kV cable sealing end and associated cable equipment will be required to connect the 110 kV incoming underground cables into the substation.

Prior to construction of the substation compound, an area incorporating a drainage system surrounding it will be marked out by a qualified engineer prior to excavation and installation of the drainage system. Peat is present at a depth from 1.8m to up to 3m across the proposed BESS and substation compound area and will be excavated in accordance with the proposed design, including details on slope excavation of peat. This will remove the need for piled foundations.



The compound extents will be excavated to the required formation level. The excavation will remove peat and other unsuitable materials. Excavated peat will be placed in designated peat storage areas for reuse or reinstatement in accordance with the Peat Management Plan (PMP). A layer of geotextile material will be laid over the footprint of the compound. Using an excavator and dozer, a base layer of suitable backfill material will be laid and compacted, followed by a capping layer which will provide the finished surface for machinery and pedestrian use. Each layer will be compacted using a vibrating roller.

A range of different concrete foundations will be constructed across the substation compound. All concrete works will be carried out in accordance with the relevant Irish and European standards.

Raft foundations will be constructed for the IPP and Eirgrid buildings.

Earthing cable will be laid underground around the substation for connection to the various electrical components during the electrical fit out phase. Marker tape and cable tiles, where required, will be placed above the buried services.

Lighting will only be required during the operational phase of the Main Wind Farm Development Site when staff personnel are onsite. This will be provided by lighting columns to be installed around the substation compound.

A lightning protection mast of approximately 18m height will be installed to protect the station from direct lightning strikes.

This element of the Proposed Development Site is to be a permanent fixture, and the Eirgrid Building will be taken in charge by EirGrid at the end of the construction phase.

2.8 Battery Energy Storage System (BESS)

It is proposed to construct one onsite BESS compound with a capacity to reflect the generation capacity of the Proposed Development. The BESS will have the future ability to store excess power being generated locally on the grid and will release it back into the grid when there is a demand for it. The BESS will comprise 120 Battery Containers and 15 Inverter Containers in total, within a compound measuring 156m long on the northwest length, 153m long on the southeast length and 99m wide either side, secured by a 2.6m high palisade fence.

Each of the 120 battery container units will measuring 2.9m in overall height, 2.54m in width and 6m in overall length. Each of the 15 inverter units will measure 2.9m in overall height, 2.7m in width and 6m in overall length.

Prior to construction of the BESS, an area incorporating a drainage system surrounding it will be marked out by a qualified engineer prior to excavation and installation of the drainage system. Peat is present at a depth from 1.8m to up to 3m across the proposed BESS and substation compound area and will be excavated in accordance with the proposed design, including details on slope excavation of peat. This will remove the need for piled foundations.

The construction of the BESS compound, the battery container units and associated equipment will sit on reinforced concrete foundations.

Raft foundations will be constructed for the BESS switchgear building.

The associated battery cable equipment will be required to connect the substation via underground cables into the substation. Marker tape and cable tiles, where required, will be placed above the buried services.

Adequate lighting will be installed on the lighting masts around the compound.



2.9 Internal Access Tracks

The Main Wind Farm Development Site will require 8.75 km of internal access tracks. Of this, 1.95 km of existing internal access tracks will be utilised and upgraded where required. It is anticipated that 6.80 km of new track will be constructed to a floating track standard, as will the existing tracks to be upgraded. The construction specification for the access tracks will be confirmed by further site investigations. This will include in-situ testing, such as Dynamic Cone Penetrometer (DCP) testing, to determine the California Bearing Ratio (CBR) of the underlying peat. The CBR values will inform the track design, including the required thickness of the stone sub-base and the need for, and specification of, any geogrid or other geosynthetic reinforcement necessary to achieve the required load-bearing capacity for construction and operational traffic.

The proposed internal site track layout will permit access for vehicles during the construction phase, for maintenance during the operational phase, and for vehicles to decommission the turbines at the end of their operational life.

All tracks will be constructed to a 6-metre surface, inclusive of a minimum 5 metre running track and space for stone shoulders where required. Existing drainage infrastructure will be retained and utilised, where possible, and improved, as necessary. New drainage infrastructure will be required on all new access tracks. Drainage infrastructure and cable runs will be constructed in parallel with new access track construction.

Cables connecting turbines to the substation will be alongside the access tracks during their construction. Electrical cables will need to cross the access tracks in a number of locations.

At construction stage the specific requirements such as number of cable crossing points and duct size will be confirmed to allow suitable ducts to be installed through / below the access track during track construction works. This will then allow cable to be pulled through in the future without need for future disturbance to the track.

A cable crossing of the public road which routes through the Main Wind Farm Development Site is required to connect Turbines T8 to T13 to the substation. Due to the low volume of traffic recorded using the road, it is proposed that this cable crossing is achieved by open cut trenching with either partial closure with traffic management or full closure of the road required. The cable ducts will be installed at a minimum 0.75m below the road surface and may be surrounded by either natural soil arising, stabilised backfill material or concrete, depending on the cable duct selected. Following cable installation, the road will be reinstated to existing make-up and condition.

2.9.1 New Access Tracks

It is anticipated that the stone required for the construction of all new internal access roads will be sourced from quarries in the vicinity of the Main Wind Farm Development Site.

As mentioned above, the depth and makeup of the floating tracks will vary dependent on the peat's CBR value which will be obtained during detailed site investigations. The range of the depth can be between 400mm and 1500mm with a varied depth and quantity of geocomposite layer placement. A standard floating track incorporates two geogrid layers, or similar.

A general construction methodology of floating tracks will be followed and will consist of the following procedures where applicable:

- The designed alignment of the track will be marked out and clearly indicated prior to any construction works.
- The ground surface will receive a base geogrid, placed directly along the track alignment, in line with the geogrid manufacturer's specification. Where the ground



surface lacks a fibrous surface layer, a geotextile or geocomposite (typically bonded geogrid and geotextile) will be placed to improve strength, separation, filtration and drainage.

- The makeup of the track will follow the designed requirement which may differ across the Main Wind Farm Development Site subject to the grounds CBR values. General methodology consists of an initial layer of specified, well-graded, granular fill being tipped in sections, typically 10m, on the base geogrid and spread using a suitable dozer, followed by a second geogrid, topped with the same specified fill and completed with a surface layer to accommodate construction traffic requirements.
- The stone buildup can range with interchangeable geogrid depths and quantities subject to the ground condition requirements. Very low CBR values may require up to three geogrid installations throughout its depth.

In sections of floating tracks where lateral support is deemed necessary, pressure berms or stabilising berms will be constructed either side of the track. This is an unlikely requirement due to the flat topography on site but may be beneficial for the reuse of excavated material. The berms act as a counterweight which widen the base of an embankment load to increase the factor of safety against slip failure.

- Shallow drainage ditches will be excavated and will tie into the existing field drains where applicable.
- Both drainage ditches and cable trenches will follow the alignment of the access tracks and will be suitably distanced to ensure track stability is maintained.

2.9.2 Upgraded Access Tracks

The existing tracks onsite are utilised within the Main Wind Farm Development Site's design to form a foundation on which the floating roads will be constructed on or the potential for cut roads. In both cases, the existing tracks will have their depth increased as well as their width to ensure track specifications are met. The historic peat compaction and drainage caused by the continued use of the tracks will benefit the founding of the upgraded floating tracks.

The improvement and extension of the existing floating tracks will follow the same methodology of the floating track construction where existing tracks are located on deep peat. The upgraded track will have interlocking geogrids installed over and around the existing track to form a base in which the upgraded track will utilise.

Where existing tracks are located on shallow peat or soils, the methodology of cut access tracks will be used. The width of the existing track and the required distance on either side of the track, will be extended to suit the requirement.

In-situ strength testing and confirmation testing on the existing track make-up, such as trial pits through the track, will be required to assess the existing tracks suitability to form part of the upgraded route.

2.9.3 Cut Access Tracks

Where applicable, cut access tracks will be formed on suitable underlying material (superficial soil or rock with sufficient bearing capacity) in the following manner:

- stripping of surface vegetation (turves) and careful stockpiling of this material.
- excavating the remaining superficial soil materials and stockpiling this material.



- where different superficial materials are present these will be stored according to type. This material will be retained for reinstatement purposes.
- the exposed suitable track formation will receive a geogrid prior to rock fill material being tipped from dumper trucks directly onto the proposed access track alignment.
- this material will then be either spread by a dozer or placed by a hydraulic excavator and compacted in layers, typically using vibratory rollers.

Access tracks will be formed from a sub-base of general fill and finished off with a cap- stone / wearing course of graded crushed rock to provide a nominal Type-B (Series 800) finish. Wearing course stone will be of a suitable material that is not susceptible to breaking down / weathering to a high fines content material.

Maintenance of the running surface on all access tracks will be carried out on a regular basis, as required, to prevent undue deterioration. Loose track material generated during the use of access tracks will be prevented from reaching watercourses by maintaining an adequate cross fall on the tracks. Periodic maintenance of tracks by way of brushing or scraping will be carried out to minimise the generation of wheel ruts, which could lead to some track material being washed away. In dry weather, dust suppression methods may be required for track and hardstanding areas.

2.10 Watercourse Crossings

Construction of water crossings has the potential to cause sediment loading to water receptors. Measures to prevent the release of any pollution/sediment are outlined in **Section 7** of the CEMP and are as follows:

- Areas exposed due to the removal of vegetation are more susceptible to erosion during heavy rainfall, so areas will be reinstated as soon as possible to reduce the potential for silt, chemicals and/or other contaminants being washed into existing watercourses.
- Best practice guidance in relation to drainage (and control of pollution to the water environment) will be followed in watercourse crossing areas.
- Ditches will remain in place to convey surface water flows during the operational life of the Proposed Project. With the notable exception of extensive ditch blocking as described in the Habitat Management Plan (Appendix A of Peatland Restoration Plan, **Appendix 7** of this NIS).

2.10.1 Internal Access Track Watercourse Crossings

The proposed wind turbine layout will utilise, in total, four watercourse crossings. These comprise two existing and two proposed crossings. Watercourse crossings can be classified as follows:

- Existing structures (bridges or culverts) that need to be crossed by infrastructure (access tracks or cables) associated with the Proposed Project, without a need to modify the structure.
- Installation of new structures to facilitate the crossing of watercourses by infrastructure associated with the Proposed Project.
- Existing structures that need to be either replaced or upgraded to facilitate the crossing of watercourses by infrastructure associated with the Proposed Project.

There are two new and two upgraded watercourse crossings for new and upgraded access tracks within the Main Wind Farm Site. New watercourse crossings will be provided as culverts according to typical specifications identified



New crossings are designed to convey 1% Annual Exceedance Probability Mid-range Future Scenario (AEP MRFS) storm event, with a minimum 300mm freeboard level. This is in line with the Office of Public Works (OPW) requirements. A Section 50 application will be required to obtain the consent of the OPW for the construction of the crossings. Existing crossings will be upgraded.

Table 2-3: Watercourse Crossings

Crossing Point	Existing / Proposed	X coordinate (ITM)	Y coordinate (ITM)
WCX1	Proposed	476064	823774
WCX2	Proposed	476880	822463
WCX3	Existing	477113	822549
WCX4	Existing	477286	822437

2.10.2 Watercourse Crossings Along the Turbine Delivery Route

Construction of water crossings has the potential to cause sediment loading to water receptors. Measures to prevent the release of any pollution/sediment are outlined in **Section 7** of the CEMP and are as follows:

- Areas exposed due to the removal of vegetation are more susceptible to erosion during heavy rainfall, so areas will be reinstated as soon as possible to reduce the potential for silt, chemicals and/or other contaminants being washed into existing watercourses.
- Best practice guidance in relation to drainage (and control of pollution to the water environment) will be followed in watercourse crossing areas.
- Ditches will remain in place to convey surface water flows during the operational life of the Proposed Project.

Over-run area 1 is located c. 94m west of the Tristia river, Over-run Area 2 intersects with the Moneynierin River and is the only watercourse crossing associated with the TDR Over-run Areas. The works for Over-run Area 2 are temporary and will not involve any in stream works, modification of the river channel or obstruction of flow. Upon completion of works, the site will be restored to its existing land use without delay.

Over-run Area 3 is located within an area of moorland with drainage ditches located within 50m of the temporary track. This Over-run Area is located within the 50m buffer due to constraints associated with land access. As there will be proposed construction or infrastructure located within 50m of the stream, further mitigation measures will be proposed to facilitate the turbine delivery with minimal impact to nearby water receptors.

There will be no construction works required on the crossing structures to facilitate the turbine delivery.

2.10.3 Watercourse Crossings Along the GCR

The GCR is approximately 25.5 km in length all located on public roads. The GCR will utilise 32 existing crossings with minimal direct impact with water environment receptors.

Crossing methodology will be either by a standard trenched crossing technique or by utilising incline Horizontal Direction Drilling (HDD) methodology.



2.11 Electrical Cabling

The electricity generated from wind turbines within both the Northern and Southern Clusters will be collected by a medium voltage 33kV circuit of underground collector cables which will follow the onsite access tracks. The collector cables will be embedded beneath the public roadway to connect the Southern Cluster to the proposed onsite substation in the Northern Cluster and forms part of the Proposed Development.

Ultimately, the electricity from the Northern and Southern Clusters will be exported from the onsite substation to the national grid via a 110kV underground cable via the GCR, which will be the subject of a separate application. Once consented and built, the GCR will be a permanent fixture and will be taken in charge by EirGrid / ESBN.

2.12 Traffic Management

2.12.1 Wind Farm

via the central spine road (L5252) taken off the L1206. There are three Access Points (AP1, AP2 and AP3) located roughly equidistant along the spine road. A Construction Traffic Management Plan (CTMP) will be implemented, covering vehicle routing, signage, road condition monitoring, and engagement with Mayo County Council.

2.12.2 Cable routes

An internal 33kV underground collector cables will connect the Northern and Southern Clusters to the proposed onsite substation.

The GCR, a 110 kV underground cable connecting the Main Wind Farm Development Site to the Bellacorick Substation, will be the subject of a separate planning application but has been assessed in this EIAR as part of the Proposed Project, as defined in **Chapter 1** of the EIAR.

2.13 Peat Management

Peat depths vary across the Main Wind Farm Development Site, with an average thickness of 2.5m across the surveyed area up to a maximum depth of 6.4m

2.14 Balances of Materials Required for Site Works

Table 2-4 below sets out the estimated cut and fill balance for soil, aggregate and concrete materials required on site.

Table 2-4: Cut and Fill Balances of Materials Required for Site Works

Material	Cut (m ³)*	Fill (m ³)*	Import Requirement (m ³)*	Balance (m ³)*
Topsoil	32,572	N/A	N/A	-32,572
Subsoil / Substrate	117,573	N/A	N/A	-117,573
Aggregate	N/A	254,398	254,398	254,398
Concrete	N/A	20,223	20,223	20,223

*Numbers rounded to nearest hundred.

Topsoil: Topsoil has been classified as acrotelm peat or nutrient rich soil due to its lack of saturation. The depth has been taken as 0.4 m, which is at the higher end of recommended topsoil cover following best practice such as British Standard BS3882:2015 Specification for Topsoil.



Subsoil / Substrate: The subsoil quantities refers to peat, which is saturated and has been assumed as 0.4 m and deeper due to the nature of the Main Wind Farm Development Site. The substrate accounts for the underlying silt and granular material found under the peat layers. Finally, the substrate also includes pile arisings from the competent bearing strata.

Due to the varied depths of peat across the Main Wind Farm Development Site, all excavated subsoil and substrate material have been accumulated in the absence of detailed site investigations. The PMP accounts for the estimated peat removal volumes whereas the cut and fill balances account for all excavation works including the Civil 3D model cut volumes.

As this is an overview assessment of likely volumes, a bulking factor has not been considered in **Table 2-4**.

Concrete volumes are included for the substation platform, BESS platform, main crane working pad, turbine foundations and met mast foundation.

The Proposed Project will utilise local quarries for the importation of materials to the Main Wind Farm Development Site and Over-run Areas. These quarries will be sourced once planning consent for the Proposed Development is secured. Further information on the quarries most likely to be utilised is found in **Chapter 6**. An assessment of trips required for the transportation of material is provided in **Chapter 14** within this EIAR.

2.15 Tree Felling

To facilitate the construction of the various infrastructural elements of the Proposed Development, the permanent removal of existing commercial forestry is planned, totalling between 27.17 - 31.37 hectares, contingent on the chosen candidate turbine model.

The felling of trees for wind farm construction is subject to and can only occur following the granting of a felling licence by the Minister for the Department of Agriculture, Food and the Marine (DAFM).

The Forest Service policy²⁰ requires that a copy of the planning permission for a wind farm is submitted with a felling licence application, therefore, the felling licence cannot be applied for until planning permission is received for the Proposed Development. The licence will include the provision of relevant replant lands to be planted in view of the proposed tree felling on the Main Wind Farm Development Site.

The construction methodology for tree clearance will follow the specifications set out in the Standards for Felling & Reforestation (DAFM, 2019) and Felling and Reforestation Policy (DAFM, 2017).

Before harvesting works commence onsite, all personnel, particularly machine operators, will be made aware of the following and will have copies of the relevant documentation including:

- The CEMP, felling plan, surface water management, construction management, emergency plans and any contingency plans.
- Environmental issues relating to the Main Wind Farm Development Site.
- The outer perimeter of all buffer and exclusion zones.
- All health and safety issues relating to the Main Wind Farm Development Site.

The proposed method of tree felling near infrastructure will be limited to:

²⁰ Forest Service, Department of Agriculture, Food and the Marine (2017) Felling and Reforestation Policy <https://teagasc.ie/wp-content/uploads/2025/05/Felling-and-Reforestation-Policy-4.pdf>



- 10m-wide exclusion zone to be established from the edges of any aquatic zones or water hotspots as per *Standards for Felling & Reforestation* (Department of Agriculture, Food and the Marine (DAFM), 2019).
- 5m-wide exclusion zone to be established from the edges of any relevant watercourses (DAFM, 2019).
- Appropriate exclusion zone to be established from the outer edges of any archaeological features: see Environmental Requirements for Afforestation (DAFM, 2024). The archaeological assessment assumes a worst-case scenario that the entire footprint of the proposals will require ground intrusive works. Turbine 11, the closest turbine, is located c.0.23 km away from the zone of protection of the national monument located within the Main Wind Farm Development Site boundary (crannog registered as Site and Monument Record MA025-004). As such is not predicted to cause direct effects to the asset. Any unknown remains related to the crannog would also not be anticipated to extend outside the Zone of Protection and within the footprint of the development.
- Should any palaeoenvironmental materials within the Main Wind Farm Development Site be preserved within the peat, it is unlikely to comprise substantial materials due to the likely low level of activity across the Site, and the disturbances caused by the extensive modern drainage ditches, peat cutting and commercial forestry. In the event that an unrecorded archaeological feature is found during harvesting, the discovery must be immediately reported to the National Museum of Ireland or the Garda Síochána. A minimum exclusion zone of 20m must be established around the feature until the site of the find has been investigated (Forest Service, 2000²¹).
- Appropriate exclusion zones and work programme for harvesting areas to be established for any areas of ecological sensitivity, such as buffers around habitats deemed valuable for breeding birds in the appropriate season and timing of works will to avoid bat roosting periods. The location of such exclusion zones will be included in the CEMP and will be well known by all operators on site.

Project Construction Management

2.16 CEMP

Overview details of the key stages of construction of the Proposed Project are provided under the respective headings set out within this section. The CEMP sets out the key environmental management measures associated with the construction of the Proposed Project, to ensure that during this phase of the Proposed Project, the environment is protected, and any potential impacts are avoided and minimised.

No oils, greases, hydraulic fluids or other hazardous substances (or associated wastes) will be stored outside designated areas within the Main Wind Farm Development Site. All such materials will be stored only within designated COSHH storage areas located in the construction compounds, substation and BESS compounds. These storage areas will comprise impermeable surfaces, be covered where appropriate, and include fuel spill trays and/or bunded containers.

A separate decommissioning environmental management plan will be prepared prior to decommissioning the Proposed Project in line with the requirements of legislation, guidance and best practice at the time of this phase commencing 35 years from operation starting.

²¹ Forest Service (2000) Forestry and Archaeology Guidelines



In the event that An Coimisiún Pleanála (ACP) grants permission for the Proposed Development, the CEMP will be updated as required to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned by ACP. The CEMP will be a key construction contract document which will ensure that the contractor will implement the prescribed measures to protect the environment. It will provide a framework for ensuring that any remaining sensitivities following construction will be appropriately managed and monitored during the operational phase of the Proposed Project. The CEMP will also be used as a framework for a future Decommissioning Plan to manage any potential environmental impacts arising at that stage. The Decommissioning Plan will be expanded in line with experience of the Proposed Project over time, as well as best practice measures as they will have evolved in the intervening period.

2.17 Phasing of Construction Activities

The construction phase of the Proposed Project, which includes civil, electrical, grid works, and turbine assembly is anticipated to take 18-24 months once the proposed turbines are acquired via a competitive tender process.

2.17.1 Wind Farm, Substation and Battery Energy Storage System

For these elements of the Proposed Development, the construction sequence will be as follows:

- off-site TDR works.
- mobilisation and site set up.
- site clearance and tree felling.
- site access and internal access tracks turbine hardstands turbine foundation construction.
- onsite substation, BESS and collector cable .onsite cable delivery and installation.
- turbine delivery & installation.
- wind farm commissioning and testing; and
- landscaping, reinstatement and demobilisation.

The electrical installation of the substation compound is expected to take 17 months (including 2 months of commissioning activities) and includes the following:

- Delivery and installation of 110 kV transformer.
- Wiring and cabling of HV/LV equipment, protection and control cabinets.
- Commissioning of all newly installed equipment.

The BESS compound installation is expected to take 14 months (including 2 months of commissioning activities) and includes the following:

- Delivery and installation of the battery units.
- Wiring and cabling of MV/LV equipment.
- Commissioning of all newly installed equipment.

2.17.2 Electrical Works and Collector Cable

Construction of the Proposed onsite Substation, BESS and internal cable network between turbines will be carried out in tandem with the wind farm element of the Proposed Development in sequenced activities.



2.17.3 Grid Connection Route

The GCR will follow a 25.5 km route from the Main Wind Farm Development Site to the Bellacorick 110 kV Substation. The GCR will follow a large section of the National Road (N59) and the local road (L1206) from the Proposed Substation. For most of the route, and subject to consultation with the TII and Mayo County Council as part of a future Planning Application, the GCR will use the National Road which will accommodate a single circuit 110 kV cable. Typical trenched method can be utilised for watercourse crossings with a likely requirement for horizontal directional drilling (HDD) at bridge crossings.

2.18 Drainage Design and Hydrological Management

2.18.1 Existing Site Drainage

The Main Wind Farm Development Site is located in an area with an extensive network of peat drainage channels. The channels are present throughout all of the open land and link with V-ditches parallel to the existing farm tracks.

There are two watercourses in proximity to the site. The northern watercourse follows the alignment of the northern red line boundary, with a small tributary stream which splits Turbine 1 and Turbine 2. The second watercourse follows the centre-eastern red line boundary and cuts through the Main Wind Farm Development Site, west of Turbine 13 and east of Turbine 11. It realigns with the south-eastern red line boundary.

2.18.2 Drainage Design

The drainage design for the Main Wind Farm Development Site utilises the existing peat drains and drainage ditches. Surface water runoff from the hardstanding areas within the Main Wind Farm Development Site will be controlled and diverted into the surrounding drainage channels and attenuation basins following the topography of the site to permit a gravity flow. All drainage is designed to incorporate Sustainable Drainage Systems (SuDS) through the use of permeable surfaces, attenuation basins, shallow ditches, stone check dams, silt fences and swales, where applicable.

Prior to main earthwork activities, interceptor drains, or diversion ditches will be created to minimise the pooling water in areas of development. The employed diversion method will flow into the existing peat drainage channels. The diversion method will follow the topography of the site and installation shall commence up gradient of all construction to commence. The clean surface water will be collected and diverted to the existing ditches via the peat channels.

Preservation of the existing local hydrology and its incorporation into the design is important to maintain equilibrium between the new tracks and the underlying peat. To ensure a lesser effect on the local hydrology, flat ditches will be employed parallel to tracks opposed to standard V-ditches. The shallower excavation will not lower the water table, preventing lateral effects to the infrastructure.

The construction of the Main Wind Farm Development Site's drainage comprises:

- The excavation of in channel rock drainage channels 2m in width and 275mm in depth from the edge of the Main Wind Farm Site's access tracks.
- Silt fence textile will be laid within the channel. The silt fence textile will be Hy-tex Terrastop premium or similar and will be fixed to the upslope side of the supporting slope within the main drainage channel.
- Support posts for silt fence support and for channel supports will be inserted at the edge of the drainage channel at 1,500mm intervals.



- Silt fence textile will be anchored using clean drainage stone.

The area behind silt fences will be maintained regularly and silt will be removed and buried. The proposed drainage system will be based on the following methods:

- The first method will involve protecting existing water quality by avoiding disturbance to natural drainage features, minimising any works in or around drainage features, and diverting clean surface runoff around excavations and construction areas.
- The second will involve collecting any drainage water from works areas that might carry silts or sediments, and to route them towards settlement ponds prior to controlled diffuse release over vegetated natural surfaces. To achieve this, shallow surface water drains will be excavated around areas of earthworks to prevent surface water runoff into the working area and thereby protect the wider water network from siltation. The CEMP identifies appropriate options for protecting watercourses and choosing stable design methods depending on the specific nature of ground conditions encountered during construction.

Perimeter drainage channels will be installed around the compounds and surface water drainage pipework will be installed within trenches in the stone platform, with downpipes from the buildings discharging to the surface water network.

Surface water runoff from impermeable surfaces will be managed via attenuation basins. 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.

Separate surface water and foul drainage networks will be provided. The network will include manholes located at junctions and directional changes in the drainage pipework as appropriate.

Oil separators will be installed where required, particularly in transformer or plant areas, to prevent hydrocarbons entering the surface water system. Discharge from the built compounds and turbine hardstandings will be directed to a network of associated attenuation ponds, which will be connected by a series of underground pipes. The compounds will utilise rainwater harvesting to collect roof runoff for reuse where feasible.

A separate system consisting of foul water drainage pipework, manholes and a foul water holding tank will be installed. The foul water holding tank will be tankered off-site by a permitted waste collector to a wastewater treatment plant.

A comprehensive water quality monitoring regime is proposed to ensure that the measures are effective in protecting the water environment.



2.19 Cable Trenches

2.19.1 Collector Cable within the Main Wind Farm Development Site

Cable-ducts parallel to the Main Wind Farm Development Site's access tracks will be laid in cable trenches when the track is being constructed and will follow the alignment of the access tracks.

Marker tape and cable tiles, where required, will be placed above the buried services.

HV circuits, transformer connections, auxiliary power supplies, control cabling and BESS interconnections will be installed within designated trenches.

All cable routes will be surveyed and recorded.

Trenches will be backfilled with specified, suitable material and reinstated to finished platform levels.

2.19.2 Internal Track Crossings

Collector cables connecting turbines to the substation will be laid alongside the access tracks as identified within the Access Track Construction methodology above. On the route from the turbines to the substation the cable will need to cross the access tracks in a number of locations. Prior to construction the number of cable crossing points, duct size and requirements will be confirmed to allow suitable ducts installed through / below the access track during track construction works. This will then allow cable to be pulled through in the future without need for future disturbance to the track.

2.19.3 Internal Collector Cable - Public Road Crossings

A cable crossing of the public road which routes through the Main Wind Farm Development Site is required to connect Turbines T8 to T13 to the substation. Due to the low volume of traffic recorded using the road it is proposed that this cable crossing is achieved by open cut trenching with either partial closure with traffic management or full closure of the road required. The cable ducts will be installed minimum 0.75m below the road surface and may be surrounded by either, natural soil arising, stabilised backfill material or concrete depending on the cable duct selected. Following cable installation, the road will be reinstated to existing make-up and condition.

2.19.4 Proposed GCR

Cable ducts will be laid and joint bays will be located within the public roadway. A separation distance of 600mm from existing services will be preserved where possible. The trenches within these locations will be backfilled using the excavated material. The contractor will excavate cable trenches and then lay high density polyethylene (HDPE) ducting in the trench in a surround of cement bound material (CBM). A rope will be inserted into the ducts to facilitate cable-pulling later. The as-constructed detail of the cable duct locations will be carefully recorded. Cable marker strips will be placed above the ducts and the two communication ducts will also be laid. An additional layer of cable marker strips will be laid above the communication ducts and the trench backfilled. Back-filling and reinstatement in public roads will be to a specification to be agreed with the road authority and at least as good as the existing.

During the construction stage of the Proposed Project, records of services such as water mains, sewers, gas mains and other power cables will be obtained from the relevant service providers ahead of construction works to ensure that all new developments between the period of assessment and pre-construction is captured.



Where required, cable detection tools, ground penetrating radar, and slit trenches will be used as appropriate to find the exact locations of existing services. The final locations of the cable routes within the public roadway will be selected following these investigatory works to minimise conflicts with other services.

2.19.5 General Construction Sequence for All Cable Trenches

A general overview of the construction sequence is detailed below:

- All relevant bodies i.e. ESBN, Gas Networks Ireland, Eir, Mayo County Council, Irish Water etc. will be contacted and all drawings for all existing services will be sought to confirm the conditions predicted in this EIAR.
- Immediately prior to construction taking place the area where excavations are planned will be surveyed and all existing services will be identified, and temporary warning signs erected where necessary.
- For cable works in the public road, the Construction Traffic Management Plan (CTMP) will be agreed with Mayo County Council Road's Department and implemented. Clear and visible temporary safety signage will be erected all around the perimeter of the live work area to visibly warn members of the public of the hazards of ongoing construction works.
- An excavator will be used to excavate the trench to the dimensions of 600mm wide by 1.2m deep.
- A silt filtration system will be installed on all existing drainage channels for the duration of the cable construction to prevent contamination of any watercourse.
- Any ingress of ground water will be removed from the trench using submersible pumps and pumped to the nearest available existing drainage channel.
- Once the trench has been excavated, a bedding layer of sand or 15 Newton concrete will be installed and compacted. All concrete will be offloaded directly from the concrete truck into the trench.
- PVC ducts will be installed on top of the compacted base layer material in the trench.
- Once the ducts have been installed, couplers will be fitted and capped to prevent any dirt etc. entering the unjointed open end of the duct.
- In poor ground conditions, the open end of the duct will be shimmed up off the bed of the trench to prevent any possible ingress of water and dirt into the duct. The shims will be removed once the next length of duct has been joined to the duct system.
- The as-built location of the installed ducts will be surveyed and recorded using a total station/GPS before the trench is backfilled to ensure recording of exact location of the ducts, and hence the operational electricity cable. These co-ordinates will be plotted on as-built record drawings for the cable route cable operational phase.
- When ducts have been installed in the correct position on the trench base layer, sand (in road trench) or Lean-mix CBM4 (CL1093) (off road trench) will be carefully installed in the trench around the ducts so as not to displace the duct and compacted.



- Spacer templates will be used during installation to ensure that the correct cover of duct surround material is achieved above, below and at the sides of the duct in the trench.
- A red cable protection strip will be installed above duct surround layer of material and for the full length of the cable route.
- A layer of Lean-mix CBM4 (CL1093) (in road) or excavated material (off road) will be installed on top of the duct surround material to a level 300mm below the finished surface level.
- Yellow marker warning tape will be installed for the full width of the trench, and for the full length of the cable route, 300mm from the finished surface level.
- The finished surface of the road, road verge, or agricultural land will be reinstated as per its original condition or to the requirements of the Mayo Area Engineer.
- Precast concrete cable joint bays will be installed within excavations in line with the trench. The cable joint bays are backfilled and the finished surface above the joint bay reinstated as per its original condition. The cable joint bays are re-excavated a second time during cable pulling and jointing, after which the finished surface above the joint bays is reinstated again to its original condition.
- When trenching and ducting is complete, the installation of the cable route cable will commence between the onsite sub-stations to the Bellacorick 110kV substation.
- Construction work areas and traffic management measures will be setup at 2 no. consecutive cable joint bays simultaneously. The underground cable will be pulled through the installed ducts from a cable drum set up at one joint bay and using a winch system which is set up at the next joint bay, the cable is pulled through.
- The cables are jointed within the precast concrete cable joint bays.
- The finished surface above each cable joint bay is reinstated to its original condition, and the construction work area removed.

2.20 Waste Generation

Any waste that is generated during the Proposed Project' construction phase will be collected, separated and stored in dedicated receptacles at the temporary construction compounds in accordance with the details outlined in the CEMP.

The contractor for the main construction works will nominate a suitable site representative such as a Project Manager, Site Manager or Site Engineer as the Waste Manager who will have overall responsibility for the management of waste. The Waste Manager will have overall responsibility to instruct all site personnel including subcontractors to comply with onsite requirements.

The following categories of waste will most likely be generated during the construction phase of the Proposed Project:

- construction waste and pile arisings.
- waste oil and hydrocarbons.
- paper and cardboard.
- timber and steel; and
- municipal solid waste generated from the office and canteen.



Sanitary waste will be removed from site by a licensed waste disposal contractor. All portaloos located on the Proposed Project during the construction phase will be operated and maintained in accordance with the manufacturer's instructions and will be serviced under contract with the supplier. All such units will be removed offsite following the completion of the construction phase.

A fully authorised and licenced waste management contractor will be appointed prior to the commencement of construction works. This contractor will provide the appropriate receptacles for the collection of the various waste streams and ensure regular emptying and/or collection of these receptacles.

2.20.1 Waste Reduction Practices

Waste generation throughout the operational phase of the Proposed Project is expected to be minimal. Measures to further reduce operational waste include the following:

- Material ordering will be optimised to ensure only the necessary quantities of materials are delivered to the Proposed Project.
- All plant will be serviced before arriving to the Proposed Project which will reduce the risk of breakdown and the possible generation of waste oil or hydrocarbons onsite.
- Where material such as concrete are to be ordered, great care will be taken in the calculation of quantities to reduce wastage.
- All operators and foreman will be instructed in measures to cut back on the amount of wastage and will only order the materials necessary to complete each construction task as required.
- Prefabrication of design elements will be used where appropriate to eliminate waste generation on sites.

2.20.2 Waste Reuse

When possible, materials will be reused onsite for other suitable purposes as follows:

- Re-use of shuttering etc. Where it is safe to do so.
- Re-use of rebar cut-offs where suitable.
- Re-use of excavated materials for screening, berms etc.
- Re-use of excavated material – it will be used as suitable fill elsewhere onsite for access tracks, the hardstanding areas and embankments where possible.

Any excess excavated material that will be used for fill, re-instatement, or similar activities, within the Proposed Project is not categorised as a waste material under relevant waste legislation, rather this material is exempt from waste classification.

Article 2 (1) (c) of Directive 2008/98/EC on waste, transposed through Article 26 (1) (c) of the European Communities (Waste Directive) Regulations (S.I. 126 of 2011) identifies the following as being an exemption from waste regulation:

“uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated”.

Surplus material will be re-instated in its natural condition on the site from which it was excavated, this material is not considered as waste as it is being reused on site. The PMP confirms that peat excavation volumes will be reused for peatland restoration during the construction, operational, and decommissioning phases of the project.



2.21 Waste Management

Wastewater holding tanks will be provided within the substation and IPP compounds. The wastewater holding tank will be a sealed storage tank with all wastewater tankered offsite as required by an authorised waste collector to a wastewater treatment plant. Only waste collectors holding valid waste collection permits under the Waste Management (Collection Permit) Regulations, 2007, will be employed to transport wastewater away from the Main Wind Farm Development Site. The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. The wastewater storage tank alarm will be part of a continuous stream of data from the Proposed Development's turbines, wind measurement devices and electricity substation that will be monitored 24 hours a day seven days per week. This approach for managing wastewater onsite has become a standard practice in wind farm sites.

Receptacles will be clearly labelled, signposted and stored in dedicated areas.

The provision of receptacles for the separation and collection of dry recyclables such as paper, cardboard, plastics will be provided and removed to a licenced facility by a suitable contractor.

The Applicant and the appointed contractor will seek to prevent, reduce, reuse and recover as much of the waste generated at the Proposed Project as possible and to ensure the appropriate transport and disposal of residual waste is undertaken offsite in accordance with the Waste Management Act 1996 (as amended) and in alignment with the National Waste Management Guidelines and the European Waste Management hierarchy.

2.21.1 Waste Recycling, Recovery and Disposal

National waste policy requires the separation of recyclable material at source. During the construction phase of the Proposed Project, receptacles will be provided for the separation and collection of dry recyclables (paper, cardboard, plastics), biological waste (canteen waste).

All receptacles will be clearly labelled, signposted and stored in dedicated areas.

Receptacles for the following sources aggregated materials will be made available onsite at a suitable location:

- food waste.
- packaging waste.
- dry mixed recyclables.
- aluminium.
- ferrous materials; and
- timber.

These materials will be transported offsite by an authorised contractor to a permitted recovery centre. These materials will then be processed through the various recovery operations.

Residual waste generated onsite may require disposal. This waste will be deposited within dedicated receptacles and collected by the permitted waste management contractor who will then transport this waste to an appropriate facility. All waste movements will be recorded, and the waste manager onsite will hold these records.



2.22 Site Security

In addition to the palisade fencing which will be erected around the perimeters of both the substation and BESS compounds, the following security measures will also be incorporated to the Main Wind Farm Development Site.

- Access gates will be installed at designated entry points.
- CCTV cameras will be mounted on poles to provide full site coverage.
- Security lighting will be installed and directed downward to minimise light spill.
- Signage and safety notices will be erected.

Project Operation and Lifespan

During the operational phase of the Proposed Development, turbines will function automatically on a day-to-day basis. The turbines will respond to changes in wind speed and direction by means of anemometry-equipment and control systems.

As mentioned above, there will be minimal operational waste associated with the wind farm once construction is finalised. As such, operational residues and emissions are expected to be negligible.

Twice a year each turbine will undergo a scheduled service. The operation of the wind turbines will be monitored remotely, and a caretaker will oversee the day-to-day running of the Proposed Development.

1. The expected physical lifetime of a turbine is 35 years, and permission is sought for a 35-year operation period commencing from full operational commissioning of the wind farm. At the end of the operational period, the developer will either decommission the Proposed Development or, subject to a new planning application, seek permission to extend its operation or re-power. The proposed substation, and the GCR (subject to a separate planning application) will continue to exist on a permanent basis.

The applicant respectfully requests that a 10-year planning permission is granted in addition to a 35-year operational period.

Decommissioning

During the decommissioning phase of the Proposed Project, cranes will disassemble the above ground turbine components and meteorological mast which will be removed offsite for recycling.

The foundations will be covered over and allowed to re-vegetate naturally. Leaving turbine foundations in situ is considered a more environmentally sensible option as to remove the reinforced concrete associated with each turbine will result in environmental effects such as noise, vibration and dust. It is likely that the onsite access tracks will be left in situ, subject to agreement with Mayo County Council and the relevant landowners at that time.

The BESS and associated electrical equipment will be removed offsite for recycling.

Underground cabling will be cut back and left in situ.

The onsite substation and GCR will be taken in charge by ESBN / EirGrid upon completion and will be left in place forming part of the national electricity network.

A detailed decommissioning plan will be agreed with Mayo County Council in advance of decommissioning.





3.0 Stage 1: Screening

3.1 Step 1: Management of European sites

The Proposed Project is the construction, operation and decommissioning of a proposed wind farm – along with all other works. Therefore, it is not connected with, or necessary for, the management of a European site.

3.2 Step 2: Description of the Proposed Project

Full details of the Proposed Project can be found in Section 2.0 of this report; however, key details relevant to the AA process are summarised below. It is important to note that the CEMP (detailed above) was not considered within the AA Screening.

The Proposed Development seeks permission for a period of 10 years, for development comprising of the construction of a 13 no. turbine wind farm development, with associated 110 kV substation, battery storage, and all associated works on land within the townlands of Muingmore (An Mhoing Mhór), Doolough (Dumha Locha), Tristia (Troiste), Moneynierin (Moing an Iarainn) and Bangor (Baingear) County Mayo. The planning application area is approximately 454 ha in size. Certain details of the Proposed Development are unconfirmed in this planning application and an opinion on unconfirmed details from the Commission (Case Reference: ABP -321948-25) pursuant to section 37CD of the Planning and Development Act 2000 (as amended) accompanies this planning application. The details unconfirmed in this application are the turbine tip height, rotor diameter and hub height (blade tip height ranging from 179-180m, rotor diameter ranging from 149-163m, hub height ranging from 98.5m to 105m). The range of parameters under which the turbine dimensions will fall are specified on the site notice.

A 35-year operational life from the date of full commissioning of the Proposed Development is being sought for all works (other than temporary and permanent works specified above), and the subsequent decommissioning. The Proposed Substation, and the 110kV cable from this substation will continue to exist on a permanent basis. Permanent planning permission is being sought for these elements. A separate planning application for a 110kV underground grid connection from the Main Wind Farm Development Site Substation to the Bellacorick Substation will be lodged to An Coimisiún Pleanála.

The Proposed Project consists of the Main Wind Farm Development Site, the Grid Connection Route (GCR) and the Turbine Delivery Route (TDR). The Main Wind Farm Development Site predominately consists of cutover lowland blanket bog (which also aligns with non-priority Annex I 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 ponticum*) 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. Other habitats identified within the Main Wind Farm Development Site were scrub (WS1), buildings and artificial lands (BL3) - these habitats are all marginal around the dominant habitat types. There are also a series of drains and watercourses in various locations.

The Main Wind Farm Development Site is generally flat with levels ranging from 3 m AOD at the southern end to 33 m AOD at the northeastern portion. Several small streams are present within, and along the boundaries of, the Main Wind Farm Development Site. 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.



The TDR extends from Killybegs, Co. Donegal to the Main Wind Farm Development Site with temporary works to facilitate delivery in 3 areas. The TDR habitat comprise primarily public roads – with three key areas referred to as the Over-run Areas which are dominated by blanket bog (PB3) in good condition or cutover bog (PB4) in unfavourable condition. These habitats align with Annex I Blanket Bog for TDR Over-run Area 1 – but not in the other two Over-run Areas. However, as Over-run Area 3 shows signs of recent management and is mapped as a favourable reference area in the Article 17 data, it is assumed to be Annex I regardless of its current state. Please refer to **Appendix 4** for more information, including habitat maps. In addition, full details of the habitats on site can be found in the associated EIA/Biodiversity chapter – however, the key elements necessary for the AA process are contained within this report throughout the assessment.

3.3 Step 3: Identification of European Sites

3.3.1 Sources of Potential Impacts

The potential impacts associated with the construction and decommissioning phases of the Proposed Project are:

- Loss or Damage of habitats and flora during the construction/removal of infrastructure;
- Loss of habitats and reduction in home ranges of QI and SCI;
- Changes in hydrology and hydrogeology (water quality/ quantity), for instance due to accidental spillages of pollutants during maintenance;
- Disturbance and displacement of qualifying feature species;
- Spread of non-native invasive species to European Sites; and
- Changes in hydrology and hydrogeology (water quality/ quantity).

The potential impacts associated with the operational phase of the Proposed Project are:

- Changes in hydrology and hydrogeology (water quality/ quantity), for instance due to accidental spillages of pollutants during maintenance;
- Mortality of bats and birds through collisions with wind turbines;
- Disturbance and displacement of birds from the area around the wind turbines;
- Reduction of prey availability for some raptors due to displacement of small birds by turbines;
- Disturbance and displacement of birds during routine maintenance operations; and
- Barrier effect, disruption of migratory or other routes used by birds due to avoidance of wind turbines.

3.3.2 Ecological Connections

3.3.2.1 General Overview of Connection Rationale

SACs are designated for Qualifying Interests (QIs) and SPAs for Special Conservation Interests (SCIs). For assessment purposes, these are collectively referred to as Qualifying Features (QFs). Many QFs are mobile species whose home ranges, distributions, movements, and dispersal abilities vary across space and time. As a result, a population of a mobile QF associated with a European site may also utilise habitat within, or adjacent to, a proposed development site.



Where such use occurs - even intermittently - there is a functional ecological connection between a proposed development site and the relevant European site. These connections can involve a range of taxa, including birds, mammals, migratory fish, and other mobile species that form the QFs of European sites.

Other examples of potential ecological connections include habitat connections either directly or as 'stepping stones'. Moreover, the area surrounding a proposed development site may support a population of the QF species which occasionally exchanges individuals with a connected European site. Furthermore, a proposed development site may support populations of species which are prey/ food or hosts to the QFs of a European site.

It is important to note that the presence of an ecological connectivity does not necessarily equate to an impact pathway as there also needs to be a source for impact which interacts with this pathway. Similarly, the receptor needs to be sensitive to these sources for an effect to be realised.

3.3.2.2 Ecological Connections – Zone of Influence

NPWS guidelines (NPWS, 2010) recommend that a 15 km study area is adopted; however the Office of the Planning Regulator's Practice Note PN01 (OPR, 2021) suggest that a 15 km study area should not be adopted, but a case-by-case basis is undertaken when assessing the potential for -SPR connectivity between a project and European sites.

Each QI and SCI species or habitat operates at a different ecological scale, with unique spatial and functional characteristics. For instance:

- Terrestrial habitats are influenced by factors such as seed dispersal distances, community composition dynamics, edge effects, and broader land-use changes.
- Mobile species are shaped by home ranges, population connectivity, and the permeability of the intervening landscape.
- Some species (e.g. *Vertigo* snails) are highly groundwater-dependent, with extremely restricted distributions and habitat requirements measurable at a microhabitat scale of just a few metres.

For SACs in general, most QIs are influenced by local scale ecological processes such as seed dispersal, edge effects, and small-scale species movement. However, larger spatial buffers were applied for species known to operate at broader scales - such as Otter (*Lutra lutra*) and Lesser Horseshoe Bat (*Rhinolophus hipposideros*). Otters have a known core range of 13.2 km (Reid et al., 2013²²) whereas Lesser horseshoe bats typically forage within 2.5 km of their roosts during summer, with seasonal movements of up to 10 km also recorded (Collins 2023²³); therefore, distances of 13.2 km and 10 km (respectively) were used for each of these. There is potential for dispersal of populations between landscape features - such as juvenile/sub-adult otters moving from one catchment to another beyond these distances, and lesser horseshoe bats moving between core areas. However, in the context of this assessment these interactions are not foreseen to have likely effects.

In the absence of any specific European or Irish guidance in relation to establishing ecological connectivity to SPAs, NatureScot guidance (formerly Scottish Natural Heritage or 'SNH') (SNH, 2016) was consulted. This document provides guidance in relation to the identification of ecological connectivity between development sites and SPAs. The guidance takes into consideration the distances species may travel beyond the boundary of relevant SPAs and

²² Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013) National Otter Survey of Ireland 2010/12. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

²³ Collins, J. (ed.) (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition). London: Bat Conservation Trust.



provides information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects. It goes on to state that "*in most cases the core range should be used when determining whether there is connectivity between the proposal and the QIs*". Where SPAs and developments are separated by a greater distance than the core foraging ranges for the SPAs listed SCI species, there is no likely ecological connectivity to the development.

According to NatureScot guidance (SNH, 2016), the core foraging distances of wintering grey geese (greylag goose *Anser anser* and pink-footed goose *Anser brachyrhynchus*) from SPAs is 15-20 km. This represents the largest foraging range of all the species listed in this guidance document recorded in Ireland. It is acknowledged that information on core foraging ranges is not available for all Irish SCI species. In such cases, the 15-20 km core foraging range for grey geese has been adopted as a precautionary approach.

Thus, all SPAs within 20 km from the Main Wind Farm Development Site were considered for ecological source-receptor connectivity.

SNH Guidance Note 3²⁴ 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. This was considered in the context of existing and consented offshore wind farms to ensure cumulative pressures were captured. Collision risk was evaluated for each relevant SPA species group with explicit reference to the current and planned wind farm footprint surrounding those sites. Therefore, the ZOI for radial distances for SACs was 15 km, for SPAs was 20 km, and further considerations were made in the marine species specifically regarding offshore wind energy projects for in-combination effect considerations. Other ZOI considerations are detailed below.

3.3.2.3 Airborne Connectivity

Airborne emissions were considered using the approaches outlined in IAQM guidance (IAQM, 2019) (IAQM, 2014), which suggests that air pollution and dust from road schemes are only likely to be important for sensitive European sites within 200 m and 500 m, respectively.

3.3.2.4 Hydrological and Hydrogeological Connections

There is potential hydrological connectivity between any European site located downstream of the Main Wind Farm Development Site. The Main Wind Farm Development Site (i.e. 13 no. wind turbines and associated infrastructure) is connected to two streams (IE_WE_33R010800 and IE_WE_33T070130) that flow into Blacksod Bay which is part of the Mullet/Blacksod Bay Complex SAC. SACs with vagile species are also considered if upstream from the Main Wind Farm Development Site.

The Main Wind Farm Development Site is located within the Belmullet, IE_WE_G_0057 groundwater body. Therefore, there is a potential hydrogeological connection with any European site located within this groundwater body.

Hydrological connectivity beyond 20 km was also searched for using GIS to identify any European sites downstream of the Main Wind Farm Development Site connected via watercourses.

²⁴ [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



3.3.2.5 Identification of European Sites - Sensitive Receptors

European sites have been identified to have potential ecological connections to the Proposed Project – this has been determined in view of the sources for impacts which have been identified. These sites are detailed in **Table 3-1** to interrogate the sensitive receptors present (if any). Given the nature of the project – all point sources such as noise, dust etc – are identified to have been captured within these considerations. Therefore, no further distances are required. The locations of these sites, along with hydrological and hydrogeological details, are shown in **Figure 2** from **Appendix 1**.

The closest European sites are the Bellacorick Bog Complex SAC and Mullet/Blacksod Bay Complex SAC which are both directly adjacent to the Main Wind Farm Development Site boundary.

Appendix 6 details the background and baseline information for each European site, including references to each of the Site-Specific Conservation Objectives, which were all reviewed in the preparation of this assessment.



Table 3-1: Designated Sites considered for Screening

Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway – Receptor)	Further Consideration Needed (Yes/No)
SAC				
Mullet/Blacksod Bay Complex SAC 000470	Directly adjacent to the west of the Main Wind Farm Development Site.	<p>Mudflats and sandflats not covered by seawater at low tide [1140]</p> <p>Large shallow inlets and bays [1160]</p> <p>Reefs [1170]</p> <p>Salicornia and other annuals colonising that mud and sand [1310]</p> <p>Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]</p> <p>Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]</p> <p>Atlantic decalcified fixed dunes (<i>Calluno-Ulicetea</i>) [2150]</p> <p>Machairs (* in Ireland) [21A0]</p> <p>Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> - type vegetation [3150]</p> <p>Alkaline fens [7230]</p> <p><i>Lutra lutra</i> (Otter) [1355]</p> <p>Salmon <i>Salmo salar</i></p> <p><i>Petalophyllum ralfsii</i> (Petalwort) [1395]</p>	<p>This SAC is directly adjacent to the Main Wind Farm Development Site. There are hydrological and hydrogeological connections present.</p> <p>Hydrological</p> <p>Construction/ decommissioning of the Proposed Development - release of suspended solid (and other) pollution into two streams IE_WE_33R010800 and IE_WE_33T070130) that flow into the SAC – alkaline fens, Salmon and otter.</p> <p>There is connection to the marine environment and the following QFs may be impacted:</p> <ul style="list-style-type: none"> • Mudflats and sandflats not covered by seawater at low tide [1140] • Salicornia and other annuals colonising mud and sand [1310] • Large shallow inlets and bays [1160] • Reefs [1170] • Alkaline fens [7230] • <i>Lutra lutra</i> (Otter) [1355] • Salmon <i>Salmo salar</i> <p>The Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> - type vegetation [3150] habitats are upstream and pollutants will not interact with this habitat.</p> <p>The remaining QIs are terrestrial habitats thus no hydrological connectivity from the Main Wind Farm Development Site to the QIs.</p>	Yes

²⁵ For SPAs, the bird species that are the reason for designation are Species of Conservation Interest (SCIs) and for SACs the habitats and species that are the reason for designation are its Qualifying Interests (QIs). For convenience, the term qualifying interest or QI is used here for both SPAs and SACs.



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			<p>Hydrogeological</p> <p>The SAC is located in the same ground waterbody (IE_WE_G_0057, Belmullet) and same sub-catchment (Glencastle_SC_010) as the Proposed Development and therefore they are hydrogeologically connected.</p> <p>Ecological</p> <p>Otter have been identified on the Main Wind Farm Development 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. Similarly, Salmon are assumed to be present and active within the watercourse.</p> <p>There is also potential hydrological connectivity between the Main Wind Farm Development Site and the downstream aquatic habitats in the marine environment as stated above.</p> <p>All other ecological connections are excluded.</p>	
Bellacorick Bog Complex SAC 001922	Directly Adjacent to Over-run Area 2. >5 km from the Main Wind Farm Development Site.	<p>Marsh saxifrage (<i>Saxifraga hirculus</i>) [1528],</p> <p>Blanket bogs * if active bog [7130],</p> <p>Depressions on peat substrates of the Rhynchosporion [7150],</p> <p>Alkaline fens [7230],</p> <p>Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010],</p> <p>Geyer's whorl snail (<i>Vertigo geyeri</i>) [1013],</p> <p>Natural dystrophic lakes and ponds [3160]</p>	<p>There are hydrological and hydrogeological connections present because the SAC is directly adjacent to Over-run Area 3. There is no hydrological or hydrogeological connectivity between the SAC and the Main Wind Farm Development Site.</p> <p>Hydrological</p> <p>Construction/ decommissioning of the Proposed Development - release of suspended solid (and other) pollution into two streams IE_WE_33R010800 and IE_WE_33T070130) that flow into the SAC – alkaline fens.</p> <p>The other aquatic dependent habitats are all upstream from the Main Wind Farm Development Site.</p> <p>Hydrogeological</p> <p>The SAC is located in the same ground waterbody (IE_WE_G_0057, Belmullet) and same sub-catchment (Glencastle_SC_010) as the Proposed Development and therefore they are hydrogeologically connected.</p> <p>Ecological Over-run Area 3 comprises an existing access track and a mosaic of habitats which include some species which</p>	Yes



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			<p>could be present in the peatland habitats for which this SAC is designated.</p> <ul style="list-style-type: none"> Blanket bogs * if active bog [7130], Depressions on peat substrates of the Rhynchosporion [7150], Alkaline fens [7230], Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010], <p>Given the potential hydrological interactions with Alkaline fens this habitat, is further considered in this regard.</p> <p>All other ecological connections are excluded.</p>	
Owenduff/Nephin Complex SAC 000534	900 m SE of Over-run Area 3 and 7.7 km SE of the Proposed Development Site	<p>Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110]</p> <p>Natural dystrophic lakes and ponds [3160]</p> <p>Water courses of plain to montane levels with the <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260]</p> <p>Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]</p> <p>Alpine and boreal heaths [4060]</p> <p><i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]</p> <p>Blanket bogs (* if active bog) [7130]</p> <p>Transition mires and quaking bogs [7140]</p> <p><i>Salmo salar</i> (Salmon) [1106]</p> <p><i>Lutra lutra</i> (Otter) [1355]</p> <p><i>Saxifraga hirculus</i> (Marsh saxifrage) [1528]</p> <p><i>Hamatocaulis vernicosus</i> (Slender green feather-moss) [6216]</p>	<p>Hydrological</p> <p>A study of local water courses confirms there is no downstream hydrological connectivity between the Main Wind Farm Development Site and the SAC which is situated upstream of the nearest potentially connected water course. However, Over-run Area 3 is located 900m NW of the SAC and hydrological interactions at a small scale could occur.- Furthermore due to the vagile nature of Salmon, the pollution of local water courses from the Main Wind Farm Development Site could result in changes to salmon dependent rivers, including upstream.</p> <p>Hydrogeological</p> <p>Owenduff/Nephin Complex SAC 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</p>	Yes



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			<p>supply schemes are located along the TDR route, six GWS and two PWS.</p> <p>Therefore, there is no realistic hydrogeological connection for potential effects to the SAC.</p> <p>Ecological</p> <p>None of the QIs are particularly sensitive to groundwater interactions except for Blanket bogs and Transition mires and quaking bogs.</p> <p>Although the SAC and the Main Wind Farm Development Site are mapped within the same regional groundwater body, the SAC lies within a separate surface water catchment and there are no identified karst features, preferential flow paths or hydrogeological conduits that would enable groundwater-mediated connectivity. In the absence of such pathways, groundwater-dependent qualifying interests within the SAC are functionally isolated from the Proposed Project, and effects on these habitats cannot reasonably occur. Additionally, these habitats are largely ombitrophic meaning they are rainwater fed systems. Furthermore, for all of the habitat QIs the Seed and spore dispersal in these systems is typically restricted to tens to hundreds of metres, largely via local surface water movement or wind under specific microtopographic conditions. At a separation distance of approximately 7.7 km, and in the absence of hydrological or habitat continuity, there is no realistic mechanism by which propagule exchange or other functional landscape-scale processes could occur. Accordingly, the SAC peatland habitats are functionally isolated from the Main Wind Farm Development Site and ecological connectivity can be excluded</p> <p>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.</p> <p>Salmon was recorded in the streams and rivers connected to the Main Wind Farm Development Site during baseline aquatic surveys. Due to the vagile nature of Salmon, the pollution of</p>	



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			local water courses could result in changes to salmon dependent rivers.	
Carrowmore Lake Complex SAC 000476	1.8 km NW of Over-run Area 3 and 5.9 km NE from the Main Wind Farm Development Site.	Blanket bogs (* if active bog) [7130] Depressions on peat substrates of the <i>Rhynchosporion</i> [7150] <i>Saxifraga hirculus</i> (Marsh saxifrage) [1528] <i>Hamatocaulis vernicosus</i> (Slender green feather-moss) [6216]	<p>Hydrological</p> <p>A study of local water courses confirms there is no hydrological connectivity as the SAC is situated upstream of the nearest potentially connected water course.</p> <p>Hydrogeological</p> <p>Carrowmore Lake Complex SAC is located within the same groundwater body 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. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC.</p> <p>Ecological</p> <p>Although the SAC and the Main Wind Farm Development Site are mapped within the same regional groundwater body, the SAC lies within a separate surface water catchment and there are no identified karst features, preferential flow paths or hydrogeological conduits that would enable groundwater-mediated connectivity. In the absence of such pathways, groundwater-dependent qualifying interests within the SAC (including blanket bog and <i>Rhynchosporion</i> depressions) are functionally isolated from the Proposed Project, and effects on these habitats cannot reasonably occur. Additionally, these habitats are largely ombitrophic meaning they are rainwater fed systems. Furthermore, the Seed and spore dispersal in</p>	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			<p>these systems is typically restricted to tens to hundreds of metres, largely via local surface water movement or wind under specific microtopographic conditions. At a separation distance of approximately 1.6 km, and in the absence of hydrological or habitat continuity, there is no realistic mechanism by which propagule exchange or other functional landscape-scale processes could occur. Accordingly, the SAC peatland habitats are functionally isolated from the Main Wind Farm Development Site and ecological connectivity can be excluded.</p> <p>No ecological connectivity as the designated features are habitats and species that are functionally isolated from the Main Wind Farm Development Site. Therefore, no connections.</p>	
Lough Dahybaun SAC 002177	1.82 km E from Over-run Area 2	Slender naiad (<i>Najas flexilis</i>) [1833]	<p>Hydrological A study of local water courses confirms there is no hydrological connectivity as the SAC is situated upstream of the nearest potentially connected water course.</p> <p>Hydrogeological Lough Dahybaun SAC is located within the same groundwater body 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.</p> <p>This is based on the characteristics of the development and the likely flow dynamics from the Proposed Project.</p> <p>Ecological</p>	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			<p>The QI species is an aquatic plant and therefore is surface water dependent no groundwater sensitive. No ecological connectivity as the designated features are habitats and species that are functionally isolated from the Main Wind Farm Development Site. Therefore, there are no sources for impacts with pathways for potential effects to the qualifying interests (sensitive receptors) identified.</p>	
<p>River Moy SAC 002298</p>	<p>4.8 km SE from Over-run Area 2, but over 20 km SE from the Main Wind Farm Development Site.</p>	<p>Active raised bogs [7110], Otter (<i>Lutra lutra</i>) [1355], White-clawed crayfish (<i>Austropotamobius pallipes</i>) [1092], Depressions on peat substrates of the Rhynchosporion [7150], Brook lamprey (<i>Lampetra planeri</i>) [1096], Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) [91E0], Sea lamprey (<i>Petromyzon marinus</i>) [1095], Degraded raised bogs still capable of natural regeneration [7120], Atlantic salmon (<i>Salmo salar</i>) [1106], Alkaline fens [7230], Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0], Lowland hay meadows (<i>Alopecurus pratensis</i>, <i>Sanguisorba officinalis</i>) [6510]</p>	<p>Hydrological A study of local water courses confirms there is no hydrological connectivity as the SAC is in a different catchment.</p> <p>Hydrogeological River Moy SAC is located within the same groundwater body 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.</p> <p>This is based on the characteristics of the Proposed Project and the likely flow dynamics from the Proposed Project.</p> <p>Ecological Although River Moy SAC and the Main Wind Farm Development Site are mapped within the same groundwater body, the SAC lies within a separate surface water catchment and there are no identified karst features, preferential flow paths or hydrogeological conduits that would enable groundwater-mediated connectivity. In the absence of such pathways, groundwater-dependent qualifying interests within the SAC (including alkaline fens, active raised bogs and</p>	<p>No</p>



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			<p>Rhynchosporion depressions) are functionally isolated from the Proposed Project, and effects on these habitats cannot reasonably occur.</p> <p>Qualifying interest habitats within the SAC are maintained by site-specific environmental conditions, including local hydrology, substrate, management regime and microclimate, and do not rely on landscape-scale dispersal or propagule exchange over kilometre-scale distances. In the absence of direct habitat continuity, surface water connectivity or other functional pathways linking the Main Wind Farm Development Site to the SAC, there is no plausible mechanism by which effects on habitat structure, function or regeneration could be transmitted. Accordingly, pathways for effects on qualifying interest habitats can be excluded.</p> <p>While there is potential for hydrological connectivity between the Main Wind Farm Development Site and the immediate receiving marine environment, any materials or contaminants potentially mobilised would be subject to rapid dilution, dispersion, tidal mixing and settlement within coastal waters. These physical processes act to markedly reduce concentration, persistence and spatial extent of any residual effects. As a result, effects would be highly localised and confined to the near-field marine environment, with no plausible mechanism for transmission at a scale capable of affecting qualifying interests within more distant marine SACs. Accordingly, likely significant effects on the marine dependent QIs for this SAC can be excluded.</p> <p>No ecological connectivity as the designated features are habitats and species that are functionally isolated from the Main Wind Farm Development Site. Therefore, there are no sources for impacts with pathways for potential effects to the qualifying interests (sensitive receptors) identified.</p>	
Bellacorick Iron Flush SAC 000466	5.3 km NE from Over-run Area 2, but over 20 km from the Main Wind Farm Development Site.	Marsh saxifrage (<i>Saxifraga hirculus</i>) [1528]	Hydrological A study of local water courses confirms there is no hydrological connectivity as the SAC in a different catchment.	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			<p>Hydrogeological</p> <p>Bellacorick Iron Flush SAC is located within the same groundwater body 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.</p> <p>Therefore, there is no realistic hydrogeological connection for potential effects to the SAC.</p> <p>Ecological</p> <p>This QI species is not groundwater sensitive. No ecological connectivity as the designated features are habitats that are functionally isolated from the Main Wind Farm Development Site. Therefore, there are no sources for impacts with pathways for potential effects to the qualifying interests (sensitive receptors) identified.</p>	
Slieve Fyagh Bog SAC 000542	11.3 km NE of the Main Wind Farm Development Site and 5.5 km NE from Over-run Area 3	Blanket bogs * if active bog [713	<p>Hydrological</p> <p>A study of local water courses confirms there is no hydrological connectivity as the SAC is in a different catchment from the Proposed Project.</p> <p>Hydrogeological</p> <p>This SAC 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</p>	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			<p>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.</p> <p>Therefore, there is no realistic hydrogeological connection for potential effects to the SAC.</p> <p>Ecological</p> <p>Given the distances, although Slieve Fyagh Bog SAC and the Main Wind Farm Development Site are mapped within the same groundwater body, the SAC lies within a separate surface water catchment and there are no identified karst features, preferential flow paths or hydrogeological conduits that would enable groundwater-mediated connectivity. In the absence of such pathways, groundwater-dependent qualifying interests within the SAC (including blanket bogs) are functionally isolated from the Proposed Project, and effects on these habitats cannot reasonably occur. Seed and spore dispersal in these systems is typically restricted to tens to hundreds of metres, largely via local surface water movement or wind under specific microtopographic conditions. At a separation distance of approximately 5.5 km from the closest point, and in the absence of hydrological or habitat continuity, there is no realistic mechanism by which propagule exchange or other functional landscape-scale processes could occur. Accordingly, the SAC peatland habitats are functionally isolated from the Main Wind Farm Development Site and ecological connectivity can be excluded.</p> <p>No ecological connectivity as the designated feature is a habitat. Therefore, there are no sources for impacts with pathways for potential effects to the qualifying interests (sensitive receptors) identified.</p>	



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Broadhaven Bay SAC 000472	6.6 km N from the Main Wind Farm Development Site	<p>Mudflats and sandflats not covered by seawater at low tide [1140]</p> <p>Large shallow inlets and bays [1160]</p> <p>Reefs [1170]</p> <p>Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) [1330]</p> <p>Submerged or partially submerged sea caves [8330]</p>	<p>Hydrological</p> <p>A study of local water courses confirms there is no hydrological connectivity as the SAC is situated upstream of the nearest potentially connected water course.</p> <p>Hydrogeological</p> <p>Broadhaven Bay SAC is located within the same ground waterbody as the Main Wind Farm Development Site. Carrowmore Lake Complex SAC is located within the same groundwater body 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. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC.</p> <p>Ecological</p> <p>There are no groundwater sensitive QIs. Furthermore, there are no pathways for effect to the terrestrial habitats for which this site is designated.</p> <p>While there is potential for hydrological connectivity between the Main Wind Farm Development Site and the immediate receiving marine environment, any materials or contaminants potentially mobilised would be subject to rapid dilution, dispersion, tidal mixing and settlement within coastal waters. These physical processes act to markedly reduce concentration, persistence and spatial extent of any residual effects. As a result, effects would be highly localised and confined to the near-field marine environment, with no</p>	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			<p>plausible mechanism for transmission at a scale capable of affecting qualifying interests within more distant marine SACs. Accordingly, likely significant effects on the marine dependent QIs for this SAC can be excluded.</p> <p>No ecological connectivity as the designated features are habitats that do not occur on within the Main Wind Farm Development Site. Therefore, there are no sources for impacts with pathways for potential effects to the qualifying interests (sensitive receptors) identified.</p>	
West Connacht Coast SAC 002998	8.0 km W from the Main Wind Farm Development Site	<i>Tursiops truncatus</i> (Common bottlenose dolphin) [1349]	<p>Hydrological</p> <p>While there is a hydrological connection between onsite streams and the receiving coastal waters of Tullaghan Bay and Blacksod Bay, this linkage does not create a realistic impact pathway for the qualifying marine mammal species of the West Connacht Coast SAC. The freshwater streams on the site are very small, shallow systems that do not provide habitat or access for marine mammals. In addition, any potential pollutant loading from the site would be extremely limited in volume and would undergo substantial dilution and dispersion before reaching the marine environment. For these reasons, there is no credible mechanism by which the Proposed Project could affect the SAC's marine mammal features, despite the presence of a hydrological connection, given the volume of the water involved.</p> <p>Ecological</p> <p>No groundwater dependent QIs. While Common Bottlenose Dolphin (<i>Tursiops truncatus</i>) may intermittently occur within coastal waters in proximity to the Main Wind Farm Development Site, this is a wide-ranging marine mammal with large foraging ranges and high mobility. Any potential effects arising locally within the adjacent bay would be spatially limited and subject to rapid dilution within the marine environment and therefore would not be of a scale or persistence capable of giving rise to knock-on effects for the SAC populations located over 8 km away. Consequently, no functional ecological connectivity exists that would plausibly link localised effects</p>	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			near the Main Wind Farm Development Site to adversely affect the conservation objectives of West Connacht Coast SAC.	
Glenamoy Bog Complex SAC 000500	8.7 km NE from Over-run Area 3 and 13.9 km NE from the Main Wind Farm Development Site.	<p>Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]</p> <p>Machairs (* in Ireland) [21A0]</p> <p>Natural dystrophic lakes and ponds [3160]</p> <p>Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]</p> <p>Juniperus communis formations on heaths or calcareous grasslands [5130]</p> <p>Blanket bogs (* if active bog) [7130]</p> <p>Transition mires and quaking bogs [7140]</p> <p>Depressions on peat substrates of the Rhynchosporion [7150]</p> <p><i>Salmo salar</i> (Salmon) [1106]</p> <p><i>Petalophyllum ralfsii</i> (Petalwort) [1395]</p> <p><i>Saxifraga hirculus</i> (Marsh saxifrage) [1528]</p> <p><i>Hamatocaulis vernicosus</i> (Slender green feather-moss) [6216]</p>	<p>Hydrological</p> <p>A study of local water courses revealed confirms there is no downstream hydrological connectivity between the Proposed Project and the SAC as the SAC is situated upstream of the nearest potentially connected water course. The Main Wind Farm Development Site which is where the majority of the works will take place is in a different catchment to this SAC.</p> <p>Hydrogeological</p> <p>Glenamoy Bog Complex SAC is located within the same ground waterbody as the Main Wind Development Site. However, there is no realistic hydrogeological connection due to the distance between them (>13 km).</p> <p>This SAC 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.</p> <p>Therefore, there is no realistic hydrogeological connection for potential effects to the SAC.</p> <p>Ecological</p> <p>QI habitats are maintained by localised processes and lack mechanisms for kilometre-scale connectivity; in the absence of hydrological or habitat continuity, no pathways for effects exist.</p>	No



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			<p>With respect to <i>Salmo salar</i> (Atlantic salmon), the Proposed Project does not present a pathway for effects to the SAC population because the main wind farm works are located within a different catchment and therefore do not drain towards waters supporting the SAC. Potential sources of effect are limited to the temporary over-run works; however, these are hydrologically disconnected from the SAC (the SAC is upstream of the nearest potentially connected watercourse) and any residual, localised increases in suspended solids or associated pollutants would be rapidly attenuated through dilution, settling and deposition within the receiving drainage network. Consequently, any effects would be short-lived, spatially limited and would not propagate to habitats used by salmon within the SAC, and population-level effects can be excluded.</p> <p>Peatland qualifying habitats such as active raised bogs and Rhynchosporion depressions are characterised by highly localised landscape dynamics, with regeneration and maintenance processes driven primarily by in situ hydrology, peat accumulation and very limited short-range propagule dispersal. Seed and spore dispersal in these systems is typically restricted to tens to hundreds of metres, largely via local surface water movement or wind under specific microtopographic conditions. At a separation distance of approximately 8.7 km, and in the absence of hydrological or habitat continuity, there is no realistic mechanism by which propagule exchange or other functional landscape-scale processes could occur. Accordingly, the SAC peatland habitats are functionally isolated from the Main Wind Farm Development Site and ecological connectivity can be excluded.</p> <p>No ecological connectivity exists, as the designated features are predominantly immobile habitats and plant species that lack mechanisms to interact with the Main Wind Farm Development Site; salmon populations are hydrologically isolated due to catchment separation and dilution effects. Therefore, no sources of impact with viable pathways to the</p>	



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			qualifying interests (sensitive receptors) are identified. No ecological connectivity as the designated features are habitats and plant species which are not mobile. Therefore, there are no sources for impacts with pathways for potential effects to the qualifying interests (sensitive receptor).	
Dooport Machair/Lough Doo SAC 001497	11.0 km SW from the Main Wind Farm Development Site	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 no realistic hydrological connection given the volume of the water involved. Furthermore, the QIs are not sensitive to hydrological interactions. Hydrogeological The SAC is located in a different groundwater body to the SAC. Therefore, no hydrogeological connectivity. Ecological QI habitats are maintained by localised processes and lack mechanisms for kilometre-scale connectivity; in the absence of hydrological or habitat continuity, no pathways for effects exist. No ecological connectivity as the designated features are habitats and plant species that do not occur within the Main Wind Farm Development Site.	No
Croaghaun/Slievemore SAC 001955	13.7 km SW from the Main Wind Farm Development Site	Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] Blanket bogs (* if active bog) [7130] Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) [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 no realistic hydrological connection to Croaghaun/Slievemore SAC given the volume of the water and distances involved. Furthermore, the QIs are not sensitive to hydrological interactions. Hydrogeological The SAC is located in a different groundwater body to the SAC. Therefore, no hydrogeological connectivity. Ecological	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			No ecological connectivity as the designated features are habitats and there is considerable distance between the SAC and Main Wind Farm Development Site. Therefore, no sources with pathways for effects to these QIs. No connectivity.	
Erris Head SAC 001501	13.8 km NW from the Main Wind Farm Development Site	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Alpine and Boreal heaths [4060]	<p>Hydrological</p> <p>No hydrological connectivity as the SAC is in a different catchment as stated above. Furthermore, the QIs are not sensitive to hydrological interactions.</p> <p>Hydrogeological</p> <p>Erris Head SAC is located within the same ground waterbody as the Main Wind Farm Development Site. However, there is no realistic hydrogeological connection due to the distance between them (>13.8 km)</p> <p>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.</p> <p>Therefore, there is no realistic hydrogeological connection for potential effects to the SAC.</p> <p>Ecological</p> <p>No groundwater dependent QIs. No ecological connectivity as the designated features are habitats and the distances are far beyond natural dispersal pathway limits. Therefore, no sources with pathways for effects to these QIs. No connectivity.</p>	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
Duvillaun Islands SAC 000495	14.8 km WSW from the Main Wind Farm Development Site	Common Bottlenose Dolphin (<i>Tursiops truncatus</i>) [1349], Grey Seal (<i>Halichoerus grypus</i>) [1364]	<p>Hydrological</p> <p>No hydrological connectivity as the SAC marine based – and the distances stated are over land distances. Therefore, there is no functional connectivity due to the dilution effect of marine waters – considering the sources for impacts identified.</p> <p>Hydrogeological</p> <p>Duvillaun Islands SAC is located within the same ground waterbody as the Main Wind Farm Development Site. However, there is no realistic hydrogeological connection due to the distance between them (>14.8 km).</p> <p>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.</p> <p>Therefore, there is no realistic hydrogeological connection for potential effects to the SAC.</p> <p>Ecological</p> <p>No groundwater dependent QIs. While Common Bottlenose Dolphin (<i>Tursiops truncatus</i>) and Grey Seal (<i>Halichoerus grypus</i>) may intermittently occur within coastal waters in proximity to the Main Wind Farm Development Site, both species are wide-ranging marine mammals with large foraging ranges and high mobility. Any potential effects arising locally within the adjacent bay would be spatially limited and subject to rapid dilution within the marine environment and therefore would not be of a scale or persistence capable of giving rise to knock-on effects for the SAC populations located over 14.8 km</p>	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			away. Consequently, no functional ecological connectivity exists that would plausibly link localised effects near the wind farm to adverse effects on the conservation objectives of Duvillaun Islands SAC.	
Newport River SAC 002144	14.9 SE from Over-run Area 2	Freshwater pearl mussel (<i>Margaritifera margaritifera</i>) [1029], Atlantic salmon (<i>Salmo salar</i>) [1106]	<p>Hydrological</p> <p>No hydrological connectivity as the SAC is in a different catchment as stated above.</p> <p>Hydrogeological</p> <p>Newport River SAC is located within the same ground waterbody as the Main Wind Farm Development Site. However, there is no realistic hydrogeological connection due to the distance between them (>14.9 km).</p> <p>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.</p> <p>Therefore, there is no realistic hydrogeological connection for potential effects to the SAC.</p> <p>Ecological</p> <p>No groundwater dependent QIs. No ecological connectivity as the designated features are aquatic species from a different catchment.</p>	No
SPA				
Owenduff/Nephin Complex SPA 004098	Adjacent to Over-run Area 3 and 7.76 km E	Merlin (<i>Falco columbarius</i>) [A098] (permanent)	Hydrological	Yes



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
	from the Main Wind Farm Development Site	Golden plover (<i>Pluvialis apricaria</i>) [A140] (breeding)	<p>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.</p> <p>Hydrogeological</p> <p>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.</p> <p>Therefore, there is no realistic hydrogeological connection for potential effects to the SPA. Furthermore, the SCIs are not groundwater sensitive.</p> <p>Ecological</p> <p>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.</p> <p>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</p>	



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			merlin was approximately 8 km (Warkentin and Oliphant, 1990) ²⁶ . 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 Area (Over-run Area 1).	<p>Red-throated diver (<i>Gavia stellata</i>) [A001] (wintering)</p> <p>Great Northern diver (<i>Gavia immer</i>) [A003] (wintering)</p> <p>Slavonian grebe (<i>Podiceps auritus</i>) [A007] (wintering)</p> <p>Light-bellied brent goose (<i>Branta bernicla hrota</i>) [A046] (wintering)</p> <p>Common scoter (<i>Melanitta nigra</i>) [A065] (wintering)</p> <p>Red-breasted merganser (<i>Mergus serrator</i>) [A069] (wintering)</p> <p>Ringed plover (<i>Charadrius hiaticula</i>) [A137] (wintering)</p> <p>Sanderling (<i>Calidris alba</i>) [A144] (breeding)</p> <p>Dunlin (<i>Calidris alpina</i>) [A149] (wintering)</p> <p>Bar-tailed godwit (<i>Limosa lapponica</i>) [A157] (wintering)</p>	<p>Hydrological</p> <p>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.</p> <p>Hydrogeological</p> <p>The SPA is located in the same ground waterbody (IE_WE_G_0057, Belmullet) and same sub-catchment (Glencastle_SC_010) as the Main Wind Farm Development Site and therefore they are hydrogeologically connected.</p> <p>Ecological</p> <p>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)²⁷. Therefore, the potential ecological connection is that the wintering curlew population of the SPA may fly across the Main Wind Development Site.</p> <p>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</p>	Yes

²⁶ 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.

²⁷ 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 ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
		<p>Curlew (<i>Numenius arquata</i>) [A160] (wintering)</p> <p>Sandwich tern (<i>Sterna sandvicensis</i>) [A191] (breeding)</p> <p>Wetland and Waterbirds [A999]</p>	<p>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.</p>	
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 (<i>Sterna sandvicensis</i>) [A191] (breeding)	<p>Hydrological & Hydrogeological</p> <p>No hydrological or hydrogeological connectivity.</p> <p>Ecological</p> <p>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 Proposed Development Site because of the unsuitability of the habitat for breeding or 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 Proposed Development Site.</p> <p>Therefore, there are no sources for impacts with pathways for potential effects to the SPA</p>	No
Mullet Peninsula SPA 004227	9.6 km NW from the Main Wind Farm Development Site	Corncrake (<i>Crex crex</i>) [A122] (breeding)	<p>Hydrological & Hydrogeological</p> <p>No hydrological or hydrogeological connectivity as this is a coastal/marine SPA connected to a different river catchment and groundwater body.</p> <p>Ecological</p> <p>No corncrake were recorded during surveys. These included extensive passage surveys and bioacoustic monitoring. Therefore, there is no ecological connection to the SPA.</p>	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
Doogort Machair SPA 004235	11.1 km SW from the Main Wind Farm Development Site	Dunlin (<i>Calidris alpina schinzii</i>) [A466] (breeding)	<p>Hydrology & Hydrogeology</p> <p>No hydrological or hydrogeological connectivity as this is a coastal/marine SPA connected to a different river catchment and groundwater body.</p> <p>Ecological</p> <p>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 Proposed Development Site is not on a direct migratory line from the SPA to the wintering grounds as the Proposed Development Site 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.</p>	No
Termoncarragh Lake and Annagh Machair SPA 004093	13.3 km NW from the Main Wind Farm Development Site	<p>Whooper swan (<i>Cygnus cygnus</i>) [A038] (wintering)</p> <p>Barnacle goose (<i>Branta leucopsis</i>) [A045] (wintering)</p> <p>Corncrake (<i>Crex crex</i>) [A122] (breeding)</p> <p>Lapwing (<i>Vanellus vanellus</i>) [A142] (breeding)</p> <p>Chough (<i>Pyrrhocorax pyrrhocorax</i>) [A346] (wintering)</p> <p>Greenland white-fronted goose (<i>Anser albifrons flavirostris</i>) [A395] (wintering)</p> <p>Dunlin (<i>Calidris alpina schinzii</i>) [A466] (breeding)</p> <p>Wetland and Waterbirds [A999]</p>	<p>Hydrological & Hydrogeological</p> <p>No hydrological or hydrogeological connectivity as this is partly a marine SPA connected to a different river catchment and groundwater body.</p> <p>Ecological</p> <p>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.</p> <p>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.</p> <p>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</p>	Yes



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			<p>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.</p> <p>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 season²⁸, indicating that no realistic ecological connection to the breeding population for this SPA is present.</p> <p>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.</p>	
Inishglora and Inishkeeragh SPA 004084	14.4 km NW from the Main Wind Farm Development Site	<p>Storm petrel (<i>Hydrobates pelagicus</i>) [A014] (breeding)</p> <p>Cormorant (<i>Phalacrocorax carbo</i>) [A017] (breeding)</p> <p>Shag (<i>Phalacrocorax aristotelis</i>) [A018] (breeding)</p> <p>Barnacle goose (<i>Branta leucopsis</i>) [A045] (wintering)</p> <p>Lesser black-backed gull (<i>Larus fuscus</i>) [A183] (breeding)</p> <p>Herring gull (<i>Larus argentatus</i>) [A184] (breeding)</p> <p>Arctic tern (<i>Sterna paradisaea</i>) [A194] (breeding)</p>	<p>Hydrological & Hydrogeological</p> <p>No hydrological or hydrogeological connectivity as this SPA is composed of several islands.</p> <p>Ecological</p> <p>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.</p> <p>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 gull²⁹. These ranges are greater than the distance of the SPA from the Main Wind Farm Development and therefore, there is potential ecological connectivity.</p>	Yes

²⁸ 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

²⁹ <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 ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			<p>The core winter foraging range for barnacle goose is 15 km. As the SPA is 14.4 km away there is potential ecological connectivity.</p> <p>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 Proposed Development Site .</p>	
Duvillaun Islands SPA 004111	15.3 km SW of the Main Wind Farm Development Site	<p>Fulmar (<i>Fulmarus glacialis</i>) [A009] (breeding)</p> <p>Storm petrel (<i>Hydrobates pelagicus</i>) [A014] (breeding)</p> <p>Barnacle goose (<i>Branta leucopsis</i>) [A045] (breeding)</p>	<p>Hydrological & Hydrogeological</p> <p>No hydrological or hydrogeological connectivity as this SPA is composed of several marine islands.</p> <p>Ecological</p> <p>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.</p> <p>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.</p>	Yes
Inishkea Islands SPA 004004	16.4 km W from the Main Wind Farm Development Site	<p>Shag (<i>Phalacrocorax aristotelis</i>) [A018] (breeding)</p> <p>Barnacle goose (<i>Branta leucopsis</i>) [A045] (wintering)</p> <p>Ringed plover (<i>Charadrius hiaticula</i>) [A137] (wintering & breeding)</p> <p>Sanderling (<i>Calidris alba</i>) [A144] (wintering)</p>	<p>Hydrological & Hydrogeological</p> <p>No hydrological or hydrogeological connectivity as this SPA is composed of several islands.</p> <p>Ecological</p> <p>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.</p>	Yes



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
		<p>Purple sandpiper (<i>Calidris maritima</i>) [A148] (wintering)</p> <p>Turnstone (<i>Arenaria interpres</i>) [A169] (wintering)</p> <p>Common gull (<i>Larus canus</i>) [A182] (breeding)</p> <p>Herring gull (<i>Larus argentatus</i>) [A184] (wintering)</p> <p>Arctic tern (<i>Sterna paradisaea</i>) [A194] (breeding)</p> <p>Little tern (<i>Sterna albifrons</i>) [A195] (breeding)</p> <p>Dunlin (<i>Calidris alpina schinzii</i>) [A466] (breeding & wintering)</p>	<p>The core foraging distances of common gull and herring gull are 50 km and 85.6 km³⁰, respectively. As the SPA is approximately 16.4 km distant there is potential ecological connectivity with regards to these two bird species.</p> <p>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 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 Proposed Development Site. Therefore, there is potential indirect ecological connectivity to the Inishkea Island SPA population of barnacle geese.</p> <p>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.</p>	
Lough Conn and Lough Cullin SPA 004228	17.1 km S from the Main Wind Farm Development Site	<p>Common Scoter (<i>Melanitta nigra</i>) [A065] (breeding),</p> <p>Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395] (wintering),</p> <p>Tufted Duck (<i>Aythya fuligula</i>) [A061] (wintering),</p> <p>Wetland and Waterbirds [A999],</p> <p>Common Gull (<i>Larus canus</i>) [A182] (breeding)</p>	<p>Hydrological & Hydrogeological</p> <p>No hydrological or hydrogeological connectivity as this is a coastal/marine SPA connected to a different river catchment and groundwater body.</p> <p>Ecological</p> <p>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 km²¹, 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</p>	Yes

³⁰ <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 ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
			<p>white-fronted goose. Therefore, there is ecological connectivity for common gull but not Greenland white-fronted goose.</p> <p>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.</p>	
Illanmaster SPA 004074	20.4 km NE from the Main Wind Farm Development Site	European storm petrel (<i>Hydrobates pelagicus</i>) [A014] (breeding)	<p>Hydrological & Hydrogeological</p> <p>No hydrological or hydrogeological connectivity as this is a coastal/marine SPA connected to a different river catchment and groundwater body.</p> <p>Ecological</p> <p>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.</p>	No
Killala Bay/Moy Estuary SPA 004036	22.7 km NE from the Main Wind Farm Development Site	<p>Sanderling (<i>Calidris alba</i>) [A144] (wintering),</p> <p>Dunlin (<i>Calidris alpina</i>) [A149] (wintering),</p> <p>Curlew (<i>Numenius arquata</i>) [A160] (wintering),</p> <p>Ringed Plover (<i>Charadrius hiaticula</i>) [A137] (wintering),</p> <p>Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] (wintering),</p> <p>Redshank (<i>Tringa totanus</i>) [A162] (wintering),</p> <p>Wetland and Waterbirds [A999],</p> <p>Golden Plover (<i>Pluvialis apricaria</i>) [A140] (wintering),</p> <p>Grey Plover (<i>Pluvialis squatarola</i>) [A141] (wintering)</p>	<p>Hydrology & Hydrogeology</p> <p>No hydrological or hydrogeological connectivity as this is a coastal/marine SPA connected to a different river catchment and groundwater body.</p> <p>Ecological</p> <p>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).</p> <p>The SPA is located approximately 22.7 km from the Main Wind Farm Development Site, therefore there is no ecological connectivity.</p>	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
Stags of Broad Haven SPA 004072	23.5 km W from the Main Wind Farm Development Site	Leach's Storm-petrel (<i>Oceanodroma leucorhoa</i>) [A015] (breeding), Storm Petrel (<i>Hydrobates pelagicus</i>) [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. 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.	No
North-west Irish Sea SPA 004236	Approx. 240 km E from the Main Wind Farm Development Site	Red-throated diver (<i>Gavia stellata</i>) [A001] (wintering) Great northern diver (<i>Gavia immer</i>) [A003] (wintering) Fulmar (<i>Fulmarus glacialis</i>) [A009] (breeding and wintering) Manx shearwater (<i>Puffinus puffinus</i>) [A013] (breeding) Cormorant (<i>Phalacrocorax carbo</i>) [A017] (breeding) Shag (<i>Phalacrocorax aristotelis</i>) [A018] (breeding) Common scoter (<i>Melanitta nigra</i>) [A065] (wintering) Black-headed gull (<i>Chroicocephalus ridibundus</i>) [A179] (wintering) Common gull (<i>Larus canus</i>) [A182] (wintering) Lesser black-backed gull (<i>Larus fuscus</i>) [A183] (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 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.	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
		Herring gull (<i>Larus argentatus</i>) [A184] (breeding and wintering) Great black-backed gull (<i>Larus marinus</i>) [A187] (wintering) Kittiwake (<i>Rissa tridactyla</i>) [A188] (breeding and wintering) Roseate tern (<i>Sterna dougallii</i>) [A192] (breeding) Common tern (<i>Sterna hirundo</i>) [A193] (breeding) Arctic tern (<i>Sterna paradisaea</i>) [A194] (breeding) Guillemot (<i>Uria aalge</i>) [A199] (breeding and wintering) Razorbill (<i>Alca torda</i>) [A200] (breeding and wintering) Puffin (<i>Fratercula arctica</i>) [A204] (breeding) Little gull (<i>Hydrocoloeus minutus</i>) [A862] (wintering) Little tern (<i>Sternula albifrons</i>) [A885] (breeding)	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.	
Clare Island SPA 004136	Approx. 32 km S from the Main Wind Farm Development Site	Fulmar (<i>Fulmarus glacialis</i>) [A009] (breeding) Shag (<i>Phalacrocorax aristotelis</i>) [A018] (breeding) Common gull (<i>Larus canus</i>) [A182] (breeding) Kittiwake (<i>Rissa tridactyla</i>) [A188] (breeding) Guillemot (<i>Uria aalge</i>) [A199] (breeding) Razorbill (<i>Alca torda</i>) [A200] (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: kittiwake and common gull. The marine core foraging ranges of these two species during the breeding season are as follows;	Yes



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
		<p>Chough (<i>Pyrhocorax pyrrhocorax</i>) [A346] (permanent)</p>	<p>Kittiwake: 300.6 km Common gull: 50 km</p> <p>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 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.</p> <p>One single kittiwake <i>Rissa tridactyla</i> was recorded during the 2023 spring passage season. Therefore, there is potential ecological connectivity for kittiwake, as summarised below.</p> <p><i>Operating wind farm – collision – kittiwake</i></p>	
<p>Inner Galway Bay SPA 004031</p>	<p>Approx 109 km S from the Main Wind Farm Development Site</p>	<p>Black-throated diver (<i>Gavia arctica</i>) [A002] (wintering) Great northern diver (<i>Gavia immer</i>) [A003] (wintering) Cormorant (<i>Phalacrocorax carbo</i>) [A017] (breeding) Grey heron (<i>Ardea cinerea</i>) [A028] Light-bellied brent goose (<i>Branta bernicla hrota</i>) [A046] (wintering) Teal (<i>Anas crecca</i>) [A052] (wintering) Red-breasted merganser (<i>Mergus serrator</i>) [A069] (wintering) Ringed plover (<i>Charadrius hiaticula</i>) [A137] (wintering) Golden plover (<i>Pluvialis apricaria</i>) [A140] (wintering) Lapwing (<i>Vanellus vanellus</i>) [A142] (wintering)</p>	<p>Hydrology & Hydrogeology</p> <p>No hydrological or hydrogeological connectivity as this is a marine SPA connected to a different river catchment and groundwater body.</p> <p>Ecological</p> <p>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</p> <p>The marine core foraging ranges of the aforementioned species during the breeding season are as follows;</p> <p>cormorant: 33.9 km black-headed gull: 18.5 km golden plover: 12 km common gull: 50 km common tern: 269 km</p> <p>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</p>	<p>Yes</p>



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
		Dunlin (<i>Calidris alpina</i>) [A149] (wintering) Bar-tailed godwit (<i>Limosa lapponica</i>) [A157] (wintering) Curlew (<i>Numenius arquata</i>) [A160] (wintering) Redshank (<i>Tringa totanus</i>) [A162] (wintering) Turnstone (<i>Arenaria interpres</i>) [A169] (wintering) Black-headed gull (<i>Chroicocephalus ridibundus</i>) [A179] (wintering) Common gull (<i>Larus canus</i>) [A182] (wintering) Common tern (<i>Sterna hirundo</i>) [A193] (breeding) Wigeon (<i>Mareca penelope</i>) [A855] (wintering) Sandwich tern (<i>Thalasseus sandvicensis</i>) [A863] (breeding) Wetland and Waterbirds [A999]	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. 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 (<i>Fulmarus glacialis</i>) [A009] (breeding) Manx shearwater (<i>Puffinus puffinus</i>) [A013] (breeding) Storm petrel (<i>Hydrobates pelagicus</i>) [A014] (breeding) Shag (<i>Phalacrocorax aristotelis</i>) [A018] (breeding) Lesser black-backed gull (<i>Larus fuscus</i>) [A183] (breeding) Herring gull (<i>Larus argentatus</i>) [A184] (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	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
		<p>Kittiwake (<i>Rissa tridactyla</i>) [A188] (breeding)</p> <p>Arctic tern (<i>Sterna paradisaea</i>) [A194] (breeding)</p> <p>Razorbill (<i>Alca torda</i>) [A200] (breeding)</p> <p>Puffin (<i>Fratercula arctica</i>) [A204] (breeding)</p> <p>Chough (<i>Pyrhocorax pyrrhocorax</i>) [A346] (breeding)</p>	<p>herring gull: 85.6 km</p> <p>lesser black backed gull: 236 km.</p> <p>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.</p>	
South Dublin and River Tolka Estuary SPA 004024	Approx. 255 km SE from the Main Wind Farm Development Site	<p>Light-bellied brent goose (<i>Branta bernicla hrota</i>) [A046] (wintering)</p> <p>Oystercatcher (<i>Haematopus ostralegus</i>) [A130] (wintering)</p> <p>Ringed plover (<i>Charadrius hiaticula</i>) [A137] (wintering)</p> <p>Grey plover (<i>Pluvialis squatarola</i>) [A141] (wintering)</p> <p>Knot (<i>Calidris canutus</i>) [A143] (wintering)</p> <p>Sanderling (<i>Calidris alba</i>) [A144] (wintering)</p> <p>Dunlin (<i>Calidris alpina</i>) [A149] (wintering)</p> <p>Bar-tailed godwit (<i>Limosa lapponica</i>) [A157] (wintering)</p> <p>Redshank (<i>Tringa totanus</i>) [A162] (wintering)</p> <p>Black-headed gull (<i>Chroicocephalus ridibundus</i>) [A179] (wintering)</p> <p>Roseate tern (<i>Sterna dougallii</i>) [A192] (concentration)</p> <p>Common tern (<i>Sterna hirundo</i>) [A193] (concentration)</p>	<p>Hydrology & Hydrogeology</p> <p>No hydrological or hydrogeological connectivity as this is a marine SPA connected to a different river catchment and groundwater body.</p> <p>Ecological</p> <p>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.</p> <p>The marine core foraging ranges of the aforementioned species during the breeding season are as follows;</p> <p>black-headed gull: 18.5 km</p> <p>common tern: 269 km.</p> <p>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.</p>	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
		Arctic tern (<i>Sterna paradisaea</i>) [A194] (concentration) Wetland and Waterbirds [A999]		
Rockabill SPA 004014	Approx. 257 km SE from the Main Wind Farm Development Site	Purple sandpiper (<i>Calidris maritima</i>) [A148] (breeding) Roseate tern (<i>Sterna dougallii</i>) [A192] (breeding) Common tern (<i>Sterna hirundo</i>) [A193] (breeding) Arctic tern (<i>Sterna paradisaea</i>) [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.	No
Lambay Island SPA 004069	Approx. 263 km SE from the Main Wind Farm Development Site	Fulmar (<i>Fulmarus glacialis</i>) [A009] (breeding) Cormorant (<i>Phalacrocorax carbo</i>) [A017] (breeding and wintering) Shag (<i>Phalacrocorax aristotelis</i>) [A018] Greylag goose (<i>Anser anser</i>) [A043] (wintering) Lesser black-backed gull (<i>Larus fuscus</i>) [A183] (breeding) Herring gull (<i>Larus argentatus</i>) [A184] Kittiwake (<i>Rissa tridactyla</i>) [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: 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: cormorant: 33.9 km kittiwake: 300.6 km	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
		<p>Guillemot (<i>Uria aalge</i>) [A199] (breeding) Razorbill (<i>Alca torda</i>) [A200] (breeding) Puffin (<i>Fratercula arctica</i>) [A204] (breeding)</p>	<p>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.</p>	
Ireland's Eye SPA 004117	Approx. 263 km SE from the Main Wind Farm Development Site	<p>Cormorant (<i>Phalacrocorax carbo</i>) [A017] (breeding) Herring gull (<i>Larus argentatus</i>) [A184] (breeding) Kittiwake (<i>Rissa tridactyla</i>) [A188] (breeding) Guillemot (<i>Uria aalge</i>) [A199] (breeding) Razorbill (<i>Alca torda</i>) [A200] (breeding)</p>	<p>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 and herring gull. The marine core foraging ranges of the aforementioned species during the breeding season are as follows;: cormorant: 33.9 km kittiwake: 300.6 km herring gull: 85.6 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 all of the above-mentioned species, Hence, no ecological connection.</p>	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
Sovereign Island SPA 004124	Approx. 288 km S from the Main Wind Farm Development Site	Cormorant (<i>Phalacrocorax carbo</i>) [A017] (breeding)	<p>Hydrology & Hydrogeology</p> <p>No hydrological or hydrogeological connectivity as this is a marine SPA connected to a different river catchment and groundwater body.</p> <p>Ecological</p> <p>Cormorant was recorded during surveys at the Main Wind Farm Development Site. The marine core foraging range of cormorant during the breeding season is 33.9 km. The direct line distance of the SPA to the Main Wind Farm Development Site is approx. 288 km. Therefore, the marine distance between the Main Wind Farm Development Site and the SPA is greater than the marine core foraging range of cormorant. Hence, no ecological connection.</p>	No
Seas off Wexford SPA 004237	Approx. 300 km SE from the Main Wind Farm Development Site	<p>Red-throated diver (<i>Gavia stellata</i>) [A001] (wintering)</p> <p>Fulmar (<i>Fulmarus glacialis</i>) [A009] (breeding)</p> <p>Manx shearwater (<i>Puffinus puffinus</i>) [A013] (breeding)</p> <p>Gannet (<i>Morus bassanus</i>) [A016] (breeding)</p> <p>Cormorant (<i>Phalacrocorax carbo</i>) [A017] (breeding and wintering)</p> <p>Shag (<i>Phalacrocorax aristotelis</i>) [A018] (breeding)</p> <p>Common scoter (<i>Melanitta nigra</i>) [A065] (wintering)</p> <p>Mediterranean gull (<i>Larus melanocephalus</i>) [A176] (breeding)</p> <p>Black-headed gull (<i>Chroicocephalus ridibundus</i>) [A179] (breeding)</p> <p>Lesser black-backed gull (<i>Larus fuscus</i>) [A183] (breeding)</p>	<p>Hydrology & Hydrogeology</p> <p>No hydrological or hydrogeological connectivity as this is a coastal/marine SPA connected to a different river catchment and groundwater body.</p> <p>Ecological</p> <p>The following species, which are SCI of this SPA, were recorded during surveys at the Main Wind Farm Development Site: cormorant, kittiwake and black-headed gull.</p> <p>The marine core foraging ranges of the aforementioned species during the breeding season are as follows:</p> <p>cormorant: 33.9 km kittiwake: 300.6 km black-headed gull: 18.5 km</p> <p>The direct line distance of the SPA to the Main Wind Farm Development Site is approx. 300 km. Given the location of this SPA on the eastern coast of Ireland the marine distance is considerably greater 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</p>	No



Site Name and Code	Distance (direct line) and Direction to Site	Qualifying Features ²⁵	Connections for Potential Effects (Source - Pathway - Receptor)	Further Consideration Needed (Yes/No)
		Herring gull (<i>Larus argentatus</i>) [A184] (breeding) Kittiwake (<i>Rissa tridactyla</i>) [A188] (breeding) Roseate tern (<i>Sterna dougallii</i>) [A192] (breeding) Common tern (<i>Sterna hirundo</i>) [A193] (breeding) Arctic tern (<i>Sterna paradisaea</i>) [A194] (breeding) Guillemot (<i>Uria aalge</i>) [A199] (breeding) Razorbill (<i>Alca torda</i>) [A200] (breeding) Puffin (<i>Fratercula arctica</i>) [A204] (breeding) Sandwich tern (<i>Thalasseus sandvicensis</i>) [A863] (breeding) Little tern (<i>Sternula albifrons</i>) [A885] (breeding)	range of any of the above-mentioned species. Hence, no ecological connection.	



3.4 Step 4 Assessment of potential for likely significant effects

3.4.1 For the Proposed Project 'Alone'

Table 3-1 identifies those European sites for which there are potential connections to the Proposed Project; **Table 3-1** details considerations of source-pathway-receptor linkages between the Proposed Project and qualifying features, and therefore where potential effects cannot be discounted at a screening level. Where there are potential effects - thus, there are sources with pathways identified to sensitive receptors - it is considered that there could be implications for the conservation objectives; therefore, further considerations are required regarding stage 2 AA alone.

Across the construction, operational and decommissioning phases, the Proposed Project has the potential to give rise to impacts including direct habitat disturbance or loss associated with infrastructure works; disturbance and displacement of qualifying species due to noise, visual presence and human activity; changes in surface water and groundwater quality or quantity arising from earthworks, drainage alteration or accidental spillages; temporary degradation of air quality due to dust and construction traffic; and the introduction or spread of invasive non-native species. During operation, additional potential effects include collision risk to birds, displacement and barrier effects affecting bird movement and migration, disturbance during maintenance activities, and indirect effects on prey availability for raptors. These impact pathways form the basis for the AA of potential effects on the integrity of the European sites identified; namely:

- Mullet/Blacksod Bay Complex SAC 000470
- Bellacorick Bog Complex SAC 001922
- Owenduff/Nephin Complex SAC 000534
- Owenduff/Nephin Complex SPA 004098
- Blacksod Bay/Broad Haven SPA 004037
- 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
- Inner Galway Bay SPA 004031

Therefore, the potential effects to European Sites - following the initial SPR model associated with the construction and decommissioning phases of the Proposed Project are:

- Loss or Damage of habitats and flora during the construction/removal of infrastructure;
- Loss of habitats and reduction in home ranges of qualifying interest and species of SCI;
- Disturbance and displacement of QI species;
- Changes in hydrology and hydrogeology (water quality / quantity);
- Spread of invasive non-native species to European Sites;
- Disturbance of SCI bird species by noise, visual, human disturbance;



The potential impacts associated with the operational phase of the Proposed Project are:

- Mortality of birds through collisions with wind turbines for the period of operation;
- Disturbance and displacement of birds from the area around the wind turbines for the period of operation.
- Barrier effect, disruption of migratory or other routes used by birds due to avoidance of wind turbines.

3.4.2 For the Proposed Project 'In Combination'

As the Proposed Project has potential significant effects alone, there is the potential for other plans and projects, specifically any other land use changes, to also impact upon the designated features of these European sites. These include projects such as other operational windfarm projects – which are considered in detail in the NIS – specifically Section 4.4.4. Therefore, likely significant effects cannot be excluded for the European sites listed above when the Proposed Project is considered in combination with other plans and projects.

3.5 AA Screening Conclusion

Through an assessment of the Pathways for potential effects and an evaluation of the Sources for impacts, taking account of the processes involved and the distance of separation from European Sites, likely significant adverse effects on the qualifying interests, special conservation interest or the conservation objectives of the following European Sites cannot be excluded without further assessment or mitigation:

- Mullet/Blacksod Bay Complex SAC 000470
- Bellacorick Bog Complex SAC 001922
- Owenduff/Nephin Complex SAC 000534
- Owenduff/Nephin Complex SPA 004098
- Blacksod Bay/Broad Haven SPA 004037
- 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
- Inner Galway Bay SPA 004031

This information that is presented in this report will allow the Competent Authority to make their determination regarding the need for a Stage 2 Appropriate Assessment regarding likely significant effects on European Sites resulting from the proposed project, in accordance with and fulfilment of the requirements of Article 6 of the Habitats Directive and the implementing legislation



4.0 Stage 2: Appropriate Assessment

4.1 Step 1, Part 1: Information on the Proposed Project

The full project description is provided above in Section 2.0. Below is a concurrent summary along with details of the surveys undertaken – and subsequent data – to provide insight into the baseline environment to further support the discussion on potential ecological connectivity.

4.1.1 Ecology Surveys

Table 4-1 details all the surveys undertaken at the Main Wind Farm Development Site and Turbine Delivery Route Over-Run Areas.

Table 4-1: Surveys undertaken at the Main Wind Farm Development Site and Turbine Delivery Route Over-Run Areas

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 <u>data</u> previously collected in <u>July 2023</u> (see <u>Extended habitat surveys below</u>) and confirm that no material changes to baseline habitat conditions had occurred.	May 2025	CIEEM, 2019 ³¹ CIEEM, 2017 ³²
Extended habitat surveys	Initial Walkover/drive of Main Wind Farm Development Site, grid connection route and turbine delivery route.	July 2023	CIEEM, 2017 ³³
Habitat surveys	Habitats within the Main Wind Farm Development Site were mapped according to the Fossitt classification system. Full details see Appendix 4 .	September 2023	Fossitt, 2007 ³⁴ Smith, 2011 ³⁵
	Annex I habitat condition assessment within the identified Peatland Habitats within the Main Wind Farm Development Site. Full details see Appendix 4 .	November 2024 January 2026	Fossitt, 2007 Smith, 2011 Smith, G.F. & Crowley, W., 2020 ³⁶ Perrin <i>et al.</i> , 2014 ³⁷

³¹ CIEEM (2019) *Advice Note: On the Lifespan of Ecological Reports & Surveys*. April 2019. Winchester: Chartered Institute of Ecology and Environmental Management.

³² Chartered Institute of Ecology and Environmental Management (CIEEM). (2017, December). *Guidelines for Ecological Report Writing* (2nd ed.). Winchester, UK. Retrieved from CIEEM website

³³ Chartered Institute of Ecology and Environmental Management (CIEEM). (2017, December). *Guidelines for Ecological Report Writing* (2nd ed.). Winchester, UK. Retrieved from CIEEM website

³⁴ Fossitt, J.A. (2007) *A guide to habitats in Ireland*. Kilkenny: The Heritage Council.

³⁵ Smith, O. P. (2011). Best practice guidance for habitat survey and mapping. Ireland: The Heritage Council.

³⁶ 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.

³⁷ 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.



Survey	Brief description	Timing	Reference
	Habitats within the Turbine Delivery route – notable the 3 Over-run Areas where works are proposed to take place that are not along the existing road network. This was undertaken following the Fossitt classification system. Full details see Appendix 4.	July 2025 January 2026	Fossitt, 2007 Smith, 2011
Bird surveys	Vantage point (VP) surveys undertaken at four locations Full details see Appendix 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 Breeding season 2023 Autumn passage season 2023 Non-breeding season 2023/24 Spring passage season 2024	NatureScot, 2025 ³⁸
	Breeding bird surveys Full details see Appendix 2	May – June 2021 May – July 2022 April – August 2023	O'Brien and Smith (1992) ³⁹
	Breeding raptor surveys Full details see Appendix 2	May – June 2021 June 2022 March 2023 – July 2023	Hardy et al., 2013 ⁴⁰
	Winter walkover surveys Full details see Appendix 2	October 2021 – February 2022 October 2022 – February 2023 October 2023 – January 2024	Bibby, 2000 ⁴¹
	Wintering waterbird surveys Full details see Appendix 2	October 2021 – March 2022 October 2022 – March 2023 October 2023 – March 2024	Irish Wetland Bird Survey Counter Manual (2025) NatureScot, 2025

³⁸ 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>

³⁹ 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.

⁴⁰ 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.

⁴¹ Bibby, C.J., Burgess, N.D., Hill, D.A. and Mustoe, S. (2000). *Bird Census Techniques*. Academic Press. Harcourt Place, London, UK.



Survey	Brief description	Timing	Reference
	Hen harrier roost searches Full details see Appendix 2	October 2021 – January 2022 October 2022 – March 2023 January – February 2024	Hardy et al., 2009 ⁴² O'Donoghue, 2019 ⁴³
	Bioacoustic monitoring Full details see Appendix 2	March – April 2023 February – April 2024	Bird Survey & Assessment Steering Group. (2025) ⁴⁴
Terrestrial Mammal Survey	Searches within 150 m of any undertaken within the main Wind Farm Development Site These surveys were not undertaken at the Over-run Areas or along the TDR.	July 2022 November 2024	CIEEM, 2019 ⁴⁵ CIEEM, 2017 ⁴⁶
Aquatic surveys	Aquatic and fisheries surveys were undertaken within the Main Wind Farm Development Site. Full details see Appendix 3	September 2023	Please refer to Triturus, 2023a and Triturus 2023b for methodology references

4.1.1.1 Limitations

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

Habitat condition assessment

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.

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

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.

⁴² 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.

⁴³ 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>

⁴⁴ Bird Survey & Assessment Steering Group. (2025). *Bird Survey Guidelines for assessing ecological impacts*, <https://birdsurveyguidelines.org> [13/05/2025].

⁴⁵ CIEEM (2019) *Advice Note: On the Lifespan of Ecological Reports & Surveys*. April 2019. Winchester: Chartered Institute of Ecology and Environmental Management.

⁴⁶ Chartered Institute of Ecology and Environmental Management (CIEEM). (2017, December). *Guidelines for Ecological Report Writing* (2nd ed.). Winchester, UK. Retrieved from CIEEM website



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, 2021¹⁹¹⁷),¹⁷ and as such, this information can be appropriately used to assess the potential impacts of the Proposed Project on the local bat population.

Birds

A total of three 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.

The number of breeding walkover and dusk surveys recommended by NatureScot (2025) were not accomplished in the 2021 and 2022 breeding seasons.

The number of breeding raptor surveys recommended by NatureScot (2017 and 2025) were not accomplished in the 2021 and 2022 breeding seasons.¹⁹¹⁵. It is recommended by NatureScot 2017 and NatureScot 2017 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. A total of two visits were conducted in 2021, despite the established occupancy of a pair of kestrel, and one visit in 2022. A total of four visits were conducted in 2023.

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

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.

Despite the minor limitations mentioned above, it is considered that the surveys carried out in 2021, 2022 and 2023 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

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.

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.

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.



4.1.1.2 Overview of Survey Results from the Main Wind Farm Development Site

The below are the key summary details of the survey results for the Main Wind Farm Development Site which are relevant to the AA Process; further details on the broader ecological context can be found in Chapter 5 of the associated EIAR. 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. 19 m above ordnance datum (AOD) to 29 m AOD.

The desktop assessment demonstrated that there is only one area of lands present within the Main Wind Farm Development Site or 500 m from the boundary⁴⁷ 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. However, while no Annex I areas have been mapped, the assessment is that all peatland within the Main Wind Farm Development Site aligns with Annex I criteria. There is also no previously mapped possible ancient woodland (PAW) or semi-natural grasslands within or in the vicinity of the Main Wind Farm Development Site. There are no known semi-natural grasslands within the receiving environment 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

Habitat contribution to ecological networks has been assessed by Parker et al. (2016).⁴⁸ 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.

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 ponticum*) 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. 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.

Table 4-2: Habitats within the Proposed 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 <i>Agrostis capillaris</i> , <i>Plantago lanceolata</i> , <i>Lolium perenne</i> , <i>Jacobaea vulgaris</i> , <i>Bellis perennis</i> , and <i>Plantago major</i> .	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 <i>Fontinalis antipyretica</i> ,	No

⁴⁷ Ordnance Survey Ireland (OSi). (2023). GeoHive Map Viewer [Online geospatial data portal]. GeoHive, Tailte Éireann.

⁴⁸ 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.



Habitat	Description	Annex I
	<i>Nasturtium officinale</i> agg., and <i>Potamogeton polygonifolius</i> . The bryophytes <i>Marchantia polymorpha</i> and <i>Brachythecium rivulare</i> 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.	
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 <i>Typha latifolia</i> .	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 <i>Agrostis capillaris</i> , <i>Agrostis stolonifera</i> , and <i>Anthoxanthum odoratum</i> .	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 <i>Schoenus nigricans</i> , 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. <i>Calluna vulgaris</i> , <i>Juncus effusus</i> and <i>Sphagnum</i> spp. are the dominant species present.	Yes – 7130 (not priority)
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 <i>Sphagnum palustre</i> , <i>Juncus effusus</i> , and <i>Molinia caerulea</i> .	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 <i>Picea sitchensis</i> and <i>Pinus contorta</i> .	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 <i>Ulex europaeus</i> and <i>Salix cinerea</i> subsp. <i>Oleifolia</i> .	No

4.1.1.3 Habitats (including Annex I)

Habitat within the Main Wind Farm Development Site predominately consists of cutover lowland blanket bog (PB4) which aligns with Annex I low blanket bog [7130]. Due to the sparse coverage of sphagnum species, there is no area of the Main Wind Farm Development Site which is active and therefore no Priority Annex I habitat is present. Please see **Appendix 4** for more information. The bog is extensively drained, is subject to scrub encroachment and there is the pervasive presence of invasive species such as rhododendron and prickly heath. Scrub (WS1), wet grassland (GS4), dry-humid acid grassland (GS3) and two small acid oligotrophic lakes (FL2) are also present. Several small streams are present within the Main Wind Farm Development Site and along the boundaries.

Species (Annex I birds and Annex II others)



Three years of baseline bird survey effort was undertaken between 2021 and 2024 at the Main Wind Farm Development Site where collision risk is a source for impacts. The TDR works will be small scale temporary works that will not have long term effects – there are no collision risks associated with these works – therefore, it is identified that the potential effects from these works are not likely to have significant effects on birds. Please refer to **Table 4-1** for more details on survey methodology and timing. A total of 10 SCIs for which there is ecological connectivity were recorded during the baseline bird survey effort; namely, curlew, cormorant, lesser black-backed gull, kittiwake, herring gull, common gull, common tern, merlin and barnacle goose. All of these bird species were recorded within 500 m of the Main Wind Farm Development Site.

Otter was recorded during baseline ecology surveys. 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. Otter signs were also recorded on the unnamed river flowing along the eastern boundary of the Main Wind Farm Development Site which could be part of an SAC population.

4.2 Step 1, Part 2 Information on European Sites

4.2.1 Mullet/Blacksod Bay Complex SAC

Mullet/Blacksod Bay Complex SAC has site specific conservation objectives (NPWS, 2014). These provide the definition of favourable conservation condition for the qualifying interests of the SAC, and state whether the qualifying interests are in favourable or unfavourable condition. Only the Qualifying Interests identified for further assessment in **Table 3-1** for this European Site are included. These are summarised in Table 4-3.

Table 4-3: Conservation objectives for the qualifying interests of Mullet/Blacksod Bay Complex SAC (F=favourable, U=unfavourable, M=maintain, R=restore)

Qualifying interest	Attributes defining conservation condition	Conservation condition and objective
Mudflats and sandflats not covered by seawater at low tide [1140]	Habitat area Community distribution	M/F
Large shallow inlets and bays [1160]	Habitat area Community extent Community structure: shoot density Community structure – merl Community structure - <i>Serpula vermiculari</i> Community distribution	M/F
Reefs [1170]	Habitat area Distribution Community Extent Community structure – <i>Serpula vermiculari</i> Community structure – reef community	M/F



Qualifying interest	Attributes defining conservation condition	Conservation condition and objective
Salicornia and other annuals colonising mud and sand [1310]	Habitat area Habitat distribution Physical structure: sediment supply Physical structure: creeks and pans Physical structure: flooding regime Vegetation structure: zonation Vegetation structure: vegetation height Vegetation structure: vegetation cover Vegetation composition: typical species and subcommunities Vegetation structure: negative indicator species – <i>Spartina anglica</i>	M/F
Alkaline fens	Habitat area Habitat distribution Hydrological regime Peat formation Water quality: nutrients Vegetation composition: typical species Vegetation composition: trees and shrubs Physical structure: disturbed bare ground Physical structure: drainage	M/F
Otter <i>Lutra lutra</i>	Distribution Extent of terrestrial habitat Extent of marine habitat Extent of freshwater (river) habitat Extent of freshwater (lake/lagoon) habitat Couching sites and holts Fish biomass available Barriers to connectivity	M/F

4.2.2 Bellacorick Bog Complex SAC

Bellacorick Bog Complex SAC has site specific conservation objectives (NPWS, 2017) (Table 4-4). These provide clarity on the definition of favourable conservation condition for the qualifying interests of the SAC, and state whether the qualifying interests are favourable or unfavourable. Only the Qualifying Interests identified for further assessment in Table 3-1 for this European Site are included.

Table 4-4: Conservation objectives for the qualifying interests of Bellacorick Bog Complex SAC (F=favourable, U=unfavourable, M=maintain, R=restore)

Qualifying interest	Attributes defining conservation condition	Conservation condition and objective
Alkaline fens	Habitat area Habitat distribution Ecosystem function: soil nutrients Ecosystem function: peat formation Ecosystem function: hydrology Ecosystem function: water quality Community diversity	R/U



Qualifying interest	Attributes defining conservation condition	Conservation condition and objective
	Vegetation composition: number of positive indicator species (brown mosses) Vegetation composition: number of positive indicator species (vascular plants) Vegetation composition: cover of positive indicator species Vegetation composition: negative indicator species Vegetation composition: non-native species Vegetation composition: native trees and shrubs Vegetation composition: soft rush and common reed cover Vegetation structure: height Physical structure: disturbed bare ground Physical structure: drainage Physical structure: tufa formations Indicators of local distinctiveness	

4.2.3 Owenduff/Nephin Complex SAC

Owenduff/Nephin Complex SAC has site specific conservation objectives (NPWS, 2017). These provide clarity on the definition of favourable conservation condition for the qualifying interests of the SAC, and state whether the qualifying interests are favourable or unfavourable. These are summarised in **Table 4-5**. Only the Qualifying Interests identified for further assessment in **Table 3-1** for this European Site are included

Table 4-5: Conservation objectives for the qualifying interests of Owenduff/Nephin Complex SAC (F=favourable, U=unfavourable, M=maintain, R=restore)

Qualifying interest	Attributes defining conservation condition	Conservation condition and objective
Otter <i>Lutra lutra</i>	Distribution Extent of terrestrial habitat Extent of freshwater (river) habitat Extent of freshwater (lake) habitat Couching sites and holts Fish biomass available Barriers to connectivity	M/F
Salmon <i>Salmo salar</i>	Distribution: extent of anadromy Adult spawning fish Salmon fry abundance Out-migrating smolt abundance Number and distribution of redds Water quality	M/F

4.2.4 Blacksod Bay/Broad Haven SPA

Blacksod Bay/Broad Haven SPA has site specific conservation objectives (NPWS, 2014). These provide clarity on the definition of favourable conservation condition for the qualifying interests of the SPA, and state whether the qualifying interests are favourable or unfavourable. The conservation objectives for the SCI species which have been identified previously to have an ecological connection are summarised in **Table 4-6**. Only the Qualifying Interests identified for further assessment in **Table 3-1** for this European Site are included.



Table 4-6: Conservation objectives for the qualifying interests of Blacksod Bay/Broad Haven SPA (F=favourable, U=unfavourable, M=maintain, R=restore)

Qualifying interest	Attributes defining conservation condition	Conservation condition and objective
Curlew <i>Numenius arquata</i>	Population trend Distribution	M/F
Wetlands	Habitat area	M/F

4.2.5 Owenduff/Nephin Complex SPA

Owenduff/Nephin Complex SPA has site specific conservation objectives (NPWS, 2025). These provide clarity on the definition of favourable conservation condition for the qualifying interests of the SPA, and state whether the qualifying interests are favourable or unfavourable. The conservation objectives for the SCI species which have been identified previously to have an ecological connection are summarised in **Table 4-7**. Only the Qualifying Interests identified for further assessment in **Table 3-1** for this European Site are included.

Table 4-7: Conservation objectives for the qualifying interests of Owenduff/Nephin Complex SPA (F=favourable, U=unfavourable, M=maintain, R=restore)

Qualifying interest	Attributes defining conservation condition	Conservation condition and objective
Merlin <i>Falco columbarius</i>	Population size Productivity rate Distribution: extent of available nesting options within the SPA Extent and condition of suitable open habitats for foraging Disturbance to breeding sites	R/U

4.2.6 Termoncarragh Lake and Annagh Machair SPA

Termoncarragh Lake and Annagh Machair SPA has site specific conservation objectives (NPWS, 2025). These provide clarity on the definition of favourable conservation condition for the qualifying interests of the SPA, and state whether the qualifying interests are favourable or unfavourable. The conservation objectives for the SCI species which have been identified previously to have an ecological connection are summarised in **Table 4-8**. Only the Qualifying Interests identified for further assessment in **Table 3-1** for this European Site are included.

Table 4-8: Conservation objectives for the qualifying interests of Termoncarragh Lake and Annagh Machair SPA (F=favourable, U=unfavourable, M=maintain, R=restore)

Qualifying interest	Attributes defining conservation condition	Conservation condition and objective
Barnacle goose <i>Branta leucopsis</i>	Winter population trend Winter spatial distribution Disturbance at wintering site Barriers to connectivity and site use Forage spatial distribution, extent and abundance Roost spatial distribution and extent Supporting habitat: area and quality	M/F



4.2.7 Inishglora and Inishkeeragh SPA

Inishglora and Inishkeeragh SPA has site specific conservation objectives (NPWS, 2025). These provide clarity on the definition of favourable conservation condition for the qualifying interests of the SPA, and state whether the qualifying interests are favourable or unfavourable. The conservation objectives for the SCI species which have been identified previously to have an ecological connection are summarised in **Table 4-9**. Only the Qualifying Interests identified for further assessment in **Table 3-1** for this European Site are included.

Table 4-9: Conservation objectives for the qualifying interests of Inishglora and Inishkeeragh SPA (F=favourable, U=unfavourable, M=maintain, R=restore)

Qualifying interest	Attributes defining conservation condition	Conservation condition and objective
Cormorant <i>Phalacrocorax carbo</i>	Breeding population size Productivity rate Distribution: extent of available nesting options within the SPA Forage spatial distribution, extent, abundance and availability Disturbance at the breeding site Disturbance at areas ecologically connected to the colony Barriers to connectivity	R/U
Lesser black-backed gull <i>Larus fuscus</i>	Breeding population size Productivity rate Distribution: extent of available nesting options within the SPA Forage spatial distribution, extent, abundance and availability Disturbance at the breeding site Disturbance at areas ecologically connected to the colony Barriers to connectivity	R/U
Herring gull <i>Larus argentatus</i>	Breeding population size Productivity rate Distribution: extent of available nesting options within the SPA Forage spatial distribution, extent, abundance and availability Disturbance at the breeding site Disturbance at areas ecologically connected to the colony Barriers to connectivity	R/U
Barnacle goose <i>Branta leucopsis</i>	Winter population trend Winter spatial distribution Disturbance at wintering site Barriers to connectivity and site use Forage spatial distribution, extent and abundance Roost spatial distribution and extent Supporting habitat: area and quality	M/F

4.2.8 Duvillaun Islands SPA

Duvillaun Islands SPA has site specific conservation objectives (NPWS, 2025). These provide clarity on the definition of favourable conservation condition for the qualifying interests of the



SPA, and state whether the qualifying interests are favourable or unfavourable. The conservation objectives for the SCI species which have been identified previously to have an ecological connection are summarised in **Table 4-10**. Only the Qualifying Interests identified for further assessment in **Table 3-1** for this European Site are included.

Table 4-10: Conservation objectives for the qualifying interests of Duvillaun SPA (F=favourable, U=unfavourable, M=maintain, R=restore)

Qualifying interest	Attributes defining conservation condition	Conservation condition and objective
Barnacle goose <i>Branta leucopsis</i>	Winter population trend Winter spatial distribution Disturbance at wintering site Barriers to connectivity and site use Forage spatial distribution, extent and abundance Roost spatial distribution and extent Supporting habitat: area and quality	M/F

4.2.9 Inishkea Islands SPA

Inishkea Islands SPA has site specific conservation objectives (NPWS, 2025). These provide clarity on the definition of favourable conservation condition for the qualifying interests of the SPA, and state whether the qualifying interests are favourable or unfavourable. The conservation objectives for the SCI species which have been identified previously to have an ecological connection are summarised in **Table 4-11**. Only the Qualifying Interests identified for further assessment in **Table 3-1** for this European Site are included.

Table 4-11: Conservation objectives for the qualifying interests of Inishkea Islands SPA (F=favourable, U=unfavourable, M=maintain, R=restore)

Qualifying interest	Attributes defining conservation condition	Conservation condition and objective
Common gull <i>Larus canus</i>	Breeding population size Productivity rate Distribution: extent of available nesting options within the SPA Forage spatial distribution, extent, abundance and availability Disturbance at the breeding site Disturbance at areas ecologically connected to the colony Barriers to connectivity	M/F
Herring gull <i>Larus argentatus</i>	Breeding population size Productivity rate Distribution: extent of available nesting options within the SPA Forage spatial distribution, extent, abundance and availability Disturbance at the breeding site Disturbance at areas ecologically connected to the colony connectivity	R/U
Barnacle goose <i>Branta leucopsis</i>	Winter population trend Winter spatial distribution Disturbance at wintering site	M/F



Qualifying interest	Attributes defining conservation condition	Conservation condition and objective
	Barriers to connectivity and site use Forage spatial distribution, extent and abundance Roost spatial distribution and extent Supporting habitat: area and quality	

4.2.10 Lough Conn and Lough Cullin SPA 004228

Lough Conn and Lough Cullin SPA has site specific conservation objectives (NPWS, 2025). These provide clarity on the definition of favourable conservation condition for the qualifying interests of the SPA, and state whether the qualifying interests are favourable or unfavourable. The conservation objectives for the SCI species which have been identified previously to have an ecological connection are summarised in **Table 4-12**. Only the Qualifying Interests identified for further assessment in **Table 3-1** for this European Site are included.

Table 4-12: Conservation objectives for the qualifying interests of Lough Conn and Lough Cullin SPA (F=favourable, U=unfavourable, M=maintain, R=restore)

Qualifying interest	Attributes defining conservation condition	Conservation condition and objective
Common gull <i>Larus canus</i>	Breeding population size Productivity rate Distribution: extent of available nesting options within the SPA Forage spatial distribution, extent, abundance and availability Disturbance at the breeding site Disturbance at areas ecologically connected to the colony Barriers to connectivity	M/F

4.2.11 Inner Galway Bay SPA

Inner Galway Bay SPA has site specific conservation objectives (NPWS, 2013). These provide clarity on the definition of favourable conservation condition for the qualifying interests of the SPA, and state whether the qualifying interests are favourable or unfavourable. The conservation objectives for the SCI species which have been identified previously to have an ecological connection are summarised in **Table 4-13**. Only the Qualifying Interests identified for further assessment in **Table 3-1** for this European Site are included.

Table 4-13: Conservation objectives for the qualifying interests Inner Galway Bay SPA (F=favourable, U=unfavourable, M=maintain, R=restore)

Qualifying interest	Attributes defining conservation condition	Conservation condition and objective
Common tern <i>Sterna hirundo</i>	Breeding population abundance: apparently occupied nests (AONs) Productivity rate: fledged young per breeding pair Distribution: breeding colonies Prey biomass available Barriers to connectivity Disturbance at breeding site	M/F



4.2.12 Clare Island SPA

Clare Island SPA has site specific conservation objectives (NPWS, 2025). These provide clarity on the definition of favourable conservation condition for the qualifying interests of the SPA, and state whether the qualifying interests are favourable or unfavourable. The conservation objectives for the SCI species which have been identified previously to have an ecological connection are summarised in **Table 4-14**. Only the Qualifying Interests identified for further assessment in **Table 3-1** for this European Site are included.

Table 4-14: Conservation objectives for the qualifying interests Clare Island SPA (F=favourable, U=unfavourable, M=maintain, R=restore)

Qualifying interest	Attributes defining conservation condition	Conservation condition and objective
Kittiwake <i>Rissa tridactyl</i>	Breeding population size Productivity rate Distribution: extent of available nesting options within the SPA Forage spatial distribution, extent, abundance and availability Disturbance at the breeding site Disturbance at areas ecologically connected to the colony Barriers to connectivity	R/U

4.3 Step 2, Part 1: Effects on European Sites ‘Alone’

This Step evaluates whether the Proposed Project, considered in isolation, could give rise to an adverse effect on the integrity of a European site in view of that site’s conservation objectives. The assessment draws directly on the source–pathway–receptor (SPR) model established during AA Screening, including the spatial and functional connectivity identified for each site. For all sites with a linkage connection, we examine the specific qualifying features, relevant impact pathways, and the Proposed Project’s potential to undermine the conservation objectives for the habitats and species for which those sites are designated that have the identified connectivity as per the screening. Each pathway is assessed using the best scientific information, considering magnitude, duration, reversibility and the likelihood of adverse effects.



Table 4-15: Effects on European Sites Alone

Site Name and Code	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
Mullet/Blacksod Bay Complex SAC 000470	<p>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] Alkaline fens [7230] <i>Lutra lutra</i> (Otter) [1355]</p>	<p>Loss or damage of habitat There will be no loss or damage to the habitats in the SAC as it does not fall within the Main Wind Farm Development Site. Loss of habitats and reduction in home ranges of QI/SCI species The Doolough Stream, Mhoing Mhór River, and unnamed river flowing along the eastern boundary of the Main Wind Farm Development Site, along which otter signs have been recorded, are beyond the boundary of the Main Wind Farm Development Site. No loss of habitat or reduction in home range of otter will occur. Disturbance/displacement of QI species As otter are recorded present in the absence of mitigation, activities undertaken during the construction/ decommissioning of the Proposed Project could result in disturbance/ displacement and/or reduction in foraging opportunities for this species. otter could be disturbed by works taking place near to watercourses within the Main Wind Farm Development Site which could result in temporary displacement of otter from the site and nearby during the construction period. Changes in water quality/quantity During construction, decommissioning, and to a lesser extent, during operation (in the form of routine maintenance) of the Proposed Project there is potential for the release of suspended solids, nutrients, and other pollutants, (such as hydrocarbons, contaminated waste-water, and cement-based products). All impacts outlined above have the potential to adversely affect the integrity of the site but only with respect to the QIs with hydrological sensitivities (Mudflats and sandflats not covered by seawater at low tide; Large shallow inlets and bays, Reefs, Salicornia and other annuals colonising mud and sand, alkaline fens and otter) if run-off from the Main Wind Farm Development Site reaches the SAC. The pathway is identified by the surface water network downstream. Suspended solids could reduce water clarity reducing the ability of plants to photosynthesize, resulting in die back. The increased availability of nutrients can lead to algal blooms (eutrophication) which can also limit light penetration, reducing growth and causing the death of plants. Hydrocarbon pollution affects leaf biochemistry, leading to decline in productivity and die back of vegetation (Arellano <i>et al.</i>, 2015).</p>

⁴⁹ The QF crossed out are the ones that were identified in the screening to not have potential effects from the Proposed Project due to the outcome of the SPR model.



Site Name and Code	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
		<p>Release of suspended solids could occur when soil is disturbed during construction and/or decommissioning works, especially during periods of heavy rainfall. Suspended solid pollution could reduce water quality and smother spawning beds of fish species, leading to negative effects on fish populations, in turn impacting prey availability for otter.</p> <p>Even at low levels of hydrocarbon pollution, bio-accumulation can occur, leading to suppressed immune systems, reduced metabolism and damage to gills (Austin, 2010). These impacts to fish would in turn negatively impact upon species that hunt them, including otter. During algal blooms, fish can die due to inflammation, mucus production and haemorrhaging gills, which impacts upon the species higher up in the food chain (Hallegraeff, 1992). When algal blooms eventually die, microbial decomposition severely depletes dissolved oxygen levels, creating a hypoxic environment that is unable to support most organisms, thus indirectly impacting upon otter.</p> <p>However, the period for potential release of suspended solids is likely to be temporary, occurring only during the construction and/or decommissioning works.</p> <p>During construction some of the works will require dry works areas within the Proposed Project. These are likely to interact with the water retained within the peatland habitats at the Main Wind Farm Development Site, this is an ombrotrophic system which means it is not groundwater fed however, there could be some small scale temporary interactions with groundwater that are not fully modelled or understood at this stage so there are unknown effects identified to water quality which may influence groundwater quality for a temporary period at very small scale sites during construction – therefore mitigation measures are required to address this risk. Alkaline fen are groundwater dependant terrestrial ecosystems sensitive to changes in water quantity. Hydrological interactions which may have links to groundwater in these habitats, even temporarily, would affect the vegetation composition, for example by facilitating colonisation of scrub within the peatlands, which would be difficult to reverse.</p> <p>Spread of Invasive Non-Native Species (INNS)</p> <p>There is the potential for construction and/or decommissioning activity to result in the importation or spread of INNS within the Main Wind Farm Development Site which may subsequently reach the SAC. Rhododendron and Prickly Heath were recorded during surveys within the Main Wind Farm Development Site. These species could be transported around the Main Wind Farm Development Site by construction machinery and potentially make their way into the SAC via the streams – the potential risk related to prickly heath is noted to be extremely low.</p>
Bellacorick Bog Complex SAC 001922	Alkaline fens [7230]	<p>Loss or damage of habitat</p> <p>There will be no loss or damage to the habitats in the SAC as it does not fall within the Main Wind Farm Development Site.</p> <p>Loss of habitats and reduction in home ranges of QI/SCI species</p>



Site Name and Code	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
		<p>No QIs which are sensitive to Loss of habitats and reduction have been identified for this SAC with connectivity to the Main Wind Farm Development Site.</p> <p>Disturbance/displacement of QI species</p> <p>No QIs which are sensitive to disturbance or displacement have been identified for this SAC with connectivity to the Main Wind Farm Development Site..</p> <p>Changes in water quality/quantity</p> <p>During construction, decommissioning, and to a lesser extent, during operation (in the form of routine maintenance) of the Proposed Project there is potential for the release of suspended solids, nutrients, and other pollutants, (such as hydrocarbons, contaminated waste-water, and cement-based products).</p> <p>All impacts outlined above have the potential to adversely affect the integrity of the site but only with respect to the QIs with hydrological sensitivities (alkaline) if run-off from the Main Wind Farm Development Site reaches the SAC. The pathway is identified to by the surface water network downstream. Suspended solids could reduce water clarity reducing the ability of plants to photosynthesize, resulting in die back. The increased availability of nutrients can lead to algal blooms (eutrophication) which can also limit light penetration, reducing growth and causing the death of plants. Hydrocarbon pollution affects leaf biochemistry, leading to decline in productivity and die back of vegetation (Arellano <i>et al.</i>, 2015).</p> <p>Release of suspended solids could occur when soil is disturbed during construction and/or decommissioning works, especially during periods of heavy rainfall.</p> <p>However, the period for potential release of suspended solids is likely to be temporary, occurring only during the construction and/or decommissioning works.</p> <p>During construction some of the works will require dry works areas within the Proposed Project. These are likely to interact with the water retained within the peatland habitats at the Main Wind Farm Development Site, this is an ombrotrophic system which means it is not groundwater fed however, there could be some small scale temporary interactions with groundwater that are not fully modelled or understood at this stage so there are unknown effects identified to water quality which may influence groundwater quality for a temporary period at very small scale sites during construction – therefore mitigation measures are required to address this risk.. Alkaline fen are groundwater dependant terrestrial ecosystems sensitive to changes in water quantity. Hydrological interactions which may have links to groundwater in these habitats, even temporarily, would affect the vegetation composition, for example by facilitating colonisation of scrub within the peatlands, which would be difficult to reverse.</p> <p>Spread of Invasive Non-Native Species (INNS)</p>



Site Name and Code	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
		<p>There is the potential for construction and/or decommissioning activity to result in the importation or spread of INNS within the Main Wind Farm Development Site which may subsequently reach the SAC. Rhododendron and Prickly Heath were recorded during surveys within the Main Wind Farm Development Site. These species could be transported around the Main Wind Farm Development Site by construction machinery and potentially make their way into the SAC via the streams – the potential risk related to prickly heath is noted to be extremely low.</p>
<p>Owenduff/Nephin Complex SAC 000534</p>	<p><i>Salmo salar</i> (Salmon) [1106] <i>Lutra lutra</i> (Otter) [1355]</p>	<p>Loss or damage of habitat</p> <p>There will be no loss or physical damage to qualifying interest habitats within the SAC, as the SAC does not overlap with the Main Wind Farm Development Site and no works are proposed within its boundary.</p> <p>Loss of habitats and reduction in home ranges of QI/SCI species</p> <p>The Doolough Stream, Mhoing Mhór River, and the unnamed river along the eastern boundary of the Main Wind Farm Development Site—where otter activity has been recorded—lie outside the SAC boundary. No works are proposed within these watercourses, and therefore no loss of habitat or reduction in home range for otter within the SAC will occur.</p> <p>Disturbance or displacement of QI species</p> <p>Otter (<i>Lutra lutra</i>) has been recorded within the wider area. Construction and decommissioning activities undertaken in proximity to watercourses within the wind farm site could give rise to temporary disturbance or displacement of individuals using these features. Any such effects would be short-term, localised, and reversible, and would not affect the availability of suitable habitat or population viability within the SAC. Salmon are not likely to be functionally disturbed by the works as there will be no instream works and they are not sensitive to on land human activities that are not functionally connected to their watercourses.</p> <p>Changes in water quality or quantity</p> <p>Salmon is a QI of the SAC; however, the Main Wind Farm Development Site lies within a separate surface water catchment and there is no downstream hydrological connectivity to salmon-supporting watercourses within the SAC. Any potential water quality effects arising from construction or decommissioning activities would be confined to local catchments draining the wind farm site and would be subject to rapid dilution and attenuation. Accordingly, there is no plausible mechanism by which the Proposed Project could affect salmon migration, spawning or nursery habitats within the SAC.</p> <p>Spread of invasive non-native species (INNS)</p>



Site Name and Code	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
		<p>The SAC is located approximately 7.7 km from the Main Wind Farm Development Site and is not hydrologically connected. In the absence of viable pathways, the spread of invasive non-native species to the SAC, either alone or in combination with other plans or projects, can be excluded.</p>
<p>Blacksod Bay/Broad Haven SPA 004037</p>	<p>Curlew (<i>Numenius arquata</i>) [A160] (wintering) Wetland and Waterbirds [A999]</p>	<p>Loss or damage of habitat No loss of habitat area; CO relates to extent only. Water quality effects, if any, would not result in habitat loss. Loss of habitats and reduction in home ranges of QI/SCI species None of the bird species of SCI for this SPA were recorded breeding or wintering within the Main Wind Farm Development Site or 500 m buffer. Therefore, no adverse effects on the integrity of the site in this regard. Changes in water quality/quantity The conservation objective for wetland habitats within the SPA relates solely to the maintenance of habitat area, rather than habitat quality or trophic function. There is no mechanism by which the Proposed Project could result in loss or fragmentation of wetland habitat area. While a theoretical pathway linking water quality changes to food availability and subsequently to bird populations can be postulated, any potential releases of suspended solids or pollutants would be temporary, highly localised and subject to rapid dilution, dispersion and settlement within the receiving waters. Such effects would not be of sufficient magnitude, duration or spatial extent to alter prey availability at a scale relevant to SCI bird populations. Accordingly, this pathway is considered too remote to give rise to effects on the conservation objectives and can be excluded. Spread of INNS There is the potential for construction activity to result in the importation or spread of INNS within the Main Wind Farm Development Site which may subsequently reach the SAC. Rhododendron and Prickly Heath were recorded during surveys within the Main Wind Farm Development Site. These species could be transported around the Main Wind Farm Development Site by construction machinery and potentially make their way into the SAC via the streams. Disturbance and displacement of SCI bird species 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</p>



Site Name and Code	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
		<p>approximately 500 m (Mander et al. 2022)⁵⁰. Therefore, the potential ecological connection is that the wintering curlew population of the SPA may fly across the Main Wind Farm Development Site and experience disturbance and/or displacement as a result of the Proposed Project.</p> <p>Curlew was recorded at low frequency during bioacoustic monitoring, indicating occasional passage through the wider area rather than regular use of the Main Wind Farm Development Site as breeding, wintering, roosting or core foraging habitat. As set out in Table 3-1, no SCI species exhibited sustained flight activity, repeated use, or spatial clustering within the wind farm footprint or 500 m buffer that would indicate functional reliance on the site.</p> <p>Displacement effects arise where wind farm development results in the loss or effective avoidance of habitat that contributes meaningfully to the conservation objectives of an SPA. In this case, the Proposed Project does not support habitat used by curlew in a way that contributes to it's distribution, population maintenance or supporting habitat within the SPA. Occasional passage movements do not constitute displacement, as alternative flight paths and habitat availability remain unrestricted at the landscape scale.</p> <p>Accordingly, even taking a precautionary approach and recognising seasonal passage activity, the Proposed Project would not result in displacement of curlew from functionally important SPA habitat, and adverse effects on site integrity via disturbance or displacement can be excluded.</p> <p>Mortality of birds through collisions with turbines</p> <p>Blacksod Bay/Broad Haven SPA is designated for a number of wetland and waterbird species. Of these species, only curlew was recorded flying within the Main Wind Farm Development Site or 500 m buffer area. Flight activity was very low level throughout the study period, with a single flock of two birds recorded during flight activity surveys in October 2022. Curlew was also recorded during bioacoustic monitoring making up 19% of total recordings with 313 records.</p> <p>There were no collisions for curlew predicted by the CRM (please refer to Appendix 8 Collision Risk Model Results for more information) and so no adverse effects on the integrity of the site in this regard on curlew are predicted.</p>

⁵⁰ 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	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
Owenduff/Nephin Complex SPA 004098	Merlin (<i>Falco columbarius</i>) [A098] (permanent)	<p>Loss or damage of habitat</p> <p>There will be no loss or damage to the habitats in the SPA as it does not fall within the Main Wind Farm Development Site.</p> <p>Loss of habitats and reduction in home ranges of QI/SCI species</p> <p>Merlin was not recorded breeding or wintering within the Main Wind Farm Development Site or 500 m buffer. Therefore, no adverse effects on the integrity of the site in this regard.</p> <p>Changes in water quality/quantity</p> <p>Not applicable to this European Site as the no hydrologically sensitive species.</p> <p>Mortality of birds through collisions with turbines</p> <p>Owenduff/Nephin Complex SPA, situated approximately 7.6 km east of the Main Wind Farm Development Site, is designated for merlin.</p> <p>Five merlin flights were observed during VP surveys, including three observations during the non-breeding seasons and two during the spring passage seasons. There were no collisions predicted for merlin by the CRM (please refer to Appendix 8 Collision Risk Model Results for more information) and so no adverse effects on the integrity of the site in this regard on merlin are predicted.</p> <p>Disturbance and displacement of SCI bird species</p> <p>Displacement effects arise where wind farm development results in the loss or effective avoidance of habitat that contributes meaningfully to the conservation objectives of an SPA. In this case, the Proposed Project does not support habitat used by merlin in a way that contributes to its distribution, population maintenance or supporting habitat within the SPA.</p>
Termoncarragh Lake and Annagh Machair SPA 004093	Barnacle goose (<i>Branta leucopsis</i>) [A045] (wintering)	<p>Loss or damage of habitat</p> <p>There will be no direct loss or damage to the wetland habitat as it does not fall within the area of the proposed works. Furthermore, there will be no indirect loss or damage as the Main Wind Farm Development Site and SPA are not hydrologically or hydrogeologically connected.</p> <p>Loss of habitats and reduction in home ranges of QI/SCI species</p> <p>Barnacle goose was not recorded breeding or wintering within the Main Wind Farm Development Site or 500 m buffer. Therefore, no adverse effects on the integrity of the site in this regard.</p> <p>Changes in water quality/quantity</p> <p>There is no hydrological or hydrogeological connectivity between the Main Wind Farm Development Site and the SPA. Therefore, no adverse effects on the integrity of the site in this regard.</p> <p>Spread of INNS</p>



Site Name and Code	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
		<p>No potential effect due to the spread of INNS due to lack of pathway for their spread to this SPA (as previously identified at screening stage).</p> <p>Disturbance and displacement of SCI bird species</p> <p>Displacement effects arise where wind farm development results in the loss or effective avoidance of habitat that contributes meaningfully to the conservation objectives of an SPA. In this case, the Proposed Project does not support habitat used by barnacle goose in a way that contributes to its distribution, population maintenance or supporting habitat within the SPA. Occasional passage movements do not constitute displacement, as alternative flight paths and habitat availability remain unrestricted at the landscape scale.</p> <p>Barnacle goose were not recorded breeding or wintering within the Main Wind Farm Development Site or 500 m buffer. Therefore, no adverse effects on the integrity of the site in this regard during construction and operation.</p> <p>Mortality of birds through collisions with turbines</p> <p>Termoncarragh Lake and Annagh Machair SPA, situated approximately 13.3 km north-west of the Main Wind Farm Development Site, has the following SCI for which connectivity was identified; barnacle goose. This species was recorded flying through the Main Wind Farm Development Site or 500 m buffer and as such as is at risk of collision with the proposed turbines</p> <p>Barnacle goose: Recorded flight activity by barnacle goose was very low. A single recording of this species during bioacoustic monitoring was made at 02:30 am on 28 March 2024. This flight may have been as part of nocturnal migration. This level of flight activity (a single flight) is too low to qualify for conducting collision risk modelling on this species. Therefore, the number of collisions per year can be considered to be 0.</p>
Inishglora and Inishkeeragh SPA 004084	<p>Cormorant (<i>Phalacrocorax carbo</i>) [A017] (breeding)</p> <p>Barnacle goose (<i>Branta leucopsis</i>) [A045] (wintering)</p> <p>Lesser black-backed gull (<i>Larus fuscus</i>) [A183] (breeding)</p> <p>Herring gull (<i>Larus argentatus</i>) [A184] (breeding)</p>	<p>Loss or damage of habitat</p> <p>There will be no loss or damage to the habitats in the SPA as it does not fall within the Main Wind Farm Development Site.</p> <p>Loss of habitats and reduction in home ranges of/SCI species</p> <p>None of the bird species of SCI for this SPA were recorded breeding or wintering within the Main Wind Farm Development Site or 500 m buffer. Therefore, no adverse effects on the integrity of the site in this regard.</p> <p>Spread of INNS</p> <p>No potential effect due to the spread of INNS due to lack of pathway for their spread to this SPA (as previously identified at screening stage).</p> <p>Disturbance and displacement of SCI bird species</p>



Site Name and Code	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
		<p>None of the bird species of SCI for this SPA were recorded breeding or wintering within the Main Wind Farm Development Site or 500 m buffer. Therefore, no adverse effects on the integrity of the site in this regard during construction and operation.</p> <p>SCI species associated with this SPA were recorded at low frequency during bioacoustic monitoring, indicating occasional passage through the wider area rather than regular use of the Main Wind Farm Development Site as breeding, wintering, roosting or core foraging habitat. As set out in Table 3-1, no SCI species exhibited sustained flight activity, repeated use, or spatial clustering within the wind farm footprint or 500 m buffer that would indicate functional reliance on the site.</p> <p>Displacement effects arise where wind farm development results in the loss or effective avoidance of habitat that contributes meaningfully to the conservation objectives of an SPA. In this case, the Proposed Project does not support habitat used by SCI species in a way that contributes to their distribution, population maintenance or supporting habitat within the SPA. Occasional passage movements do not constitute displacement, as alternative flight paths and habitat availability remain unrestricted at the landscape scale.</p> <p>Accordingly, even taking a precautionary approach and recognising seasonal passage activity, the Proposed Project would not result in displacement of SCI birds from functionally important SPA habitat, and adverse effects on site integrity via disturbance or displacement can be excluded.</p> <p>Changes in water quality/quantity Not applicable to this European Site as the qualifying features listed do not include any habitats.</p> <p>Mortality of birds through collisions with turbines Inishglora and Inishkeeragh SPA, situated approximately 14.4 km north-west of the Main Wind Farm Development Site, has the following SCI's for which there is connectivity; cormorant, lesser black-backed gull, herring gull and barnacle goose. All of these bird species were recorded flying through the Main Wind Farm Development Site or 500 m buffer and as such as are at risk of collision with the proposed turbines. CRM (please refer to Appendix 8 Collision Risk Modelling Report for more detail) has been undertaken for cormorant, lesser black-backed gull and herring gull using data collected from flight activity surveys. Barnacle goose was recorded in flight via bioacoustic monitoring. Therefore, flight line data is not available for this species and as such can't be included in collision risk modelling.</p> <p>Cormorant A total of five cormorant observations were recorded during flight activity surveys. All records were of single birds during the non-breeding and the autumn passage seasons, with most flights associated with birds commuting along waterbodies. Using the data from the surveys, CRM has been completed which indicates that the Proposed Project could result in 0.02 collisions per year, or 1 bird every 42.86 years. The latest population figures for Inishglora and Inishkeeragh SPA is 114</p>



Site Name and Code	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
		<p>birds. The predicted increase in annual mortality (taking into account the current level) on that size of population is 0.146%.</p> <p>Lesser black-backed gull</p> <p>Lesser black-backed gull was the most frequently recorded gull species with 82 observations. Flock size ranged from one to three birds, with typically observed flights involving one bird. Flight activity was considerably higher during the breeding seasons compared to the non-breeding seasons. The high frequency of flights recorded in summer, mainly located in the west, centre and south-west of the 500 m turbine buffer, suggests that there is likely breeding in the wider area.</p> <p>Using the data from the surveys, CRM has been completed which indicates that the Project could result in 0.15 - 0.18 collisions per year, or 1 bird every 5.5 – 6.5 years. The latest population figures for Inishglora and Inishkeeragh SPA is 132 birds. The predicted increase in annual mortality (taking into account the current level) on that size of population is 1.567% (worst-case).</p> <p>Herring gull</p> <p>A total of 63 herring gull observations were recorded during flight activity surveys. Flock size ranged from one to five birds. Flight activity was recorded during the breeding seasons.</p> <p>CRM indicates that the Proposed Project could result in 0.12 - 0.15 collisions per year, or 1 birds every 6.49 – 8.11 years. The predicted increase in annual mortality (taking into account the current level) on that size of population is 0.801% (worst-case).</p> <p>Barnacle goose</p> <p>Recorded flight activity by barnacle goose was very low. A single recording of this species during bioacoustic monitoring was made at 02:30 am on 28 March 2024. This flight may have been nocturnal migration. This level of flight activity (a single flight) is too low to qualify for conducting collision risk modelling on this species. Therefore, the number of collisions per year can be considered to be 0.</p> <p>While no quantitative estimate of collision risk was possible, it is effectively zero because only a single call was recorded during surveys.</p>
Duvillaun Islands SPA 004111	Barnacle goose (<i>Branta leucopsis</i>) [A045] (breeding)	<p>Loss or damage of habitat</p> <p>There will be no loss or damage to the habitats in the SPA as it does not fall within the Main Wind Farm Development Site.</p> <p>Loss of habitats and reduction in home ranges of QI/SCI species</p> <p>Barnacle goose was not recorded breeding or wintering within the Main Wind Farm Development Site or 500 m buffer. Therefore, no adverse effects on the integrity of the site in this regard.</p> <p>Changes in water quality/quantity</p>



Site Name and Code	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
		<p>Not applicable to this European Site as the qualifying features listed do not include any habitats.</p> <p>Spread of INNS</p> <p>No potential effect due to the spread of INNS due to lack of pathway for their spread to this SPA (as previously identified at screening stage).</p> <p>Disturbance and displacement of SCI bird species</p> <p>Barnacle goose were not recorded breeding or wintering within the Main Wind Farm Development Site or 500 m buffer. Therefore, no adverse effects on the integrity of the site in this regard during construction, operation and decommissioning.</p> <p>Barnacle goose was recorded at low frequency during bioacoustic monitoring, indicating occasional passage through the wider area rather than regular use of the Main Wind Farm Development Site as wintering habitat. As set out in Table 3-1, barnacle goose did not exhibit sustained flight activity, repeated use, or spatial clustering within the wind farm footprint or 500 m buffer that would indicate functional reliance on the site.</p> <p>Displacement effects arise where wind farm development results in the loss or effective avoidance of habitat that contributes meaningfully to the conservation objectives of an SPA. In this case, the Proposed Project does not support habitat used by barnacle goose in a way that contributes to its distribution, population maintenance or supporting habitat within the SPA. Occasional passage movements do not constitute displacement, as alternative flight paths and habitat availability remain unrestricted at the landscape scale.</p> <p>Accordingly, even taking a precautionary approach and recognising seasonal passage activity, the Proposed Project would not result in displacement of barnacle goose from functionally important SPA habitat, and adverse effects on site integrity via disturbance or displacement can be excluded</p> <p>Mortality of birds through collisions with turbines</p> <p>Duvillaun Islands SPA, situated approximately 15.3 km south-west of the Main Wind Farm Development Site, is designated for fulmar, storm petrel and barnacle goose. Of these species, only barnacle goose is considered to have ecological connectivity. Recorded activity by barnacle goose was very low. A single recording of this species during bioacoustic monitoring was made at 02:30 am on 28 March 2024. This flight may have been nocturnal migration. This level of flight activity (a single flight) is too low to qualify for conducting collision risk modelling on this species. Therefore, the number of collisions per year can be considered to be 0.</p> <p>SCI species associated with this SPA were recorded at low frequency during bioacoustic monitoring, indicating occasional passage through the wider area rather than regular use of the Main Wind Farm Development Site as wintering habitat. As set out in Table 3-1, no SCI species exhibited sustained</p>



Site Name and Code	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
		<p>flight activity, repeated use, or spatial clustering within the wind farm footprint or 500 m buffer that would indicate functional reliance on the site.</p> <p>Displacement effects arise where wind farm development results in the loss or effective avoidance of habitat that contributes meaningfully to the conservation objectives of an SPA. In this case, the Proposed Project does not support habitat used by SCI species in a way that contributes to their distribution, population maintenance or supporting habitat within the SPA. Occasional passage movements do not constitute displacement, as alternative flight paths and habitat availability remain unrestricted at the landscape scale.</p> <p>Accordingly, even taking a precautionary approach and recognising seasonal passage activity, the Proposed Project would not result in displacement of SCI birds from functionally important SPA habitat, and adverse effects on site integrity via disturbance or displacement can be excluded.</p>
<p>Inishkea Islands SPA 004004</p>	<p>Barnacle goose (<i>Branta leucopsis</i>) [A045] Common gull (<i>Larus canus</i>) [A182] Herring gull (<i>Larus argentatus</i>) [A184]</p>	<p>Loss or damage of habitat</p> <p>There will be no loss or damage to the habitats in the SPA as it does not fall within the Main Wind Farm Development Site.</p> <p>Loss of habitats and reduction in home ranges of QI/SCI species</p> <p>None of the bird species of SCI for this SPA were recorded breeding or wintering within the Main Wind Farm Development Site or 500 m buffer. Therefore, no adverse effects on the integrity of the site in this regard.</p> <p>Changes in water quality/quantity</p> <p>Not applicable to this European Site as the qualifying features listed do not included any habitats.</p> <p>Spread of INNS</p> <p>No potential effect due to the spread of INNS due to lack of pathway for their spread to this SPA (as previously identified at screening stage).</p> <p>Disturbance and displacement of SCI bird species</p> <p>None of the bird species of SCI for this SPA were recorded breeding or wintering within the Main Wind Farm Development Site or 500 m buffer. Therefore, no adverse effects on the integrity of the site in this regard during construction, operation and decommissioning.</p> <p>SCI species associated with this SPA were recorded at low frequency during bioacoustic monitoring, indicating occasional passage through the wider area rather than regular use of the Main Wind Farm Development Site as breeding, wintering, roosting or core foraging habitat. As set out in Table 3-1, no SCI species exhibited sustained flight activity, repeated use, or spatial clustering within the wind farm footprint or 500 m buffer that would indicate functional reliance on the site.</p>



Site Name and Code	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
		<p>Displacement effects arise where wind farm development results in the loss or effective avoidance of habitat that contributes meaningfully to the conservation objectives of an SPA. In this case, the Proposed Project does not support habitat used by SCI species in a way that contributes to their distribution, population maintenance or supporting habitat within the SPA. Occasional passage movements do not constitute displacement, as alternative flight paths and habitat availability remain unrestricted at the landscape scale.</p> <p>Accordingly, even taking a precautionary approach and recognising seasonal passage activity, the Proposed Project would not result in displacement of SCI birds from functionally important SPA habitat, and adverse effects on site integrity via disturbance or displacement can be excluded.</p> <p>Accordingly, even taking a precautionary approach and recognising seasonal passage activity, the Proposed Project would not result in displacement of SCI birds from functionally important SPA habitat, and adverse effects on site integrity via disturbance or displacement can be excluded.</p> <p>Mortality of birds through collisions with turbines</p> <p>Inishkea Islands SPA, situated approximately 16.4 km west of the Main Wind Farm Development Site, is designated for a number of waterbird species. Barnacle goose, common gull and herring gull are considered to have ecological connectivity.</p> <p>Common gull</p> <p>Common gull was observed making a total of six flights through the Main Wind Farm Development Site. Flock size ranged between one to two birds. CRM indicates that the Proposed Project could result in 0.04 - 0.05 collisions per year, or 1 bird every 22.22 – 26.67 years. The predicted increase in annual mortality (taking into account the current level) on that size of population is 0.380% (worst-case).</p> <p>Herring gull</p> <p>A total of 63 herring gull observations were recorded during flight activity surveys. Flock size ranged from one to five birds. Flight activity was recorded during the breeding seasons. CRM indicates that the Proposed Project could result in 0.12 - 0.15 collisions per year, or 1 bird every 6.49 – 8.11 years. The predicted increase in annual mortality (taking into account the current level) on that size of population is 0.772% (worst-case).</p> <p>None of the other bird species of SCI for this SPA were recorded within the Main Wind Farm Development Site or 500 m buffer. Therefore, there are no adverse effects on the integrity of the site in this regard on these species.</p> <p>Barnacle goose</p> <p>Recorded flight activity by barnacle goose was very low. A single recording of this species during bioacoustic monitoring was made at 02:30 am on 28 March 2024. This flight may have been</p>



Site Name and Code	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
		nocturnal migration. This level of flight activity (a single flight) is too low to qualify for conducting collision risk modelling on this species. Therefore, the number of collisions per year can be considered to be 0.
Lough Conn and Lough Cullin SPA 004228	Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395] (wintering), Common Gull (<i>Larus canus</i>) [A182] (breeding) Wetland and Waterbirds [A999],	<p>Loss or damage of habitat</p> <p>There will be no loss or damage to the habitats in the SPA as it does not fall within the Main Wind Farm Development Site.</p> <p>Loss of habitats and reduction in home ranges of QI/SCI species</p> <p>None of the bird species of SCI for this SPA were recorded breeding or wintering within the Main Wind Farm Development Site or 500 m buffer. Therefore, no adverse effects on the integrity of the site in this regard.</p> <p>Changes in water quality/quantity</p> <p>The conservation objective for wetland habitats within the SPA relates solely to the maintenance of habitat area, rather than habitat quality or trophic function. There is no mechanism by which the Proposed Project could result in loss or fragmentation of wetland habitat area. While a theoretical pathway linking water quality changes to food availability and subsequently to bird populations can be postulated, any potential releases of suspended solids or pollutants would be temporary, highly localised and subject to rapid dilution, dispersion and settlement within the receiving waters. Such effects would not be of sufficient magnitude, duration or spatial extent to alter prey availability at a scale relevant to SCI bird populations. Accordingly, this pathway is considered too remote to give rise to effects on the conservation objectives and can be excluded.</p> <p>Spread of INNS</p> <p>No potential effect due to the spread of INNS due to lack of pathway for their spread to this SPA (as previously identified at screening stage).</p> <p>Disturbance and displacement of SCI bird species</p> <p>None of the bird species of SCI for this SPA were recorded breeding or wintering within the Main Wind Farm Development Site or 500 m buffer. Therefore, no adverse effects on the integrity of the site in this regard during construction and operation.</p> <p>Greenland white-fronted goose was recorded at low frequency during bioacoustic monitoring, indicating occasional passage through the wider area rather than regular use of the Main Wind Farm Development Site as wintering, habitat. As set out in Table 3-1, no SCI species exhibited sustained flight activity, repeated use, or spatial clustering within the wind farm footprint or 500 m buffer that would indicate functional reliance on the site.</p> <p>Displacement effects arise where wind farm development results in the loss or effective avoidance of habitat that contributes meaningfully to the conservation objectives of an SPA. In this case, the</p>



Site Name and Code	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
		<p>Proposed Project does not support habitat used by Greenland white-fronted goose in a way that contributes to its distribution, population maintenance or supporting habitat within the SPA. Occasional passage movements do not constitute displacement, as alternative flight paths and habitat availability remain unrestricted at the landscape scale.</p> <p>Accordingly, even taking a precautionary approach and recognising seasonal passage activity, the Proposed Project would not result in displacement of Greenland white-fronted goose from functionally important SPA habitat, and adverse effects on site integrity via disturbance or displacement can be excluded.</p> <p>Mortality birds through collisions with turbines</p> <p>Lough Conn and Lough Cullin SPA, situated approximately 16.4 km west of the Main Wind Farm Development Site, is designated for a number of waterbird species. Of these species, only common gull and Greenland White-fronted goose are considered to have ecological connectivity.</p> <p>Common gull</p> <p>Common gull was observed making a total of six flights through the Main Wind Farm Development Site. Flock size ranged between one to two birds. CRM (please refer to Appendix 8 Collision Risk Model Results for more information) indicates that the Proposed Project could result in 0.05 collisions per year. With a current SPA population of 94 birds, this equates to a 0.38% increase in mortality relative to background mortality. As this increase is <1% it will not undermine the conservation objectives.</p>
<p>Inner Galway Bay SPA 004031</p>	<p>Common tern (<i>Sterna hirundo</i>) [A193]</p>	<p>Loss or damage of habitat</p> <p>There will be no loss or damage to the habitats in the SPA as it does not fall within the Main Wind Farm Development Site.</p> <p>Loss of habitats and reduction in home ranges of QI/SCI species</p> <p>None of the bird species of SCI for this SPA were recorded breeding or wintering within the Main Wind Farm Development Site or 500 m buffer. Therefore, no adverse effects on the integrity of the site in this regard.</p> <p>Changes in water quality/quantity</p> <p>The conservation objective for wetland habitats within the SPA relates solely to the maintenance of habitat area, rather than habitat quality or trophic function. There is no mechanism by which the Proposed Project could result in loss or fragmentation of wetland habitat area. While a theoretical pathway linking water quality changes to food availability and subsequently to bird populations can be postulated, any potential releases of suspended solids or pollutants would be temporary, highly localised and subject to rapid dilution, dispersion and settlement within the receiving waters. Such effects would not be of sufficient magnitude, duration or spatial extent to alter prey availability at a</p>



Site Name and Code	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
		<p>scale relevant to SCI bird populations. Accordingly, this pathway is considered too remote to give rise to effects on the conservation objectives and can be excluded.</p> <p>Spread of INNS</p> <p>No potential effect due to the spread of INNS due to lack of pathway for their spread to this SPA (as previously identified at screening stage).</p> <p>Disturbance and displacement of SCI bird species</p> <p>None of the bird species of SCI for this SPA were recorded breeding or wintering within the Main Wind Farm Development Site or 500 m buffer. Therefore, no adverse effects on the integrity of the site in this regard during construction of operation.</p> <p>SCI species associated with this SPA were recorded at low frequency during bioacoustic monitoring, indicating occasional passage through the wider area rather than regular use of the Main Wind Farm Development Site as breeding, wintering, roosting or core foraging habitat. As set out in Table 3-1, no SCI species exhibited sustained flight activity, repeated use, or spatial clustering within the wind farm footprint or 500 m buffer that would indicate functional reliance on the site.</p> <p>Displacement effects arise where wind farm development results in the loss or effective avoidance of habitat that contributes meaningfully to the conservation objectives of an SPA. In this case, the Proposed Project does not support habitat used by SCI species in a way that contributes to their distribution, population maintenance or supporting habitat within the SPA. Occasional passage movements do not constitute displacement, as alternative flight paths and habitat availability remain unrestricted at the landscape scale.</p> <p>Accordingly, even taking a precautionary approach and recognising seasonal passage activity, the Proposed Project would not result in displacement of SCI birds from functionally important SPA habitat, and adverse effects on site integrity via disturbance or displacement can be excluded.</p> <p>Mortality of birds through collisions with turbines</p> <p>Inner Galway Bay SPA is situated approximately 109 km south of the Main Wind Farm Development Site. Of the SCI for which it is designated, only common tern is considered to have ecological connectivity.</p> <p>Common tern was observed making a total of two flights through the Main Wind Farm Development Site. All flights were of a single bird. CRM indicates that the Proposed Project could result in 0 collisions per year. Therefore, there would be no increase in annual mortality.</p>
Clare Island SPA 004136	Kittiwake (<i>Rissa tridactyla</i>) [A188]	Loss or damage of habitat



Site Name and Code	Qualifying Features (Qualifying Interests and Special Conservation Interests) ⁴⁹	Potential Impacts
		<p>There will be no loss or damage to the habitats in the SPA as it does not fall within the Main Wind Farm Development Site.</p> <p>Loss of habitats and reduction in home ranges of QI/SCI species</p> <p>None of the bird species of SCI for this SPA were recorded breeding or wintering within the Main Wind Farm Development Site or 500 m buffer. Therefore, no adverse effects on the integrity of the site in this regard.</p> <p>Changes in water quality/quantity</p> <p>Not applicable to this European Site as habitat is not included in the list of Qualifying Features.</p> <p>Spread of INNS</p> <p>No potential effect due to the spread of INNS due to lack of pathway for their spread to this SPA (as previously identified at screening stage).</p> <p>Disturbance and displacement of SCI bird species</p> <p>Kittiwake were not recorded breeding or wintering within the Main Wind Farm Development Site or 500 m buffer. Therefore, no adverse effects on the integrity of the site in this regard during construction of operation.</p> <p>Mortality of birds through collisions with turbines</p> <p>Clare Island SPA is situated approximately 32 km south of the Main Wind Farm Development Site. Of the SCI for which it is designated only kittiwake is considered to have ecological connectivity. One single kittiwake was recorded during the 2023 spring passage season,</p> <p>CRM indicates that the Proposed Project could result in 0 collisions per year. Therefore, there would be no increase in annual mortality.</p>



4.4 Step 2, Part 2: Effects on European sites ‘In Combination’

4.4.1 Plans

The following development plans have been reviewed and taken into consideration:

- Regional Spatial and Economic Strategy 2020-2032 (RSES), and
- Mayo County Development Plan 2022 – 2028.

The review examined policies and objectives relating to designated sites for nature conservation, biodiversity, protected species, conservation of peatlands, sustainable land use and preservation of surface water quality.

Key policies and development allocations are summarised in **Table 4-16**.

Table 4-16: Assessment of relevant plans

Plan	Policies for the protection of European Sites	Development allocations with potential for in combination effects
Regional Spatial and Economic Strategy 2020-2031	<p>RPO 5.4 Encourage the prioritisation of Site-Specific Conservation Objectives (SSCO) for all sites of Conservation Value, designated in EU Directive (i.e. SACs, SPAs) to integrate with the development objectives of this Strategy.</p> <p>RPO 5.5 Conserve and protect European sites and their integrity.</p> <p>RPO 5.7 Ensure that all plans, projects and activities requiring consent arising from the RSES are subject to the relevant environmental assessment requirements including SEA, EIA and AA as appropriate.</p>	Not applicable.
Mayo County Development Plan 2022-2028	<p>NEP 1 To support the protection, conservation and enhancement of the natural heritage and biodiversity of County Mayo, including the protection of the integrity of European sites, that form part of the Natura 2000 network, the protection of Natural Heritage Areas, proposed Natural Heritage Areas Ramsar Sites, Nature Reserves and Wild Fowl Sanctuaries (and other designated sites including any future designations).</p> <p>NEO 14 To protect and enhance the ecological network throughout the county to improve the ecological coherence of the Natura 2000 network in accordance with Article 10 of the Habitats Directive.</p>	No development allocations identified within the development plan were found to occur within the wider area surrounding the Main Wind Farm Development Site. However, the Plan provides a framework for land use developments and activities with potential for construction and operation source effects throughout the County.

4.4.2 Projects Connected to the Main Wind Farm Development Site

A desktop-based planning search spanning 10 years within a radius of 20 km of each of the European sites was undertaken. However, where applicable, this radius was extended to account for marine foraging ranges based on NatureScot guidance⁵¹. Sources consulted consisted of the EIA portal, An Coimisiún Pleanála (ACP formerly An Bord Pleanála [ABP]) and Mayo County Council planning portal.

⁵¹ <https://www.nature.scot/doc/guidance-note-3-guidance-support-offshore-wind-applications-marine-birds-identifying-theoretical>
Accessed 12/11/2025



This search captured operational developments, permitted developments, and live planning applications, representing the range of projects considered reasonably foreseeable in accordance with Article 6(3) of the EU Habitats Directive. Projects not yet submitted to the planning system or not defined within statutory planning frameworks are not considered reasonably foreseeable and cannot be meaningfully assessed.

The list was refined by eliminating all single homes from 2 km outside the red line boundary of the Main Wind Farm Development Site (on the basis that such developments are of a scale and nature that they do not give rise to significant in combination effects via the identified impact pathways, including disturbance, hydrological change, or traffic-related effects), and focused on planning applications of over 50 houses and planning applications which contained an EIAR or an NIS. This formed our in-combination long list of developments.

Further refinement was undertaken to ascertain developments within this list. This refinement was undertaken on a source–pathway–receptor basis to identify projects with a realistic potential to act in combination with the Proposed Project. These refinements included:

- All wind farms and grid cable route planning applications within 20 km of the Main Wind Farm Development Site where the planning status has been granted or to be determined;
- All infrastructural projects which are operational and utilising the same road networks that are proposed by the Proposed Project;
- All quarries within 2 km (reflecting the potential for localised hydrological and disturbance interactions);
- All Strategic Infrastructure and Strategic Housing Developments within 20 km where the same road network would be utilised; and
- All Strategic Housing Development and Large-Scale Residential Developments within 5 km.

This approach ensures that the in-combination assessment focuses on projects with a credible potential to contribute to cumulative effects, while applying a proportionate and evidence-based screening of developments that lack a viable impact pathway to the European sites.

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 South 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, 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 4-17**; with further breakdown of the environmental considerations below per project.

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.



4.4.3 Potential Construction and Decommissioning Phase In-combination effects

The Main Wind Farm Development Site is located within a remote upland landscape dominated by blanket bog, forestry and peatland, with a very low density of other industrial or infrastructural development. A review of national planning databases confirms that there is minimal proposed and consented development within 2 km of the Main Wind Farm Development Site. Consequently, construction and decommissioning-phase activities are effectively isolated within the wider landscape, and there are no realistic pathways by which construction-related effects (including habitat loss, disturbance, hydrological change or pollution directly and indirectly with connectivity to European sites) could interact cumulatively with other plans or projects so as to give rise to adverse effects on European sites.

In-combination effects associated with other construction and decommissioning-phase impact factors, including habitat loss, reduction in home ranges, disturbance and displacement of qualifying species, spread of invasive non-native species, hydrogeological change and air quality effects, have been considered and excluded. These effects are either confined to the footprint of the Proposed Development, GCR and TDR, or do not extend beyond the site boundary, or arise solely from the Proposed Project with no plausible mechanism for interaction with other plans or projects. Accordingly, water quality effects represent the only credible pathway for construction-phase in-combination effects and are therefore the sole focus of the detailed assessment below.

There are no operational, consented or proposed projects with direct hydrological connectivity to the Proposed Project or the connected European sites. 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. This assessment was used to inform the NIS – and support the AA process.

The main sources of potential effects on water quality associated with the Proposed Project relate to on-site construction activities, including run-off from bare ground exposed during felling to create bat mitigation buffers and during the construction of turbine bases, hardstands, access tracks and on-site underground electrical cabling between turbines and the on-site substation. Any such effects are expected to be short-term, as disturbed areas will be reinstated and re-vegetated.

If infrastructure is poorly designed, engineered or constructed, increased runoff and sedimentation could occur from turbine hardstands and access tracks. Similarly, if reinstatement works associated with on-site cable trenches are not undertaken correctly, there could be a localised risk to adjacent watercourses and aquatic receptors. Service vehicles could also accidentally spill small volumes of hydrocarbons when accessing the operational Proposed Project.

Direct effects relevant to construction-phase in-combination assessment are confined to water quality-related interactions with watercourses. These include localised disturbance associated with the placement of culverts and watercourse crossings, which could, in the absence of mitigation, result in short-term increases in suspended solids, hydrocarbons or cement-based contaminants within watercourses inside the Main Wind Farm Development Site. Such effects could also arise from temporary diversion or modification of minor channels during construction, potentially affecting small areas of freshwater habitat.

The watercourses in the vicinity of the Proposed Project are typically heavily modified lowland channels draining blanket bog, or higher-gradient upland channels that are naturally prone to spate conditions. Elevated background siltation, primarily associated with peat escapement, was observed throughout much of the survey area, with eutrophication less evident. In the absence of mitigation, water-quality effects arising from the Proposed Project alone could have the potential to affect downstream designated sites (Bellacorick Bog Complex SAC,



Mullet/Blacksod Bay Complex SAC and Blacksod Bay/Broad Haven SPA) and aquatic receptors including otter and Atlantic salmon. The same pathway represents the only plausible mechanism by which in-combination effects could theoretically arise.

In theory, significant in-combination effects on water quality could arise where multiple hydrologically connected projects are constructed concurrently and without mitigation. However, no such circumstances apply in this case. There are no operational, consented or proposed projects with hydrological connectivity to the Main Wind Farm Development Site and European sites with hydrological connectivity, and any hydrogeological connections are remote and weakly coupled. Accordingly, construction-phase in-combination effects on water quality can be excluded

4.4.3.1 Potential Operational Phase In-combination effects

Operational impacts will 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.

The proposed lifespan of the Proposed Project is 35 years, therefore for birds, the duration of effects is likely to be long-term. As the footprint of the Main Wind Farm Development Site is within a landscape highly modified by peatland habitats and forestry, some effects due to habitat loss are fully reversible – however, some infrastructure such as the turbine bases will be permanent - as most habitats due to be lost are in poor condition i.e. Cutover heavily drained peatlands and conifer plantations.

In the absence of mitigation, possible In-combination effects from the operational phase consist of:

- Loss of habitats and reduction in home ranges of qualifying interest and species of SCI;
- Disturbance and displacement of QI species;
- Disturbance of SCI bird species by noise, visual, human disturbance;

The potential impacts associated with the operational phase of the Proposed Project are:

- Mortality of birds through collisions with wind turbines for the period of operation;
- Disturbance and displacement of birds from the area around the wind turbines for the period of operation.
- Barrier effect, disruption of migratory or other routes used by birds due to avoidance of wind turbines.

A review of the national planning database and the surrounding land-use context confirms that there are no operational, consented or proposed developments in the wider area (please refer to Section 4.4.2 above for relevant distances), other than wind energy developments, that could give rise to operational in-combination effects relevant to European sites. In particular, there are no other projects with the potential to cause operational habitat loss, reduction in home ranges, disturbance, displacement or barrier effects for qualifying interest species or SCI birds. Accordingly, wind farms represent the only project type with a credible potential for operational in-combination effects, principally through collision risk, displacement or barrier effects for birds. Other potential operational impact sources can therefore be excluded.

There are **eight** no. onshore wind farm developments, specifically five operational wind farms (Oweninny Wind Farm (Phases 1 and 2), Bunnahowen Wind Farm, Sheskin Wind Farm, Lackan Wind Farm and Burtonport Harbour Single Turbine), one consented wind farm (Oweninny Wind Farm – Phase 3) and the consented extension to Sheskin Wind Farm (Sheskin South Wind Farm) and three decommissioned/non-operational (Bellacorick Wind Farm, Corvoderry Wind Farm and Dooleeg More Wind Farm) located in proximity to the



Proposed Project; however, only some have details of collision risk assessments undertaken, as summarised below.

4.4.3.2 Bunnahowen Wind Farm

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 (Planning reference: 081997 and 0819970).

According to the EIAR written in 2008 no bird surveys were undertaken.

In terms of collision risk, no quantitative assessment was undertaken, so no quantitative cumulative collision risk assessment is possible.

Nonetheless, there is the potential for adverse in-combination effects to occur in combination with the Main Wind Farm Development Site for bird species that are present both at the Proposed Project and Bunnahowen – the species identified in our CRM are therefore considered.

4.4.3.3 Oweninny Windfarm

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).

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 are present of which 21 are amber listed with many occurring 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 Site and the Oweninny project are:

- Greenland white-fronted goose (*Anser albifrons flavirostris*)
- Common gull (*Larus canus*)
- Merlin (*Falco columbarius*)

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.

The ACP (formerly ABP) Inspectors report concluded the following:

“the likely residual effects of the project on flora and fauna would not be significant”.

The Oweninny Wind Farm is located approximately 17 km from the Main Wind Farm Development Site, 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.

4.4.3.4 Sheskin Wind Farm

Sheskin Wind Farm is an eight-turbine wind farm located approximately 20 km northeast of the Main Wind Farm Development Site. It became operational in 2023 (Planning reference: 15825).

Given the separation distance, there is no realistic potential for significant in-combination barrier effects or operational displacement upon IEF bird species.

According to the EIS written in 2015 to support the planning application, the following target SCI bird species, which are also considered in 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.

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’.

The chapter also stated

“However, despite the low risk there is potential and the impact could result in fatality”.

The NIS concluded:

“no significant adverse effects on Natura 2000 sites or Annex I bird species (including Greenland white-fronted goose, merlin and golden plover), subject to mitigation”.

Golden Plover are not identified as species with ecological connectivity to the Proposed Main Wind Farm Development Site. Therefore, there is the potential for significant in-combination effects due to collision to occur in combination with the Main Wind Farm Development Site for SCI bird species that are present both at the Main Wind Farm Development Site and Sheskin Wind Farm (cormorant, curlew, lesser black-backed gull and merlin).

4.4.3.5 Sheskin South Wind Farm

Sheskin South Wind Farm is a proposed 21-turbine extension to the operational Sheskin Wind Farm, located just over 20 km northeast (Planning reference: ABP: PA16.315933).

Given the separation distance, there is no realistic potential for significant in-combination barrier effects or operational displacement upon SCI bird species.

According to the EIAR written in 2023 by MKO to support the planning application, the following SCI target bird species, which are also considered in the current assessment, were recorded during flight activity surveys: merlin.

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).

Of these three species Merlin is the only SCI species identified for the Main Wind Farm Development Site with collision risk identified in **Table 3-1**.



4.4.3.6 Lackan Wind Farm

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.

Given the separation distance, there is no realistic potential for significant in-combination barrier effects or operational displacement upon SCI bird species which have been identified to have collision risk from the Proposed Development alone. Moreover, the primary reason significant in-combination effects are not predicted is that no operational displacement of SCI bird species is anticipated at the Main Wind Farm Development Site. In the absence of displacement effects, there is no mechanism by which cumulative impacts could arise for species recorded at both sites, including common gull, Greenland white-fronted goose and merlin.

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 SCI species, which are also considered in the current assessment, were recorded during flight activity surveys: curlew, cormorant, brent goose, herring gull and lesser black-backed gull.

Carcass searches carried out from 2007 to 2022 found no evidence of collisions for any bird species.

Therefore, there is no potential for in-combination effects to occur in combination with the Main Wind Farm Development Site.

4.4.3.7 Burtonport Harbour Single Turbine

There is no planning information for this single turbine and no data available on whether any target bird SCI species were recorded in the vicinity of the same. Given the large separation distance between the turbine and Main Wind Farm Development Site (c. 131 km direct-line distance) and that it is only a single turbine, there is no potential for in-combination effects to occur in combination with the Proposed Development.

4.4.3.8 Bellacorick Wind Farm

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, no potential for in-combination effects.

4.4.3.9 Corvoderry Wind Farm

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.

4.4.3.10 Dooleeg More Wind Farm

Dooleeg Moore Wind Farm is a proposed single-turbine wind energy development located approximately 25 km southeast of the Main Wind Farm Development Site (Planning reference: Mayo County Council Reg. Ref. 092590). The development has not been constructed therefore is not operational. If constructed, given the large separation distance between the



turbine and Proposed Development (c. 25 km) and that it is only a single turbine, there would be no potential for in-combination effects to occur with the Proposed Development.

4.4.4 Projects with Pathways for In-Combination Effects Related to Collision Risk

Where collision risk has been analysed quantitatively, the number of collisions per year can be summed together to obtain an estimate of in-combination collision risk. This is the most usable approach for assessing in-combination collision risk and is recommended by NatureScot (2025)⁵² guidance.

The approach of summing together the number of collisions is included in **Table 4-17** below for SCI birds present at the Main Wind Farm Development Site where collision risk modelling was done. It must be acknowledged that these in-combination estimates are likely to over-represent collision risk, as all flights within 500 m of the turbines were included. 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 bird populations is likely to be less. Avoidance rates used are highly precautionary and the default 98% avoidance rate used (see **Appendix 8** Collision Risk Model Results) is not based on empirical evidence. Again, this is likely to produce an overestimate of true collision risk.

It is noted that the CRM had two other species (Common Kestrel and Snipe) identified, however, they are not SCI species and therefore not assessed as part of the AA process.

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

A desktop planning review was undertaken covering the past 10 years within the largest core foraging range (inclusive of marine core foraging range, where applicable) of sensitive bird species of each European Site for which a potential pathway for collision risk has been identified. The identified projects are found in **Table 4-17** and the detailed considerations relative to each SPA is found in **Table 3-1**.

⁵² [Guidance - Assessing the cumulative impacts of onshore wind farms on birds | NatureScot](#) Accessed 11/11/2025



Table 4-17: Projects with Pathways for In-Combination Effects Related to Collision Risk

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
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



Table 4-18: In-combination effects of collision risk for each of the SPAs identified with connectivity to the Proposed Development

European Site	SCIs identified within the Proposed Development CRM with Ecological Connectivity	Relevant Wind Farms Identified	CRM Calculations From Existing EIAR for the Relevant Wind Farm	In-combination Effects Calculation and Rational
Blacksod Bay/Broad Haven SPA 004037	Curlew (<i>Numenius arquata</i>) [A160]	None	Curlew – did not spend any time at collision heights so 0 collisions/year predicted.	None – core foraging range for winter curlew is c.500 m and there are no other wind farms within c.500 m of the SPA; no collisions predicted for Proposed Development; therefore, no in-combination collision risk above that predicted for Proposed Development possible.
Owenduff/Nephin Complex SPA 004098	Merlin (<i>Falco columbarius</i>) [A098]	Sheskin Wind Farm (Phase 1), Oweninny Wind Farm, Bellacorick Wind Farm, Corvoderry Wind Farm, Dooleg Moore Wind Farm	Merlin – 0 collisions / year	Merlin - none as no collisions predicted for Proposed Development alone, so no in-combination collision risk above that predicted for Proposed Development possible.
Termoncarragh Lake and Annagh Machair SPA 004093	Barnacle goose (<i>Branta leucopsis</i>) [A045]	Bunnahowen Wind Farm	Barnacle goose – no quantitative collision risk possible but very low observation rate indicates collision risk is 0 collisions/year.	Barnacle goose - none as no collisions predicted for Proposed Development alone, so no in-combination collision risk above that predicted for Proposed Development possible.
Inishglora and Inishkeeragh SPA 004084	Cormorant (<i>Phalacrocorax carbo</i>) [A017] Barnacle goose (<i>Branta leucopsis</i>) [A045] Lesser black-backed gull (<i>Larus fuscus</i>) [A183] Herring gull (<i>Larus</i>)	Bunnahowen Wind Farm (for cormorant only) Lackan Wind Farm (lesser black-backed gull only) Burtonport Single Turbine (lesser black-backed gull only)	Cormorant – 0.02 collisions/year Barnacle goose – no quantitative collision risk possible but very low observation rate indicates collision risk is 0 collisions/year Lesser black-backed gull – 0.18 collisions/year Herring gull – 0.15 collisions/year	Cormorant – 0.02 collisions / year for the Proposed Development; no quantitative collision risk predicted for Bunnahowen Wind Farm and collisions assessed as 'extremely unlikely', so no in-combination collision risk above that predicted for Proposed Development. Barnacle goose – none as no collisions predicted for the Proposed Development alone, so no in-combination collision risk above that predicted for Proposed Development possible. Lesser black-backed gull – 0.15 – 0.18 collisions / year for the Proposed Development alone; no collisions recorded at operational Lackan Wind Farm during carcass searches, and Burtonport only a single turbine at considerable distance from Proposed Development; therefore, no in-combination collision risk above that predicted for Proposed Development.



European Site	SCIs identified within the Proposed Development CRM with Ecological Connectivity	Relevant Wind Farms Identified	CRM Calculations From Existing EIAR for the Relevant Wind Farm	In-combination Effects Calculation and Rational
	argentatus) [A184]			Herring gull – 0.12 – 0.15 collisions / year for the Proposed Development alone. No marine or coastal wind farms within marine core foraging distance from SPA therefore no in-combination collision risk.
Duvillaun Islands SPA 004111	Barnacle goose (Branta leucopsis) [A045]	Bunnahowen Wind Farm	Barnacle goose – no quantitative collision risk possible but very low observation rate suggests collision risk is 0 collisions/year	Barnacle goose - none as no collisions predicted for Proposed Development alone, so no in-combination collision risk above that predicted for Proposed Development possible.
Inishkea Islands SPA 004004	Common gull (Larus canus) [A182] Herring gull (Larus argentatus) [A184] Barnacle goose (Branta leucopsis) [A045]	None	Common gull – 0.05 collisions/year Herring gull – 0.15 collisions/year Barnacle goose – no quantitative collision risk possible but very low observation rate indicates collision risk is 0 collisions/year	Common gull - 0.04 – 0.05 collisions per year. No marine or coastal wind farms within marine core foraging distance from SPA therefore no in-combination collision risk. Herring gull – 0.12 – 0.15 collisions / year for the Proposed Development alone. No marine or coastal wind farms within marine core foraging distance from SPA therefore no in-combination collision risk. Barnacle goose - none as no collisions predicted for Proposed Development alone, so no in-combination collision risk above that predicted for Proposed Development possible.
Inner Galway Bay SPA	Common tern (Sterna hirundo) [A193]	Lackan Wind Farm (included on a precautionary basis)	Common tern– 0 collisions/year	Common tern - none as no collisions predicted for Proposed Development alone, so no in-combination collision risk above that predicted for Proposed Development possible.
Clare Island SPA	Kittiwake (<i>Rissa tridactyla</i>) [A188]	Lackan Wind Farm	Kittiwake– 0 collisions/year	Kittiwake - none as no collisions predicted for Proposed Development alone, so no in-combination collision risk above that predicted for Proposed Development possible.



4.5 Step 2, Part 3: Implications for the Conservation Objectives

The section summarises the conservation objectives of each of the European sites with pathways for potential effects and considers the sources for impacts regarding the conservation objectives of each QI and SCI individually regarding the project alone and in combination with other plans and projects.

Risk ratings in **Table 4-18** are assigned on an unmitigated and precautionary basis. Therefore, where a low, moderate or high risk is identified, mitigation is required to avoid any adverse effect on site integrity in view of the relevant conservation objectives; in this context, low risk denotes a limited but credible pathway for effect, moderate risk denotes a meaningful potential effect if unmanaged, and high risk denotes a likely material effect on conservation objectives without mitigation.



Table 4-19: Summary of the Implications for the Conservation Objectives

Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
Mullet/Blacksod Bay Complex SAC 000470	0.07 km W	Maintain the: <ul style="list-style-type: none"> Habitat area Community distribution of Mudflats and sandflats not covered by seawater at low tide [1140] 	Low risk (if unmitigated): There will be no direct habitat loss within the SAC. Potential effects identified in Table 4-15 are limited to temporary and localised changes in water quality (e.g. suspended solids, nutrients or other contaminants) arising during construction or decommissioning, with pathways to the SAC via hydrological connectivity. Such effects would be short-term, spatially confined and subject to rapid dilution, dispersion and settlement within the receiving marine environment. There is risk to the integrity of the SAC if there are no water control measures implemented.	Negligible or very low (if unmitigated): Negligible or very low risk of other construction and/or decommissioning works at other project sites adding to the risk to the CO due to the Proposed Development alone.
		Maintain the: <ul style="list-style-type: none"> Habitat area Community extent Community structure: shoot density Community structure – merl Community structure - <i>Serpula vermiculari</i> Community distribution of Large shallow inlets and bays [1160] 		
		Maintain the: <ul style="list-style-type: none"> Habitat area Distribution Community Extent Community structure – <i>Serpula vermiculari</i> Community structure – reef community of Reefs [1170] 		
		<ul style="list-style-type: none"> Maintain the: Habitat area 		



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
		<ul style="list-style-type: none"> • Habitat distribution • Physical structure: sediment supply • Physical structure: creeks and pans • Physical structure: flooding regime • Vegetation structure: zonation • Vegetation structure: vegetation height • Vegetation structure: vegetation cover • Vegetation composition: typical species and subcommunities • Vegetation structure: negative indicator species – <i>Spartina anglica</i> of Salicornia and other annuals colonising mud and sand 		
		<p>Maintain the:</p> <ul style="list-style-type: none"> • habitat area, and • habitat distribution of Alkaline fen within the SAC. 	<p>No risk:</p> <p>No works are proposed within the SAC, and there will be no direct loss, fragmentation, or physical alteration of qualifying habitats or supporting features within the designated site.</p> <p>Temporary and highly localised groundwater drawdown may occur during construction of turbine foundations outside the SAC boundary. However, any such drawdown will be limited in spatial extent, short in duration, and confined to the immediate construction footprint. There is no hydrological connectivity pathway capable of transmitting effects at a magnitude or</p>	<p>No risk:</p> <p>There are no operational, consented or other projects with direct hydrological connectivity to the Proposed Development Site. 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</p>



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
			<p>duration sufficient to alter the structure, function, or distribution of the qualifying habitats within the SAC.</p> <p>Construction-phase dewatering will cease upon completion of foundation works, with groundwater levels expected to recover rapidly to baseline conditions. No permanent alteration of groundwater flow regimes, recharge rates, or catchment-scale hydrology will occur.</p> <p>On this basis, the Proposed Development will not adversely affect the integrity of the SAC, nor will it undermine the site's Conservation Objectives, including the maintenance of the extent, structure, function, and favourable conservation condition of the qualifying habitats.</p>	<p>with the Proposed Development Site.</p>
		<p>Maintain the:</p> <ul style="list-style-type: none"> hydrological regime, and peat formation of Alkaline fen 	<p>No risk:</p> <p>No works are proposed within the SAC, and there will be no direct loss, fragmentation, or physical alteration of qualifying habitats or supporting features within the designated site.</p> <p>Temporary and highly localised groundwater drawdown may occur during construction of turbine foundations outside the SAC boundary. However, any such drawdown will be limited in spatial extent, short in duration, and confined to the immediate construction footprint. There is no hydrological connectivity pathway capable of transmitting effects at a magnitude or duration sufficient to alter the structure, function, or distribution of the qualifying habitats within the SAC.</p> <p>Construction-phase dewatering will cease upon completion of foundation works, with groundwater levels expected to recover rapidly to baseline conditions. No permanent alteration of groundwater flow regimes, recharge rates, or catchment-scale hydrology will occur.</p> <p>On this basis, the proposed development will not adversely affect the integrity of the SAC, nor will it</p>	<p>No risk:</p> <p>There are no operational, consented or other projects with direct hydrological connectivity to the Proposed Development Site. 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 Development Site.</p>



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
			undermine the site's Conservation Objectives, including the maintenance of the extent, structure, function, and favourable conservation condition of the qualifying habitats.	
		Maintain the: <ul style="list-style-type: none"> water quality: nutrients of Alkaline fen 	Low risk (if unmitigated): Unmitigated, the Proposed Development could release suspended sediment, nutrients and other pollutants into water courses hydrologically connected with the SAC resulting in a deterioration of water quality and increase in soil nutrients. Therefore, mitigation measures are required to further limit the risk to the water quality of the site.	No risk: There are no operational, consented or other projects with direct hydrological connectivity to the Proposed Development Site. 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 Development Site.
		Maintain the: <ul style="list-style-type: none"> vegetation composition: typical species, and vegetation composition: trees and shrubs of Alkaline fen 	No risk: There are no works proposed within the SAC and alkaline fen habitat was not recorded within the Main Wind Farm Development Site. There will be no works within this habitat and therefore no changes to vegetation composition because of the Proposed Development.	No risk: Given the absence of works within alkaline fen habitat and the lack of functional pathways, in-combination effects on vegetation composition can be excluded.
		Maintain the; <ul style="list-style-type: none"> physical structure: disturbed bare ground, and physical structure: drainage of Alkaline fens. 	No risk: There are no works proposed within the SAC and alkaline fen habitats were not recorded within the Main Wind Farm Development Site.	No risk: Given the absence of works within alkaline fen habitat and the lack of functional pathways, in-combination



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
				effects on vegetation composition can be excluded.
		Maintain the; <ul style="list-style-type: none"> • distribution, • extent of terrestrial habitat, • extent of marine habitat, • extent of freshwater (river) habitat, • extent of freshwater (lake/lagoon) habitat, • couching sites and holts, • fish biomass available, and • barriers to connectivity for otter. 	Low risk (if unmitigated): There will be no works within the SAC. However, otter signs were recorded along watercourses along the northern and eastern boundaries of the Main Wind Farm Development Site. There is the potential for construction/decommissioning activity to cause disturbance to the otters using these watercourses.	Negligible or very low (if unmitigated): Negligible or very low risk of other construction and/or decommissioning works at other project sites adding to the risk to the CO due to the Proposed Development alone.
Bellacorick Bog Complex SAC	0.05 km E	Maintain the: <ul style="list-style-type: none"> • habitat area, and • habitat distribution of Alkaline fen within the SAC. 	No risk: No works are proposed within the SAC, and there will be no direct loss, fragmentation, or physical alteration of qualifying habitats or supporting features within the designated site. Temporary and highly localised groundwater drawdown may occur during construction of turbine foundations outside the SAC boundary. However, any such drawdown will be limited in spatial extent, short in duration, and confined to the immediate construction footprint. There is no hydrological connectivity pathway capable of transmitting effects at a magnitude or duration sufficient to alter the structure, function, or distribution of the qualifying habitats within the SAC. Construction-phase dewatering will cease upon completion of foundation works, with groundwater levels expected to recover rapidly to baseline conditions. No	No risk: There are no operational, consented or other projects with direct hydrological connectivity to the Proposed Development Site. 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 Development Site.



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
			<p>permanent alteration of groundwater flow regimes, recharge rates, or catchment-scale hydrology will occur.</p> <p>On this basis, the Proposed Development will not adversely affect the integrity of the SAC, nor will it undermine the site's Conservation Objectives, including the maintenance of the extent, structure, function, and favourable conservation condition of the qualifying habitats.</p>	
		<p>Maintain the:</p> <ul style="list-style-type: none"> hydrological regime, and peat formation of Alkaline fen 	<p>No risk:</p> <p>No works are proposed within the SAC, and there will be no direct loss, fragmentation, or physical alteration of qualifying habitats or supporting features within the designated site.</p> <p>Temporary and highly localised groundwater drawdown may occur during construction of turbine foundations outside the SAC boundary. However, any such drawdown will be limited in spatial extent, short in duration, and confined to the immediate construction footprint. There is no hydrological connectivity pathway capable of transmitting effects at a magnitude or duration sufficient to alter the structure, function, or distribution of the qualifying habitats within the SAC.</p> <p>Construction-phase dewatering will cease upon completion of foundation works, with groundwater levels expected to recover rapidly to baseline conditions. No permanent alteration of groundwater flow regimes, recharge rates, or catchment-scale hydrology will occur.</p> <p>On this basis, the proposed development will not adversely affect the integrity of the SAC, nor will it undermine the site's Conservation Objectives, including the maintenance of the extent, structure, function, and favourable conservation condition of the qualifying habitats.</p>	<p>No risk:</p> <p>There are no operational, consented or other projects with direct hydrological connectivity to the Proposed Development Site. 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 Development Site.</p>



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
		Maintain the: <ul style="list-style-type: none"> water quality: nutrients of Alkaline fen 	Low risk (if unmitigated): Unmitigated, the Proposed Development could release suspended sediment, nutrients and other pollutants into water courses hydrologically connected with the SAC resulting in a deterioration of water quality and increase in soil nutrients. Therefore, mitigation measures are required to further limit the risk to the water quality of the site.	Negligible or very low (if unmitigated): Negligible or very low risk of other construction and/or decommissioning works at other project sites adding to the risk to the CO due to the Proposed Development alone.
		Maintain the: <ul style="list-style-type: none"> vegetation composition: typical species, and vegetation composition: trees and shrubs of Alkaline fen 	No risk: There are no works proposed within the SAC and alkaline fen habitat was not recorded within the Main Wind Farm Development Site. There will be no works within this habitat and therefore no changes to vegetation composition because of the Proposed Development.	No risk: Given the absence of works within alkaline fen habitat and the lack of functional pathways, in-combination effects on vegetation composition can be excluded.
		Maintain the; <ul style="list-style-type: none"> physical structure: disturbed bare ground, and physical structure: drainage of Alkaline fens. 	No risk: There are no works proposed within the SAC and alkaline fen habitats were not recorded within the Main Wind Farm Development Site.	No risk: Given the absence of works within alkaline fen habitat and the lack of functional pathways, in-combination effects on vegetation composition can be alone.
		Maintain the; <ul style="list-style-type: none"> distribution, extent of terrestrial habitat, extent of marine habitat, extent of freshwater (river) habitat, extent of freshwater (lake/lagoon) habitat, couching sites and holts, 	Low risk (if unmitigated): There will be no works within the SAC. However, otter signs were recorded along watercourses along the northern and eastern boundaries of the Main Wind Farm Development Site. There is the potential for construction/decommissioning activity to cause disturbance to the otters using these watercourses.	Negligible or very low (if unmitigated): Negligible or very low risk of other construction and/or decommissioning works at other project sites adding to the risk to the CO due to the Proposed Development alone.



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
		<ul style="list-style-type: none"> fish biomass available, and barriers to connectivity for otter. 		
Owenduff/Nephin Complex SAC 000534	7.7 km SE	Maintain the; <ul style="list-style-type: none"> distribution, extent of terrestrial habitat, extent of freshwater (river) habitat, extent of freshwater (lake) habitat, couching sites and holts, fish biomass available, and barriers to connectivity for otter. 	<p>Low risk (if unmitigated): There will be no works within the SAC. However, otter signs were recorded along watercourses along the northern and eastern boundaries of the Main Wind Farm Development Site. There is the potential for construction/decommissioning activity to cause disturbance to the otters using these watercourses.</p>	<p>Negligible or very low (if unmitigated): Negligible or very low risk of other construction and/or decommissioning works at other project sites adding to the risk to the CO due to the Proposed Development alone.</p>
Blacksod Bay/Broad Haven SPA 004037	0.07 km W	Maintain the: <ul style="list-style-type: none"> winter population trend; and distribution of curlew within the SPA. 	<p>No risk [collision risk]: Curlew were recorded on the ground within 500 m of turbine locations; however, no curlew were recorded in flight within the collision risk envelope. Accordingly, collision risk for this species is zero.</p> <p>Low risk [disturbance and displacement] (if unmitigated): Low numbers of wintering curlew were recorded within the Main Wind Farm Development Site, and the SPA is located in close proximity. In the absence of mitigation, temporary disturbance or localised displacement could occur, with potential effects on fine-scale winter distribution.</p> <p>No risk (barrier effect): The Proposed Development is not of a scale or configuration that would present a barrier to curlew movement or connectivity within or between wintering areas.</p>	<p>No risk [collision risk]: Collision risk modelling predicts zero collisions, and no other operational, consented or proposed wind farms within the wider area present overlapping or additive risks in relation to collision, disturbance, displacement, habitat loss or barrier effects.</p> <p>Accordingly, there is no mechanism by which cumulative effects could arise, and the Proposed Development, alone or in combination with other plans or projects, will not undermine the conservation objectives or integrity of the SPA.</p>



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
			<p>Conclusion: While disturbance and displacement effects associated with the Proposed Development are characterised as low rather than absent, their limited magnitude and localised nature mean they will not undermine the winter population trend or spatial distribution of curlew within the SPA. Subject to mitigation, the integrity of the SPA will not be adversely affected.</p>	<p>Negligible or very low [disturbance and displacement] (if unmitigated): Negligible or very low risk of other construction and/or decommissioning works at other project sites adding to the risk to the CO due to the Proposed Development alone.</p> <p>No risk [barrier effects]: As there is no risk identified for the project alone regarding barrier effects there is no mechanism for in combination effects.</p>
Owenduff/Nephin Complex SPA 004098	7.6 km E	<p>Restore the:</p> <ul style="list-style-type: none"> • population size; • productivity rate; • extent of available nesting options within the SPA; • extent and condition of suitable habitats for foraging; and • levels of disturbance to breeding sites of merlin within the SPA. 	<p>No risk [collision risk]: Collision risk modelling predicts 0 collisions/year for merlin for the Proposed Development alone. Accordingly, turbine-related mortality will not contribute to changes in adult survival or population size within the SPA.</p> <p>Low risk [Habitat loss and foraging use] (if unmitigated) Merlin were recorded within the Main Wind Farm Development Site, indicating that the site forms part of the wider foraging landscape available to the SPA population. The Proposed Development will result in the loss and modification of habitats that are used intermittently by merlin for foraging.</p> <p>Although the site does not represent core or regularly utilised foraging habitat, and recorded activity was low and sporadic, the loss of habitat gives rise to a plausible pathway for effect whereby reduced availability of</p>	<p>No risk [collision risk]: As no collision risk is predicted for the Proposed Development alone, there can be no in-combination collision risk for merlin possible.</p> <p>The same is true for productivity or nesting options / level of disturbance to breeding sites – as there are no effects predicted due to the Proposed Development alone, there can be no in-combination effects.</p> <p>Negligible or very low [Habitat loss and foraging use] (if unmitigated)</p>



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
			<p>supporting foraging habitat could, in the absence of mitigation, influence population dynamics and breeding success (due to population dynamics at a landscape scale) within the SPA over the long term.</p> <p>Accordingly, measures are required to ensure that habitat loss and disturbance associated with the Proposed Development do not adversely affect the long-term viability of the SPA population.</p> <p>No risk [Breeding and nesting]</p> <p>No breeding merlin or nesting habitat were recorded within or adjacent to the Main Wind Farm Development Site. Therefore, there is no mechanism by which the Proposed Development could directly affect nesting availability, productivity rate or breeding success within the SPA.</p> <p>Low risk [disturbance and displacement] (if unmitigated):</p> <p>While the Proposed Development is located at a substantial distance from known breeding territories within the SPA, construction and operational activities could result in low-level disturbance within areas ecologically connected to the SPA population. In the absence of mitigation, this represents a plausible pathway for effect.</p> <p>Measures are therefore required to ensure that disturbance does not give rise to effects on breeding behaviour, foraging efficiency or productivity at the population level.</p> <p>No risk [barrier effect]:</p> <p>The Proposed Development is not of a scale or configuration that would present a barrier to curlew movement or connectivity within or between wintering areas.</p> <p>Conclusion</p>	<p>Negligible or very low risk of other construction and/or decommissioning works at other project sites adding to the risk to the CO due to the Proposed Development alone.</p> <p>No risk [Breeding and nesting]</p> <p>No mechanism for effects to breeding from the project alone, therefore no in-combination effects.</p> <p>Negligible or very low [disturbance and displacement] (if unmitigated):</p> <p>Negligible or very low risk of other construction and/or decommissioning works at other project sites adding to the risk to the CO due to the Proposed Development alone.</p> <p>No risk [barrier effects]:</p> <p>As there is no risk identified for the project alone regarding barrier effects there is no mechanism for in combination effects.</p>



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
			<p>The Proposed Development will result in limited loss of habitat used by merlin within the wider foraging landscape. While these effects are not predicted to be significant in isolation, they represent plausible pathways for effect on the SPA population in the absence of mitigation.</p> <p>With the implementation of appropriate measures, it can be concluded beyond reasonable scientific doubt that the Proposed Development, alone, will not undermine the conservation objectives for merlin within the SPA and will not adversely affect the integrity of the site.</p>	
<p>Termoncarragh Lake and Annagh Machair SPA 004093</p>	<p>13.3 km NW</p>	<p>Maintain the:</p> <ul style="list-style-type: none"> • winter population trend; • winter spatial distribution; • levels of disturbance; • lack of barriers to connectivity and site use; • spatial distribution, extent and abundance of foraging habitats; • spatial distribution and extent of roosts; and • area and quality of supporting habitat of barnacle goose within the SPA. 	<p>No risk [collision risk]: The modelled collision risk for barnacle goose associated with the Proposed Development is 0 collisions/year. Accordingly, there is no risk of collision-related mortality affecting the wintering population.</p> <p>No risk [Winter population trend] Given the absence of collision risk and the lack of regular or sustained use of the Main Wind Farm Development Site by barnacle goose, there is no plausible mechanism by which the Proposed Development could affect winter population size or trend.</p> <p>No risk [Winter spatial distribution] Barnacle geese were not recorded using the Main Wind Farm Development Site as a regular foraging or roosting area. Any flights recorded were infrequent and indicative of transit rather than functional site use. As a result, no changes to winter spatial distribution within the SPA are predicted.</p> <p>No risk [Foraging habitat availability and quality] The Main Wind Farm Development Site does not comprise key or regularly used foraging habitat for</p>	<p>In-combination effects – No risk No additional wind farms with predicted collision risk for barnacle goose are present. Accordingly, there is no potential for in-combination effects beyond those assessed for the Proposed Development alone. The same conclusions apply in respect of winter distribution, disturbance, displacement, barrier effects, foraging and roosting objectives.</p>



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
			<p>barnacle goose. Given the availability of extensive alternative foraging areas within the wider landscape and coastal environment, any localised avoidance or displacement at the wind farm would not result in a meaningful reduction in foraging opportunity or habitat availability.</p> <p>No risk [Roosting]</p> <p>No roosting sites for barnacle goose were identified within or adjacent to the Main Wind Farm Development Site. Therefore, no effects on the spatial distribution or extent of roosts are predicted.</p> <p>Low risk [disturbance and displacement] (if unmitigated):</p> <p>While occasional movements through the wider area cannot be excluded, the Proposed Development is not subject to regular or intensive use by barnacle goose. Any disturbance would be localised and transient, with no effect on wintering behaviour, distribution or habitat use at the SPA scale.</p> <p>No risk [barrier effect]:</p> <p>The Proposed Development is not of a scale or configuration that would present a barrier to curlew movement or connectivity within or between wintering areas The Proposed Development is not of a scale or configuration that would present a barrier to barnacle goose movements. Given the species' flight capability and the absence of reliance on the site, no effects on connectivity or site use are predicted.</p>	
Inishglora and Inishkeeragh SPA 004084	14.4 km NW	<p>Restore the:</p> <ul style="list-style-type: none"> • breeding population size; • productivity rate; • extent of available nesting options; 	<p>Low risk [Collision Risk] (if unmitigated)</p> <p>The modelled collision risk for cormorant was 0.02 collisions/year (worst-case using the Nordex N163 candidate turbine). The current SPA breeding population is 114 birds. This equates to an increase in mortality of 0.15% relative to background mortality. As</p>	<p>Negligible or very low [collision risk] (if unmitigated):</p> <p>Negligible or very low risk of other construction and/or decommissioning works at</p>



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		<ul style="list-style-type: none"> spatial distribution, extent and abundance of foraging habitats; levels of disturbance at the breeding site; levels of disturbance at areas ecologically connected to the colony; and lack barriers to connectivity for cormorant within the SPA. 	<p>this increase is well below 1%, the risk of undermining the conservation objective related to breeding population size is low. While it cannot be confirmed that individuals recorded at the Main Wind Farm Development Site originate from the SPA population, the low collision risk remains precautionary and population-level effects can be excluded.</p> <p>No risk [Breeding productivity and nesting] No cormorant nests or breeding colonies were recorded within or adjacent to the Main Wind Farm Development Site. Consequently, there is no mechanism by which the Proposed Development could affect nesting availability, breeding success or productivity rate. Effects on breeding-related conservation objectives can therefore be excluded.</p> <p>No risk [Foraging habitat (ex situ pathways)] Cormorant were not recorded foraging within the Main Wind Farm Development Site, and the site does not comprise suitable or regularly utilised foraging habitat for the species. As a result, the Proposed Development cannot affect the spatial distribution, extent or quality of foraging habitats supporting the SPA population. Ex-situ effects on prey availability or foraging resources are therefore excluded.</p> <p>No risk [Disturbance and displacement] The Proposed Development is located at a substantial distance from the SPA breeding colony, and no disturbance-sensitive behaviours (e.g. breeding, roosting or repeated foraging) were recorded at or near the site. Accordingly, no disturbance effects at breeding sites or ecologically connected areas are predicted.</p> <p>No risk [Barrier effects and connectivity] The Proposed Development is not of sufficient scale or configuration to present a barrier to cormorant</p>	<p>other project sites adding to the risk to the CO due to the Proposed Development alone.</p> <p>Other In-combination effects – No risk No other operational, consented or proposed wind farms within the wider area present overlapping or additive risks in relation to collision, disturbance, displacement, habitat loss or barrier effects.</p> <p>Accordingly, there is no mechanism by which cumulative effects could arise, and the Proposed Development, alone or in combination with other plans or projects, will not undermine the conservation objectives or integrity of the SPA.</p>



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
			<p>movements between breeding, foraging or resting areas. Barrier effects can therefore be excluded.</p> <p>Conclusion While effects associated with the Proposed Development are characterised as low rather than absent (in relation to collision risk), their very limited magnitude, the absence of functional reliance on the site, and the lack of connectivity with the SPA breeding colony mean that population-level effects on breeding success or population viability are not predicted. The integrity of the SPA conservation objectives will not be undermined.</p>	
		<p>Maintain the:</p> <ul style="list-style-type: none"> winter population trend; winter spatial distribution; levels of disturbance; lack of barriers to connectivity and site use; spatial distribution, extent and abundance of foraging habitats; spatial distribution and extent of roosts; and area and quality of supporting habitat of barnacle goose. 	<p>No risk [collision risk]: The modelled collision risk for barnacle goose associated with the Proposed Development is 0 collisions/year. Accordingly, there is no risk of collision-related mortality affecting the wintering population.</p> <p>No risk [Winter population trend] Given the absence of collision risk and the lack of regular or sustained use of the Main Wind Farm Development Site by barnacle goose, there is no plausible mechanism by which the Proposed Development could affect winter population size or trend.</p> <p>No risk [Winter spatial distribution] Barnacle geese were not recorded using the Main Wind Farm Development Site as a regular foraging or roosting area. Any flights recorded were infrequent and indicative of transit rather than functional site use. As a result, no changes to winter spatial distribution within the SPA are predicted.</p> <p>No risk [Foraging habitat availability and quality]</p>	<p>Negligible or very low [collision risk] (if unmitigated): Negligible or very low risk of other construction and/or decommissioning works at other project sites adding to the risk to the CO due to the Proposed Development alone.</p> <p>Other In-combination effects – No risk No other operational, consented or proposed wind farms within the wider area present overlapping or additive risks in relation to collision, disturbance, displacement, habitat loss or barrier effects.</p> <p>Accordingly, there is no mechanism by which cumulative effects could arise,</p>



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			<p>The Main Wind Farm Development Site does not comprise key or regularly used foraging habitat for barnacle goose. Given the availability of extensive alternative foraging areas within the wider landscape and coastal environment, any localised avoidance or displacement at the wind farm would not result in a meaningful reduction in foraging opportunity or habitat availability.</p> <p>No risk [Roosting habitat]</p> <p>No roosting sites for barnacle goose were identified within or adjacent to the Main Wind Farm Development Site. Therefore, no effects on the spatial distribution or extent of roosts are predicted.</p> <p>Low risk [Disturbance and displacement]</p> <p>While occasional movements through the wider area cannot be excluded, the Proposed Development is not subject to regular or intensive use by barnacle goose. Any disturbance would be localised and transient, with no effect on wintering behaviour, distribution or habitat use at the SPA scale.</p> <p>No risk [Barrier effects and connectivity]</p> <p>The Proposed Development is not of a scale or configuration that would present a barrier to barnacle goose movements. Given the species' flight capability and the absence of reliance on the site, no effects on connectivity or site use are predicted.</p>	<p>and the Proposed Development Site, alone or in combination with other plans or projects, will not undermine the conservation objectives or integrity of the SPA.</p>
		<p>Restore the:</p> <ul style="list-style-type: none"> • breeding population size; • productivity rate; • extent of available nesting options within the SPA; 	<p>Low risk [Collision Risk] (if unmitigated)</p> <p>The modelled collision risk for herring gull is 0.15 collisions/year (worst-case using the Nordex N163 candidate turbine). With a current SPA population of 156 birds, this equates to a 0.8% increase in mortality relative to background mortality. As this increase is</p>	<p>Negligible or very low [collision risk] (if unmitigated):</p> <p>Negligible or very low risk of other construction and/or decommissioning works at other project sites adding to</p>



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		<ul style="list-style-type: none"> • spatial distribution, extent, abundance and availability of foraging habitat; • levels of disturbance at breeding sites; • levels of disturbance at areas ecologically connected to the colony; and • Lack of barriers to connectivity for herring gull 	<p><1%, the risk of undermining the conservation objective relating to breeding population size is low.</p> <p>No risk [Breeding and productivity] No nests were recorded within or in proximity to the Main Wind Farm Development Site. Consequently, there is no mechanism by which the Proposed Development could affect breeding productivity, nesting success, or other breeding-related conservation objectives for the SPA population.</p> <p>No risk [Foraging habitat and ex-situ supporting habitat] The potential ex-situ pathway whereby effects at the wind farm could influence SPA population dynamics via loss or degradation of supporting foraging habitat has been considered and excluded. As set out in Table 3-1, the Main Wind Farm Development Site is not used as a key or regularly utilised foraging area by herring gull. Recorded flight activity was low and sporadic, indicating transit rather than functional reliance. Given the species' wide foraging range and the availability of extensive alternative foraging habitats within the wider landscape and marine environment, any localised avoidance or displacement at the wind farm would not result in a meaningful reduction in foraging opportunity.</p> <p>No risk [Disturbance and displacement] The Main Wind Farm Development Site does not support regular foraging, roosting or breeding use by herring gull. Any disturbance would therefore be localised and transient, with no plausible mechanism to affect SPA population distribution, productivity or viability.</p> <p>No risk [Barrier effects and connectivity] The Proposed Development is not of a scale or configuration that would present a barrier to herring gull</p>	<p>the risk to the CO due to the Proposed Development alone.</p> <p>Other In-combination effects – No risk No other operational, consented or proposed wind farms within the wider area present overlapping or additive risks in relation to collision, disturbance, displacement, habitat loss or barrier effects.</p> <p>Accordingly, there is no mechanism by which cumulative effects could arise, and the Proposed Development, alone or in combination with other plans or projects, will not undermine the conservation objectives or integrity of the SPA.</p>



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
			movements. The species regularly traverses landscapes at much broader spatial scales, and no disruption to connectivity between breeding, foraging or roosting areas is predicted.	
		<p>Restore the:</p> <ul style="list-style-type: none"> • breeding population size; • productivity rate; • extent of available nesting options within the SPA; • spatial distribution, extent, abundance and availability of foraging habitat; • levels of disturbance at breeding sites; • levels of disturbance at areas ecologically connected to the colony; and • Lack of barriers to connectivity for lesser black-backed gull 	<p>Low risk [Collision risk] (if unmitigated)</p> <p>The modelled collision risk for lesser black-backed gull is 0.18 collisions/year (worst-case using the Nordex N163 candidate turbine). The current SPA breeding population is 132 birds. This equates to a 1.57% increase in mortality relative to background mortality. Although this exceeds 1%, the absolute magnitude of predicted mortality is very small and would represent only a marginal additional pressure on the SPA population.</p> <p>Recent population data indicate a substantial decline in the SPA breeding population (approximately 43% decline between 2020 and 2023; Harris et al., 2024). Under a 'do nothing' scenario, further population decline is expected irrespective of the Proposed Development. In this context, the predicted collision-related mortality would result in only a negligible increase in the rate of decline and would not hinder conservation or recovery measures. Accordingly, the risk of undermining the conservation objective relating to breeding population size is assessed as low.</p> <p>No risk [Productivity rate]</p> <p>No nests or breeding territories were recorded within or adjacent to the Main Wind Farm Development Site. Consequently, there is no mechanism by which the Proposed Development could affect breeding productivity, nesting success or chick survival.</p> <p>No risk [Nesting options]</p> <p>The Main Wind Farm Development Site does not provide nesting habitat for lesser black-backed gull, and</p>	<p>Negligible or very low [collision risk] (if unmitigated):</p> <p>Negligible or very low risk of other construction and/or decommissioning works at other project sites adding to the risk to the CO due to the Proposed Development alone.</p> <p>Negligible or very low [Foraging habitat (extent, availability and use)] (if unmitigated):</p> <p>Negligible or very low risk of other construction and/or decommissioning works at other project sites adding to the risk to the CO due to the Proposed Development alone.</p> <p>Other In-combination effects – No risk</p> <p>No other operational, consented or proposed wind farms within the wider area present overlapping or additive risks in relation to collision, disturbance, displacement, habitat loss or barrier effects.</p>



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			<p>no nesting activity occurs within the wind farm footprint. Therefore, the extent or availability of nesting options within the SPA will not be affected.</p> <p>Low risk [Foraging habitat (extent, availability and use)] (if unmitigated)</p> <p>The Main Wind Farm Development Site is not a key or regularly utilised foraging area for lesser black-backed gull. Recorded flight activity was low and sporadic, consistent with transit rather than functional reliance. Given the species' wide foraging range and the availability of extensive alternative foraging habitat, any localised avoidance or displacement would not result in a meaningful reduction in foraging opportunity at the SPA population level.</p> <p>No risk [Disturbance at breeding sites and ecologically connected areas]</p> <p>The Proposed Development is located at a substantial distance from the SPA breeding colony. No pathways exist by which construction or operational activities could disturb breeding sites or ecologically connected areas.</p> <p>No risk [Barrier effects and connectivity]</p> <p>The Proposed Development is not of sufficient scale or configuration to act as a barrier to movement for lesser black-backed gull. No effects on connectivity between breeding, foraging or resting areas are predicted.</p>	<p>Accordingly, there is no mechanism by which cumulative effects could arise, and the Proposed Development Site, alone or in combination with other plans or projects, will not undermine the conservation objectives or integrity of the SPA.</p>
Duvillaun Islands SPA 004111	15.3 km SW	<p>Maintain the:</p> <ul style="list-style-type: none"> winter population trend; winter spatial distribution; levels of disturbance; lack of barriers to connectivity and site use; 	<p>Low risk [Collision risk] (if unmitigated)</p> <p>The modelled collision risk for barnacle goose associated with the Proposed Development is 0 collisions/year. Accordingly, there is no risk of collision-related mortality affecting the wintering population.</p> <p>No risk [Winter population trend]</p>	<p>Negligible or very low [collision risk] (if unmitigated):</p> <p>Negligible or very low risk of other construction and/or decommissioning works at other project sites adding to</p>



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		<ul style="list-style-type: none"> spatial distribution, extent and abundance of foraging habitats; spatial distribution and extent of roosts; and area and quality of supporting habitat of barnacle goose. 	<p>Given the absence of collision risk and the lack of regular or sustained use of the Main Wind Farm Development Site by barnacle goose, there is no plausible mechanism by which the Proposed Development could affect winter population size or trend.</p> <p>No risk [Winter spatial distribution]</p> <p>Barnacle geese were not recorded using the Main Wind Farm Development Site as a regular foraging or roosting area. Any flights recorded were infrequent and indicative of transit rather than functional site use. As a result, no changes to winter spatial distribution within the SPA are predicted.</p> <p>No risk [Foraging habitat availability and quality]</p> <p>The Main Wind Farm Development Site does not comprise key or regularly used foraging habitat for barnacle goose. Given the availability of extensive alternative foraging areas within the wider landscape and coastal environment, any localised avoidance or displacement at the wind farm would not result in a meaningful reduction in foraging opportunity or habitat availability.</p> <p>No risk [Roosting habitat]</p> <p>No roosting sites for barnacle goose were identified within or adjacent to the Main Wind Farm Development Site. Therefore, no effects on the spatial distribution or extent of roosts are predicted.</p> <p>No risk [Disturbance and displacement]</p> <p>While occasional movements through the wider area cannot be excluded, the Proposed Development is not subject to regular or intensive use by barnacle goose. Any disturbance would be localised and transient, with no effect on wintering behaviour, distribution or habitat use at the SPA scale.</p>	<p>the risk to the CO due to the Proposed Development alone.</p> <p>Other In-combination effects – No risk</p> <p>No other operational, consented or proposed wind farms within the wider area present overlapping or additive risks in relation to collision, disturbance, displacement, habitat loss or barrier effects.</p> <p>Accordingly, there is no mechanism by which cumulative effects could arise, and the Proposed Development, alone or in combination with other plans or projects, will not undermine the conservation objectives or integrity of the SPA.</p>



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			<p>No risk [Barrier effects and connectivity]</p> <p>The Proposed Development is not of a scale or configuration that would present a barrier to barnacle goose movements. Given the species' flight capability and the absence of reliance on the site, no effects on connectivity or site use are predicted.</p>	
<p>Inishkea Islands SPA 004004</p>	<p>16.4 km W</p>	<p>Maintain the:</p> <ul style="list-style-type: none"> • breeding population size; • productivity rate; • extent of available nesting options within the SPA; • spatial distribution, extent, abundance and availability of foraging habitat; • levels of disturbance at breeding sites; • levels of disturbance at areas ecologically connected to the colony; and • Lack of barriers to connectivity for common gull 	<p>Low risk [Collision risk] (if unmitigated)</p> <p>The modelled collision risk for common gull is 0.05 collisions/year (worst-case using the Nordex N163 candidate turbine). With a current SPA population of 94 birds, this equates to a 0.38% increase in mortality relative to background mortality. As this increase is <1%, the risk of undermining the conservation objective relating to breeding population size is low.</p> <p>No risk [Breeding and productivity]</p> <p>No nests were recorded within or in proximity to the Main Wind Farm Development Site. Consequently, there is no mechanism by which the Proposed Development could affect breeding productivity, nesting success, or other breeding-related conservation objectives for the SPA population.</p> <p>No risk [Foraging habitat and ex-situ supporting habitat]</p> <p>The potential ex-situ pathway whereby effects at the wind farm could influence SPA population dynamics via loss or degradation of supporting foraging habitat has been considered and excluded. As set out in Table 3-1, the Main Wind Farm Development Site is not used as a key or regularly utilised foraging area by common gull, and recorded flight activity was low and sporadic, indicating transit rather than functional reliance. Given the wide foraging range of the species and the availability of extensive alternative foraging habitat within the wider landscape and marine environment,</p>	<p>Negligible or very low [collision risk] (if unmitigated):</p> <p>Negligible or very low risk of other construction and/or decommissioning works at other project sites adding to the risk to the CO due to the Proposed Development alone.</p> <p>Other In-combination effects – No risk</p> <p>No other operational, consented or proposed wind farms within the wider area present overlapping or additive risks in relation to collision, disturbance, displacement, habitat loss or barrier effects.</p> <p>Accordingly, there is no mechanism by which cumulative effects could arise, and the Proposed Development, alone or in combination with other plans or projects, will not undermine the conservation objectives or integrity of the SPA.</p>



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			<p>any localised avoidance or displacement at the wind farm would not result in a meaningful reduction in foraging opportunity.</p> <p>No risk [Disturbance and displacement]</p> <p>The Main Wind Farm Development Site does not support regular foraging, roosting or breeding use by common gull. Any disturbance would therefore be localised and transient, with no plausible mechanism to affect SPA population distribution, productivity or viability.</p> <p>No risk [Barrier effects and connectivity]</p> <p>The Proposed Development is not of a scale or configuration that would present a barrier to common gull movements. The species routinely undertakes movements at much broader spatial scales, and no disruption to connectivity between breeding, foraging or roosting areas is predicted.</p>	
		<p>Restore the:</p> <ul style="list-style-type: none"> • breeding population size; • productivity rate; • extent of available nesting options within the SPA; • spatial distribution, extent, abundance and availability of foraging habitat; • levels of disturbance at breeding sites; • levels of disturbance at areas ecologically connected to the colony; and • Lack of barriers to connectivity for herring gull 	<p>Low risk [Collision risk] (if unmitigated)</p> <p>The modelled collision risk for herring gull is 0.15 collisions/year (worst-case using the Nordex N163 candidate turbine). With a current SPA population of 156 birds, this equates to a 0.8% increase in mortality relative to background mortality. As this increase is <1%, the risk of undermining the conservation objective relating to breeding population size is low.</p> <p>No risk [Breeding and productivity]</p> <p>No nests were recorded within or in proximity to the Main Wind Farm Development Site. Consequently, there is no mechanism by which the Proposed Development could affect breeding productivity, nesting success, or other breeding-related conservation objectives for the SPA population.</p>	<p>Negligible or very low [collision risk] (if unmitigated):</p> <p>Negligible or very low risk of other construction and/or decommissioning works at other project sites adding to the risk to the CO due to the Proposed Development alone.</p> <p>Other In-combination effects – No risk</p> <p>No other operational, consented or proposed wind farms within the wider area present overlapping or additive risks in relation to collision, disturbance,</p>



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			<p>No risk [Foraging habitat and ex-situ supporting habitat]</p> <p>The potential ex-situ pathway whereby effects at the wind farm could influence SPA population dynamics via loss or degradation of supporting foraging habitat has been considered and excluded. As set out in Table 3-1, the Main Wind Farm Development Site is not used as a key or regularly utilised foraging area by herring gull. Recorded flight activity was low and sporadic, indicating transit rather than functional reliance. Given the species' wide foraging range and the availability of extensive alternative foraging habitats within the wider landscape and marine environment, any localised avoidance or displacement at the wind farm would not result in a meaningful reduction in foraging opportunity.</p> <p>No risk [Disturbance and displacement]</p> <p>The Main Wind Farm Development Site does not support regular foraging, roosting or breeding use by herring gull. Any disturbance would therefore be localised and transient, with no plausible mechanism to affect SPA population distribution, productivity or viability.</p> <p>No risk [Barrier effects and connectivity]</p> <p>The Proposed Development is not of a scale or configuration that would present a barrier to herring gull movements. The species regularly traverses landscapes at much broader spatial scales, and no disruption to connectivity between breeding, foraging or roosting areas is predicted.</p>	<p>displacement, habitat loss or barrier effects.</p> <p>Accordingly, there is no mechanism by which cumulative effects could arise, and the Proposed Development, alone or in combination with other plans or projects, will not undermine the conservation objectives or integrity of the SPA.</p>
		<p>Maintain the:</p> <ul style="list-style-type: none"> • winter population trend; • winter spatial distribution; • levels of disturbance; 	<p>No risk [Collision risk]</p> <p>The modelled collision risk for barnacle goose associated with the Proposed Development is 0 collisions/year. Accordingly, there is no risk of collision-related mortality affecting the wintering population.</p>	<p>In-combination effects – No risk</p> <p>No additional wind farms with predicted collision risk for barnacle goose are present.</p>



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
		<ul style="list-style-type: none"> • lack of barriers to connectivity and site use; • spatial distribution, extent and abundance of foraging habitats; • spatial distribution and extent of roosts; and area and quality of supporting habitat of barnacle goose. 	<p>No risk [Winter population trend] Given the absence of collision risk and the lack of regular or sustained use of the Main Wind Farm Development Site by barnacle goose, there is no plausible mechanism by which the Proposed Development could affect winter population size or trend.</p> <p>No risk [Winter spatial distribution] Barnacle geese were not recorded using the Main Wind Farm Development Site as a regular foraging or roosting area. Any flights recorded were infrequent and indicative of transit rather than functional site use. As a result, no changes to winter spatial distribution within the SPA are predicted.</p> <p>No risk [Foraging habitat availability and quality] The Main Wind Farm Development Site does not comprise key or regularly used foraging habitat for barnacle goose. Given the availability of extensive alternative foraging areas within the wider landscape and coastal environment, any localised avoidance or displacement at the wind farm would not result in a meaningful reduction in foraging opportunity or habitat availability.</p> <p>No risk [Roosting habitat] No roosting sites for barnacle goose were identified within or adjacent to the Main Wind Farm Development Site. Therefore, no effects on the spatial distribution or extent of roosts are predicted.</p> <p>No risk [Disturbance and displacement] While occasional movements through the wider area cannot be excluded, the Proposed Development is not subject to regular or intensive use by barnacle goose. Any disturbance would be localised and transient, with</p>	<p>Accordingly, there is no potential for in-combination effects beyond those assessed for the Proposed Development alone. The same conclusions apply in respect of winter distribution, disturbance and displacement, barrier effects, foraging and roosting objectives.</p>



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
			<p>no effect on wintering behaviour, distribution or habitat use at the SPA scale.</p> <p>No risk [Barrier effects and connectivity]</p> <p>The Proposed Development is not of a scale or configuration that would present a barrier to barnacle goose movements. Given the species' flight capability and the absence of reliance on the site, no effects on connectivity or site use are predicted.</p>	
Lough Conn and Lough Cullin SPA 004228	17.1 km S	<p>Maintain the:</p> <ul style="list-style-type: none"> • breeding population size; • productivity rate; • extent of available nesting options within the SPA; • spatial distribution, extent, abundance and availability of foraging habitat; • levels of disturbance at breeding sites; • levels of disturbance at areas ecologically connected to the colony; and • Lack of barriers to connectivity for common gull 	<p>Low risk [Collision risk] (if unmitigated)</p> <p>The modelled collision risk for common gull is 0.05 collisions/year (worst-case using the Nordex N163 candidate turbine). With a current SPA population of 94 birds, this equates to a 0.38% increase in mortality relative to background mortality. As this increase is <1%, the risk of undermining the conservation objective relating to breeding population size is low.</p> <p>No risk [Breeding and productivity]</p> <p>No nests were recorded within or in proximity to the Main Wind Farm Development Site. Consequently, there is no mechanism by which the Proposed Development could affect breeding productivity, nesting success, or other breeding-related conservation objectives for the SPA population.</p> <p>No risk [Foraging habitat and ex-situ supporting habitat]</p> <p>The Main Wind Farm Development Site does not comprise key or regularly used foraging habitat for common gull. Given the availability of extensive alternative foraging areas within the wider landscape and coastal environment, any localised avoidance or displacement at the wind farm would not result in a meaningful reduction in foraging opportunity or habitat availability.</p>	<p>Negligible or very low [collision risk] (if unmitigated):</p> <p>Negligible or very low risk of other construction and/or decommissioning works at other project sites adding to the risk to the CO due to the Proposed Development alone.</p> <p>Other In-combination effects – No risk</p> <p>No other operational, consented or proposed wind farms within the wider area present overlapping or additive risks in relation to collision, disturbance, displacement, habitat loss or barrier effects.</p> <p>Accordingly, there is no mechanism by which cumulative effects could arise, and the Proposed Development, alone or in combination with other plans or projects, will not undermine</p>



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
			<p>No risk [Disturbance and displacement] The Main Wind Farm Development Site does not support regular foraging, roosting or breeding use by common gull. Any disturbance would therefore be localised and transient, with no plausible mechanism to affect SPA population distribution, productivity or viability.</p> <p>No risk [Barrier effects and connectivity] The Proposed Development is not of a scale or configuration that would present a barrier to common gull movements. The species routinely undertakes movements at much broader spatial scales, and no disruption to connectivity between breeding, foraging or roosting areas is predicted.</p>	<p>the conservation objectives or integrity of the SPA.</p>
<p>Inner Galway Bay SPA 004031</p>	<p>Approx 109 km S</p>	<p>Maintain the:</p> <ul style="list-style-type: none"> • Breeding population abundance: apparently occupied nests (AONs) • Productivity rate: fledged young per breeding pair • Distribution: breeding colonies • Prey biomass available • Barriers to connectivity • Disturbance at breeding site of common tern 	<p>No risk [Collision risk] Common tern was observed making a total of two flights through the Main Wind Farm Development Site. All flights were of a single bird. CRM indicates that the Proposed Development could result in 0 collisions per year. Therefore, there would be no increase in annual mortality</p> <p>No risk [Breeding and productivity] No nests were recorded within or in proximity to the Main Wind Farm Development Site. Consequently, there is no mechanism by which the Proposed Development could affect breeding productivity, nesting success, or other breeding-related conservation objectives for the SPA population.</p> <p>No risk [Foraging habitat and ex-situ supporting habitat] The Main Wind Farm Development Site does not comprise key or regularly used foraging habitat for common tern. Given the availability of extensive alternative foraging areas within the wider landscape</p>	<p>In-combination effects – No risk No additional wind farms with predicted collision risk for common tern are present. Accordingly, there is no potential for in-combination effects beyond those assessed for the Proposed Development alone. The same conclusions apply in respect of foraging, disturbance and displacement, and barrier effects.</p>



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
			<p>and coastal environment, any localised avoidance or displacement</p> <p>No risk [Disturbance and displacement]</p> <p>The Main Wind Farm Development Site does not support regular foraging, roosting or breeding use by common tern. Any disturbance would therefore be localised and transient, with no plausible mechanism to affect SPA population distribution, productivity or viability.</p> <p>No risk [Barrier effects and connectivity]</p> <p>The Proposed Development is not of a scale or configuration that would present a barrier to common tern movements.</p>	
Clare Island SPA 004136	Approx. 32 km S	<p>Restore the:</p> <ul style="list-style-type: none"> Breeding population size Productivity rate Distribution: extent of available nesting options within the SPA Forage spatial distribution, extent, abundance and availability Disturbance at the breeding site Disturbance at areas ecologically connected to the colony Barriers to connectivity for kittiwake 	<p>No risk [Collision risk]</p> <p>CRM indicates that the Proposed Development could result in 0 collisions per year. Therefore, there would be no increase in annual mortality.</p> <p>No risk [Breeding and productivity]</p> <p>No nests were recorded within or in proximity to the Main Wind Farm Development Site. Consequently, there is no mechanism by which the Proposed Development could affect breeding productivity, nesting success, or other breeding-related conservation objectives for the SPA population.</p> <p>No risk [Foraging habitat and ex-situ supporting habitat]</p> <p>The Main Wind Farm Development Site does not comprise key or regularly used foraging habitat for kittiwake. Given the availability of extensive alternative foraging areas within the wider landscape and coastal environment, any localised avoidance or displacement</p> <p>No risk [Disturbance and displacement]</p>	<p>In-combination effects – No risk</p> <p>No additional wind farms with predicted collision risk for common tern are present. Accordingly, there is no potential for in-combination effects beyond those assessed for the Proposed Development alone. The same conclusions apply in respect of foraging, disturbance and displacement, and barrier effects.</p>



Site Name and Code	Distance (direct line) and Direction to Site	Conservation Objective (summary) - all relate exclusively to within the SAC or SPA	Risk to the Conservation Objectives Due to the Proposed Development Alone	Risk to the Conservation Objectives In combination with other plans and projects
			<p>The Main Wind Farm Development Site does not support regular foraging, roosting or breeding use by kittiwake. Any disturbance would therefore be localised and transient, with no plausible mechanism to affect SPA population distribution, productivity or viability.</p> <p>No risk [Barrier effects and connectivity]</p> <p>The Proposed Development is not of a scale or configuration that would present a barrier to kittiwake movements.</p>	



4.6 Step 3: Effects on the Integrity of the European Sites

The detailed assessment of effects on European sites (summarised in **Table 4-15**) demonstrates that, for the majority of qualifying features and conservation objectives considered, the Proposed Project - both alone and in combination with other plans and projects - is associated with no risk or low to very low risk of adverse effects, due to the absence of direct habitat loss, limited spatial overlap, distance from designated sites, and the localised and temporary nature of potential impact pathways.

Notwithstanding this, a number of potential effect pathways are identified which, in the absence of mitigation, could give rise to low-level risks for certain conservation objectives. These relate primarily to:

- temporary disturbance of mobile qualifying features (notably otter and certain SPA bird species) during construction and decommissioning works;
- short-term, localised changes in water quality associated with construction and decommissioning activities in hydrologically connected catchments;
- the potential introduction or spread of invasive non-native species via construction activities; and
- collision risk, disturbance or barrier effects for selected SCI bird species during the operational phase.

While these effects are limited in magnitude, spatial extent and duration, and are not expected to result in habitat loss or population-level impacts, mitigation measures are required to avoid or further reduce these risks and to ensure that the conservation objectives of the relevant European sites are fully safeguarded.

Accordingly, the mitigation measures set out in **Section 4.7** have been designed to address these identified pathways and to provide certainty that the Proposed Project will not adversely affect the integrity of any European site, either alone or in combination with other plans and projects.



4.7 Step 4: Mitigation Measures

The Proposed Project incorporates a comprehensive suite of environmental mitigation measures, addressing a wide range of potential effects including habitat loss, species disturbance, and bat interactions. These measures are described in full within **Chapter 5: Biodiversity** of the accompanying EIAR and form an integral part of the overall project design and environmental management framework. None of these measures were considered at the Screening Stage.

However, for the purposes of this NIS, mitigation measures are considered only insofar as they are required to address potential effects that could give rise to adverse effects on the integrity of European sites or undermine their Conservation Objectives.

As set out in Sections 4.5 and 4.6, the detailed assessment demonstrates that many qualifying features and conservation objectives are not at risk due to the absence of direct habitat loss within European sites, limited spatial overlap, separation distances, and the localised and temporary nature of the sources for effects from the Proposed Project's activities. No mitigation is therefore required in respect of those pathways within the context of the AA.

The assessment has identified a limited number of potential effect pathways which, in the absence of mitigation, could give rise to low-level risk to the integrity of certain European sites (as stated in Section 4.6).

The mitigation measures presented in this section have therefore been designed specifically to address these pathways and to ensure that all relevant Conservation Objectives are fully safeguarded. The measures are preventative in nature, targeted to the identified risks, and are supported by established best practice guidance and expert ecological judgement. Details of the mitigation measures, their implementation, effectiveness, timescale and monitoring arrangements are provided in **Table 4-20**.

4.7.1 Mitigation Measures – Construction

Mitigation measures to prevent adverse effects on downstream European sites during construction are provided in full in this NIS as outlined below. These will ensure no deterioration in the quality of water entering the Bellacorick Bog Complex SAC, Mullet/Blacksod Bay Complex SAC and, Blacksod Bay/Broad Haven SPA (the only European sites identified with hydrological connectivity), and will ensure there will be no impacts on any the habitats to support the QIs and SCI species. The same is true for SCI, non-QI aquatic habitats and species. These measures are taken from **Chapter 7** of the accompanying EIAR and the CEMP (**Appendix 5** of this NIS).

The CEMP details a range of good practice measures that 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 response plans, re-fuelling and spillage procedures, siltation avoidance measures etc. Including the maintenance and monitoring of silt traps etc.

The CEMP (**Appendix 5** of this NIS) has been developed for the Proposed Project to ensure adequate protection of the water environment. All personnel working on the Proposed Project will be responsible for the environmental control of their work and will perform their duties in accordance with the requirements and procedures of the CEMP. The measures that are relevant to this NIS are further detailed below.

4.7.1.1 Environmental Incident and Emergency Response Plan

The plan will provide:



- a summary of the key actions required as part of the Battery Safety Management Plan (BSMP);
- a summary of local environmental sensitivities, e.g. environmentally designated areas, protected species or habitats and high amenity areas;
- a description of the construction works and appropriate references to other environmental plans and construction method statements;
- an inventory of stored materials and emergency response spill kits;
- details on training requirements, evidence of training of site staff / plant operators in emergency response procedures including inclusion of EIERP training in site inductions and toolbox talks; and key staff contacts for environmental management and emergency response;
- detailed procedures to be taken in the event of an incident or emergency (including procedures for positioning and movement of plant) and identification of relevant personnel who will be responsible for implementing such procedures; and
- contact telephone numbers for emergency services and the EPA Pollution out-of-hours telephone number (0818 33 55 99).

4.7.1.2 Refuelling of Vehicles, Plant and Machinery

Refuelling will take place either:

- within the construction compound at a dedicated impermeable refuelling pad; or
- by mobile double-skinned bowsers located at least 50 m from watercourses, in accordance with OPW (2019) guidance.

Drainage from the compound will pass through oil interceptors prior to discharge.

Oils, greases, hydraulic fluids, hazardous substances and associated wastes will be stored under cover, over spill trays or within bunded containers in designated storage areas within the construction compounds. No fuel storage will occur outside the compounds.

Plant will be maintained in good operational order, with leaks recorded for attention. Absorbent pads and granules will be available in the event of accidental leaks or spillages.

The CEMP also states that:

- storage vessels will be regularly monitored and inspected;
- construction plant and equipment will be regularly maintained and serviced;
- an Environmental Incident and Emergency Response Plan (EIERP) will include contingency procedures for leaks and spills; and
- emergency spill response kits will be held onsite at strategic locations including refuelling areas and within plant.

4.7.1.3 Spillage and Chemical Storage

All fuels, oils, waste oils and other potential contaminants will be stored in secure, fit-for-purpose containers within bunded containment, in accordance with EPA guidance.

The refuelling pad will:

- have an impermeable base and bund with 110% capacity; and
- include sumps that do not drain directly to surface water drains.



Maintenance of mobile plant will only occur within construction compounds and in accordance with EPA guidance.

4.7.1.4 Storage of Materials

Stone stockpiles for tracks, compounds and hardstandings will be restricted to work areas. Temporary stockpiles will be located within pre-developed areas close to the working area.

Excavated material will be stored in low mounded stockpiles adjacent to access tracks, turbine areas and compounds, away from open drains.

4.7.1.5 Prevention of Mud and Debris on Public Roads

Wheel washing facilities and road sweepers will be provided as required to prevent mud and debris being transferred onto public roads.

Wheel wash facilities will:

- be located at site exits;
- be located at least 50 m from the nearest watercourse or surface water drain; and
- discharge runoff to the attenuation basin network.

Settled solids will be regularly removed and buried with silty fines collected from silt fences.

Open-backed lorries and tippers transporting material will be sheeted where required.

The CEMP also states that weather-responsive management will be implemented during periods of wet weather and high vehicle movement volumes.

4.7.1.6 Cement / Concrete

Ready-mixed concrete will be imported from an offsite source.

Bagged cement will:

- be stored within a soil-bunded area;
- be stored on pallets above ground level; and
- be covered with secured plastic sheeting.

Any spilled cement will be removed and disposed of offsite.

Concrete vehicle washing will only occur within designated washout facilities and not elsewhere onsite.

4.7.1.7 Silt

The CEMP identifies exposed soil, rock and access tracks as potential sources of silt-laden runoff.

It states that:

- no material will be discharged or disposed of directly into rivers, streams or drainage ditches; and
- measures to control silt entrainment in runoff are set out in Section 7.4 of the CEMP.

4.7.1.8 Waste and Litter

A licensed waste management contractor will be appointed prior to construction.

The contractor will:



- provide receptacles for waste streams, including domestic/canteen waste; and
- ensure regular emptying and collection of waste.

4.7.1.9 Hydrocarbon Contamination

Plant and machinery will be regularly maintained to minimise the potential for fuel or oil leaks and spillages.

Maintenance will be undertaken on absorbent spill pads and all machinery will be equipped with drip pans.

All fuels, oils and chemicals will be stored within secure bunded containment in the construction compound. Bunded areas will:

- have 110% storage capacity;
- have impervious walls and bases; and
- be underlain by an impermeable ground membrane layer.

4.7.1.10 Site Drainage

During the construction phase of the Proposed Project, measures, as detailed in **Sections 7 Drainage and Surface Water Management of the CEMP** will be adopted to prevent silt, chemicals and/or other contaminants from being washed into existing watercourses. Areas exposed due to the removal of vegetation are more susceptible to erosion during heavy rainfall so areas will be reinstated prior to heavy rainfall to minimise this effect.

This will include specific guidance in relation to drainage (and control of pollution to the water environment) around the following aspects of site infrastructure as outlined in the DoHLGH guidance “The Planning System and Flood Risk Management - Guidelines for Planning Authorities”:

- access routes,
- foundations, and
- hardstanding areas and new structures.

The appropriate methodologies to cover water control and the means of drainage from all hard surfaces and structures within the Proposed Project are described in the following sections.

4.7.1.11 Management of Sediment and Surface Waters

Techniques outlined in Section 7 of the CEMP (see **Appendix 5**) will be adopted for the management of sediment and surface water run-off generated during the construction phase of the Proposed Project.

A drainage system for the Proposed Development Site will be developed to comprise:

- The excavation of in channel rock drainage channels approx. 2 m in width and 275 mm in depth from the edge of the Proposed Development Site’s access tracks.
- Silt fence textile will be laid within the channel. The silt fence textile will be Hy-tex Terrastop premium or similar and will be fixed to the upslope side of the supporting slope within the main drainage channel.
- Support posts for silt fence support and for channel supports will be inserted at the edge of the drainage channel at 1,500 mm intervals.
- Silt fence textile will be anchored using clean drainage stone.

The proposed drainage system will be based on the following methods:



- The first method will involve protecting existing water quality by avoiding disturbance to natural drainage features, minimising any works in or around drainage features, and diverting clean surface runoff around excavations and construction areas.
- The second will involve collecting any drainage water from works areas that might carry silts or sediments, and to route them towards attenuation basins prior to controlled diffuse release over vegetated natural surfaces. To achieve this, shallow surface water drains will be excavated around areas of earthworks to prevent surface water runoff into the working area and thereby protect the wider water network from siltation.

The drainage design for the Proposed Development shall utilise the existing peat drains and drainage ditches.

Good practice construction techniques⁵³ will be adopted for the management of sediment and surface water run-off generated during the construction phase of the Proposed Development. Sustainable Drainage Systems (SuDS) will be used where applicable.

Drainage from the Site will include elements of SuDS design. SuDS replicate natural drainage patterns and have several benefits:

- SuDS will attenuate run-off, thus reducing peak flow and any flooding issues that might arise downstream;
- SuDS will treat run-off, which can reduce sediment and pollutant volumes in run-off before discharging back into the water environment; and

In addition, a wet weather protocol will be implemented by the PSCS to manage activities during periods of heavy and prolonged precipitation.

Heavy or prolonged rainfall during construction and operation may lead to sediment transport or vegetation causing blockage to infrastructure drainage channels or watercourse crossing structures. Regular monitoring and prompt maintenance of these assets will ensure that the drainage system continues to function as designed.

These 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.

4.7.1.12 Foul Drainage

Any waste that is generated during the Proposed Project's construction phase will be collected, separated and stored in dedicated receptacles at the temporary construction compounds during construction works. A fully authorised waste management contractor will be appointed prior to the commencement of construction works. This contractor will provide the appropriate receptacles for the collection of the various waste streams and ensure regular emptying and/or collection of these receptacles. Appropriate licensed waste facilities in the surrounding area will be used as part of Waste Management arrangements. Effluent and waste from onsite construction will be captured onsite in a foul holding tank and stored for offsite disposal by a licensed contractor.

4.7.1.13 Water Quality Monitoring

The CEMP includes a Water Quality Monitoring Plan (WQMP) to monitor and protect surface water and groundwater during construction. Monitoring will be undertaken weekly or monthly as required and will address risks including siltation, hydrocarbon contamination, concrete-

⁵³ CIRIA (2015). The SuDS Manual (C753). London: Construction Industry Research and Information Association (CIRIA).



related pollution, drainage issues and impacts from excavation and construction traffic. The WQMP includes monitoring of water chemistry, fish and macroinvertebrate communities upstream and downstream of works areas, alongside groundwater monitoring at installed standpipes. Monitoring will include visual inspections, laboratory analysis and comparison against baseline conditions and environmental quality standards. The ECoW will undertake regular inspections of watercourses, sediment controls and active work areas, maintain hydrological records and coordinate responses to any issues identified. Any pollution incident or deviation from expected water quality trends will trigger inspection, corrective action and reporting procedures under the Pollution Prevention and Incident Plan and EIERP.

With regard to the protection of the water environment the following risks will be addressed:

- siltation of watercourses;
- discolouration of raw water;
- potential pollution from construction traffic due to diesel spillage or similar;
- alteration of raw water quality resulting from imported track construction material;
- excavation and earthworks;
- use of large quantities of concrete; and
- construction compound and associated drainage/foul drainage and diesel spill issues.

The PSCS will compile a monitoring and maintenance plan for the drainage system and surface water runs for use by the ECoW which will as a minimum include:

- visual monitoring/inspections; and
- During site works, including water crossing construction works, the relevant drainage/surface water runs potentially being impacted by these works will be inspected daily by the ECoW while works are ongoing in this area.

4.7.1.14 Invasive Species

Any plant or equipment that may have worked in environments where invasive species are present (including but not restricted to rhododendron and prickly heath which were identified on site), will be suitably cleaned by high pressure hose, disinfected and dried before being used on site to prevent the spread of invasive species. A check-clean-dry protocol will be used to help spread crayfish plague.

Temporary fencing (paling with 25 mm mesh) will be erected around the required site works to delineate the works area and to minimise the potential for disturbance impacts outside of the works area. As no other holts were identified within the Main Wind Farm Development Site, there is no specific mitigation required for the protection of this species in relation to relocation/construction of artificial dwellings.

Removal of brash and felled trees near to watercourses and drainage ditches will ensure that no significant acidification of downstream watercourses will occur.

A Habitat Management Plan (HMP) will be used to prevent the spread of invasive and non-native species and is included as part of the Peatland Restoration Plan (Appendix A) in **Appendix 7** of this NIS.

A pre-construction 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.



4.7.1.15 Birds

To avoid widespread disturbance to birds, access will be restricted to the footprint of the proposed works corridor. Measures proposed above will prevent deterioration of water quality and adverse effects on any birds relying on downstream habitats.

The following will be implemented to reduce the possibility of 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.
- 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 e.g. cover for ground nesting species will be made unsuitable by cutting vegetation or tracking over with an excavator, 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 Project and to undertake surveys for nesting birds throughout the construction period, enforcing exclusion areas as required.

4.7.2 Mitigation Measures During Operational Phase

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 Habitat Management Plan included as part of the Peatland Restoration Plan (Appendix A) of **Appendix 7** of this NIS providing the 35-year long term active management strategy.

4.7.2.1 Designated Nature Conservation Sites, Fisheries and Aquatic Ecology

Maintenance of the Proposed Development 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 temporary construction compounds or a minimum of 50 m from any surface water drainage.

This will prevent any negative effects on downstream aquatic receptors and designated sites..

4.7.2.2 Birds

Turbine curtailment

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 effect on bird populations.

Curtailment will be implemented via a system of adaptive management; where appropriate during 'at-risk' time periods and weather conditions, and as discussed and agreed with NPWS.



Curtailement for birds is different to curtailment for bats and would involve downtime of the actual turbine. Adaptive management options relating to turbine curtailment will include but are not limited to:

- Targeted curtailment during defined 'at risk' periods and conditions (e.g. low visibility such as fog) using turbine supervisory control and data acquisition (SCADA)-linked triggers informed by on-site weather/visibility sensors; and/or
- Automated detection-based curtailment using a validated camera / AI system to initiate turbine shutdown when the relevant species approach within a defined risk envelope.

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.

The effectiveness of any adaptive measures will be reviewed against monitoring results and refined as necessary in agreement with NPWS.

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 SCI birds. 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.

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.).

4.7.3 Mitigation Measures During Decommissioning Phase

Mitigation measures for decommissioning will be the same as those for the construction phase, as described in **Section 4.7.1**. (with the exception of **Section 4.7.1.2**). However, the magnitude required will be less, as track and turbine installation will not be required. Monitoring

4.7.3.1 General Pre-Construction Confirmation Surveys

To prevent accidental disturbance to otter holts, an ecological confirmatory walkover survey will be undertaken prior to any construction activities within the development footprint to check that no new resting places have been established since the date of the previous survey.

Checks for nesting birds will be required for construction undertaken 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 **Birds (Post-Construction)**

Based on current best-practice guidelines (SNH, 2009) and in accordance with EC Recommendation (C/2022/3219), a targeted range of flight activity surveys and collision monitoring (carcass searching) will be undertaken during the breeding and non-breeding seasons in years 1, 2 and 3 post construction, to monitor the rate of avian turbine collisions.⁵⁴ Six hours of survey per vantage point per month will be carried out for flight activity surveys

⁵⁴ Scottish Natural Heritage. (2009). *Monitoring the impact of onshore wind farms on birds*. SNH Guidance Document. Inverness: Scottish Natural Heritage.



and one round of carcass searches per turbine per month will be carried out. These surveys should be carried out by qualified ecologists. The results of each year of monitoring will be presented in a report that will be submitted to the competent authority and NPWS. After 3 years of post-construction monitoring surveys, consultation with NPWS and Mayo County Council will be undertaken to determine if further monitoring surveys or any further actions are required



Table 4-20: Summary of mitigation measures, implementation mechanisms, effectiveness, monitoring and reporting arrangements to avoid or reduce potential adverse effects on the integrity of European sites and their Conservation Objectives.

DESCRIPTION OF THE MEASURES, DETAILS ON IMPLEMENTATION, EFFECTIVENESS, MONITORING							
Effect identified in table 4-15 and the risks outlined in Table 4-18	European site potentially subject to effect	mitigation measures	how the measure will contribute to avoiding/reducing the effects on the integrity European sites	how it will be implemented and by whom	demonstrate its effectiveness (e.g. based on scientific evidence / expert rationale)	timescale of implementation, relative to the plan or project	proposed monitoring scheme and reporting requirements
Collision Risk	<ul style="list-style-type: none"> Inishkeeragh SPA 004084 Inishkea Islands SPA 004004 Lough Conn and Lough Cullin SPA 004228 	The mitigation measures outlined above in section 4.7 outline curtailment during operation.	Curtailment will directly reduce the risk of collision risk for qualifying bird species by temporarily stopping turbine operation during periods of elevated activity and highest collision susceptibility (e.g. low wind speeds, migration events, peak foraging periods, and/or seasonally sensitive times). By preventing turbine blade rotation at these high-risk times, the likelihood of individuals being struck is	Curtailment will be achieved by fitting weather detection sensors or cameras to the turbines, which will be linked to turbines via a supervisory control and data acquisition (SCADA) system. Thus, curtailment will only occur in foggy conditions during the ‘at-risk’ period for the relevant species. This will be implemented by the client.	<p>This measure prevents the collision event from occurring rather than addressing impacts afterwards, it acts as an impact avoidance measure. Studies consistently show substantial reductions in mortality commonly in the order of ~40–70% for birds while requiring turbine shutdown for only a limited proportion of operating time.</p> <p>Please refer to Machado et al. 2024⁵⁵ for more information on turbine curtailment to mitigate collision risk for birds</p>	Curtailment mitigation measure will be implemented during the operational phase. Post-commission monitoring will be implemented during the operational phase.	Post construction monitoring will be undertaken to ensure the effectiveness of the mitigation measures. This will be undertaken in collaboration with the NPWS. If monitoring indicates that collision rates exceed predicted levels for the SCI species, the curtailment regime will be refined in consultation with the Planning Authority and NPWS to ensure that significant effects are avoided.

⁵⁵ Machado, R., Nabo, P., Cardia, P., Moreira, P., Nicolau, P., & Repas-Goncalves, M. (2024). Bird Curtailment in Offshore Wind Farms: Application of curtailment in offshore wind farms at a sea basin level to mitigate collision risk for birds. Birdlife Europe and Central Asia and STRIX, Brussels, Belgium. Access online: [Curtailment Report Digital Spreads.pdf](#)



DESCRIPTION OF THE MEASURES, DETAILS ON IMPLEMENTATION, EFFECTIVENESS, MONITORING							
Effect identified in table 4-15 and the risks outlined in Table 4-18	European site potentially subject to effect	mitigation measures	how the measure will contribute to avoiding/reducing the effects on the integrity European sites	how it will be implemented and by whom	demonstrate its effectiveness (e.g. based on scientific evidence / expert rationale)	timescale of implementation, relative to the plan or project	proposed monitoring scheme and reporting requirements
			substantially reduced.				
Introduction or spread of invasive non-native species	<ul style="list-style-type: none"> Mullet/Blacksod Bay Complex SAC 000470 Bellacorick Bog Complex SAC Owenduff/Nephin Complex SAC 000534 	The mitigation measures outlined above in section 4.7 outline mitigation of the spread/introduction of invasive species during construction and decommissioning phases.	The Habitat Management Plan will control and, where feasible, eradicate invasive non-native plant species within and adjacent to the European site through biosecurity procedures, early detection surveys, and targeted removal (e.g. manual removal, appropriate treatment, and monitored follow-up).	The Environmental Manager / ECoW will monitor the implementation of the mitigation measures with regular reporting to client. Temporary fencing (paling with 25 mm mesh) will be erected around the required site works to delineate the works area and to minimise the potential for disturbance impacts outside of the works area.	The Habitat Management Plan represents a structured conservation management measure comprising survey, targeted control and monitoring. Guidance from the European Commission on the management of Natura 2000 sites ⁵⁶ recognises planned invasive species control programmes as measures that prevent habitat deterioration and maintain ecological structure and function. Ecological research further demonstrates that sustained, monitored management programmes are significantly more effective than one-off removal in reducing invasive plant abundance and allowing recovery of native communities. By maintaining habitat composition and	For the duration of construction and decommissioning.	A Habitat Management Plan (HMP) will be used to prevent the spread of invasive and non-native species. Rhododendron and Prickly heath must not be spread during construction works. A pre-construction 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.

⁵⁶ Commission Notice C (2018) 7621 final, Brussels, 21.11.2018. Access online: [managing natura 2000 sites-KH0618414ENN.pdf](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018N07621(01)&from.do=collection)



DESCRIPTION OF THE MEASURES, DETAILS ON IMPLEMENTATION, EFFECTIVENESS, MONITORING							
Effect identified in table 4-15 and the risks outlined in Table 4-18	European site potentially subject to effect	mitigation measures	how the measure will contribute to avoiding/reducing the effects on the integrity European sites	how it will be implemented and by whom	demonstrate its effectiveness (e.g. based on scientific evidence / expert rationale)	timescale of implementation, relative to the plan or project	proposed monitoring scheme and reporting requirements
					quality, the plan safeguards the favourable conservation condition of qualifying habitats and species and therefore protects the integrity of the European site.		
Changes in water quality	<ul style="list-style-type: none"> Mullet/Blacksod Bay Complex SAC 000470 Bellacorick Bog Complex SAC 	The mitigation measures outlined above in section 4.7 outline mitigation of the changes in water quality.	These measures will prevent sediment and pollution runoff to the aquatic environment thereby blocking a pathway for effects on the downstream European sites	Measures will be implemented by the Contractor	EU Water Framework Directive (Directive 2000/60/EC) Water quality monitoring) will detect any deterioration in water quality arising from construction activities at an early stage, allowing works to cease and corrective measures to be implemented immediately. This prevents the release and downstream spread of silt, hydrocarbons, concrete leachate and other pollutants that could otherwise damage aquatic habitats and species. By maintaining water quality and preventing habitat degradation, the measure safeguards the ecological conditions required to support the qualifying	For the duration of construction and decommissioning.	The Environmental Manager and ECoW will monitor the implementation of the mitigation measures with regular reporting to client.



DESCRIPTION OF THE MEASURES, DETAILS ON IMPLEMENTATION, EFFECTIVENESS, MONITORING							
Effect identified in table 4-15 and the risks outlined in Table 4-18	European site potentially subject to effect	mitigation measures	how the measure will contribute to avoiding/reducing the effects on the integrity European sites	how it will be implemented and by whom	demonstrate its effectiveness (e.g. based on scientific evidence / expert rationale)	timescale of implementation, relative to the plan or project	proposed monitoring scheme and reporting requirements
					interests of the European site. Accordingly, the conservation objectives and site integrity will not be adversely affected, either alone or in combination with other plans or projects.		
Disturbance of mobile qualifying features	<ul style="list-style-type: none"> Mullet/Blacksod Bay Complex SAC 000470 Bellacorick Bog Complex SAC Owenduff/Nephrin Complex SAC 000534 Blacksod Bay/Broad 	The mitigation measures outlined above in section 5.40 of the Biodiversity chapter of the EIAR outline the mitigation of disturbance of mobile qualifying features during	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 otter, birds (breeding, overwintering).	The ECoW will advise on timing to minimise disturbance to mammals, birds and aquatic fauna	Guidance from NatureScot recognises the effectiveness of these measures ^{57 58 59} during construction and decommissioning	For the duration of construction and decommissioning.	The Environmental Manager and ECoW will monitor the implementation of the mitigation measures with regular reporting to client.

⁵⁷ NatureScot (2024) Standing advice for planning consultation – otters. Accessed online at: <https://www.nature.scot/doc/standing-advice-planning-consultations-otters>

⁵⁸ <https://www.nature.scot/doc/bats-and-artificial-lighting>

⁵⁹ <https://www.nature.scot/doc/dealing-construction-and-breeding-birds>



DESCRIPTION OF THE MEASURES, DETAILS ON IMPLEMENTATION, EFFECTIVENESS, MONITORING							
Effect identified in table 4-15 and the risks outlined in Table 4-18	European site potentially subject to effect	mitigation measures	how the measure will contribute to avoiding/reducing the effects on the integrity European sites	how it will be implemented and by whom	demonstrate its effectiveness (e.g. based on scientific evidence / expert rationale)	timescale of implementation, relative to the plan or project	proposed monitoring scheme and reporting requirements
	Haven SPA 004037 <ul style="list-style-type: none"> Owenduff/Nepin Complex SPA 004098 Inishglora and Inishkeeragh SPA 004084 Inishkea Islands SPA 004004 	construction and decommission.					



5.0 Conclusion

This report presents a detailed AA Screening and NIS, together with all supporting information, to inform the competent authority in making its own complete, precise and definitive findings in respect of the potential effects of the Proposed Project on the integrity of European sites.

The assessment has examined, based on best available scientific knowledge, those impact pathways identified as having the potential to affect conservation objectives, including disturbance, habitat loss or degradation, changes in hydrological and hydrogeological conditions, collision risk, displacement and barrier effects, both alone and in combination with other plans and projects.

The assessment demonstrates that, with the implementation of the mitigation measures identified in this report, the Proposed Project will not result in loss of habitat area, sustained deterioration of habitat condition, or population-level effects on qualifying interest species within any European site. Mitigation measures have been specifically designed to avoid or reduce effects associated with identified pathways.

On this basis, and subject to the competent authority's independent assessment, it is concluded that sufficient scientific certainty exists to determine without any reasonable doubt that the Proposed Project, either alone or in combination with other plans or projects, will not adversely affect the integrity of any European site, in view of their conservation objectives, and will not undermine the ability of those sites to maintain or restore their qualifying interests to favourable conservation condition.



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Site Synopses, Conservation Objectives and Standard Data Forms for European Sites: <https://www.npws.ie/protected-sites>

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Woodrow (2025) 2024 Bat Survey Results Report for the Proposed Muingmore Wind Farm,
Co. Mayo.



FIGURES

Figure 1 Site Location

Figure 2 European Sites within 20 km

Figure 3 Hydrological Connections

Figure 4 Cumulative Assessment





Appendix 1 Site Location, European Sites within 20 km and Hydrological Connections

AA Screening and Natura Impact Statement

Muingmore Wind Farm

RWE Renewables Ireland Limited

SLR Project No.: 501.065301.00001



460000

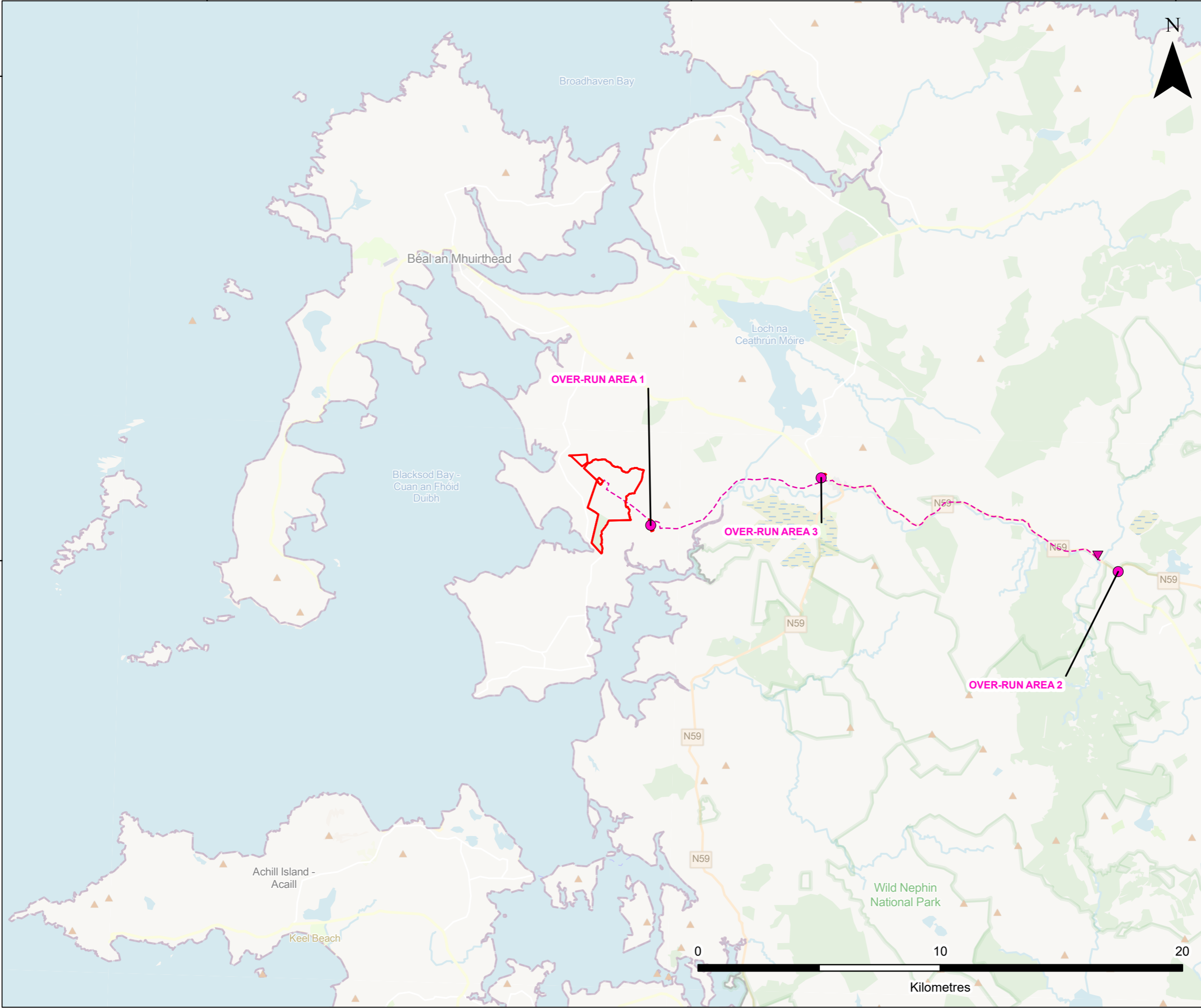
480000

500000

840000

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402.064443.00001.0117.0 Proposed Development and GCR



LEGEND

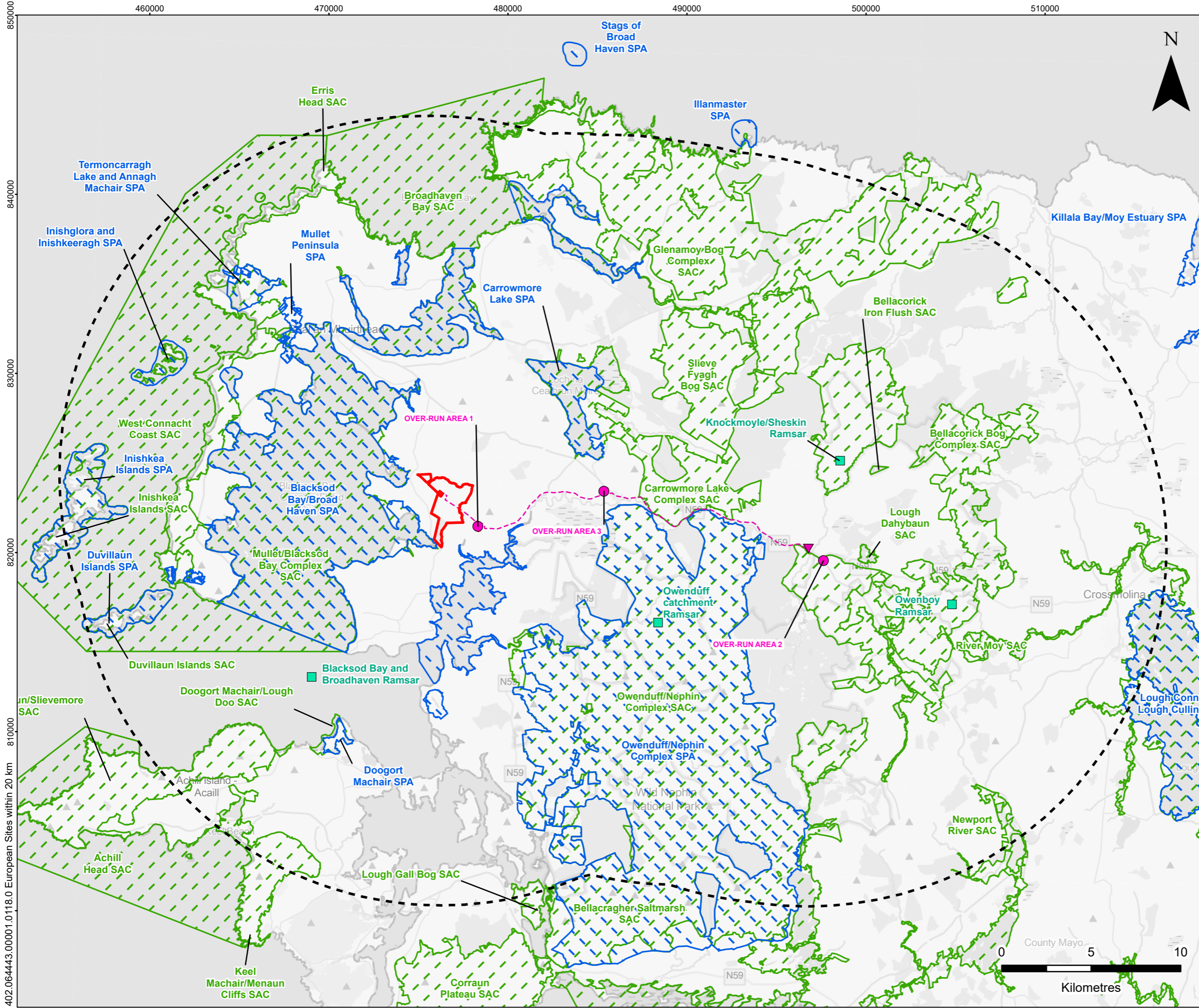
- Proposed Development Site Boundary
- ▼ Bellacorick 110 kv Substation
- Proposed Grid Connection Route (Subject to Separate Planning Application)
- Proposed Over-run Area Location



MUINGMORE WIND FARM
NATURA IMPACT STATEMENT
PROPOSED DEVELOPMENT AND
CABLE ROUTE

FIGURE 1

Scale 1:150,000 @ A3	Date MARCH 2026
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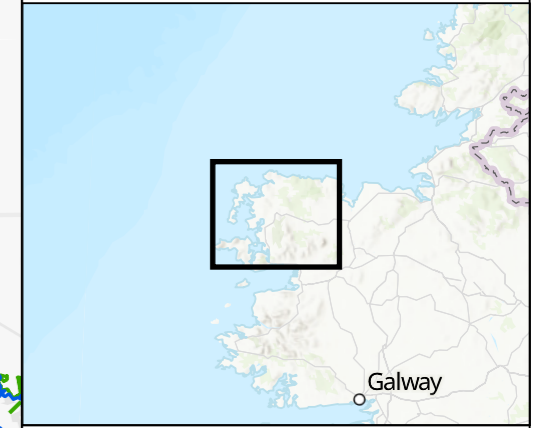


LEGEND

- Proposed Development Site Boundary
- ▼ Bellacorick 110 kv Substation
- Proposed Grid Connection Route (Subject to Separate Planning Application)
- Study Area (Proposed Development Site Boundary and Cable Route 20 km Buffer)
- Proposed Over-run Area Location

Ecological Designations

- Ramsar Wetland and Site Location
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)



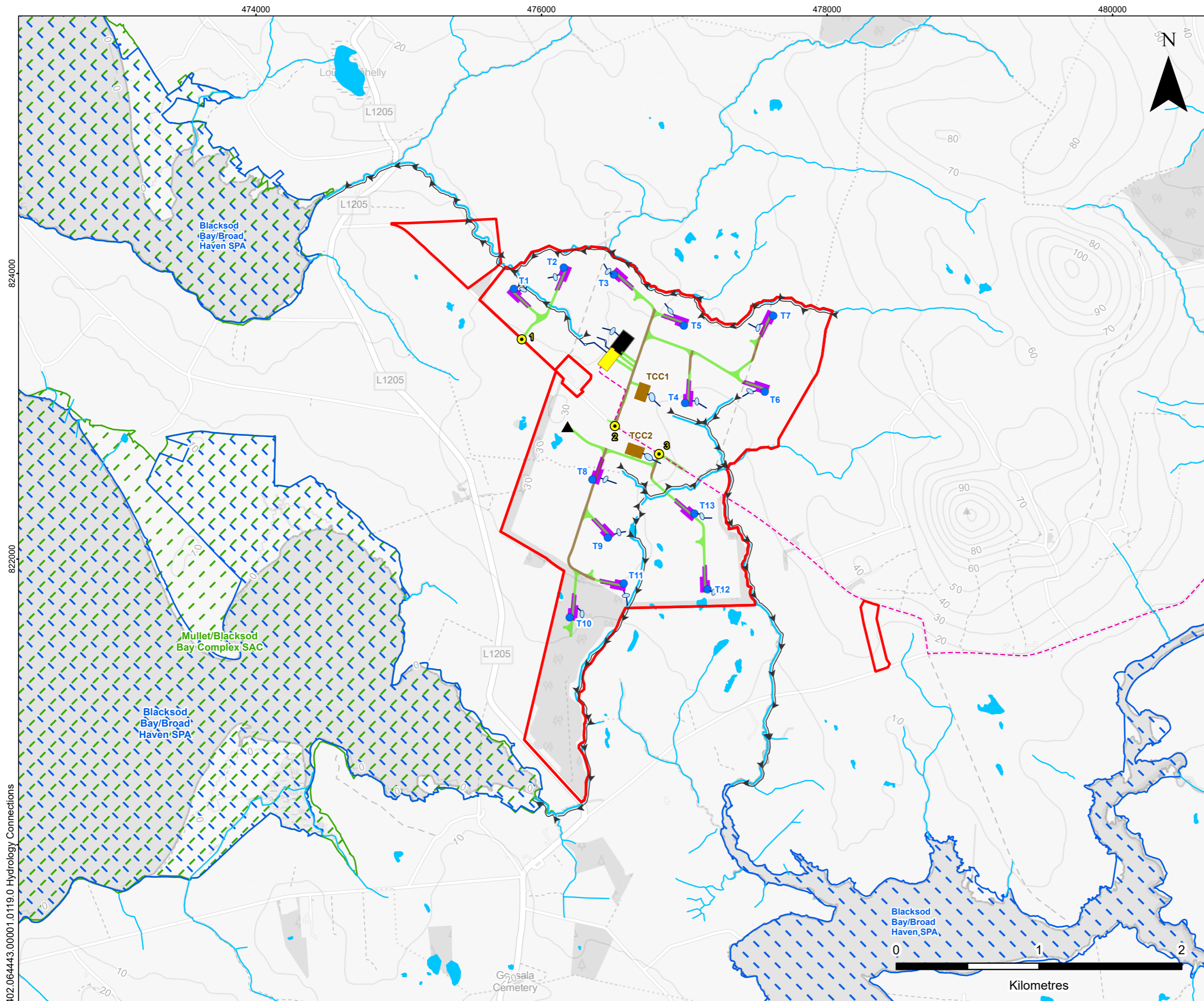
**MUINGMORE WINDFARM
NATURA IMPACT STATEMENT
EUROPEAN SITES WITHIN 20 KM
OF THE PROPOSED DEVELOPMENT
AND CABLE ROUTE**

FIGURE 2

Scale 1:200,000 @ A3 Date MARCH 2026

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS, Map data © OpenStreetMap contributors, Microsoft, Facebook, Google, Esri Community Maps contributors, Map layer by Esri. Copyright Government of Ireland. This dataset was created by National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs. This copyright material is licensed for re-use under the Creative Commons Attribution 4.0 International licence.

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- 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)
 - ▭ Battery Energy Storage System (BESS) Compound (Indicative Size and Location)
 - ▭ Proposed Temporary Construction Compound (TCC)
 - ▬ Proposed Drainage Feature
 - ▭ Proposed Attenuation Basin
 - ▬ Watercourse
 - ▬ Potential Hydrological Connection
 - ▭ Waterbody
- Ecological Designations**
- ▭ Special Area of Conservation (SAC)
 - ▭ Special Protection Area (SPA)

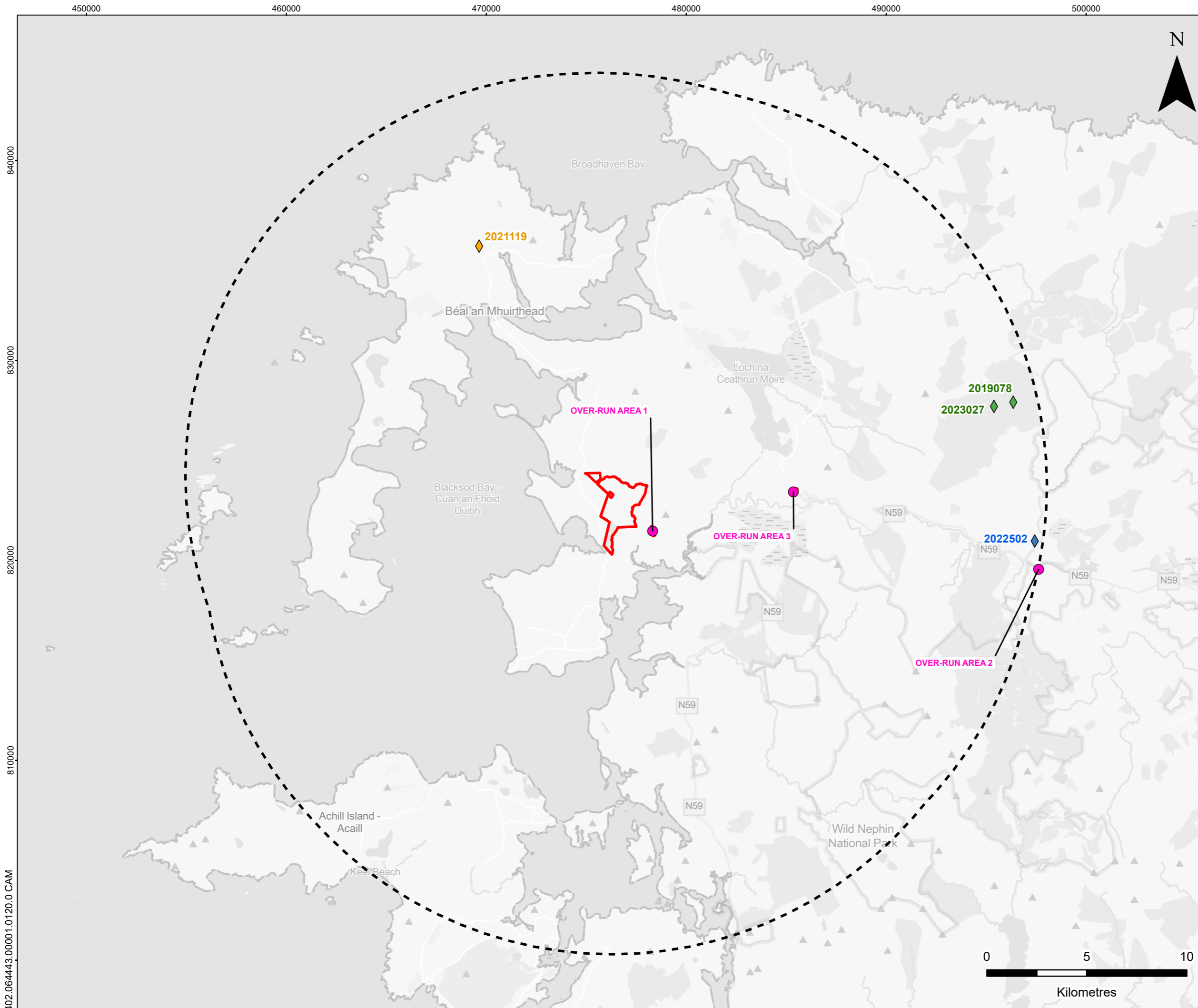


MUINGMORE WIND FARM
NATURA IMPACT STATEMENT
HYDROLOGICAL AND
HYDROGEOLOGICAL CONNECTIONS

FIGURE 3

Scale 1:25,000 @ A3 Date MARCH 2026

402.064443.00001.0119.0 Hydrology Connections

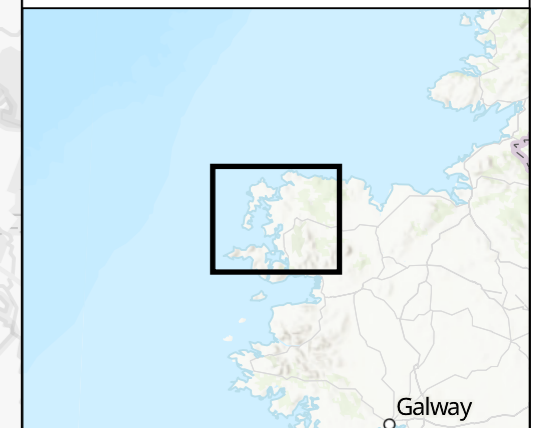


LEGEND

- Proposed Development Site Boundary
- Study Area (Proposed Development Site Boundary 20 km Buffer)
- Proposed Over-run Area Location

Environmental Impact Assessment Application (Development Type)

- ◆ Agricultural
- ◆ Hydrogen Production
- ◆ Windfarm



MUINGMORE WIND FARM
 NATURA IMPACT STATEMENT
 CUMULATIVE ASSESSMENT

FIGURE 4

Scale 1:180,000 @ A3	Date MARCH 2026
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Appendix 2 Bird Survey Reports

AA Screening and Natura Impact Statement

Muingmore Wind Farm

RWE Renewables Ireland Limited

SLR Project No.: 501.065301.00001



RWE

Ornithology Results Reports for Muingmore Wind Farm, Co. Mayo 2021-2024

EIAR Technical Appendix

Woodrow Ref: P00008408

Date: 05 December 2024

COMMERCIAL IN CONFIDENCE



woodrow
APEM Group

Client: RWE

Project reference: P00008408

Date of issue: 5 December 2024

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1	23/10/2024	All	All	QA	MMW
1	05/12/2024	All	All	Sign-off	MMW

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STATEMENT OF AUTHORITY

This report has been prepared on behalf of RWE by Woodrow Sustainable Solutions Limited, part of the APEM Group (APEM Group Woodrow). Ornithological surveys at the location of the proposed Muingmore Wind Farm were conducted by appropriately experienced surveyors as listed below. This report has been written by Julieta Pedrana, reviewed by Maeve Maher-McWilliams.

Julieta is a Senior Ecologist with APEM Group Woodrow. She has completed a BSc in Biological Science at the University of Mar del Plata, Argentina and a PhD in Conservation Biology at the University of Southern Patagonia, Argentina. From 2017 to 2023, Julieta worked as a Senior Scientist researcher at the National Council of Scientific Research from Argentina at the Department of Environmental Science, National Technological University, Argentina. The main themes of her research have been the application of GIS-based modelling in nature conservation focusing on the predictive models for species occurrence and habitat suitability. She regularly carries out ornithological surveys and compiles ornithological reports, including carrying out Collision Risk Modelling to inform wind farm planning.

This report has been approved by Maeve Maher-McWilliams, Associate Director Ecologist with APEM Group Woodrow. Maeve is an experienced ecologist and has worked for over twelve years on complex environmental impact assessments and mitigation strategies for development projects across Ireland, Northern Ireland, and Scotland. Maeve has been involved in projects across several sectors such as renewable energy; linear infrastructure; flood relief schemes and port developments; tourism and recreation; residential, pharmaceutical and data centre developments. She is proficient in ecological impact assessment and Appropriate Assessment. Maeve's specialism is ornithology.

As required by Chartered Institute of Ecology and Environmental Management (CIEEM), all APEM Group Woodrow staff are required to abide by a strict code of professional conduct in all aspects of their work.

QUALIFICATIONS

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ORNITHOLOGICAL SURVEYORS

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1. OVERVIEW

Woodrow APEM Group (hereafter referred to as Woodrow) was commissioned by RWE to undertake ornithological survey work for the proposed Muingmore Wind Farm, Co. Mayo (hereafter referred to as the proposed development site). The proposed development site is for a 14-turbine wind farm, located in northwest Co. Mayo, north of Gweesalia and 1 km from Mullet/Blacksod Bay Complex Special Area of Conservation (SAC).

Survey work at the proposed development site commenced in April 2021. This report presents the methodologies and results of surveys undertaken at the proposed site between April 2021 and March 2024, and that comprise the Year 1, Year 2 and Year 3 surveys. Year 1 surveys were completed between April 2021 and March 2022, Year 2 surveys between April 2022 and March 2023 and Year 3 surveys between April 2023 and March 2024.

A summary of breeding season surveys undertaken included:

- Vantage point (VP) watches
- Breeding bird surveys including:
 - Lowland breeding wader surveys (O'Brien and Smith, 1992)
 - Dusk surveys for crepuscular species (Gilbert *et al.*, 1998)
- Breeding raptor surveys

A summary of non-breeding season surveys undertaken included:

- VP watches
- Winter walkover surveys
- Wintering waterbird surveys
- Hen harrier roost searches

This results report is a factual report which presents the survey methodologies and results from Year 1, Year 2 and Year 3 ornithological surveys and includes a discussion on the most sensitive ornithological findings. The report provides the baseline ornithological information required to inform the ornithological impact assessment for the proposed development, and will form a Technical Appendix to the Environmental Impact Assessment Report (EIAR).

2. DESK STUDY

An initial desk-based study of the proposed development site and wider area was compiled to determine the appropriate surveys required to inform any potential for ornithological constraints. A preliminary assessment of avian habitat suitability and availability was undertaken using ortho-imagery and six-inch mapping, which was viewed using Bing Maps, Google Earth Pro, Google Maps, and Ordnance Survey Ireland – GeoHive.

The National Parks and Wildlife Service (NPWS) Designations Viewer was used to identify the location of sites designated for nature conservation, specifically Special Protection Areas (SPAs) and the bird species, Special Conservation Interests (SCIs), for which these sites have been designated. EPA Maps was used to investigate hydrological connectivity to sites designated for nature conservation. SPAs occurring within an indicative distance of 15 km from (or with a hydrological connection to) the proposed development site are listed in Table 1 and Figure 1.

Table 1: SPAs and Special Areas of Conservation (SACs) within 15 km of the proposed development site

Designated site	Distance to the proposed development site	Qualifying Interests/Special Conservation Interests
Special Protection Areas (SPAs)		
Blacksod Bay/Broad Haven SPA (Site code: 004037)	c. 1 km west and south	Red-throated diver (<i>Gavia stellata</i>) [A001] Great Northern diver (<i>Gavia immer</i>) [A003] Slavonian grebe (<i>Podiceps auritus</i>) [A007] Light-bellied brent goose (<i>Branta bernicla hrota</i>) [A046] Common scoter (<i>Melanitta nigra</i>) [A065] Red-breasted merganser (<i>Mergus serrator</i>) [A069] Ringed plover (<i>Charadrius hiaticula</i>) [A137] Sanderling (<i>Calidris alba</i>) [A144] Dunlin (<i>Calidris alpina</i>) [A149] Bar-tailed godwit (<i>Limosa lapponica</i>) [A157] Curlew (<i>Numenius arquata</i>) [A160] Sandwich tern (<i>Sterna sandvicensis</i>) [A191] Dunlin (<i>Calidris alpina schinzii</i>) [A466] Wetland and waterbirds [A999]
Carrowmore Lake SPA (Site code: 004052)	c. 6.5 km north-east	Sandwich tern (<i>Sterna sandvicensis</i>) [A191]
Owenduff/Nephin Complex SPA (Site code: 004098)	c. 7.5 km south-west	Merlin (<i>Falco columbarius</i>) [A098] Golden plover (<i>Pluvialis apricaria</i>) [A140]
Mullet Peninsula SPA (Site code: 004227)	c. 10.2 km north-west	Corncrake (<i>Crex crex</i>) [A122]
Doogort Machair SPA (Site code: 004235)	c. 11.5 km south-west	Dunlin (<i>Calidris alpina schinzii</i>) [A466]
Termoncarragh Lake and Annagh Machair SPA (Site code: 004093)	c. 13.3 km north-west	Whooper swan (<i>Cygnus cygnus</i>) [A038] Barnacle goose (<i>Branta leucopsis</i>) [A045] Corncrake (<i>Crex crex</i>) [A122] Lapwing (<i>Vanellus vanellus</i>) [A142] Chough (<i>Pyrrhocorax pyrrhocorax</i>) [A346] Greenland white-fronted goose (<i>Anser albifrons flavirostris</i>) [A395] Dunlin (<i>Calidris alpina schinzii</i>) [A466] Wetland and waterbirds [A999]
Inishglora and Inishkeeragh SPA (Site code: 004084)	c. 14.5 km north-west	Storm petrel (<i>Hydrobates pelagicus</i>) [A014] Cormorant (<i>Phalacrocorax carbo</i>) [A017] Shag (<i>Phalacrocorax aristotelis</i>) [A018] Barnacle goose (<i>Branta leucopsis</i>) [A045] Lesser black-backed gull (<i>Larus fuscus</i>) [A183] Herring gull (<i>Larus argentatus</i>) [A184] Arctic tern (<i>Sterna paradisaea</i>) [A194]
Special Areas of Conservation (SAC)		
Mullet/Blacksod Bay Complex SAC (Site code: 000470)	c. 1 km west	Mudflats and sandflats not covered by seawater at low tide [1140] Large shallow inlets and bays [1160] Reefs [1170] <i>Salicornia</i> and other annuals colonising mud and sand [1310] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]

Designated site	Distance to the proposed development site	Qualifying Interests/Special Conservation Interests
		Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Atlantic decalcified fixed dunes (<i>Calluno-Ulicetea</i>) [2150] Machairs (* in Ireland) [21A0] Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150] Alkaline fens [7230] <i>Lutra lutra</i> (Otter) [1355] <i>Petalophyllum ralfsii</i> (Petalwort) [1395]
Carrowmore Lake Complex SAC (Site code: 000476)	c. 5.5 km north-east	Blanket bogs (* if active bog) [7130] Depressions on peat substrates of the Rhynchosporion [7150] <i>Saxifraga hirculus</i> (Marsh Saxifrage) [1528] <i>Hamatocaulis vernicosus</i> (Slender Green Feather-moss) [6216]
Broadhaven Bay SAC (Site code: 000472)	c. 6.5 km north	Mudflats and sandflats not covered by seawater at low tide [1140] Large shallow inlets and bays [1160] Reefs [1170] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330] Submerged or partially submerged sea caves [8330]
Owenduff/Nephin Complex SAC (Site code: 000534)	c. 7.5 km south-west	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110] Natural dystrophic lakes and ponds [3160] Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260] Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] Alpine and Boreal heaths [4060] <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] <i>Salmo salar</i> (Salmon) [1106] <i>Lutra lutra</i> (Otter) [1355] <i>Saxifraga hirculus</i> (Marsh Saxifrage) [1528] <i>Hamatocaulis vernicosus</i> (Slender Green Feathermoss) [6216]
Doogort Machair/Lough Doo SAC (Site code: 001497)	c. 9 km south-west	Machairs (* in Ireland) [21A0] <i>Petalophyllum ralfsii</i> (Petalwort) [1395]
Slieve Fyagh Bog SAC (Site code: 000542)	c. 11 km north-east	Blanket bogs (* if active bog) [7130]
Erris Head SAC (Site code: 001501)	c. 11 km north-west	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Alpine and Boreal heaths [4060]
Croaghaun/Slievemore SAC (Site code: 001955)	c. 12.5 km south-west	Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] European dry heaths [4030]

Designated site	Distance to the proposed development site	Qualifying Interests/Special Conservation Interests
		Alpine and Boreal heaths [4060] Blanket bogs (* if active bog) [7130] Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) [8110] Siliceous rocky slopes with chasmophytic vegetation [8220]
West Connacht Coast SAC (Site code: 002998)	c. 12.7 km west	<i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349]
Glenamoy Bog Complex SAC (Site code: 000500)	c. 14 km north-east	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 <i>Erica tetralix</i> [4010] <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] Depressions on peat substrates of the Rhynchosporion [7150] <i>Salmo salar</i> (Salmon) [1106] <i>Petalophyllum ralfsii</i> (Petalwort) [1395] <i>Saxifraga hirculus</i> (Marsh Saxifrage) [1528] <i>Hamatocaulis vernicosus</i> (Slender Green Feather-moss) [6216]

Bird records from the last ten years for the 10 km national grid square, F72, encompassing the proposed development site were collated from the National Biodiversity Data Centre (NBDC) database, using the report function on Biodiversity Maps¹ (Balmer *et al.*, 2013). Most of these records were based on the Bird Atlas 2007-11 (Balmer *et al.*, 2013). A full list of records and their current conservation status from *Birds of Conservation Concern in Ireland 2020-2026* (BoCCI) (Gilbert *et al.*, 2021) are listed in **Appendix I**. These records were reviewed to investigate target species potentially occurring within the proposed 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. These historical records and their conservation status (Gilbert *et al.*, 2021) are listed in **Appendix I**.

The NBDC mapping tool was also used to examine other relevant data sets including the BirdWatch Ireland bird sensitivity to wind energy layer as per Mc Guinness *et al.* (2015), though no data was found for the proposed development site.

¹ Available at <https://maps.biodiversityireland.ie/Map> (Accessed: March 2024)

Based on the Scottish Natural Heritage (SNH, 2017) guidelines, migratory populations of wintering geese and swans are considered to be notably sensitive to wind farm developments. As such, to characterise the distribution of these populations, data from recent population monitoring reports have been reviewed, and included:

- Boland and Crowe (2008), Lewis *et al.* (2019a) and Burke *et al.* (2022) for greylag goose *Anser anser* and pink-footed goose *Anser brachyrhynchus* distribution
- Burke *et al.* (2021) for whooper swan *Cygnus cygnus* distribution
- Fox *et al.* (2021) for Greenland white-fronted goose *Anser albifrons flavirostris* distribution.

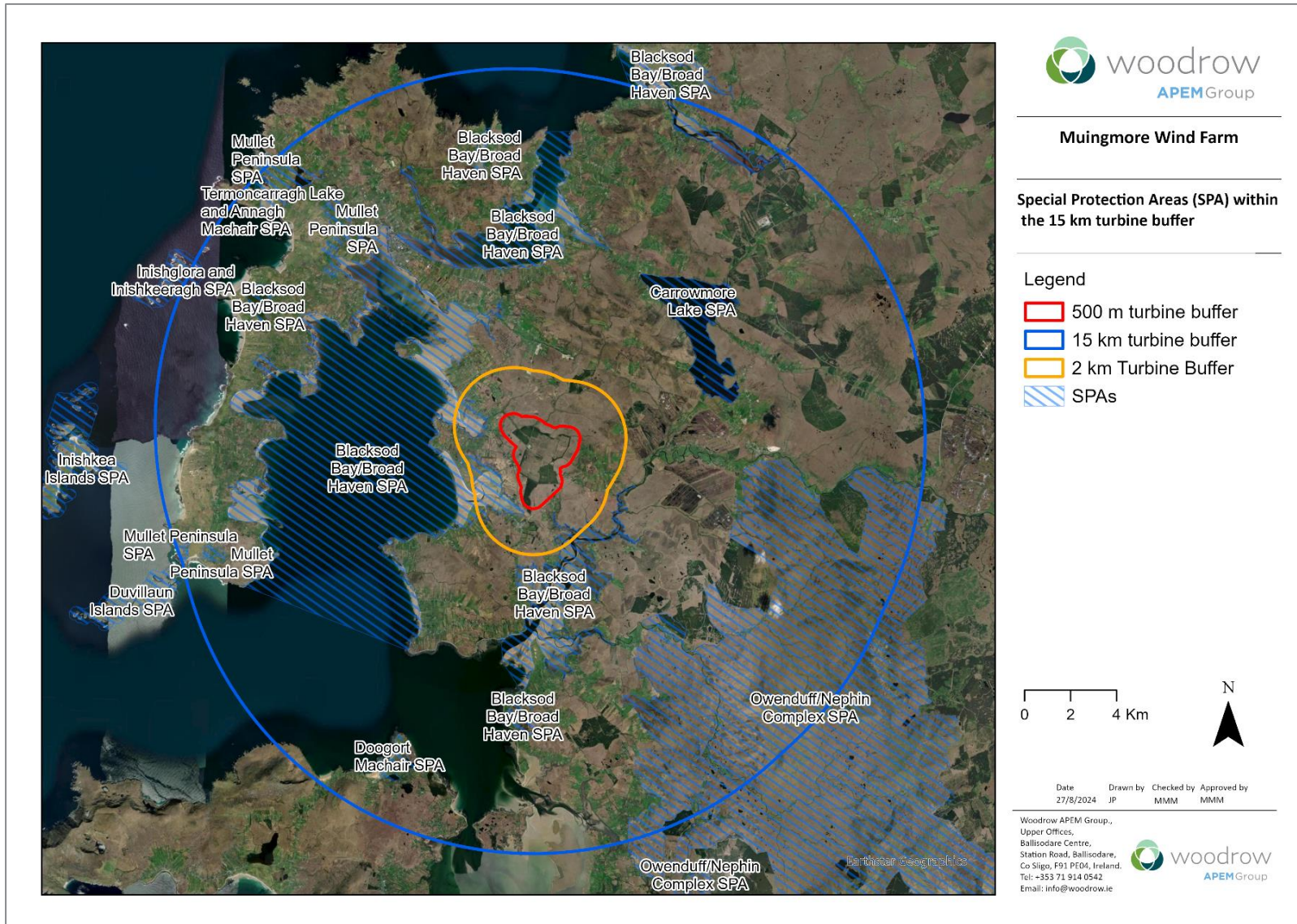


Figure 1: Special Protection Areas (SPAs) within the vicinity of the proposed development site

3. METHODOLOGY

Scottish Natural Heritage (SNH) (2017) guidelines provide recommended survey methodologies for the assessment of avian populations within and adjacent to proposed onshore wind farms. The survey methodologies utilised for ornithological surveys are outlined in the following sections and adhere to the relevant SNH guidance (SNH, 2017).

Two years of ornithological surveys are recommended by the SNH guidelines (SNH, 2017), unless it can be clearly demonstrated that a single year of data is sufficiently robust and appropriate for assessing the potential impacts of the proposal. For the proposed development, three years of ornithological surveys have been undertaken. This is to ensure there is no gap in data collection between the completion of surveys and the submission of a planning application.

3.1. VP watches

VP watches record flight line activity within the survey area, this is a 500 m buffer of the proposed turbine locations, to provide data on selected target species for assessing avian collision risk. Four

VPs were used to cover the proposed development site, and their locations are shown in

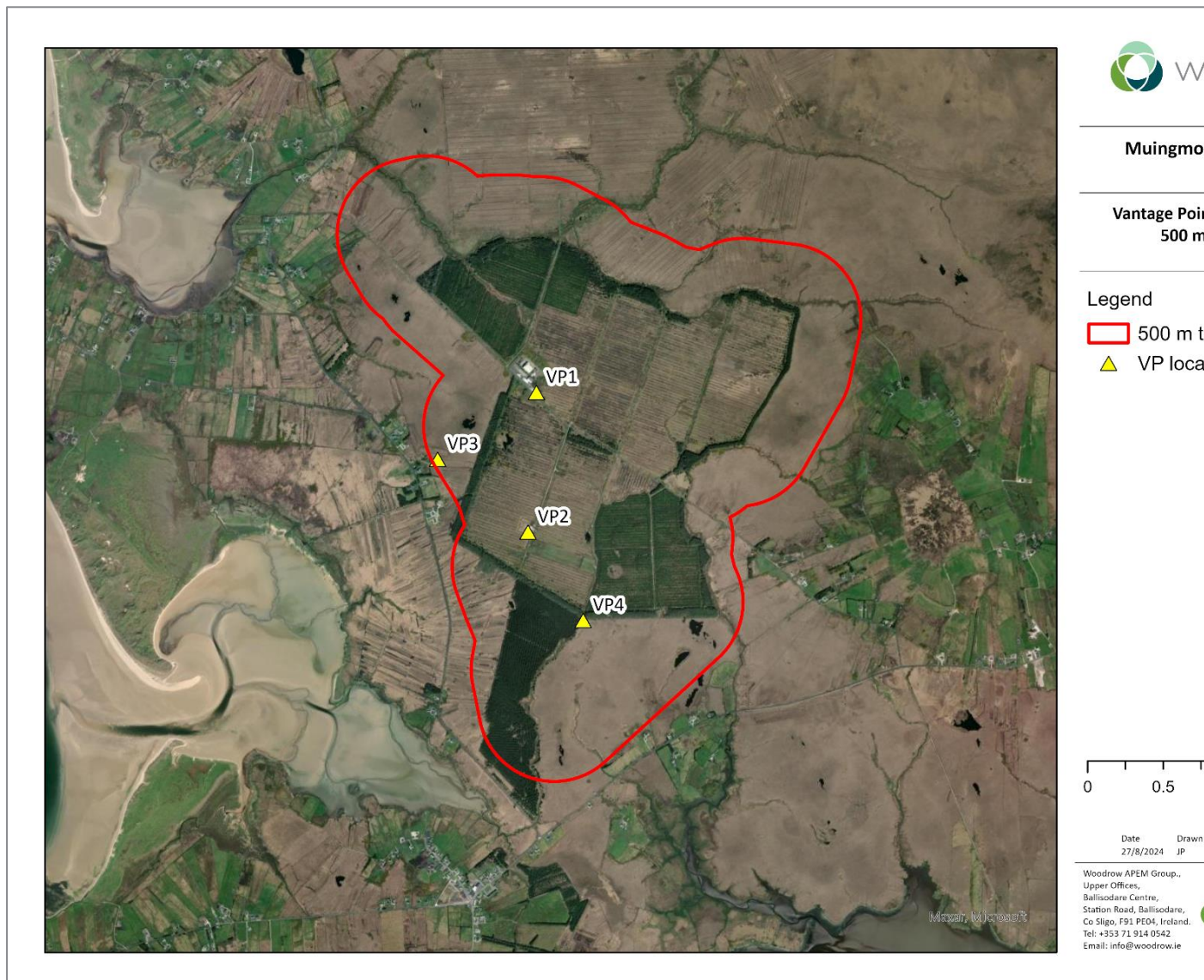


Figure 2.

Target species are those identified as being at risk from displacement effects caused by wind farm developments or from collision with turbines. Target species for which flightline 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 BoCCI (Gilbert *et al.*, 2021).

VP watches involve the surveyor observing birds from a stationary position using binoculars and a telescope. In accordance with SNH guidelines (SNH, 2017), the viewshed of the VP is scanned at five-minute intervals. When a target species is seen, the surveyor estimates the height of the bird and its usage of the area by drawing its flight path on a map and noting its behaviour. Flight heights are estimated visually. Other data collected includes the number of birds, time of detection and duration

of flight, as well as sex and age class if determinable. A list of all non-target species encountered within the proposed development site is also compiled during watches, though priority is given to recording target species in the case of busier survey days. To limit observer fatigue, surveyors did not typically undertake VP watches of more than three hours in duration without a break, unless inclement periods of weather meant watches were paused for short durations until conditions improved.

The four selected VPs provide complete coverage (98.35%) of the 500 m turbine buffer of the proposed development, see **Appendix II** for the viewshed map. The VPs selected to cover this survey area are compliant with the SNH guidelines (SNH, 2017), which stipulate that viewsheds from VPs should not extend more than 2 km and that the angle of view should also not extend beyond an arc of 180 degrees. Based on viewsheds extending 2 km, some of the VP viewsheds overlap (see **Appendix II**). Given this overlap, it is acknowledged that the flight seconds reported cumulatively for all the VP watches will provide an overestimate of target species flight times. Conducting VP surveys simultaneously from VPs with overlapping viewsheds was avoided in order to avoid any duplicate records. In the rare case that VP watches were conducted simultaneously for VPs with overlapping viewsheds, surveyors would communicate with one another if a bird was seen flying to/from another viewshed so that the bird was recorded by only one surveyor at any one time. This overlap is also corrected in the collision risk modelling.

In compliance with SNH guidelines (SNH, 2017), for each VP a minimum of 36 hours of observation has been collected during the breeding season and non-breeding season, i.e. a minimum of 72 hours per VP per year. Survey hours completed at each VP location are provided in **Appendix III**.

In addition to the standard 36 hours of VP watches during the breeding and non-breeding seasons, an important consideration for the proposed development, given its location in the north-west of Ireland, is VP coverage during the spring (March to April) and autumn (September to October) passage seasons. Geese, swans and other waterfowl migrate to Ireland for the winter period arriving largely from Iceland, Greenland and Canada. For the Year 1 surveys at the proposed development site, investigative passage VP surveys were undertaken in September and October 2021 at each of the four VP locations lasting 1.5 hours each. In Year 2 and Year 3, a minimum of 18 hours of passage VP surveys were undertaken in the spring and autumn passage season at each of the four VP locations (See **Appendix III** for details). SNH guidelines (SNH, 2017) are not prescriptive on the number of hours required during the passage seasons but should be appropriate and adequate for the site and migration activity.

A summary of VP survey hours completed for each season is provided below.

Table 2: Number of VP watch survey hours during each season

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

3.2. Breeding bird surveys

The purpose of the breeding season walkovers, according to SNH guidelines (SNH, 2017), is to give a broad overview of bird activity in the survey area using a route which is representative of the important ornithological features and habitats present within the proposed development site (SNH, 2017). Breeding bird surveys aim to provide information on the distribution of breeding birds occurring within the proposed development site, highlighting the locations of potentially sensitive species which may present an ecological constraint. The survey area for breeding bird surveys included a 500 m buffer of the proposed turbine locations, shown at



Figure 2. Walkovers surveys employed a variety of survey techniques depending on the habitat suitability and target species likely to be present.

Lowland breeding wader surveys followed the survey technique by O'Brien and Smith (1992). A minimum of three visits were undertaken in each breeding season between April and June. One visit may comprise one survey which covers the entire survey area or a number of surveys covering different areas of the survey area undertaken over consecutive days. An exception to this was in Year 2, during the 2022 breeding season, where one visit was completed over three consecutive dates. This visit was however supplemented with four dusk visits. Surveyors walked open habitats occurring within the survey area which extended to covering suitable habitats within 800 m of the proposed turbine locations for breeding curlew *Numenius arquata*. During these walkover surveys, all other bird species encountered were also noted, along with their behaviour to indicate breeding status. Observations were recorded using the ESRI application Survey123.

To record crepuscular species, such as breeding snipe, surveys running from dawn to three hours after or from late afternoon to dusk were employed to increase the chances of detecting breeding behaviour, including chipping, or drumming snipe (O'Brien & Smith, 1992). As for the above walkover surveys, one visit may comprise one survey which covers the entire survey area or a number of surveys covering different areas of the survey area undertaken over consecutive days. 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. During dusk surveys, surveyors also listened for other crepuscular and nocturnal species, including woodcock and owls.

A summary of breeding bird surveys completed for each season is provided below. Survey dates, times and weather conditions of the walkover and dusk survey is provided in **Appendix IV**.

Table 3: Breeding bird survey visits during each season

Survey year	Season	Survey type	Survey dates
Year 1	Breeding season 2021	Walkover	12/05/2021
		Walkover	17/05/2021
		Walkover	15/06/2021
		Dusk	28/06/2021
Year 2	Breeding season 2022	Walkover	24/06/2022
		Walkover	25/06/2022
		Walkover	26/06/2022
		Dusk	16/05/2022
		Dusk	02/06/2022, 06/06/2022
		Dusk	19/07/2022
Year 3	Breeding season 2023	Walkover	06/04/2023, 07/04/2023, 11/04/2023
		Walkover	06/05/2023, 07/05/2023, 08/05/2023
		Walkover	11/06/2023, 12/06/2023, 13/06/2023
		Walkover	20/06/2023
		Dusk	06/04/2023, 08/04/2023
		Dusk	05/05/2023, 06/05/2023, 08/05/2023
		Dusk	05/06/2023
		Dusk	10/06/2023
		Dusk	09/08/2023

3.3. Breeding raptor surveys

SNH guidelines (SNH, 2017) recommend surveying the wider area (hinterland) for up to 2 km from the proposed turbines for most breeding raptor species, including hen harrier *Circus cyaneus* and merlin *Falco columbarius*. This can be extended if the proposed development site lies within the potential zone of influence SPAs (SNH, 2016). In this instance, the proposed development site is not near any SPAs designated for raptors and the 2 km survey area was considered appropriate, see Figure 3.

A combination of mini-VPs, as well as driven and walked transects were used to search potential nesting habitats within the hinterland over the 2021, 2022 and 2023 breeding seasons. Survey methods for breeding raptors follow those outlined in Hardey *et al.* (2013). A total of two visits were carried out during the 2021 breeding season, one visit during the 2022 breeding season, and four visits during the 2023 breeding season. A summary of breeding raptor surveys completed for each season is provided below, and the survey dates, times and weather conditions are detailed in **Appendix V**.

Table 4: Breeding raptor survey visits during each season

Survey year	Season	Survey dates
Year 1	Breeding season 2021	31/05/2021
		01/06/2021
Year 2	Breeding season 2022	13/06/2022
Year 3	Breeding season 2023	28/03/2023
		09/04/2023, 10/04/2023
		11/06/2023, 12/06/2023, 13/06/2023, 14/06/2023
		11/07/2023

3.4. Winter walkover surveys

Winter walkover surveys aim to provide information on the distribution of birds wintering throughout the proposed development site and 500 m turbine buffer, highlighting the locations of sensitive species to be flagged as ecological constraints. Winter walkovers are important in providing context to VP watch data and facilitating validation of bird numbers utilising the proposed development site.

Winter walkovers of the proposed development site were undertaken during the Year 1 (non-breeding season 2021-22), Year 2 (non-breeding season 2022-23) and Year 3 (non-breeding season 2023-24) non-breeding seasons. Surveyors walked the survey area noting down all species encountered, ensuring to cover a sample of all habitats present. As such, winter walkovers provide useful information on the distribution of winter bird species within the proposed development site and how they are using each habitat type. A summary of breeding raptor surveys completed for each season is provided below, and the dates times and weather conditions are detailed in **Appendix VI**.

Table 5: Winter walkover survey visits during each season

Survey year	Season	Survey dates
Year 1	Non-breeding season 2021-22	28/10/2021, 31/10/2021
		11/01/2022, 12/01/2022

Survey year	Season	Survey dates
		23/02/2022, 28/02/2022
Year 2	Non-breeding season 2022-23	11/10/2022, 12/10/2022, 14/10/2022, 16/10/2022
		08/11/2022, 09/11/2022, 11/11/2022, 12/11/2022, 14/11/2022
		24/02/2023
Year 3	Non-breeding season 2023-24	15/10/2023, 16/10/2023
		07/11/2023, 08/11/2023
		11/01/2024, 18/01/2024

3.5. Wintering waterbird surveys

In assessing the impact of the proposed development site, it is important to provide contextual data on the numbers of waterbirds in the wider area relative to the usage of the proposed development site by these species. SNH guidelines (SNH, 2017) advise fortnightly monitoring of swan and geese foraging and roosting locations when occurring in the environs of the site (as detailed in Gilbert *et al.*, 1998), and specifically where SPAs are designated for these species. Survey areas of up to 500 m from the proposed development site for foraging locations and up to 6 km from the site for roost locations are recommended, although this may be extended where high levels of activity are anticipated (Figure 3).

In Ireland, swan and goose distribution is not well documented beyond designated sites. In addition, many wintering waterbirds occur outside of SPAs. As such, the number of survey visits undertaken was subject to the level of waterbird activity recorded within the proposed development and wider area. The surveys were based on the approach employed by BirdWatch Ireland’s Irish Wetland Bird Surveys (I-WeBS) and the survey area was extended up to 6 km from the proposed development to cover turloughs and loughs in the wider area which were considered suitable for foraging and roosting wintering waterbirds Figure 3.

SNH guidelines recommend that core foraging ranges of species should be examined to assess connectivity between the site and surrounding SPAs (SNH, 2016 and 2017). As detailed in Section 2, the closest SPA to the survey area is Blacksod Bay/Broad Haven SPA (site code: 004037), see Figure 1, which lies 1 km west. This site is of high ornithological importance for its excellent diversity of wintering waterbirds, including internationally important populations of great northern diver *Gavia immer* and light-bellied brent goose *Branta bernicla hrota*, and nationally important populations of nine other species. Of particular note is the usage of the site by over 20% of the all-Ireland populations of great northern diver and common scoter *Melanitta nigra*. It is also a nationally important breeding site for sandwich tern *Sterna sandvicensis* and dunlin *Calidris alpina*. Eight of the species that occur regularly are listed in Annex I of the EU Birds Directive, i.e. great northern diver, red-throated diver *Gavia stellata*, golden plover *Pluvialis apricaria*, bar-tailed godwit *Limosa lapponica*, sandwich tern, common tern *Sterna hirundo* and arctic tern *Sterna paradisaea*. Blacksod Bay and Broad Haven is a Ramsar Convention site.

To determine the density of use by wintering bird populations, and especially to identify any foraging or roosting sites for swans and geese, point count surveys (following those employed for I-

WebS) were undertaken to survey all publicly accessible/viewable bogs, ponds, canals, rivers and other wetland habitats within the wider area of the proposed wind farm, as shown at Figure 3.

A summary of wintering waterbird surveys completed for each season is provided below, and the dates times and weather conditions are detailed in **Appendix VII**. Surveys focussed on waterbirds, other target species, notably raptors, present during the surveys were also recorded.

Table 6: Wintering waterbird survey visits during each season

Survey year	Season	Survey dates
Year 1	Non-breeding season 2021-22	27/10/2021, 31/10/2021
		15/11/2021
		30/11/2021
		09/12/2021, 12/12/2021
		17/01/2022
		31/01/2022, 01/02/2022
		09/02/2022, 15/02/2022
17/03/2022		
Year 2	Non-breeding season 2022-23	15/10/2022
		12/11/2022, 17/11/2022
		06/12/2022, 08/12/2022, 09/12/2022, 11/12/2022
		21/01/2023, 22/01/2023, 25/01/2023
		20/02/2023, 23/02/2023
		04/03/2023, 06/03/2023
Year 3	Non-breeding season 2023-24	15/10/2023, 16/10/2023
		03/11/2023, 06/11/2023
		31/12/2023
		16/01/2024
		05/03/2024
		22/03/2024, 25/03/2024

3.6. Bioacoustic Monitoring

As mentioned under the VP watch methodology, the location of the proposed development site in the north-west of Ireland is an important consideration for the survey design to ensure surveys adequately cover migratory species. In addition, the proximity of Blacksod Bay/Broad Haven SPA and Carrowmore Lake SPA has been a consideration in determining the need for bioacoustic monitoring of night-time flights at the proposed development site. Due to these factors, it was deemed judicious to use bioacoustic monitoring equipment to supplement day-time VP watches which would not capture the occurrence of waterbird flights at night. Bioacoustic monitoring does not provide data on the abundance of species, however it does confirm the presence or absence of species.

In Year 2, two bioacoustic monitors, SongMeter-Minis, were deployed with an acoustic microphone set to record the bird calls. The deployment was made in the spring passage season between March and April 2023. In Year 3, three bioacoustic monitors were deployed during the spring passage season between February and April 2024. Monitoring was repeated at two locations with a third location added in Year 3. 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. The bioacoustic monitors were placed in open habitats to reduce any noise interference with trees or other structures. Detectors were set to record between 2 hours before sunset to 3 hours after sunset, and between 3 hours before sunrise to 2 hours after sunrise.

Table 7: Bioacoustic detector locations and deployment periods

Survey year	Season	Monitoring unit no.	Location	Deployment period
Year 2	Spring passage	WSS049	54.151324, -9.906162	13/03/2023-11/04/2023
		WSS045	54.136525, -9.892722	13/03/2023-11/04/2023
Year 3	Spring passage	WSS050	54.151324, -9.906162	13/02/2024 - 13/04/2024
		WSS042	54.136525, -9.892722	13/02/2024 - 13/04/2024
		WSS049	54.146473, -9.874215	13/02/2024 - 27/03/2024

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.

Across the two years of bioacoustic monitor there was a total of 1294hrs of sound data analysed using Kaleidoscope Pro. A cluster analysis was performed using the following settings for the target species: F(min) = 500Hz; F(max) = 5000Hz; Length(min) = 0.1s; Length(max) = 7.5s; and, Inter-syllable gap = 0.35s.

3.7. Hen harrier roost searches

SNH guidance (SNH, 2017) stipulates that surveying for communal raptor roosts, including those of hen harriers, roost sites within 2 km of a proposed development site should be identified (see Figure 3 for the survey areas).

With respect to the proposed development, the approach to surveying for hen harrier roosts was determined by two factors:

- Availability of potentially suitable roosting habitat in the vicinity of the proposed development, as described by Clarke and Watson (1990) and in the Irish national hen harrier winter roost survey guidelines (O'Donoghue, 2012 and 2019); and
- Hen harrier activity observed during VP watches, site walkovers and wider area surveys.

SNH (2017) defers to Hardey *et al.* (2013) for specific roost survey methodology, requiring surveyors to employ professional judgement in identifying and targeting potential roosts based on observed flight activity within or adjacent to the proposed development. Hardey *et al.* (2013) recommend locating birds in the late afternoon and then attempting to track them back to roosts. O'Donoghue (2019) notes that the best time to conduct a roost watch is at least 30 minutes before sunset until dark or 30 minutes before sunrise until at least 30 minutes after sunrise.

A total of four roost watches were carried out during the 2021-22 non-breeding season, 12 roost watches during the 2022-23 non-breeding season, and four during the 2023-24 non-breeding season. A summary of surveys completed for each season is provided below, and the dates, times and weather conditions are detailed in **Appendix VIII**.

Table 8: Hen harrier roost searches during each season

Survey year	Season	Survey dates
Year 1	Non-breeding season 2021-22	27/10/2021

Survey year	Season	Survey dates
		15/11/2021
		17/12/2021
		27/01/2022
Year 2	Non-breeding season 2022-23	12/10/2022
		14/10/2022
		19/10/2022
		09/11/2022
		13/11/2022
		14/11/2022
		21/01/2023
		29/01/2023
		30/01/2023
		23/02/2023
		02/03/2023
		05/03/2023
Year 3	Non-breeding season 2023-24	08/01/2024
		10/01/2024
		16/01/2024
		27/02/2024

3.8. Survey limitations

Survey limitations included the following:

- The number of breeding walkover and dusk surveys recommended by SNH (SNH, 2017) were not accomplished in the 2021 and 2022 breeding seasons
- The number of breeding raptor surveys recommended by SNH (SNH, 2017) were not accomplished in the 2021 and 2022 breeding seasons
- Access to the full ornithological survey area for walkover surveys could only be undertaken on lands where permission had been granted.
- During the Year 1 autumn passaging season, 4.5 hours per VP location were completed. These surveys were investigative to understand the usage of the area by migratory species. While SNH (2017) guidelines are not prescriptive, a greater survey effort will be undertaken in following passage seasons to gather more information.

Despite the limitations mentioned above, it is considered that the surveys carried out in Year 1, Year 2 and Year 3 provide sufficient data to identify any ornithological constraints and provide a robust data set for the purposed of an ornithological impact assessment for the proposed development.

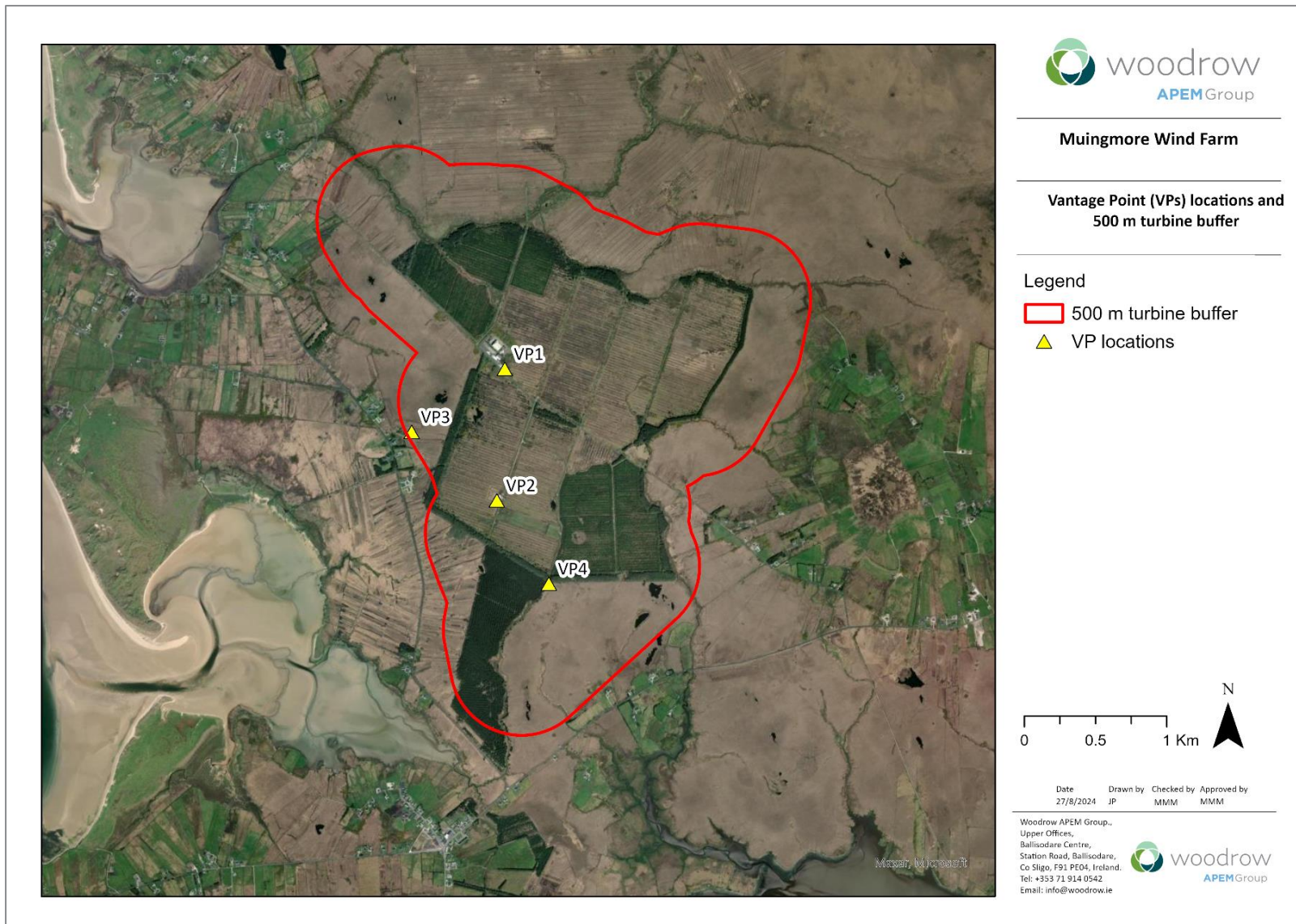


Figure 2: 500 m turbine buffer for VP watches, breeding bird surveys and winter walkover surveys

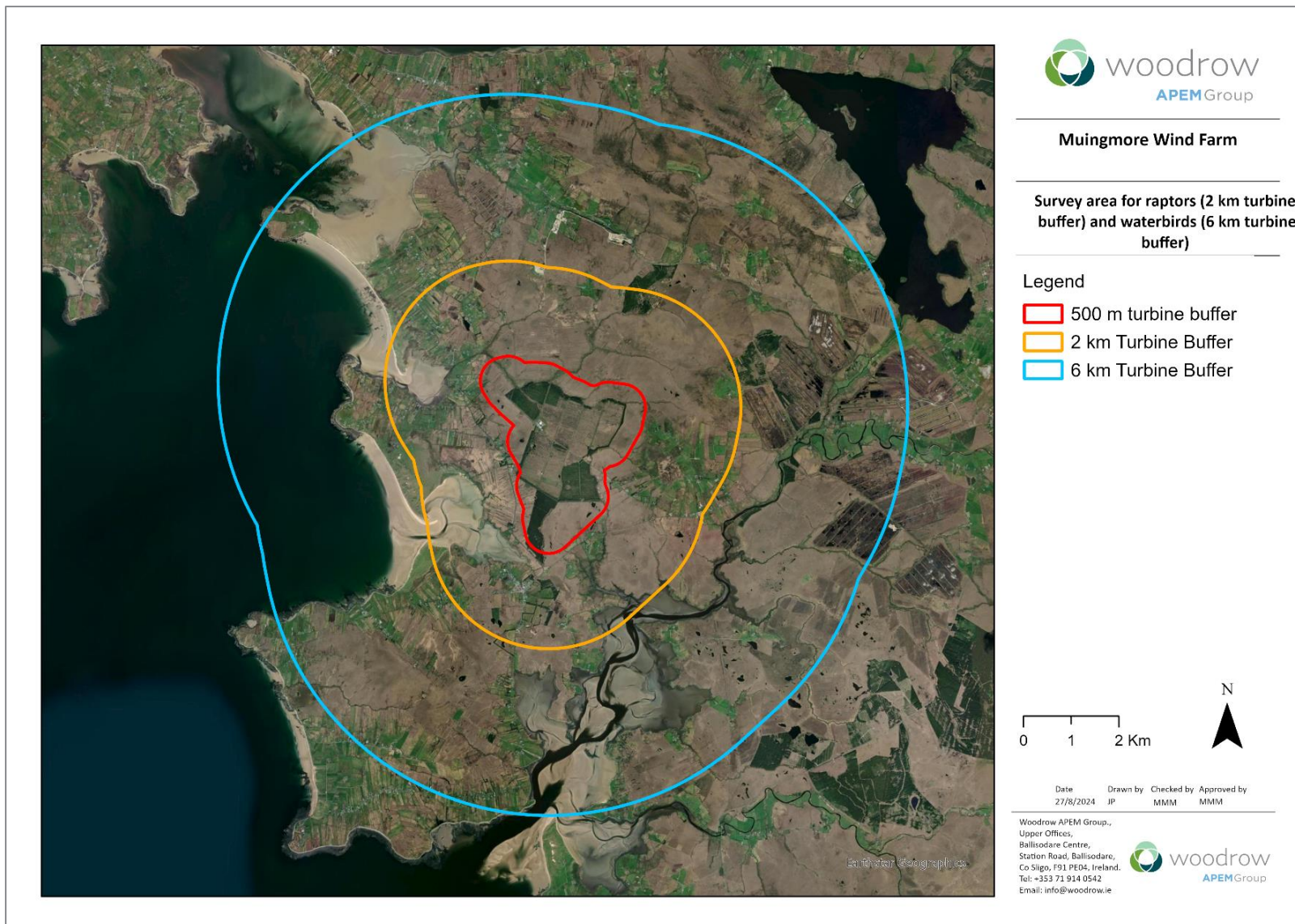


Figure 3: Survey area for breeding raptors and hen harrier roost searches (2 km turbine buffer) and for wintering waterbird surveys (6 km turbine buffer)

4. SURVEY RESULTS

4.1. VP watches

A total of 33 target species were recorded during VP watches over three years of surveys between April 2021 and March 2024. Flight times for target species recorded within the 500 m turbine buffer over three years of surveys are provided in

Table 9. Flightline maps are provided in **Appendix IX**, where individual flightlines shown on the maps can be cross-referenced via identification numbers to additional data on flight behaviour within attribute tables. To examine seasonal or annual variation in the occurrence of target species, the flight time data has been presented by the year:

- Year 1 - 2021 breeding season data (Table 10), 2021 autumn passage season data (Table 11), and 2021-22 non-breeding season data (Table 12)
- Year 2 - 2022 breeding season data (Table 13), 2022 autumn passage season data (Table 14), 2022-23 non-breeding season data (Table 15), and 2023 spring passage season data (Table 16)
- Year 3 - 2023 breeding season data (Table 17), the 2023 autumn passage season data (Table 18), 2023-24 non-breeding season data (Table 19) and 2024 spring passage season data (Table 20)

Flight time is split into time in different altitudinal levels to better understand the extent to which target species fly within the Collision Risk Zone (CRZ). The flight height range of the CRZ was defined as 10 to 150 m, a precautionary range based on the lowest minimum rotor swept height and highest tip height for the proposed turbine specifications.

A total of 11 species, which are highlighted in

Table 9, were identified as having flight times greater than 1,000 seconds within the CRZ. Generally, Collision Risk Modelling (CRM) is run for target species with a total aggregate flight time (i.e. number of individuals x flight time) of greater than 1,000 seconds within the CRZ, over a three-year study period. These species included:

- Four gull species (black-headed gull *Larus ridibundus*, great black-backed gull *Larus marinus*, herring gull *Larus argentatus*, and lesser black-backed gull *Larus fuscus*)
- Three raptor species (buzzard *Buteo buteo*, kestrel *Falco tinnunculus*, and sparrowhawk *Accipiter nisus*)
- Two wader species (snipe *Gallinago gallinago* and Wilson's phalarope *Phalaropus tricolor*), and
- Two other waterbird species (grey heron *Ardea cinerea* and greylag goose).

Table 9: Overall target species flight time, number of flights and the maximum number of individuals observed at any one time within the 500 m turbine buffer between April 2021 and May 2024

Target species	Max no. birds	No. observations	Flight time (seconds) in height bands			
			A 0-10 m	B 10-150 m	C >150 m	Total
Black-headed gull	3	71	2,852	3,537	-	6,389
Buzzard	2	9	-	741	310-	1,051
Canada goose	1	1	-	50	-	50
Common gull	2	6	-	699	-	699

Target species	Max no. birds	No. observations	Flight time (seconds) in height bands			
			A 0-10 m	B 10-150 m	C >150 m	Total
Common tern	1	2	-	54	-	54
Cormorant	1	5	-	510	-	510
Curlew	2	1	-	-	-	-
Golden plover	3	1	-	36	-	36
Great black-backed gull	4	65	9	6,654	-	6,663
Greenshank	1	1	-	20	-	20
Grey heron	3	36	421	1,105	300	1,826
Greylag goose	17	1	-	4,335	-	4,335
Gull sp.	4	8	-	443	-	443
Hen harrier	1	9	850	265	-	1115
Herring gull	5	64	23	2,650	-	2,673
Hobby	1	3	50	240	-	290
Kestrel	4	192	864	14,977	2,060	17,901
Kittiwake	1	1	-	40	-	40
Lapwing	3	1	-	222	-	222
Lesser black-backed gull	5	91	306	8,452	-	8,758
Mallard	4	25	107	1070	-	1,177
Meadow pipit	7	7	70	78	-	148
Merlin	1	5	88	26	-	114
Mistle thrush	6	1	-	210	-	210
Peregrine	1	11	-	465	-	465
Pheasant	1	2	22	-	-	22
Raptor Sp.	1	1	-	30	-	30
Snipe	27	22	5	2,153	-	2,158
Sparrowhawk	2	80	756	5,588	-	6,359
Swift	1	1	-	12	-	12
Teal	5	3	40	87	-	127
Whimbrel	7	1	-	-	945	945
Whooper swan	5	3	-	1,125	-	1,125
Wilson's phalarope	18	1	-	1,080	-	1,080
Woodcock	1	4	14	21	-	35

Table 10: 2021 breeding season target species flight time, number of flights and the maximum number of individuals observed at any one time within the 500 m turbine buffer

Target species	Max no. birds	No. observations	Flight time (seconds) in height bands			
			A 0-10 m	B 10-150 m	C >150 m	Total
Black-headed gull	2	47	332	2,087	-	2,419
Buzzard	1	1	-	53	-	53
Common gull	2	1	-	580	-	580
Great black-backed gull	1	11	-	765	-	765
Grey heron	1	7	119	143	-	262
Herring gull	2	16	-	576	-	576
Kestrel	2	48	430	3,349	-	3,779

Target species	Max no. birds	No. observations	Flight time (seconds) in height bands			
			A 0-10 m	B 10-150 m	C >150 m	Total
Lesser black-backed gull	3	53	171	2,856	-	3,027
Mallard	1	4	44	46	-	90
Pheasant	1	1	12	-	-	12
Sparrowhawk	1	1	14	-	-	14
Teal	1	1	-	12	-	12

Table 11: 2021 autumn passage season target species flight time, number of flights and the maximum number of individuals observed at any one time within the 500 m turbine buffer

Target species	Max no. birds	No. observations	Flight time (seconds) in height bands			
			A 0-10 m	B 10-150 m	C >150 m	Total
Kestrel	1	1	-	134	-	134
Pheasant	1	1	10	-	-	10
Sparrowhawk	2	13	393	1,328	-	1,721

Table 12: 2021-22 non-breeding season target species flight time, number of flights and the maximum number of individuals observed at any one time within the 500 m turbine buffer

Target species	Max no. birds	No. observations	Flight time (seconds) in height bands			
			A 0-10 m	B 10-150 m	C >150 m	Total
Great black-backed gull	2	10	-	490	-	490
Grey heron	3	6	47	244	-	291
Kestrel	1	15	-	470	-	470
Lapwing	3	1	-	222	-	222
Merlin	1	1	-	26	-	26
Snipe	1	5	5	45	-	50
Sparrowhawk	2	23	15	963	-	978
Whooper swan	3	1	-	120	-	120
Woodcock	1	4	14	21	-	35

Table 13: 2022 breeding season target species flight time, number of flights and the maximum number of individuals observed at any one time within the 500 m turbine buffer

Target species	Max no. birds	No. observations	Flight time (seconds) in height bands			
			A 0-10 m	B 10-150 m	C >150 m	Total
Black-headed gull	3	6	-	510	-	510
Buzzard	2	6	-	938	-	938
Common tern	1	2	-	54	-	54
Great black-backed gull	2	10	-	360	-	360
Grey heron	1	7	10	180	180	370
Gull Sp.	4	7	-	418	-	418
Hen harrier	1	2	-	225	-	225
Herring gull	2	29	23	813	-	836
Hobby	1	3	50	240	-	290
Kestrel	4	32	-	5,632	700	6,332
Lesser black-backed gull	2	10	45	522	-	567
Mallard	2	8	-	278	-	278

Target species	Max no. birds	No. observations	Flight time (seconds) in height bands			
			A 0-10 m	B 10-150 m	C >150 m	Total
Meadow pipit	7	3	70	10	-	80
Raptor sp.	1	1	-	30	-	30
Sparrowhawk	1	1	-	30	-	30

Table 14: 2022 autumn passage season target species flight time, number of flights and the maximum number of individuals observed at any one time within the 500 m turbine buffer

Target species	Max no. birds	No. observations	Flight time (seconds) in height bands			
			A 0-10 m	B 10-150 m	C >150 m	Total
Black-headed gull	2	2	-	75	-	75
Cormorant	1	3	-	230	-	230
Curlew	2	1	-	-	-	-
Great black-backed gull	1	1	-	270	-	270
Grey heron	1	1	-	120	-	120
Herring gull	1	2	-	135	-	135
Kestrel	2	7	345	200	-	545
Peregrine	1	4	-	245	-	245
Snipe	27	4	-	1,475	-	1,475
Sparrowhawk	2	3	35	175	-	210

Table 15: 2022-23 non-breeding season target species flight time, number of flights and the maximum number of individuals observed at any one time within the 500 m turbine buffer

Target species	Max no. birds	No. observations	Flight time (seconds) in height bands			
			A 0-10 m	B 10-150 m	C >150 m	Total
Black-headed gull	1	1	-	25	-	25
Buzzard	1	2	-	60	-	60
Common gull	2	2	-	-	-	-
Cormorant	1	1	-	165	-	165
Great black-backed gull	3	8	-	1,985	-	1,985
Greenshank	1	1	-	20	-	20
Grey heron	1	2	120	40	-	160
Hen harrier	1	3	450	40	-	490
Kestrel	2	8	55	1,010	-	1,065
Lesser black-backed gull	2	1	-	250	-	250
Mallard	4	2	45	40	-	85
Merlin	1	1	30	-	-	30
Peregrine	1	4	-	145	-	145
Snipe	2	4	-	365	-	365
Sparrowhawk	2	12	110	1,575	-	1,685
Whooper swan	5	1	-	875	-	875
Wilson's phalarope	18	1	-	1,080	-	1,080

Table 16: 2023 spring passage season target species flight time, number of flights and the maximum number of individuals observed at any one time within the 500 m turbine buffer

Target species	Max no. birds	No. observations	Flight time (seconds) in height bands			
			A 0-10 m	B 10-150 m	C >150 m	Total
Cormorant	1	1	-	115	-	115
Great black-backed gull	4	10	-	1,484	-	1,484
Grey heron	1	6	125	215	-	340
Greylag goose	17	1	-	4,335	-	4,335
Hen harrier	1	1	160	-	-	160
Herring gull	1	2	-	95	-	95
Kestrel	2	12	-	760	-	760
Kittiwake	1	1	-	40	-	40
Lesser black-backed gull	3	2	90	75	-	165
Mallard	4	2	10	400	-	410
Merlin	1	2	23	-	-	23
Sparrowhawk	1	6	85	1,125	-	1,210
Teal	2	1	40	-	-	40

Table 17: 2023 breeding season target species flight time, number of flights and the maximum number of individuals observed at any one time within the 500 m turbine buffer

Target species	Max no. birds	No. observations	Flight time (seconds) in height bands			
			A 0-10 m	B 10- 150 m	C >150 m	Total
Black-headed gull	2	13	2,520	696	-	3,216
Canada goose	1	1	-	50	-	50
Common gull	1	2	-	109	-	109
Golden plover	3	1	-	36	-	36
Great black-backed gull	2	10	-	1,025	-	1,025
Grey heron	1	2	-	45	-	45
Gull Sp.	1	1	-	25	-	25
Herring gull	5	12	-	891	-	891
Kestrel	2	39	-	3,474	-	3,474
Lesser black-backed gull	2	10	-	1,608	-	1,608
Mallard	2	2	-	40	-	40
Meadow pipit	4	4	-	68	-	68
Mistle thrush	6	1	-	210	-	210
Snipe	2	7	-	200	-	200
Sparrowhawk	1	13	60	200	-	260
Swift	1	1	-	12	-	12
Teal	5	1	-	75	-	75
Whimbrel	7	1	-	-	945	945

Table 18: 2023 autumn passage season target species flight time, number of flights and the maximum number of individuals observed at any one time within the 500 m turbine buffer

Target species	Max no. birds	No. observations	Flight time (seconds) in height bands			
			A 0-10 m	B 10-150 m	C >150 m	Total
Black-headed gull	1	1	-	20	-	20
Grey heron	1	1	-	15	-	15
Hen harrier	1	1	40	-	-	40

Target species	Max no. birds	No. observations	Flight time (seconds) in height bands			
			A 0-10 m	B 10-150 m	C >150 m	Total
Herring gull	1	2	-	95	-	95
Kestrel	1	5	5	105	-	110
Lesser black-backed gull	1	4	-	350	-	350
Snipe	2	2	-	68	-	68
Sparrowhawk	1	1	15	-	-	15

Table 19: 2023-24 non-breeding season target species flight time, number of flights and the maximum number of individuals observed at any one time within the 500 m turbine buffer

Target species	Max no. birds	No. observations	Flight time (seconds) in height bands			
			A 0-10 m	B 10-150 m	C >150 m	Total
Common gull	1	1	-	10	-	10
Great black-backed gull	2	3	-	275	-	275
Hen harrier	1	1	20	-	-	20
Kestrel	2	6	-	340	-	340
Lesser black-backed gull	1	1	-	30	-	30
Mallard	2	1	-	60	-	60
Merlin	1	1	35	-	-	35
Sparrowhawk	1	2	15	-	-	15

Table 20: 2024 spring passage season target species flight time, number of flights and the maximum number of individuals observed at any one time within the 500 m turbine buffer

Target species	Max no. birds	No. observations	Flight time (seconds) in height bands			
			A 0-10 m	B 10-150 m	C >150 m	Total
Black-headed gull	1	1	-	124	-	124
Great black-backed gull	1	2	9	-	-	9
Grey heron	1	4	-	223	-	223
Hen harrier	1	1	180	-	-	180
Herring gull	1	1	-	45	-	45
Kestrel	2	19	29	863	-	892
Lesser black-backed gull	5	10	-	2,761	-	2,761
Mallard	4	6	8	206	-	214
Peregrine	1	3	-	75	-	75
Sparrowhawk	1	5	29	192	-	221
Whooper swan	1	1	-	130	-	130

4.2. Breeding bird surveys

4.2.1. Breeding season 2021

Breeding bird walkovers including dusk surveys covering the proposed development site were undertaken between May and June 2021. A total of 38 different bird species were recorded during these surveys. Table 21 lists red and amber-listed species recorded, the number of individuals recorded and their breeding status within the 500 m turbine buffer. Figure 4 and Figure 5 show the

locations of red and amber-listed birds recorded during the 2021 breeding season, respectively. A list of all species recorded, including green-listed species, is provided in **Appendix X**.

Table 21: Summary of breeding bird walkover and dusk surveys carried out during the 2021 breeding season

Species	BTO code	No. individuals			BoCCI 2020-2026	Breeding status within 500 m turbine buffer
		Visit 1	Visit 2	Visit 3		
Kestrel	K	2	1	-	Red	A breeding pair of kestrels has been confirmed within the existing buildings in the central area of the site
Meadow pipit	MP	-	-	30	Red	Breeding in suitable habitats within the 500 m turbine buffer
Snipe	SN	2	1	-	Red	Snipe were recorded chipping and drumming to the north-west and south-east of the 500 m turbine buffer
Black-headed gull	BH	-	-	4	Amber	Not breeding within the 500 m turbine buffer
Goldcrest	GC	-	4	2	Amber	Breeding in suitable forestry habitat within the 500 m turbine buffer
Lesser black-backed gull	LB	1	5	-	Amber	Five observations were recorded in the central part of the site. One potential breeding territory within the 500 m turbine buffer
Mallard	MA	5	-	-	Amber	Likely breeding in a small waterbody in the west within the 500 m turbine buffer
Skylark	S	-	2	2	Amber	Breeding in suitable habitat within the 500 m turbine buffer
Starling	SG	2	-	-	Amber	One observation recorded near the buildings located in the central part of the site
Swallow	SL	2	3	-	Amber	Two observations were recorded in the north and central parts of the 500 m turbine buffer. Likely to breed in the north of the site where suitable habitats are present, although no nesting site is located
Teal	T	1	2	-	Amber	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	WW	2	13	14	Amber	Breeding in suitable woodland and scrub habitat within the 500 m turbine buffer and wider area

4.2.2. Breeding season 2022

A total of 27 different bird species were recorded during the 2022 breeding bird surveys. Table 22 lists the species, the number of individuals recorded on each visit and the BoCCI conservation status following Gilbert *et al.* (2021). The breeding status of each species within the 500 m turbine buffer is also provided in this table. Figure 6 and Figure 7 show the locations of red and amber-listed birds recorded during the 2022 breeding bird surveys, respectively. A list of all species recorded, including green-listed species, is provided in **Appendix X**.

Table 22: Summary of breeding bird walkover and dusk surveys carried out during the 2022 breeding season

Species	BTO code	No. individuals	BoCCI 2020-2026	Breeding status within 500 m turbine buffer
		Visit 1		
Kestrel	K.	2	Red	A breeding pair of kestrel was confirmed in the central area of the site, as it was recorded in the previous breeding season
Meadow pipit	MP	45	Red	Breeding in suitable habitat within the 500 m turbine buffer
Snipe	SN	1	Red	Snipe were recorded chipping and drumming to the south-east of the 500 m turbine buffer
Black-headed gull	BH	6	Amber	Not breeding within the 500 m turbine buffer
Herring gull	HG	1	Amber	Not breeding within the 500 m turbine buffer
Lesser black-backed gull	LB	1	Amber	Not breeding within the 500 m turbine buffer
Skylark	S.	4	Amber	Breeding in suitable habitat within the 500 m turbine buffer
Starling	SG	12	Amber	One observation with 12 individuals was recorded in the north-east side of the site. No breeding behaviour was recorded
Swallow	SL	12	Amber	One observation with 12 individuals was recorded in the central part of the site. No breeding site was located
Willow warbler	WW	12	Amber	Breeding in suitable woodland and scrub habitat within the 500 m turbine buffer and wider area

4.2.3. Breeding season 2023

A total of 41 different bird species were recorded during the 2023 breeding bird surveys. Table 23 lists the species, the number of individuals recorded on each visit and the BoCCI conservation status following Gilbert *et al.* (2021). The breeding status of each species within the 500 m turbine buffer is also provided in this table. Figure 8 and Figure 9 show the locations of red and amber-listed birds recorded during the 2023 breeding bird surveys, respectively. A list of all species recorded, including green-listed species, is provided in **Appendix X**.

Table 23: Summary of breeding bird walkover and dusk surveys carried out during the 2023 breeding season

Species	BTO code	No. individuals				BoCCI 2020-2026	Breeding status within 500m turbine buffer
		Visit 1	Visit 2	Visit 3	Visit 4		
Kestrel	K.	-	-	4	-	Red	A breeding pair of kestrel was confirmed in the central area of the site, as it was recorded in the two previous breeding seasons
Meadow pipit	MP	56	26	38	18	Red	Breeding in suitable habitat within the 500 m turbine buffer
Snipe	SN	11	1	-	3	Red	Snipe were recorded chipping and drumming to south-east of the 500 m turbine buffer
Goldcrest	GC	19	28	28	8	Amber	Breeding in suitable forestry habitat within the 500 m turbine buffer, which is consistent with breeding territory locations recorded during the 2021 breeding season
House sparrow	HS	-	2	-	-	Amber	One observation with two individuals was recorded. No breeding behaviour was noted
Linnet	LI	-	-	2	-	Amber	One observation with two individuals was recorded. No breeding behaviour was noted
Mallard	MA	5	-	1	-	Amber	All flying individuals. No breeding site was recorded
Sand martin	SM	-	2	-	-	Amber	A couple was recorded feeding in a pasture in the north-west of the site. No breeding colonies were located
Skylark	S.	12	26	24	4	Amber	Breeding in suitable habitat within the 500 m turbine buffer
Starling	SG	6	-	-	-	Amber	Two observations with 6 and 4 individuals were recorded in the central part of the site. No breeding behaviour was recorded
Swallow	SL	2	18	7	3	Amber	Likely breeding in suitable structures in the central part of the site within the 500 m turbine buffer and wider area
Teal	T.	2	-	1	-	Amber	Two observations were recorded in a small waterbody in the south within the 500 m turbine buffer. No breeding site was located
Willow warbler	WW	25	53	48	4	Amber	Breeding in suitable woodland and scrub habitat within the 500 m turbine buffer and wider area

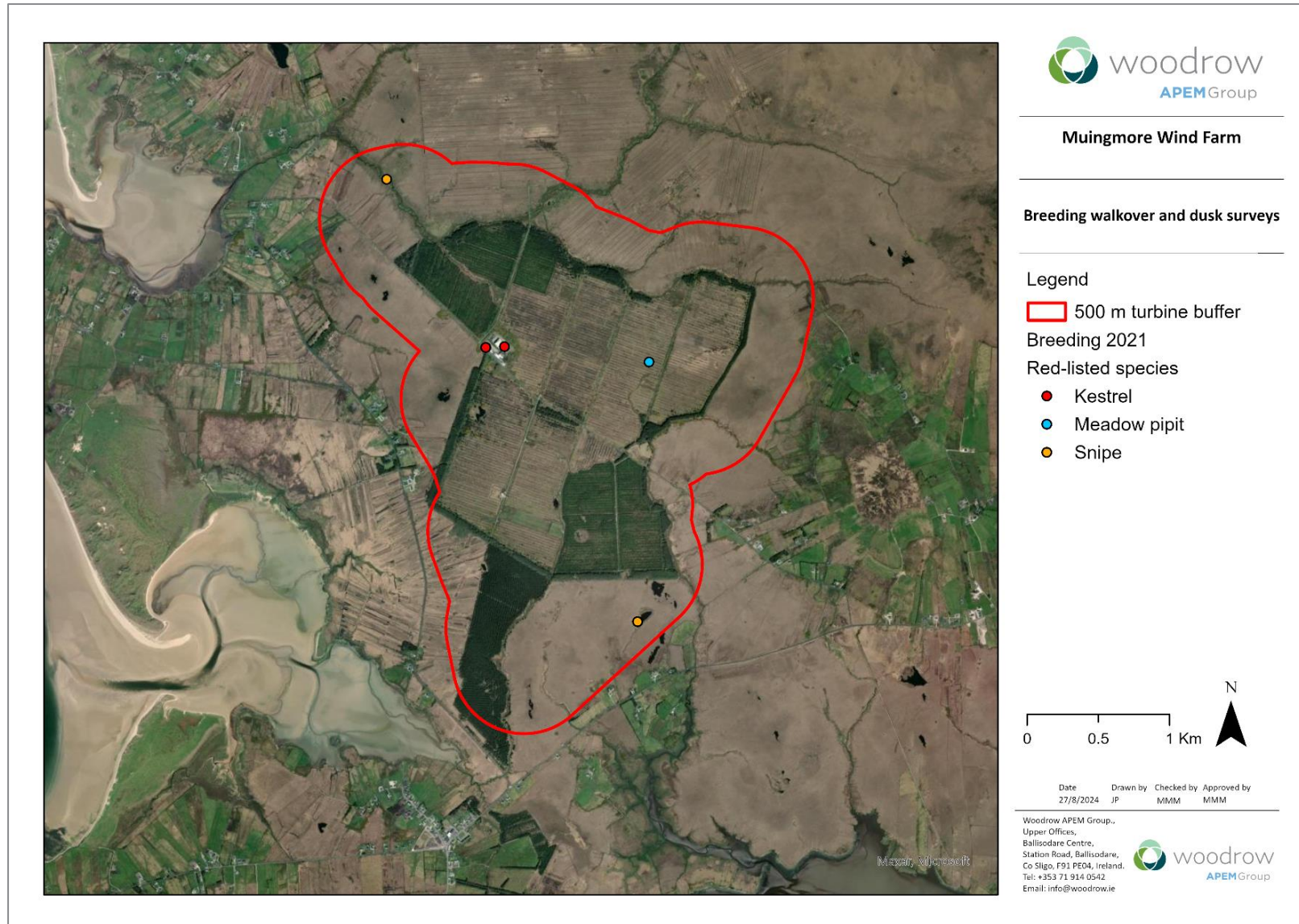


Figure 4: Red-listed species recorded during the 2021 breeding bird surveys within 500 m turbine buffer

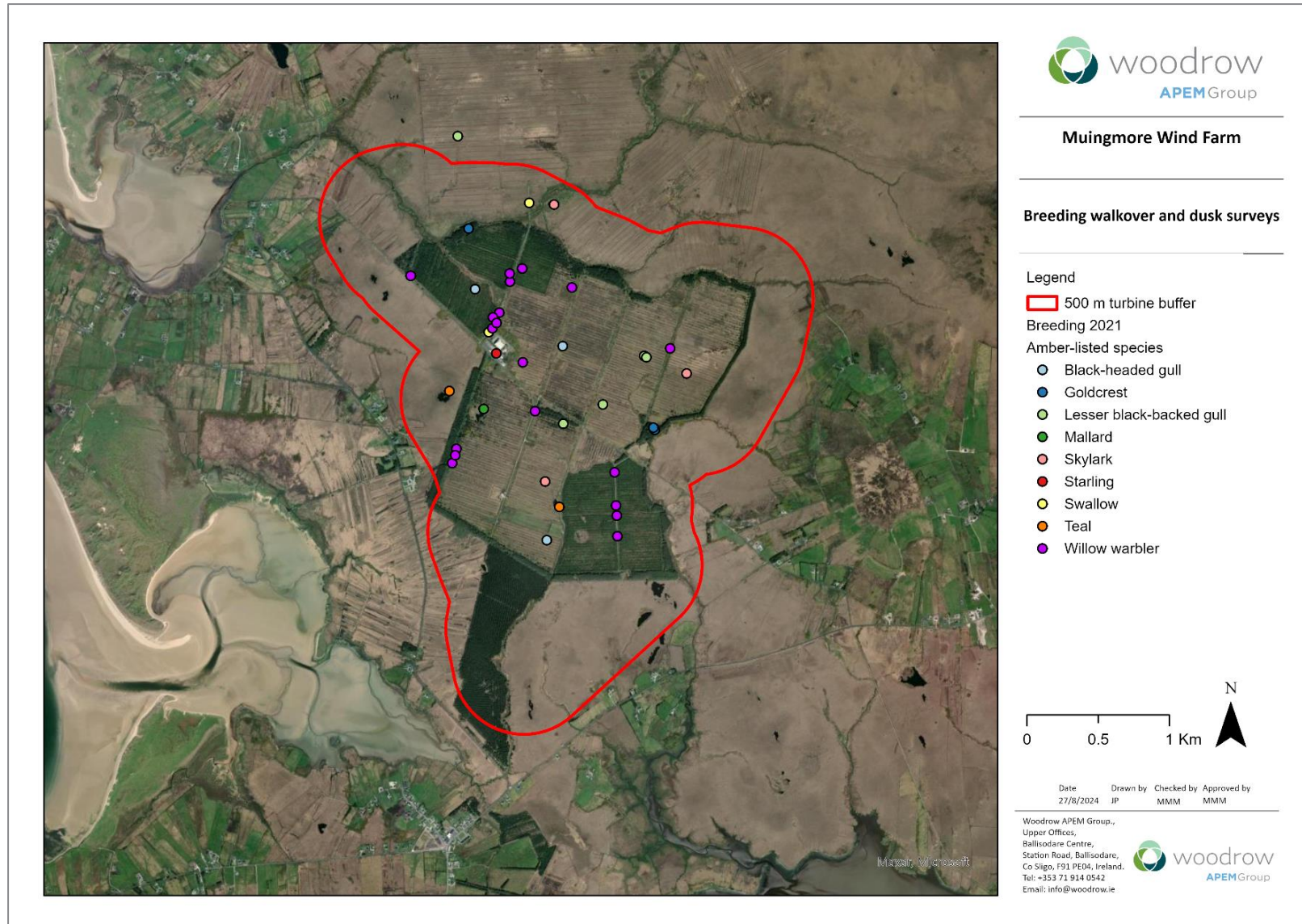


Figure 5: Amber-listed species recorded during the 2021 breeding bird surveys within 500 m turbine buffer

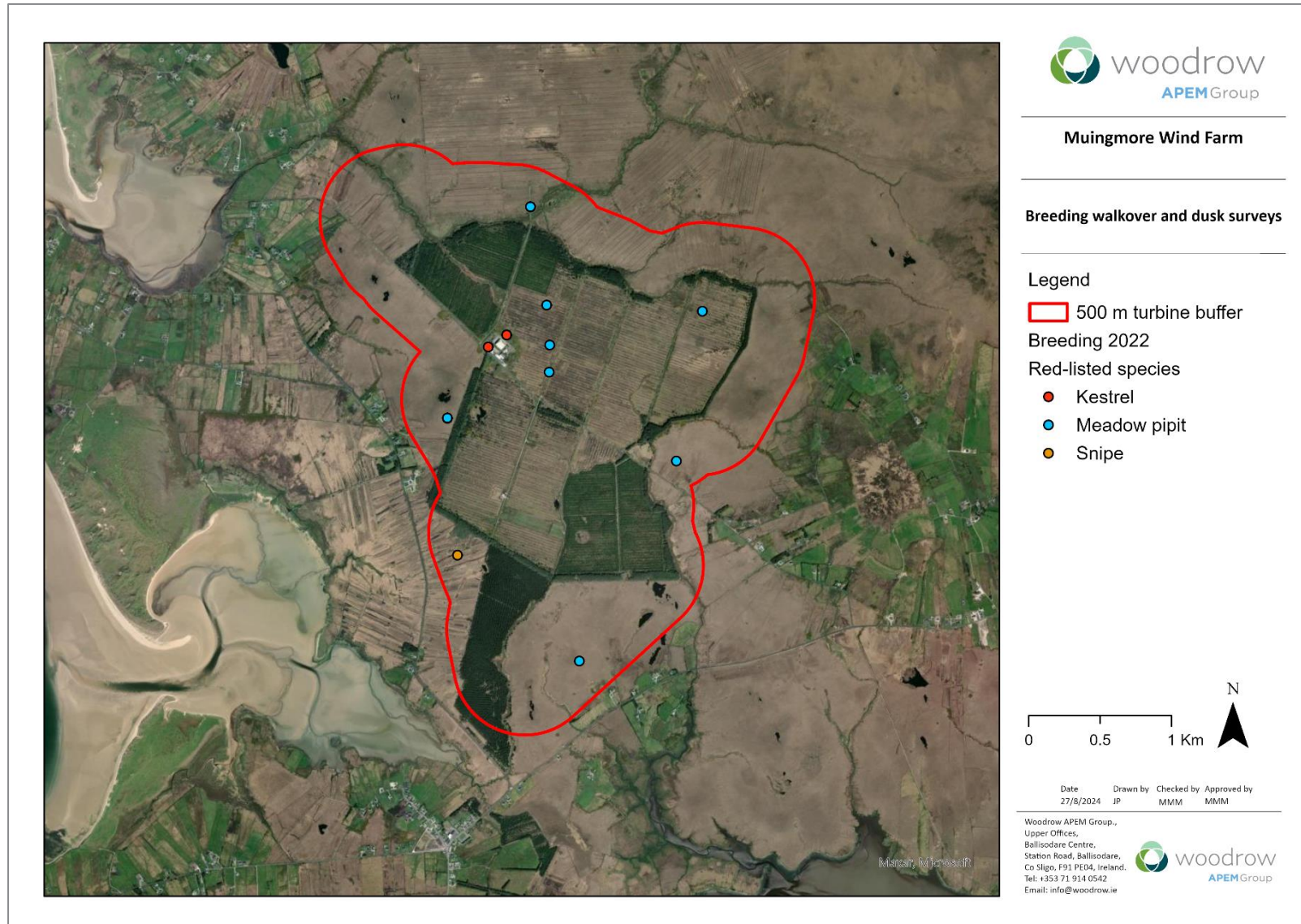


Figure 6: Red-listed species recorded during the 2022 breeding bird surveys within 500 m turbine buffer

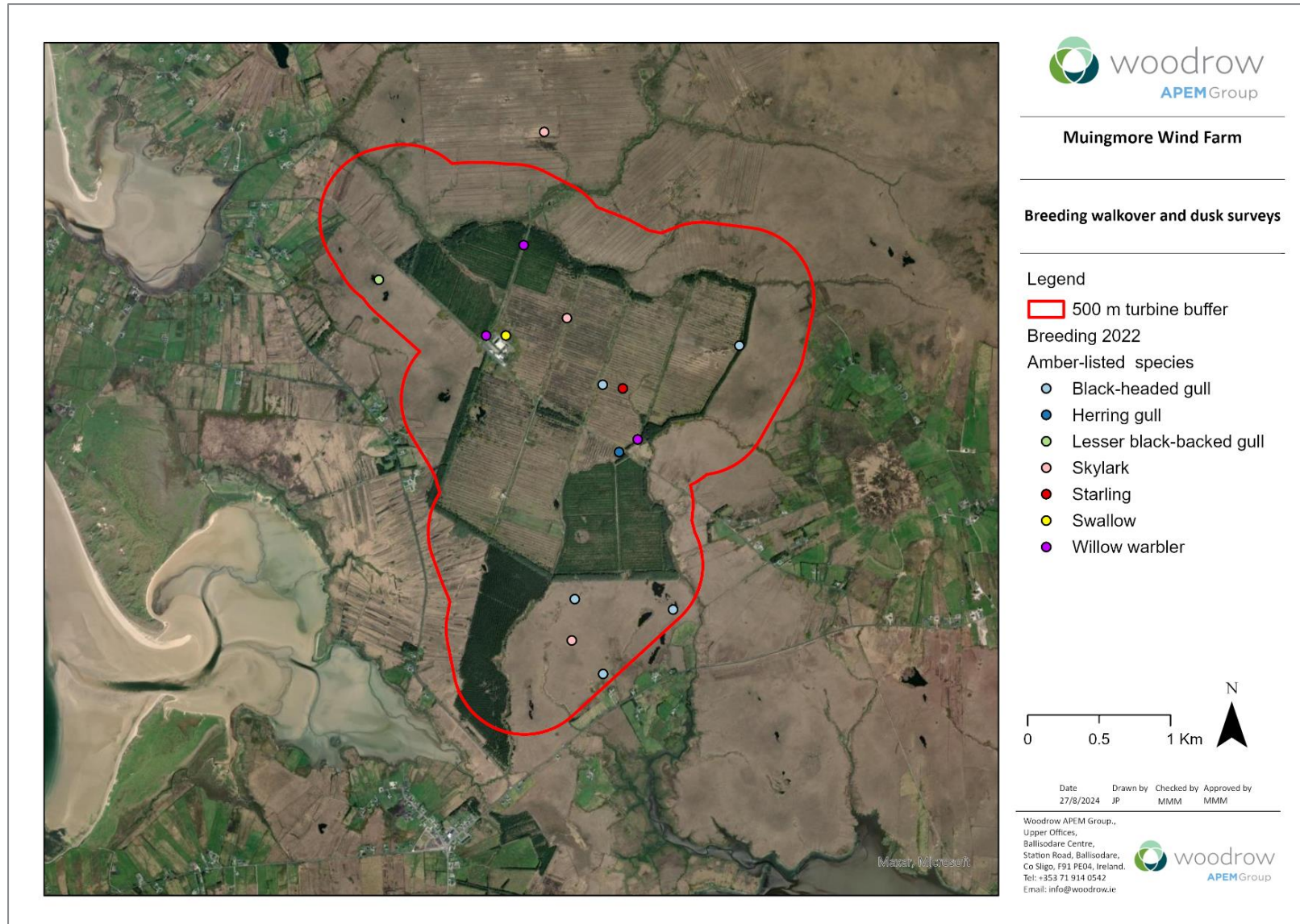


Figure 7: Amber-listed species recorded during the 2022 breeding bird surveys within 500 m turbine buffer

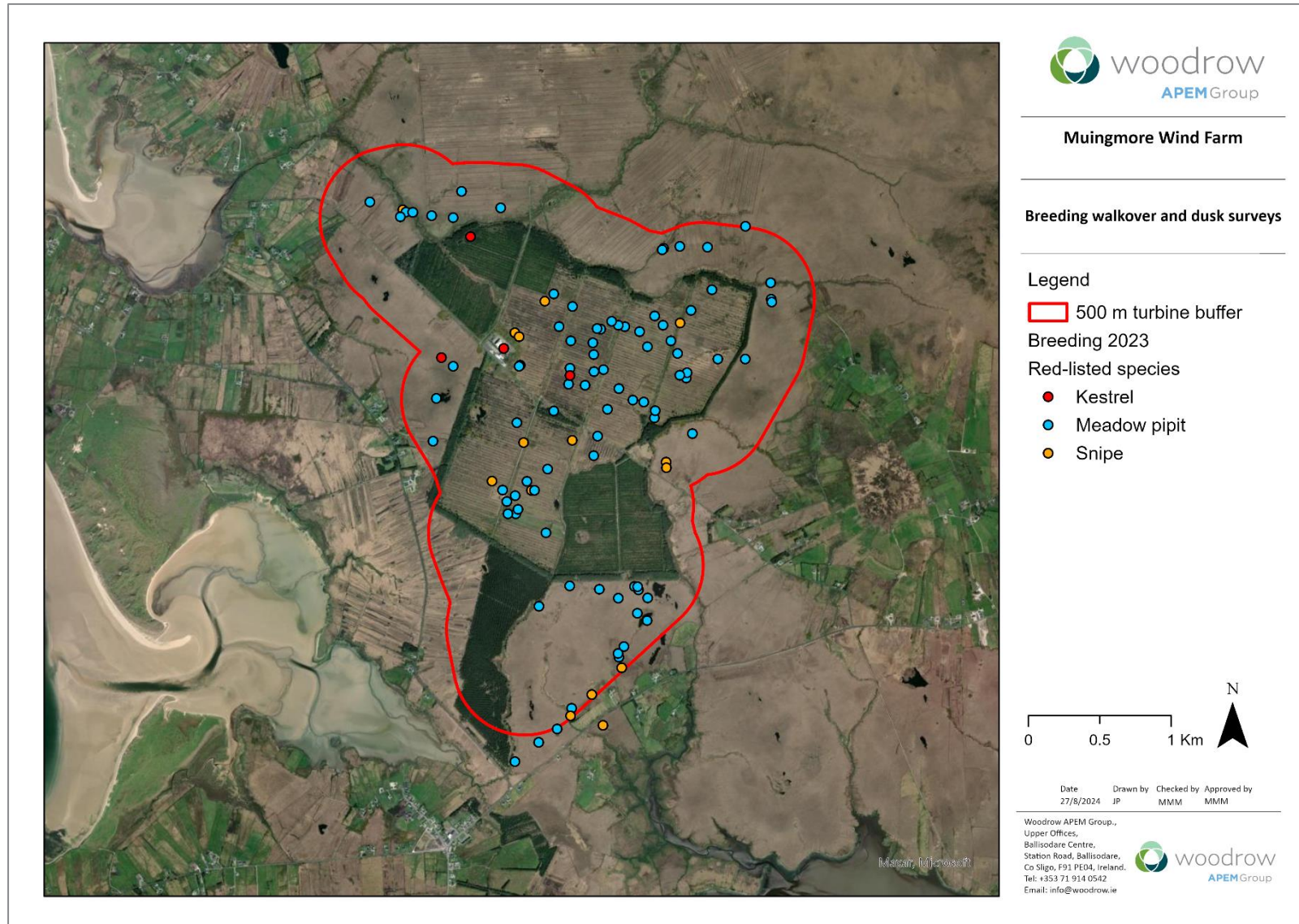


Figure 8: Red-listed species recorded during the 2023 breeding bird surveys within 500 m turbine buffer

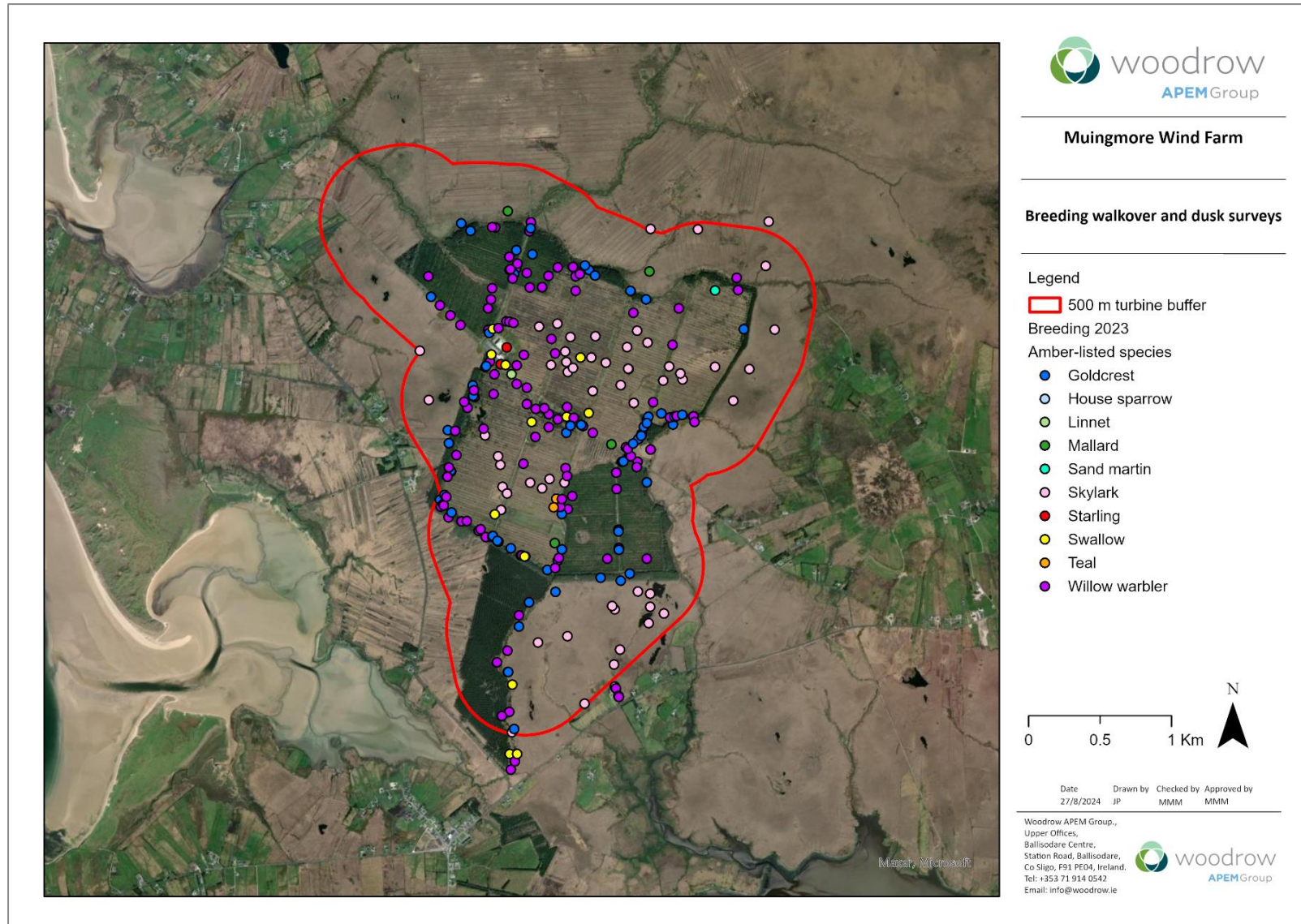


Figure 9: Amber-listed species recorded during the 2023 breeding bird surveys within 500 m turbine buffer

4.3. Breeding raptor surveys

Table 24, Table 25 and Table 26 show the number of raptor observations recorded during each breeding raptor survey date in the wider area for the 2021, 2022 and 2023 breeding seasons, respectively. The breeding status of each species within the 500 m turbine buffer is also provided in these tables. Figure 10, Figure 11 and Figure 12 show the locations of raptor species recorded during the 2021, 2022, and 2023 breeding raptor surveys, respectively.

No hen harrier, peregrine or merlin were recorded during the breeding raptor surveys within the 2 km turbine buffer. A breeding pair of kestrel have nested within the existing buildings in the central area of the site during the 2021, 2022 and 2023 breeding seasons.

Table 24: Summary of breeding raptor survey results for the 2021 breeding season

Species	BTO code	No. individuals		BoCCI 2020-2026	Breeding status within 500m turbine buffer
		Visit 1	Visit 2		
Kestrel	K.	1	8	Red	A breeding pair of kestrel was confirmed in the central area of the site

Table 25: Summary of breeding raptor survey results for the 2022 breeding season

Species	BTO code	No. individuals	BoCCI 2020-2026	Breeding status within 500m turbine buffer
		Visit 1		
Kestrel	K.	4	Red	A breeding pair of kestrel was confirmed in the central area of the site, as it was recorded in the previous breeding season

Table 26: Summary of breeding raptor survey results for the 2023 breeding season

Species	BTO code	No. individuals				BoCCI 2020-2026	Breeding status within 500m turbine buffer
		Visit 1	Visit 2	Visit 3	Visit 4		
Kestrel	K.	1	-	2	5	Red	A breeding pair of kestrel was confirmed in the central area of the site, as it was recorded in the two previous breeding seasons

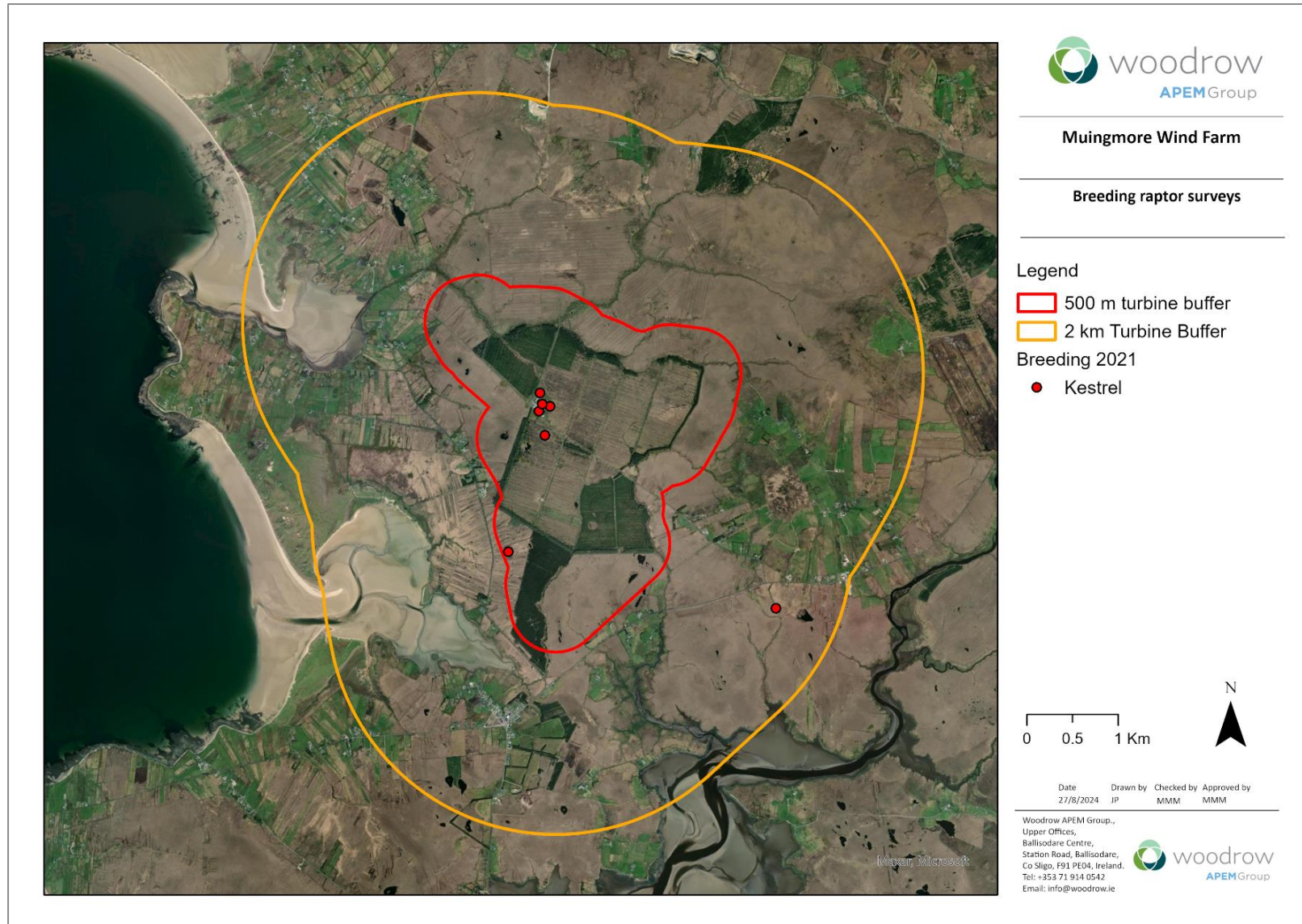


Figure 10: Raptor species recorded during the 2021 breeding raptor bird surveys within 2 km turbine buffer

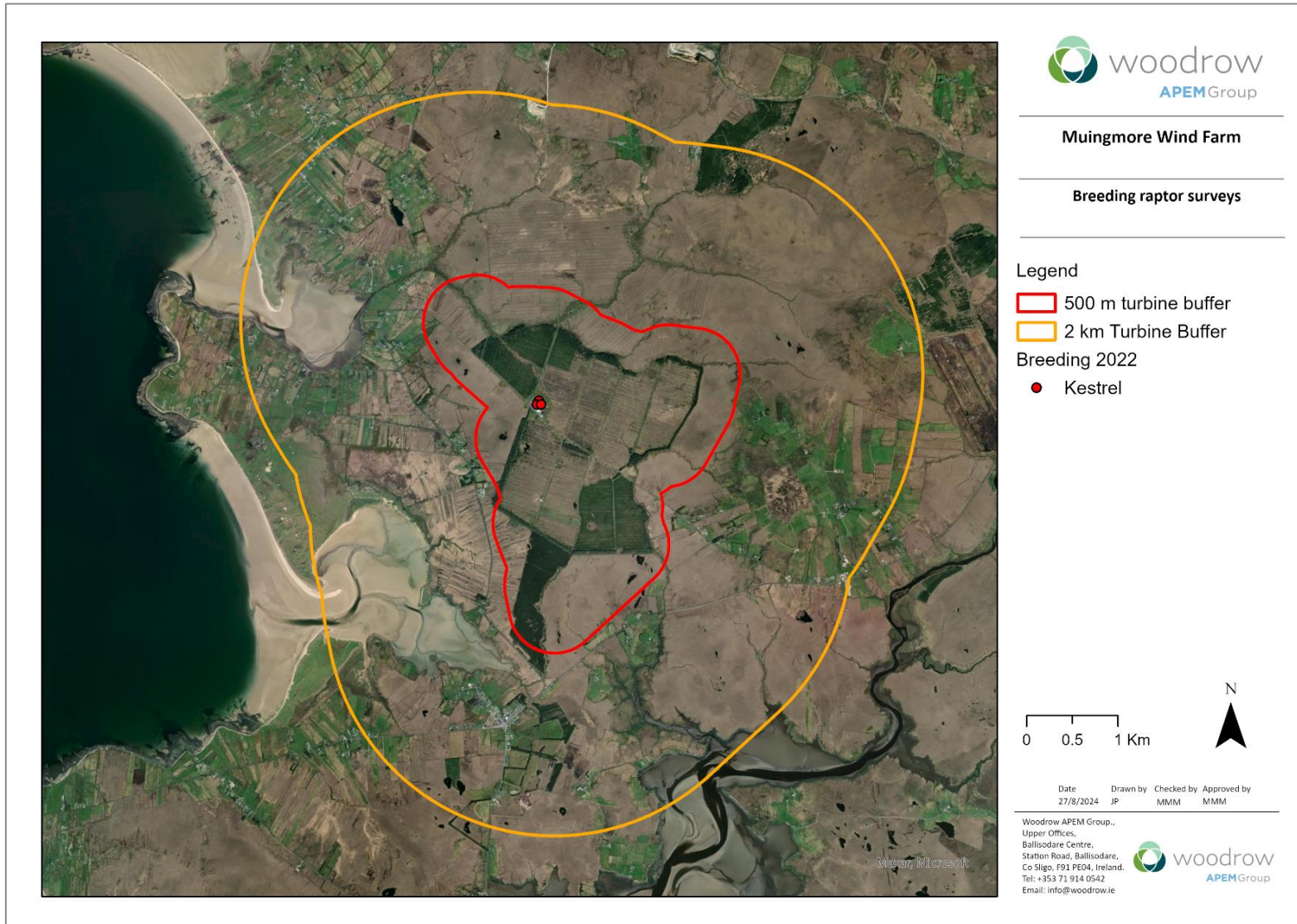


Figure 11: Raptor species recorded during the 2022 breeding raptor bird surveys within 2 km turbine buffer

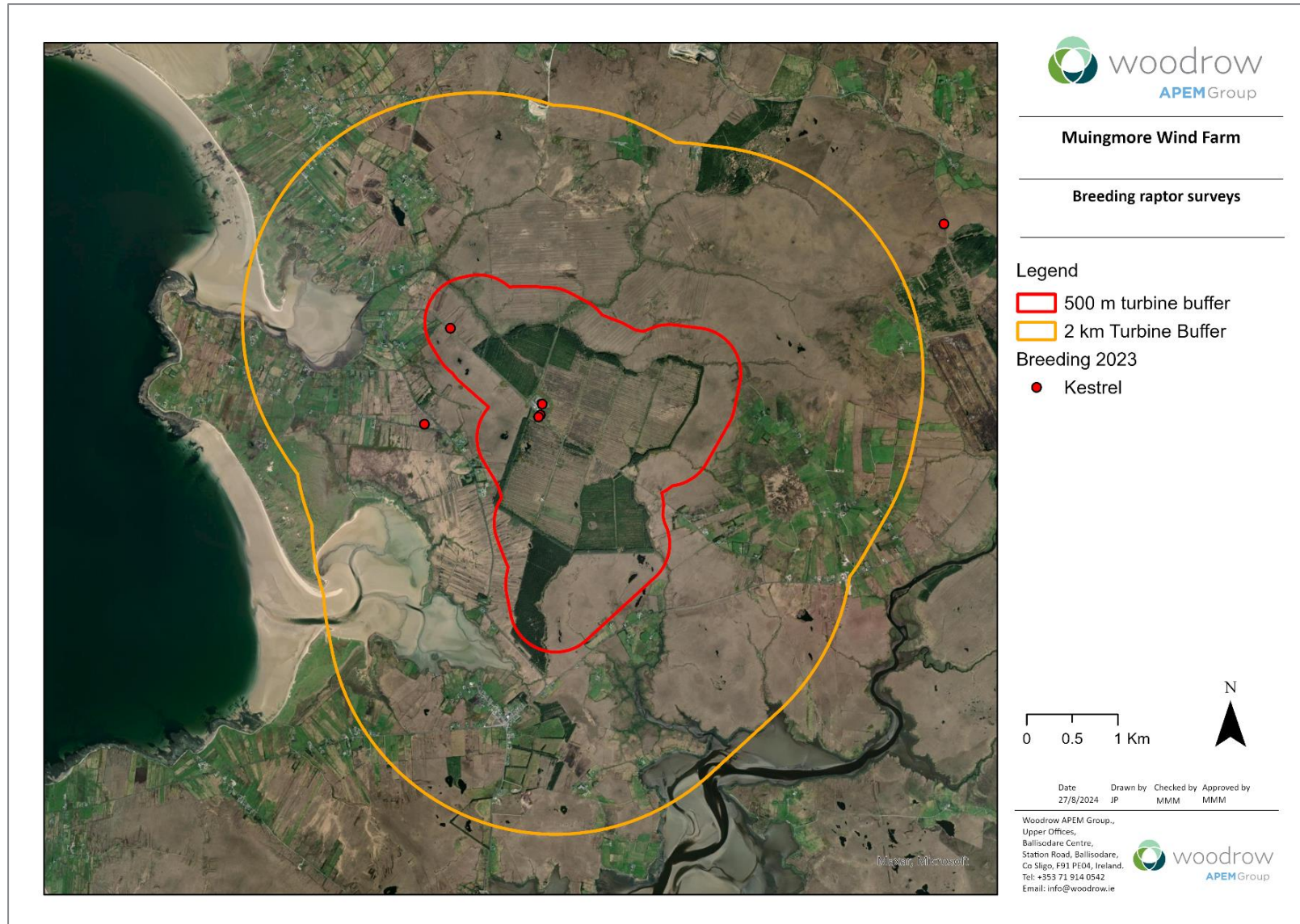


Figure 12: Raptor species recorded during the 2023 breeding raptor bird surveys within 2 km turbine buffer

4.4. Winter walkover surveys

4.4.1. Non-breeding season 2021-22

Winter walkover surveys covering the 500 m turbine buffer were undertaken on three visits during the 2021-22 non-breeding season. A total of 24 different bird species were recorded during the walkover surveys. Table 27 lists the red and amber-listed species, the number of individuals recorded on each visit and their location within the 500 m turbine buffer. Figure 13 and Figure 14 show the locations of red and amber-listed birds recorded during the 2020-21 non-breeding season, respectively. A list of all species recorded, including green-listed species, is provided in **Appendix XI**.

Table 27: Summary of winter walkover surveys carried out during the 2021-22 non-breeding season

Species	BTO code	Visit 1	Visit 2	Visit 3	BoCCI 2020-2026	Location within 500 m turbine buffer
Kestrel	K.	-	1	-	Red	An observation of a male kestrel flying near the buildings in the central part of the 500 m turbine buffer
Meadow pipit	MP	13	3	8	Red	Meadow pipit was the most frequently recorded species with 6 individuals flying from any one location. Observations were mainly distributed across the grassland habitats within the 500 m buffer
Snipe	SN	5	10	4	Red	Snipe were recorded in all visits with a maximum of two individuals from any one location. Observations were mainly distributed across bog habitats within the 500 m buffer
Woodcock	WK	-	5	1	Red	Small numbers of woodcock were recorded in the south-east and western section of the 500 m buffer
Goldcrest	GC	2	3	2	Amber	Observations were mainly distributed near forestry habitat within the 500 m turbine
Linnet	LI	5	5	1	Amber	Observations were spread within the 500 m turbine
Whooper swan	WS		12	-	Amber	In January 2022 a flock of 12 birds were recorded travelling over the south of the 500 m turbine buffer

4.4.2. Non-breeding season 2022-23

Winter walkover surveys covering the 500 m turbine buffer were undertaken on three visits during the 2022-23 non-breeding season. A total of 29 different bird species were recorded during the walkover surveys. Table 28 lists the red and amber-listed species, the number of individuals recorded on each visit and their location within the 500 m turbine buffer. Figure 15 and Figure 16

show the locations of red and amber-listed birds recorded during the 2022-23 non-breeding season, respectively. A list of all species recorded, including green-listed species, is provided in **Appendix XI**.

Table 28: Summary of winter walkover surveys carried out during the 2022-23 non-breeding season

Species	BTO code	Visit 1	Visit 2	Visit 3	BoCCI 2020-2026	Location within 500 m turbine buffer
Kestrel	K.	1	-	2	Red	One observation of a hunting juvenile was recorded in January over the north-east of the 500 m turbine buffer. Two observations of a hunting male were recorded during the same visit in February 2023 over the central proportion of the 500 m turbine buffer.
Meadow pipit	MP	117	93	28	Red	Meadow pipit was the most frequently recorded species with 25 individuals foraging from any one location. Observations were mainly distributed across the grassland habitats within the 500 m buffer
Redwing	RE	-	3	-	Red	One flock of three birds was observed during the visit in November 2022 over the north-east of the 500 m turbine buffer
Snipe	SN	12	20	3	Red	Observations were mainly distributed across bog habitats within the 500 m turbine buffer, and in wet grassland habitat over the central part of the 500 m buffer
Woodcock	WK	-	-	2	Red	Two observations were recorded during the same visit in February 2023 over the north-east of the 500 m turbine buffer
Black-headed gull	BH	-	2	-	Amber	Two individuals recorded on flying over the western section outside the 500 m turbine buffer.
Common gull	CM	-	1	-	Amber	One bird was recorded on flying over the western section outside the 500 m turbine buffer.
Goldcrest	GC	-	-	28	Amber	Observations were mainly distributed near forestry habitat within the 500 m turbine
Hen harrier	HH	-	-	2	Amber	Two observations of a hunting adult were recorded during the visit in January 2023 over the central and eastern portion of the 500 m turbine buffer
House sparrow	HS	3	-	-	Amber	One observation of three birds was observed during the visit in October 2022 over the south boundary of the 500 m turbine buffer

Species	BTO code	Visit 1	Visit 2	Visit 3	BoCCI 2020-2026	Location within 500 m turbine buffer
Linnet	LI	3	2	-	Amber	Two observations were recorded over the north-west and south of the 500 m turbine buffer

4.4.3. Non-breeding season 2023-24

Winter walkover surveys covering the 500 m turbine buffer were undertaken on three visits during the 2023-24 non-breeding season. A total of 37 different bird species were recorded during the walkover surveys. Table 29 lists the red and amber-listed species, the number of individuals recorded on each visit and their location within the 500 m turbine buffer. Figure 17 and Figure 18 show the locations of red and amber-listed birds recorded during the 2023-24 non-breeding season, respectively. A list of all species recorded, including green-listed species, is provided in **Appendix XI**.

Table 29: Summary of winter walkover surveys carried out during the 2023-24 non-breeding season

Species	BTO code	Visit 1	Visit 2	Visit 3	BoCCI 2020-2026	Location within 500 m turbine buffer
Grey wagtail	GL	1	1	-	Red	Two observations of one grey wagtail were recorded at the same location during two different visits over the southern section of the 500 m turbine buffer
Kestrel	K.	1	1	1	Red	One observation of an adult was recorded in October over the central section of the 500 m turbine buffer. Another observation of a hunting adult male was recorded during the visit in November 2023 near the buildings in the central part of the 500 m turbine buffer. A third observation was made in January 2024 of a male flying over the bog in the north-east of the 500 m turbine buffer
Meadow pipit	MP	56	57	16	Red	Meadow pipit was the most frequently recorded species with seven individuals flying from any one location. Observations were mainly distributed across the grassland habitats within the 500 m buffer
Redwing	RE	1	-	-	Red	One redwing was observed during the visit in October 2023 over the central section of the 500 m turbine buffer
Snipe	SN	15	17	11	Red	Observations were mainly distributed across bog habitats within the 500 m turbine buffer, and in wet grassland habitat over the central part of the 500 m buffer
Woodcock	WK	-	3	4	Red	Three observations were recorded during the visit in November 2023 over the central section of the 500 m buffer. Another three observations were recorded during the visit in January 2024

Species	BTO code	Visit 1	Visit 2	Visit 3	BoCCI 2020-2026	Location within 500 m turbine buffer
						over the south-east of the 500 m turbine buffer
Goldcrest	GC	78	-	5	Amber	Observations were mainly distributed near forestry habitat within the 500m turbine
Mallard	MA	-	-	2	Amber	An observation of two mallards was recorded in a small waterbody located in the west of the 500 m buffer
Teal	T.	-	5	-	Amber	An observation of five teal was recorded in a small waterbody located in the west of the 500 m buffer

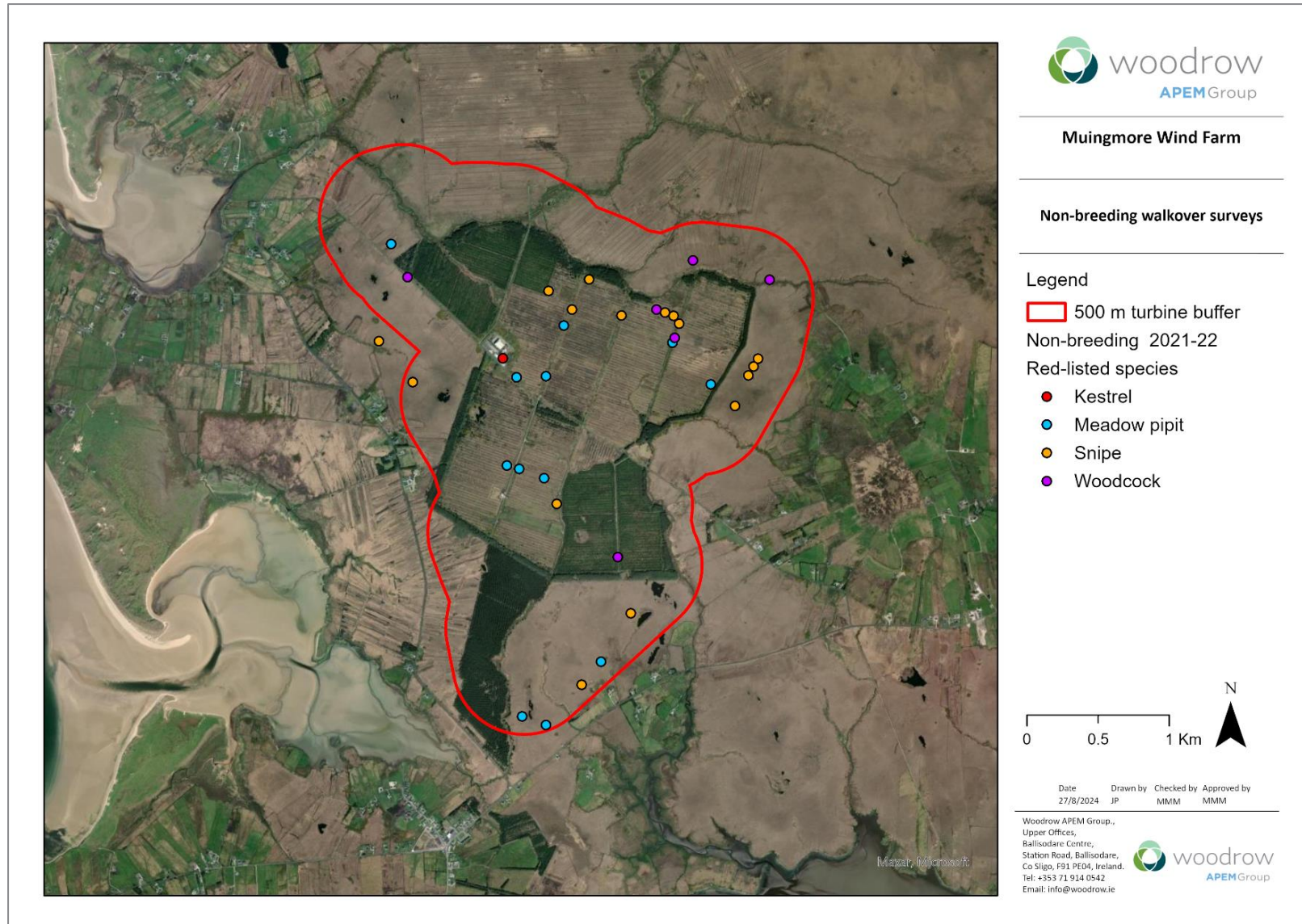


Figure 13: Red-listed species recorded during the 2021-22 non-breeding season bird surveys within 500 m turbine buffer

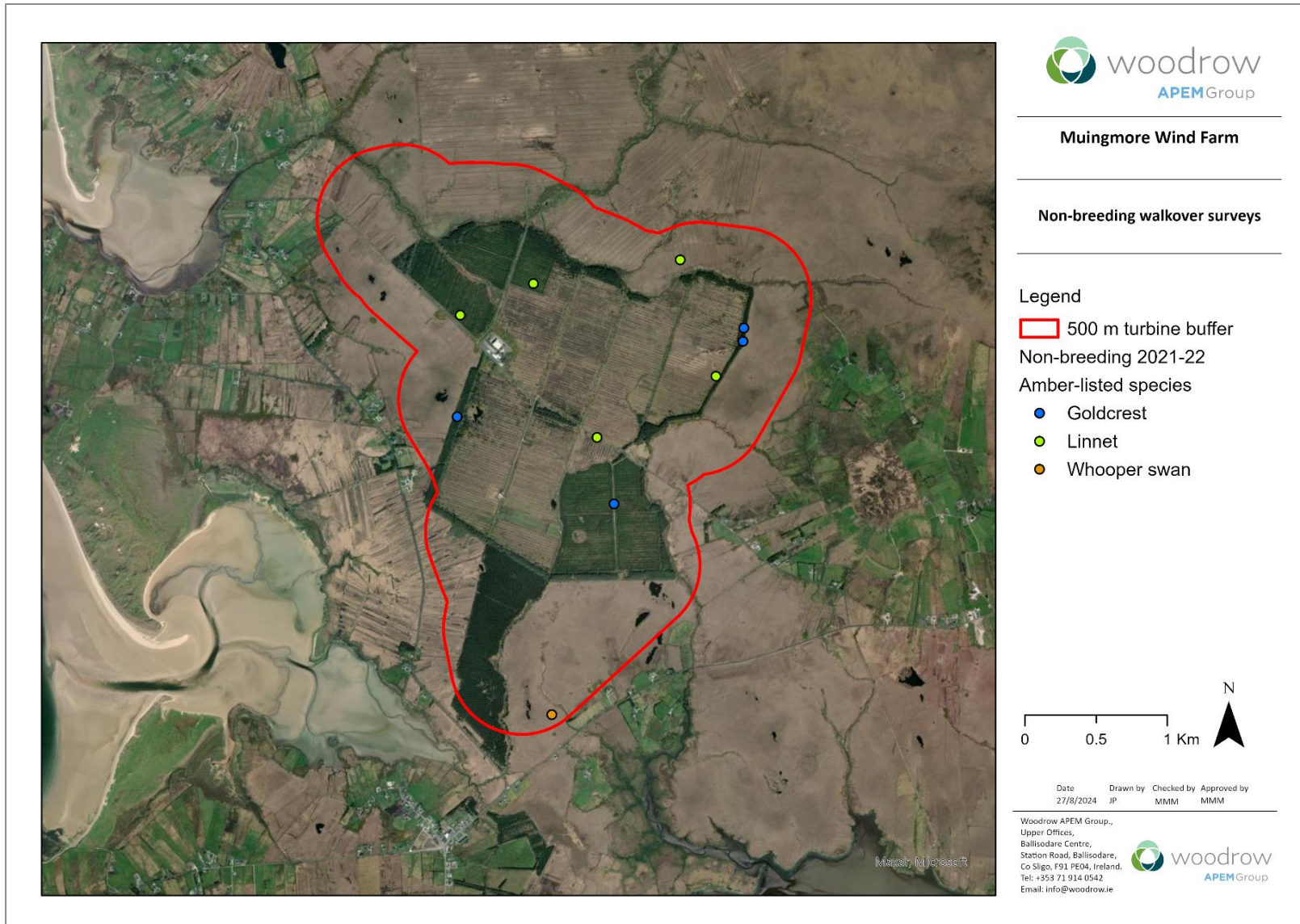


Figure 14: Amber-listed species recorded during the 2021-22 non-breeding season bird surveys within 500 m turbine buffer

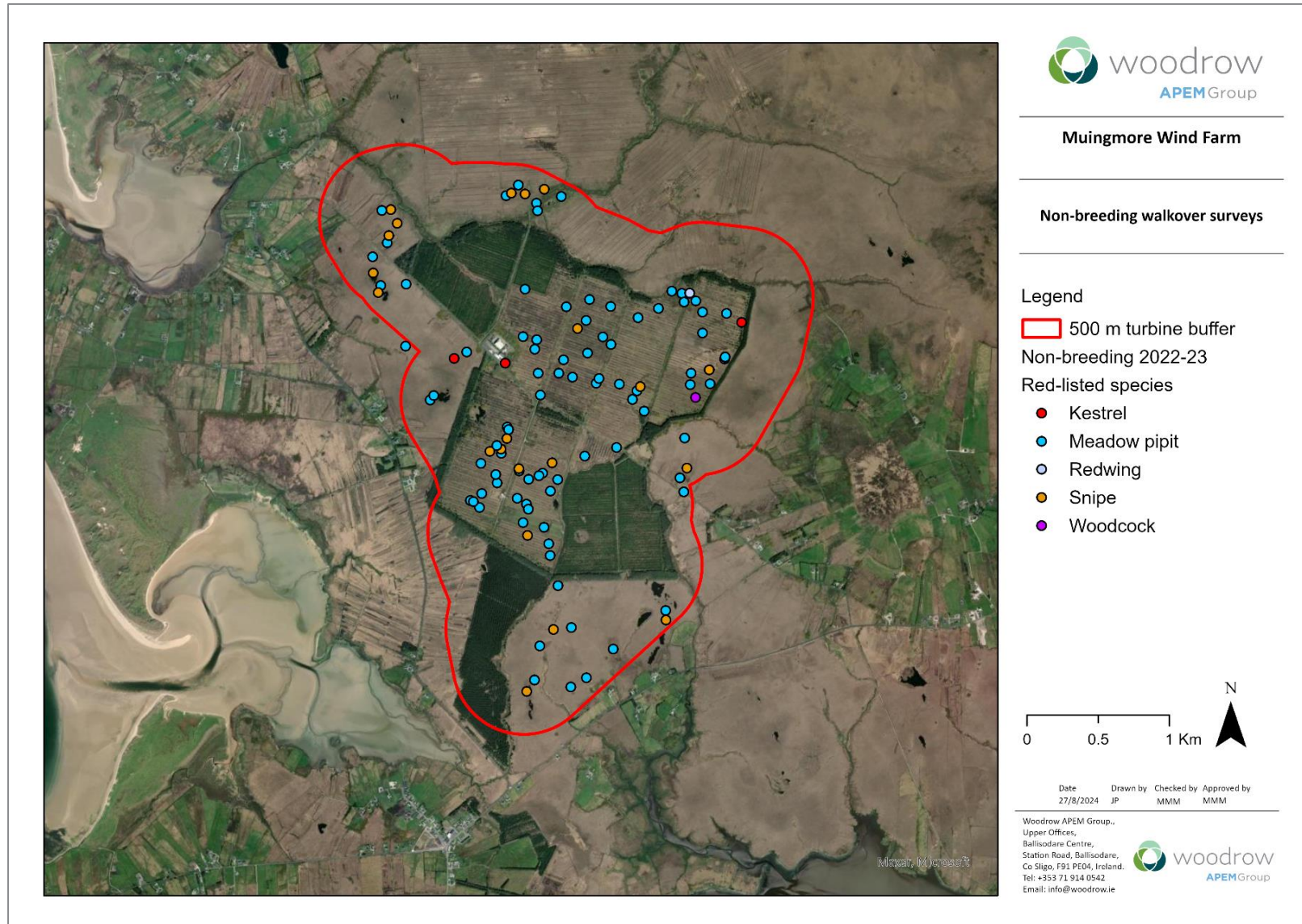


Figure 15: Red-listed species recorded during the 2022-23 non-breeding season bird surveys within 500 m turbine buffer

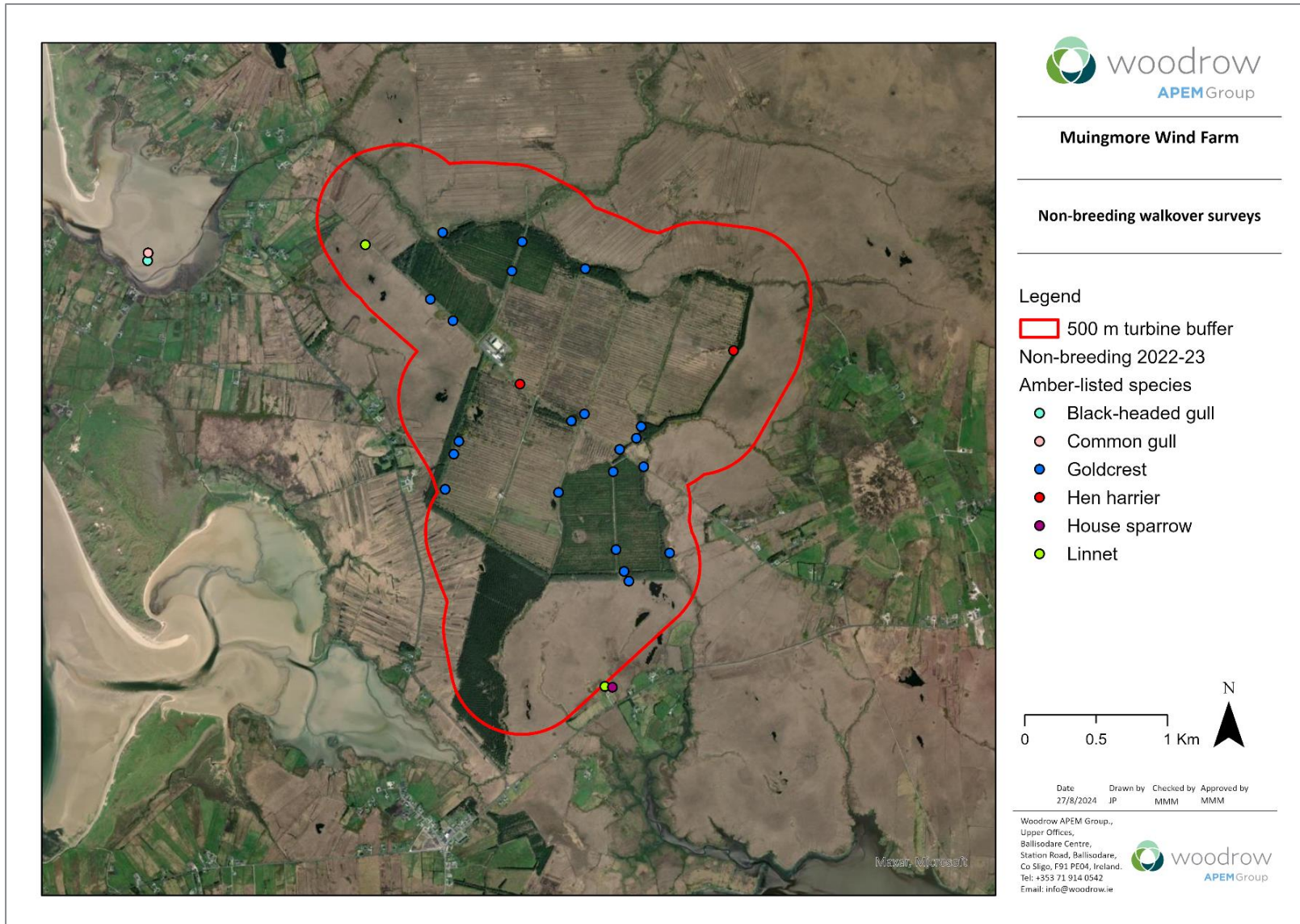


Figure 16: Amber-listed species recorded during the 2022-23 non-breeding season bird surveys within 500 m turbine buffer

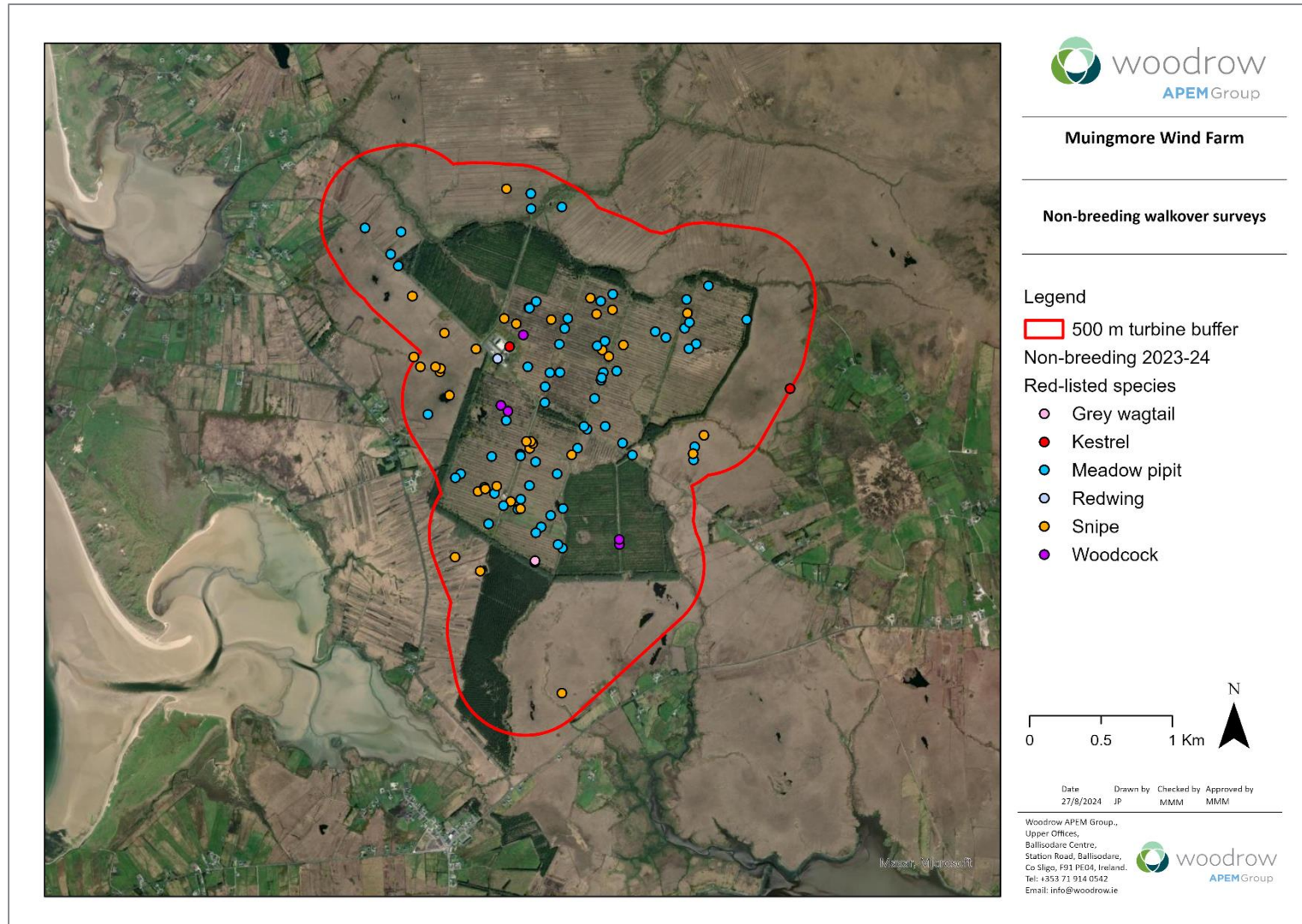


Figure 17: Red-listed species recorded during the 2023-24 non-breeding season bird surveys within 500 m turbine buffer

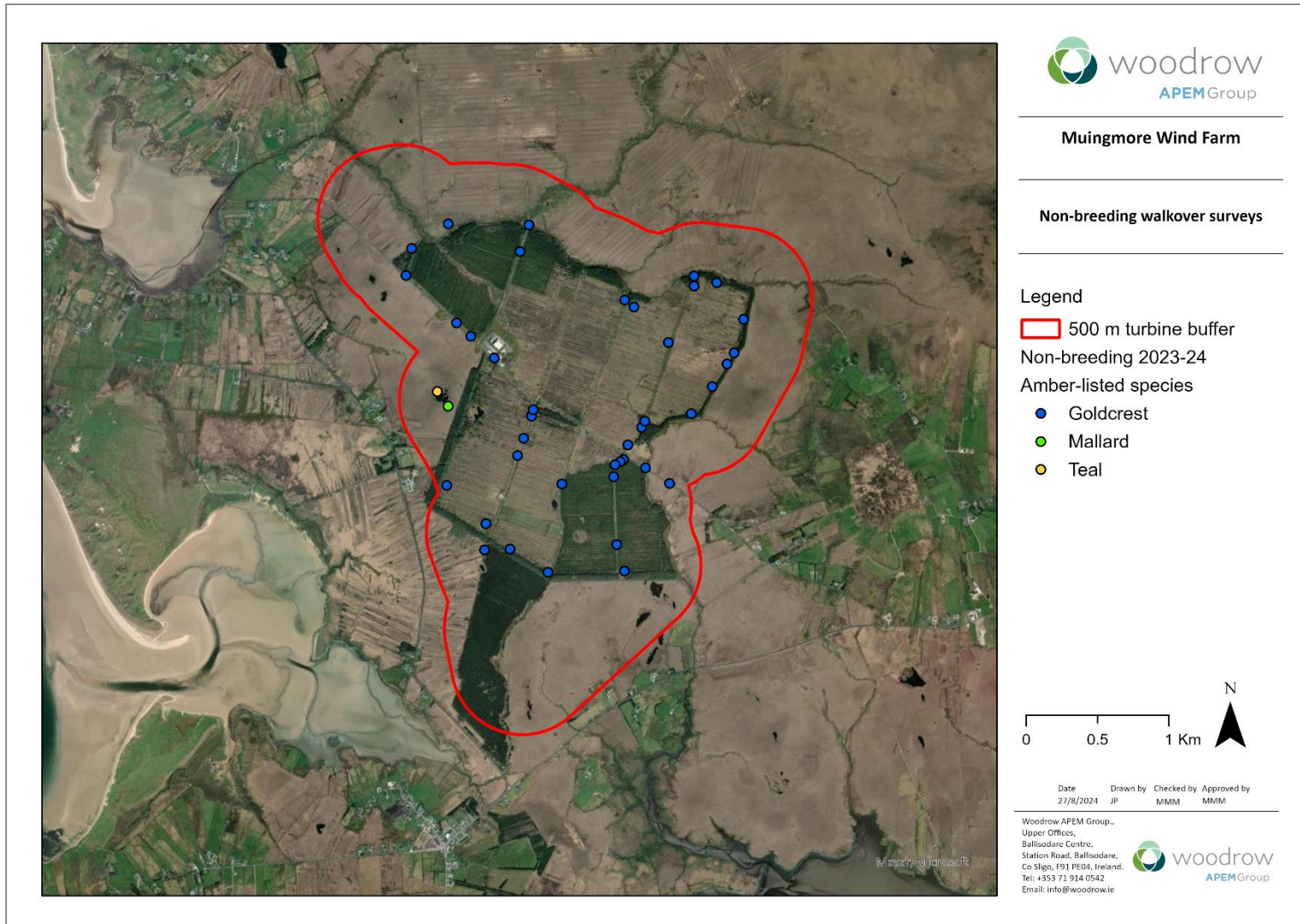


Figure 18: Amber-listed species recorded during the 2023-24 non-breeding season bird surveys within 500 m turbine buffer

4.5. Wintering waterbird surveys

4.5.1. Non-breeding season 2021-22

Table 30 lists the species and the number of waterbirds recorded on each visit to the wider area during the 2021-22 non-breeding season. From the survey results, a total of 40 waterbird species were recorded, shown in Table 30.



Figure 19 and



Figure 20 show the locations of red and amber-listed waterbirds recorded during the 2021-22 non-breeding season, respectively. Waterbird activity was higher on the west coast within the 6 km buffer, with most of the activity recorded along the Blacksod Bay/Broad Haven SPA. Gull activity was notably higher than any other species, including common gull *Larus canus*, Mediterranean gull *Ichthyaetus melanocephalus* and great black-backed. Black guillemot *Cephus grylle* was also noted in the western part of the survey area.

During these surveys, two raptor species were recorded, a single merlin in Visit 7 and a single peregrine in Visit 6.

Concentrations of waterbirds as presented in the table below, and in Figure 19 and 20, were observed in coastal, estuarine and wetland habitats associated with the Blacksod Bay/Broad Haven SPA and Carrowmore Lake SPA.

Table 30: Summary of wider area wintering waterbird surveys carried out during the 2021-22 non-breeding season

Species	BTO code	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6	Visit 7	Visit 8	BoCCI 2020-2026
Bar-tailed godwit	BA	165	200	259	133	-	116	326	83	Red
Common scoter	CX	-	-	-	-	-	-	20	-	Red
Curlew	CU	45	21	9	26	79	14	34	7	Red
Dunlin	DN	41	16	58	92	88	96	117	125	Red
Golden plover	GP	-	-	-	-	6	-	-	-	Red
Lapwing	L.	-	1		33	6	4	3	-	Red
Oystercatcher	OC	50	46	103	90	33	52	49	138	Red
Redshank	RK	8	13	20	43	21	29	6	2	Red
Snipe	SN	2	-	-	-	-	-	-	-	Red
Slavonian grebe	SZ	-	-	-	-	-	-	-	5	Red
Black guillemot	TY	-	4	-	3	79	-	8	-	Amber
Black-headed gull	BH	-	-	-	-	11	-	-	13	Amber
Brent goose	BG	-	196	133	243	34	-	155	8	Amber
Common gull	CM	-	-	-	4	18	-	72	36	Amber
Coot	CO	-	-	1	-	-	-	-	-	Amber
Cormorant	CA	2	2	3	3	2	2	9	1	Amber
Great northern diver	ND	-	1	-	2	6	-	2	-	Amber
Herring gull	HG	1	2	-	-	2	1	3	-	Amber
Lesser black-backed gull	LB	-	-	-	-	3	5	-	-	Amber
Mallard	MA	28	12	10	42	-	10	12	14	Amber
Mediterranean gull	MU	55	53	13	20	-	-	-	-	Amber
Red-breasted merganser	RM	-	13	12	20	6	-	2	2	Amber
Ringed plover	RP	60	96	48	31	-	47	124	42	Amber
Shelduck	SU	-	-	-	-	-		2	-	Amber
Teal	T.	3	12	4		-	2	-	-	Amber
Turnstone	TT	-	-	11	11	-	-	3	-	Amber
Whooper swan	WS	21	7	-	23	-	-	-	3	Amber
Wigeon	WN	2	-	8	14	36	22	4	2	Amber
Shelduck	SU	6	-	-	8	-	6	-	-	Amber
Teal	T.	16	3	2	30	-	12	-	14	Amber
Tufted duck	TU	-	-	89	95	-	68	-	27	Amber
Turnstone	TT	8	30	14	26	-	-	-	12	Amber
Whooper swan	WS	5	16	20	5	-	16	-	17	Amber
Wigeon	WN	4	15	75	20	-	32	-	35	Amber
Great black-backed gull	GB	5	-	12	9	3	3	9	11	Green
Greenshank	GK	2	-	1	5	3	1	2	7	Green
Grey heron	H	1	3	1	3	1	3	1	-	Green
Little egret	ET	-	-	-	-	-	-	2	-	Green
Little grebe	LG	-	-	-	-	-	1	-	-	Green
Sanderling	SS	-	76	83	93	6	-	55	-	Green

4.5.2. Non-breeding season 2022-23

Table 31 lists the species and the number of waterbirds recorded on each visit to the wider area during the 2022-23 non-breeding season. From the survey results, a total of 56 waterbird species were recorded (Table 31 Table 30).

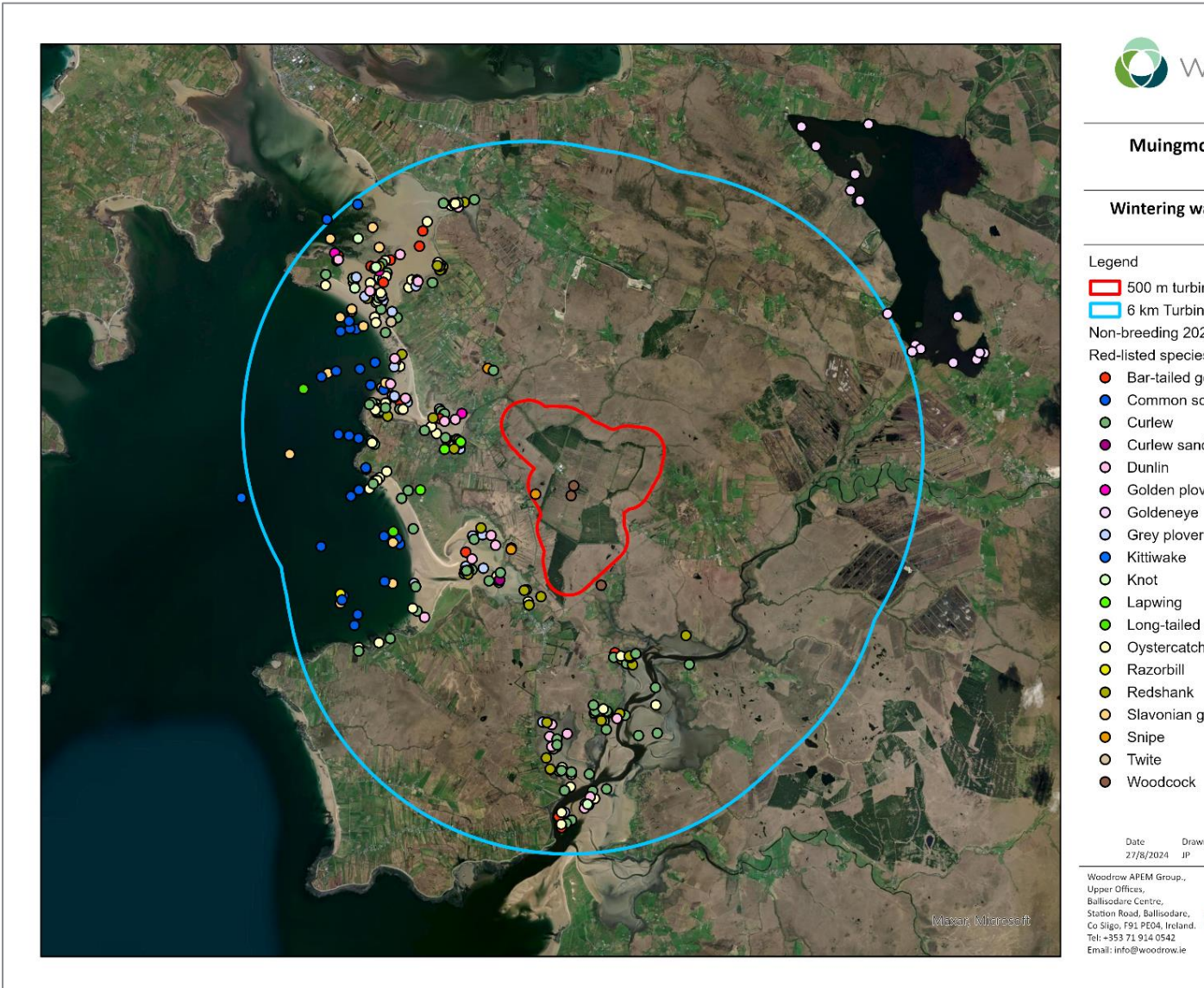


Figure 21 and

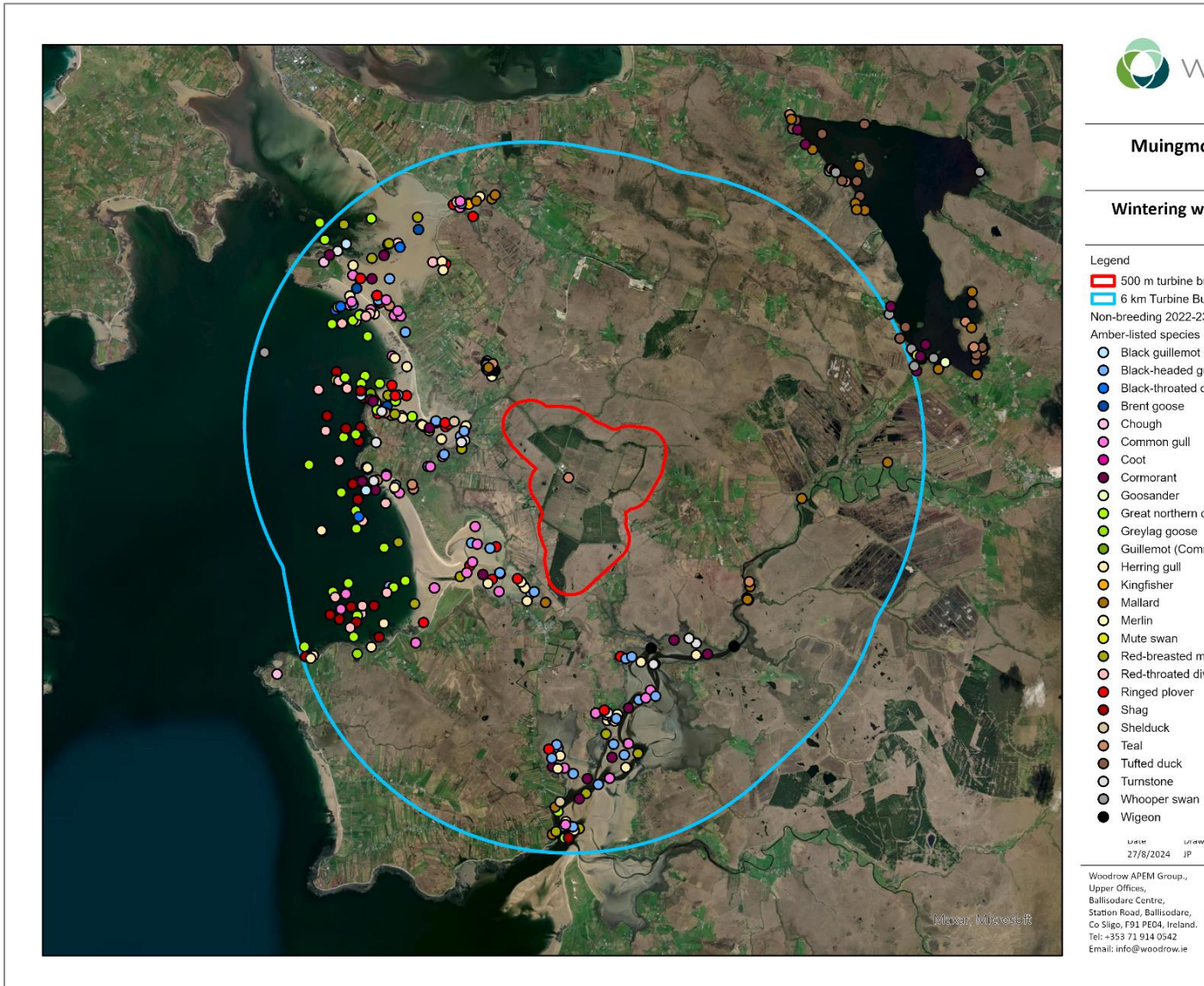


Figure 22 show the locations of red and amber-listed waterbirds recorded during the 2022-23 non-breeding season, respectively.

During these surveys, there was one observation of merlin and one observation of three chough *Pyrhocorax pyrrhocorax* during Visit 1, with one observation of 33 twite *Linaria flavirostris* in Visit 6.

Concentrations of waterbirds as presented in the table below, and in Figure 21 and 22, were observed in coastal, estuarine and wetland habitats associated with the Blacksod Bay/Broad Haven SPA and Carrowmore Lake SPA.

Table 31: Summary of wider area wintering waterbird surveys carried out during the 2022-23 non-breeding season

Species	BTO code	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6	BoCCI 2020-2026
Bar-tailed godwit	BA	114	743	755	226	710	762	Red
Common scoter	CX	109	188	111	281	103	349	Red
Curlew	CU	97	127	155	146	78	262	Red

Species	BTO code	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6	BoCCI 2020-2026
Curlew sandpiper	CV	1	-	-	-	-	-	Red
Dunlin	DN	571	646	607	935	810	523	Red
Golden plover	GP	65	48	1	-	39	-	Red
Goldeneye	GN	-	-	8	10	4	14	Red
Grey plover	GV	87	53	52	68	65	155	Red
Kittiwake	KI	-	-	-	-	1	-	Red
Knot	KN	1	51	15	70	23	11	Red
Lapwing	L.	-	2	26	3	-	-	Red
Long-tailed duck	LN	-	1	-	-	-	2	Red
Oystercatcher	OC	100	38	176	151	93	136	Red
Razorbill	RA	-	-	-	-	-	1	Red
Redshank	RK	33	28	83	58	16	62	Red
Slavonian grebe	SZ	4	4	-	4	5	33	Red
Snipe	SN	5	-	1	-	-	1	Red
Woodcock	WK	-	-	-	3	-	1	Red
Black guillemot	TY	-	-	4	-	-	2	Amber
Black-headed gull	BH	91	64	15	11	-	37	Amber
Black-throated diver	BV	2	5	-	1	-	4	Amber
Brent goose	BG	-	-	28	-	77	-	Amber
Common gull	CM	18	123	16	78	8	84	Amber
Coot	CO	-	-	-	-	1	-	Amber
Cormorant	CA	9	8	3	15	22	19	Amber
Goosander	GD	-	-	-	-	-	2	Amber
Great northern diver	ND	5	54	34	53	43	129	Amber
Greylag goose	GJ	2	-	-	-	-	-	Amber
Guillemot (common)	GU	-	-	1	-	-	-	Amber
Herring gull	HG	23	17	22	10	31	126	Amber
Kingfisher	KF	-	-	1	-	-	-	Amber
Mallard	MA	13	35	26	45	17	29	Amber
Mute swan	MS	-	-	-	-	-	3	Amber
Red-breasted merganser	RM	23	33	58	25	20	66	Amber
Red-throated diver	RH	6	71	4	6	1	79	Amber
Ringed plover	RP	119	133	107	294	30	11	Amber
Shag	SA	3	38	6	27	9	47	Amber
Shelduck	SU	-	-	-	3	-	7	Amber
Teal	T.	-	20	60	67	9	28	Amber
Tufted duck	TU	-	42	-	61	56	60	Amber
Turnstone	TT	7	7	45	9	-	10	Amber
Whooper swan	WS	4	15	60	24	21	20	Amber
Wigeon	WN	13	44	10	22	48	31	Amber
Bufflehead	VH	-	2	-	-	-	-	Green
Glaucous gull	GZ	-	-	-	-	1	-	Green

Species	BTO code	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6	BoCCI 2020-2026
Great black-backed gull	GB	22	9	6	13	18	33	Green
Greenshank	GK	11	13	13	15	10	9	Green
Grey heron	H	2	4	2	7	-	3	Green
Grey phalarope	PL	1	-	-	-	-	-	Green
Jack snipe	JS	-	-	1	-	-	-	Green
Light-bellied brent goose	PB	4	48	-	36	-	34	Green
Little egret	ET	-	2	4	2	2	1	Green
Little grebe	LG	-	-	-	-	2	2	Green
Moorhen	MH	17	2	3	1	-	4	Green
Ring-necked duck	NG	-	1		1	1	-	Green
Sanderling	SS	68	146	33	43	-	56	Green

4.5.3. Non-breeding season 2023-24

Table 32 lists the species and the number of waterbirds recorded on each visit to the wider area during the 2023-24 non-breeding season. From the survey results, a total of 40 waterbird species

were recorded (Table 32).



Figure 23 and Figure 24 show the locations of red and amber-listed waterbirds recorded during the 2023-24 non-breeding season, respectively.

During these surveys, there was four observations of kestrel, one observation of rock pipit *Anthus petrosus* and three observations of starling *Sturnus vulgaris*.

Concentrations of waterbirds as presented in the table below, and in Figure 23 and 24, were observed in coastal, estuarine and wetland habitats associated with the Blacksod Bay/Broad Haven SPA and Carrowmore Lake SPA.

Table 32: Summary of wider area wintering waterbird surveys carried out during the 2023-24 non-breeding season

Species	BTO code	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6	BoCCI 2020-2026
Bar-tailed godwit	BA	467	551	28	333	450	1,422	Red
Common scoter	CX	70	12	-	-	35	58	Red
Curlew	CU	53	58	32	17	16	21	Red
Dunlin	DN	68	286	240	19	549	80	Red

Species	BTO code	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6	BoCCI 2020-2026
Grey plover	GV	28	38	-	-	-	65	Red
Knot	KN	72	45	-	-	-	6	Red
Lapwing	L.	-	8	2	-	-	-	Red
Long-tailed duck	LN	-	-	-	-	-	1	Red
Oystercatcher	OC	139	46	22	72	134	39	Red
Redshank	RK	51	19	10	2	6	-	Red
Slavonian grebe	SZ	-	-	-	-	-	5	Red
Black guillemot	TY	-	2	-	-	-	-	Amber
Black-headed gull	BH	33	26	1	1	-	2	Amber
Black-throated diver	BV	1	-	-	-	-	-	Amber
Brent goose	BG	4	38	25	10	43	12	Amber
Common gull	CM	50	33	32	48	24	9	Amber
Cormorant	CA	2	-	3	1	10	-	Amber
Great crested grebe	GG	-	-	-	1	-	-	Amber
Great northern diver	ND	24	2	-	-	2	15	Amber
Herring gull	HG	37	2	12	8	16	40	Amber
Lesser black-backed gull	LB	-	-	-	-	6	32	Amber
Mallard	MA	21	16	37	36	6	-	Amber
Mute swan	MS	3	-	-	18	-	3	Amber
Red-breasted merganser	RM	63	95	-	3	5	9	Amber
Red-throated diver	RH	6	2	-	-	-	9	Amber
Ringed plover	RP	304	249	5	51	29	27	Amber
Shag	SA	-	-	-	-	-	1	Amber
Shelduck	SU	6	-	-	8	6	-	Amber
Teal	T.	16	3	2	30	12	14	Amber
Tufted duck	TU	-	-	89	95	68	27	Amber
Turnstone	TT	8	30	14	26	-	12	Amber
Whooper swan	WS	5	16	20	5	16	17	Amber
Wigeon	WN	4	15	75	20	32	35	Amber
Great black-backed gull	GB	11	-	4	1	4	1	Green
Greenshank	GK	4	5	1	1	22	-	Green
Grey heron	H.	4	-	1	2	-	-	Green
Little egret	ET	-	-	1	3	1	1	Green
Little grebe	LG	-	-	-	-	2	-	Green
Moorhen	MH	2	-	-	1	-	1	Green
Sanderling	SS	162	15	34	-	-	40	Green

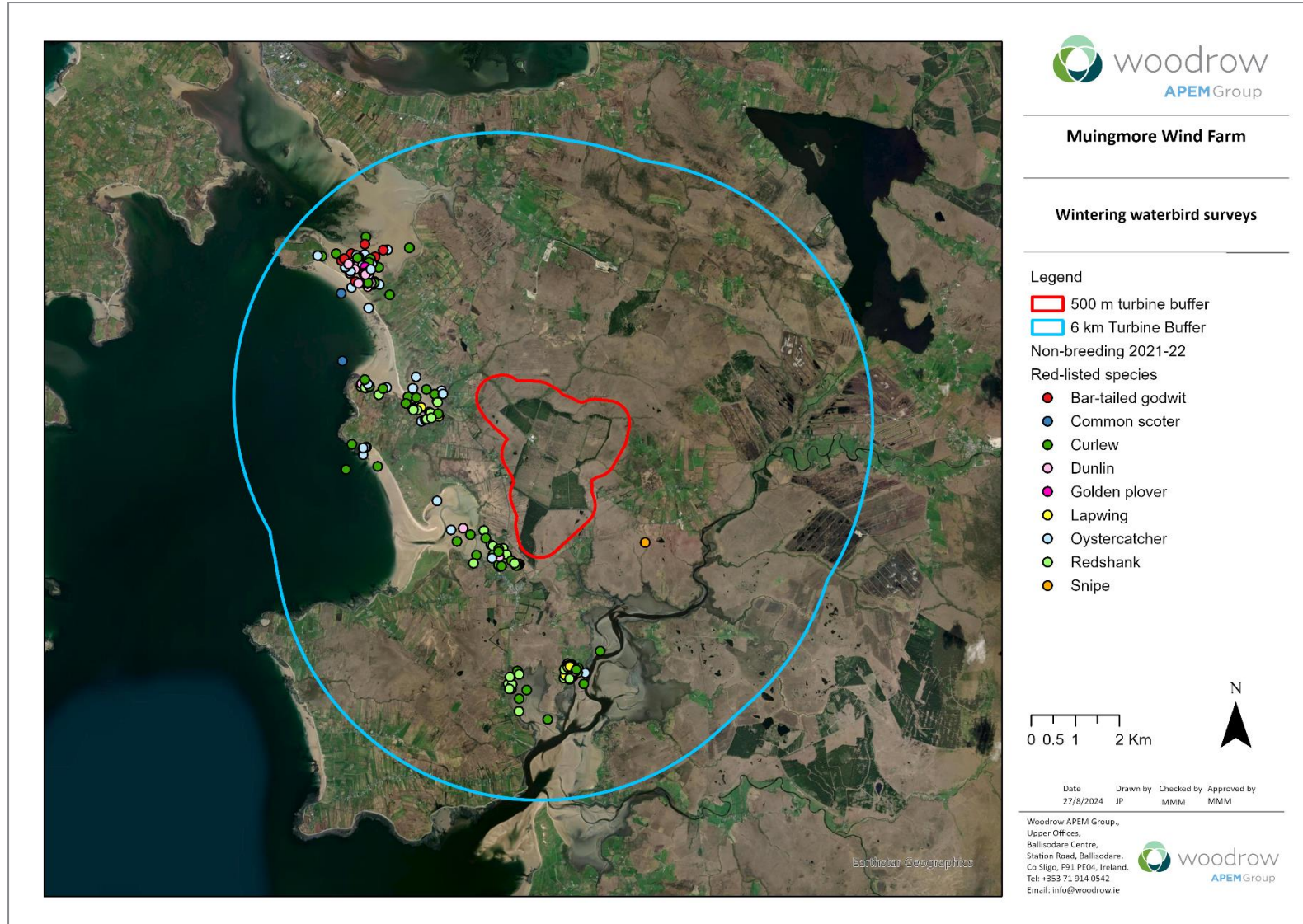


Figure 19: Red-listed species identified during waterbird surveys in the 2021-22 non-breeding season

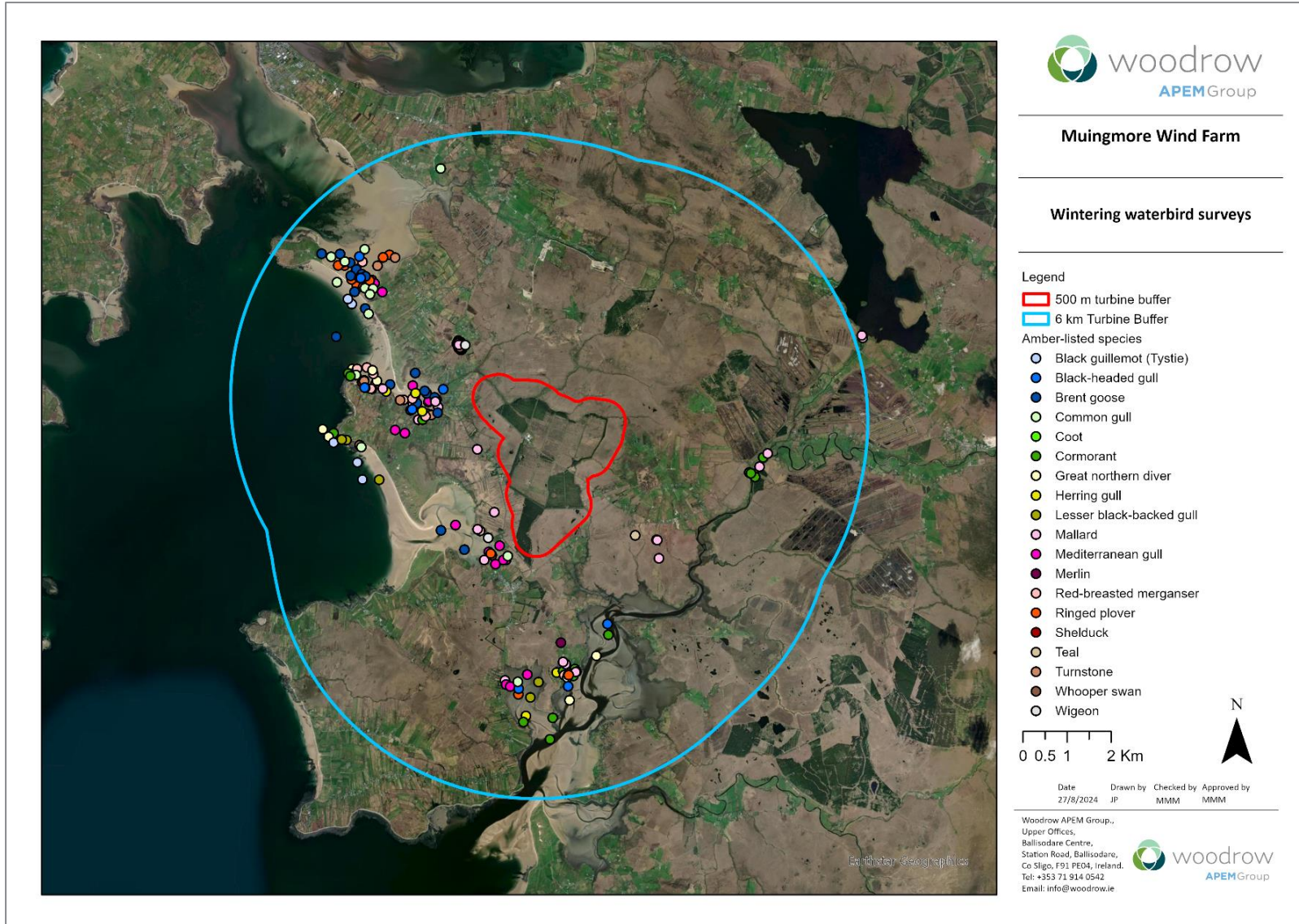


Figure 20: Amber-listed species identified during waterbird surveys in the 2021-22 non-breeding season

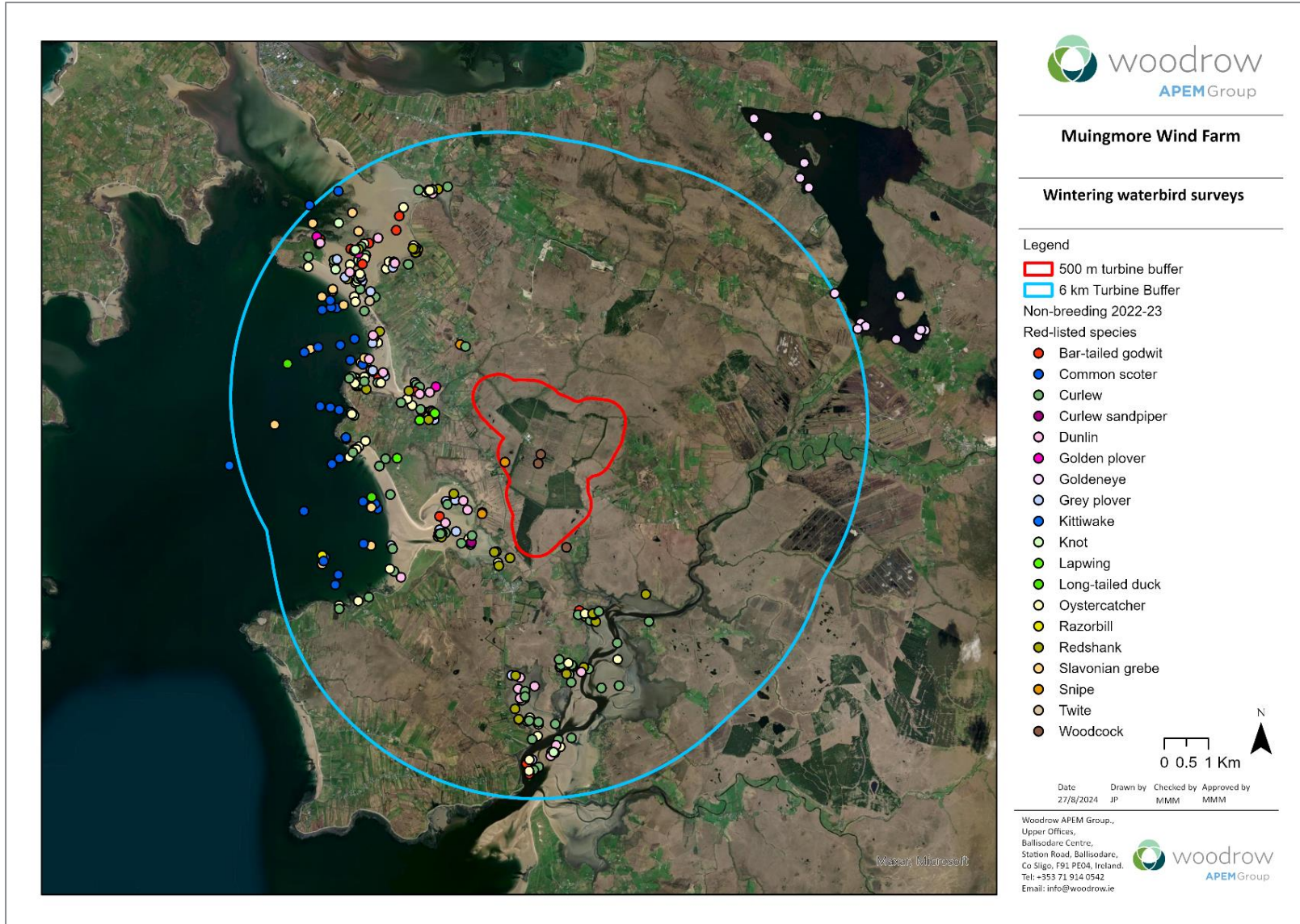


Figure 21: Red-listed species identified during waterbird surveys in the 2022-23 non-breeding season

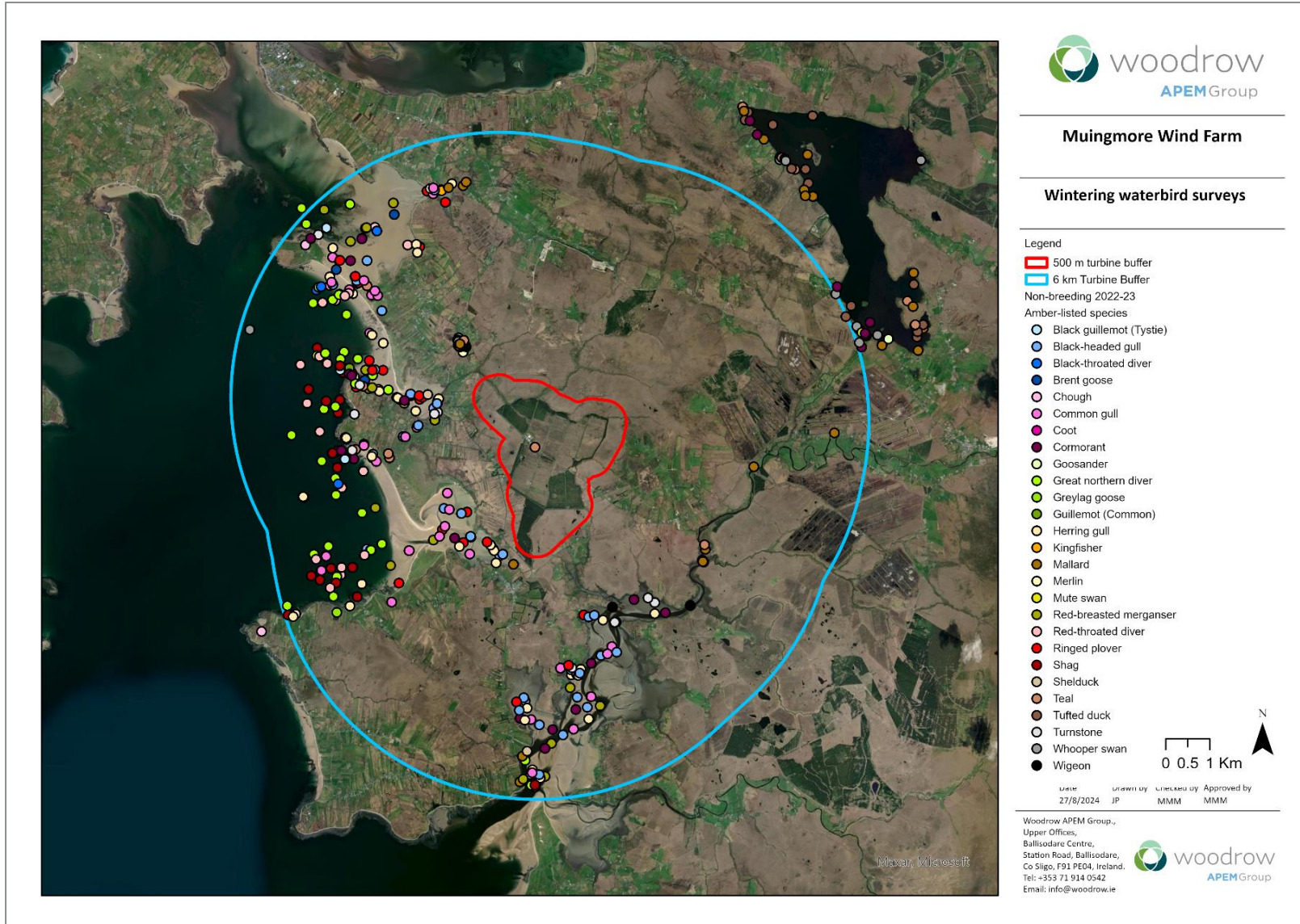


Figure 22: Amber-listed species identified during waterbird surveys in the 2022-23 non-breeding season

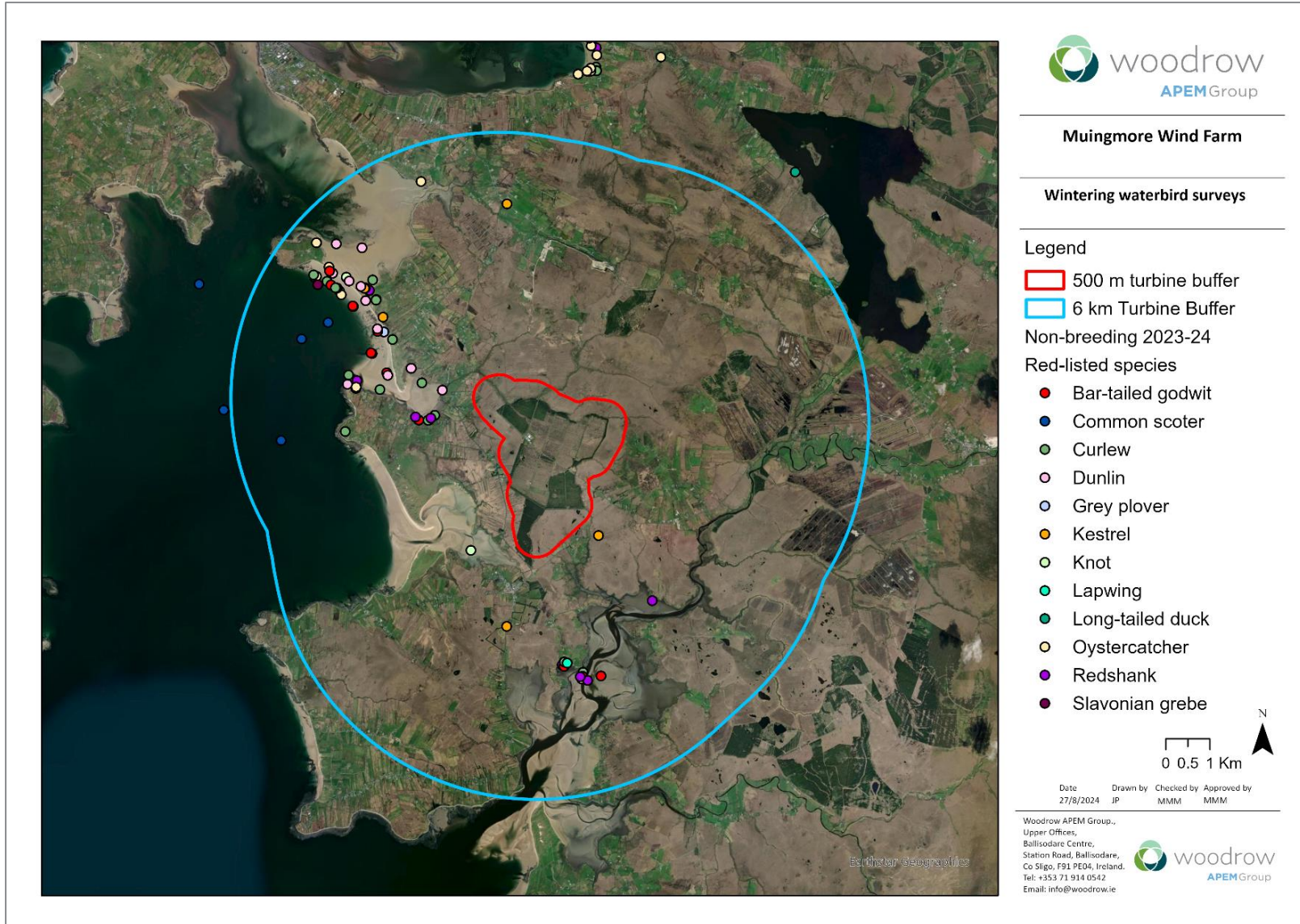


Figure 23: Red-listed species identified during waterbird surveys in the 2023-24 non-breeding season

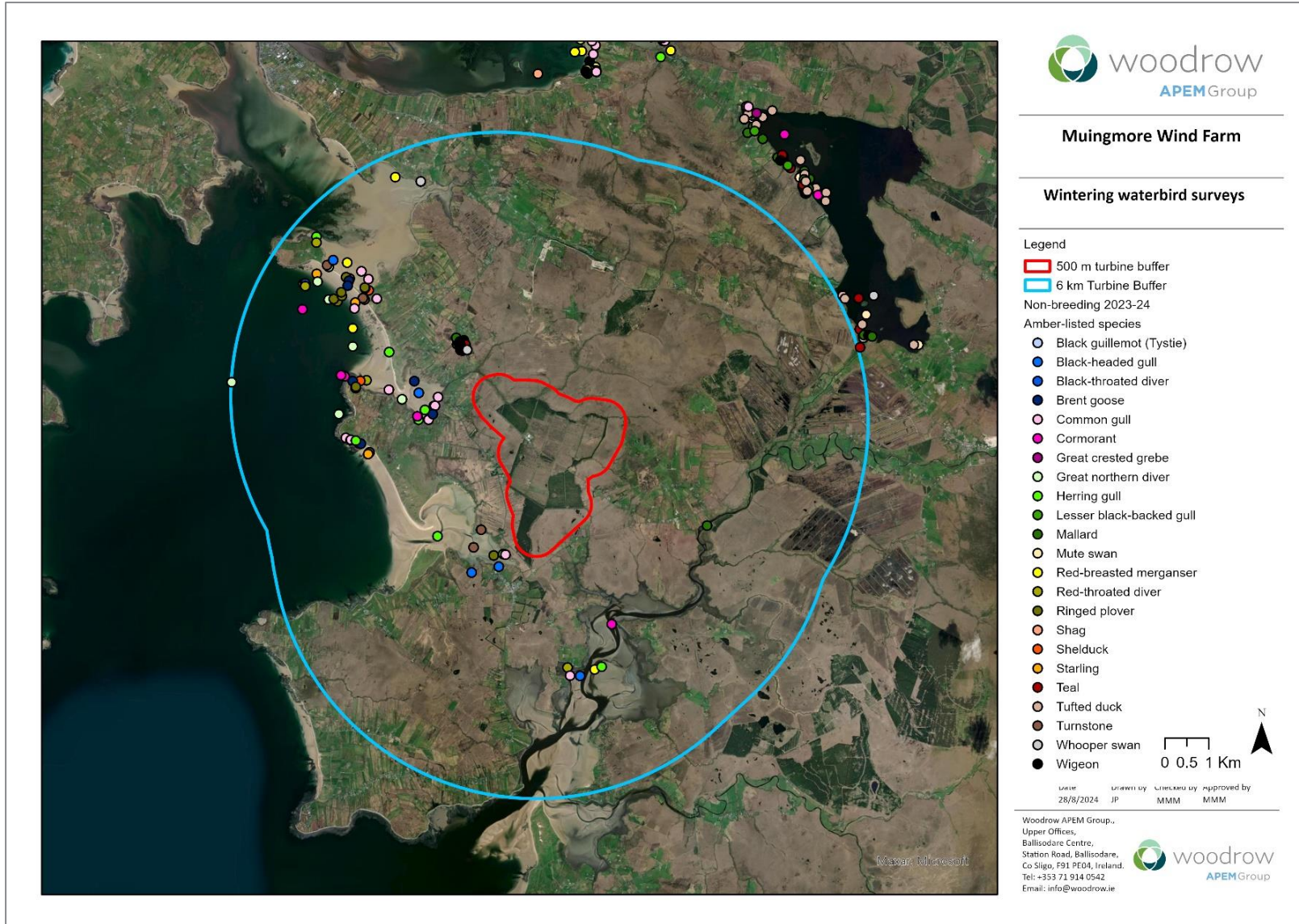


Figure 24: Amber-listed species identified during waterbird surveys in the 2023-24 non-breeding season

4.6. Bioacoustic Monitoring

No raptor species were recorded or identified during the bioacoustic monitoring. The most abundant target species was the snipe, making 78% of all the target detections, followed by the curlew (19%), while other species occasionally occurred in the recordings. Snipe produced three types of vocalisations: the snap in flight, the repetitive ground call (although sometimes in flight) and the tail drumming. Greenland white-fronted goose occurred as a flock in a single event, with multiple recordings, in the hour 10:00pm on 6 April 2023. Similarly, Barnacle goose occurred once, possibly nocturnal migration, with a single recording made at 02:30am on 28 March 2024. A range of passerine species were also identified in the recordings however were not the focus of the analysis and so are not listed here. Below is a summary of the species recorded in Table 33 and Table 34. Figure 25 presents the species recordings across all deployment periods. See **Appendix XII** a list of dates and times of each target species bioacoustic recordings.

Table 33: Overall account of target species recorded during two seasons of bioacoustic monitoring for frequency and abundance of recordings

Species	BTO code	Frequency	Abundance
Barnacle goose	BY	1	0.001
Curlew	CU	313	0.194
Grey heron	H.	1	0.001
Lapwing	L.	4	0.002
Mallard	MA	1	0.001
Moorhen	MH	7	0.004
Oystercatcher	OC	1	0.001
Snipe	SN	1255	0.779
Teal	T.	14	0.009
Greenland white-fronted goose	WG	15	0.009

Table 34: Target species for each bioacoustic monitoring deployment showing frequency and abundance of recordings

Year	Deployment dates	Monitoring unit no.	Species	BTO code	Frequency	Abundance
2	13-03-2023 to 27-03-2023	WSS045	Curlew	CU	8	0.005
	13-03-2023 to 27-03-2023	WSS045	Moorhen	MH	1	0.001
	13-03-2023 to 27-03-2023	WSS045	Snipe	SN	195	0.121
	13-03-2023 to 27-03-2023	WSS045	Teal	T.	4	0.002
	13-03-2023 to 27-03-2023	WSS049	Curlew	CU	10	0.006
	13-03-2023 to 27-03-2023	WSS049	Snipe	SN	243	0.151
	28-03-2023 to 11-04-2023	WSS045	Curlew	CU	26	0.016
	28-03-2023 to 11-04-2023	WSS045	Lapwing	L.	1	0.001
	28-03-2023 to 11-04-2023	WSS045	Mallard	MA	1	0.001
	28-03-2023 to 11-04-2023	WSS045	Moorhen	MH	5	0.003
	28-03-2023 to 11-04-2023	WSS045	Snipe	SN	102	0.063
	28-03-2023 to 11-04-2023	WSS045	Teal	T.	1	0.001
	28-03-2023 to 11-04-2023	WSS045	Greenland white-fronted goose	WG	15	0.009
	28-03-2023 to 11-04-2023	WSS049	Curlew	CU	16	0.010

Year	Deployment dates	Monitoring unit no.	Species	BTO code	Frequency	Abundance
	28-03-2023 to 11-04-2023	WSS049	Grey heron	H.	1	0.001
	28-03-2023 to 11-04-2023	WSS049	Snipe	SN	614	0.381
	28-03-2023 to 11-04-2023	WSS049	Teal	T.	4	0.002
3	13-02-2024 to 16-03-2024	WSS042	Curlew	CU	16	0.010
	13-02-2024 to 16-03-2024	WSS042	Lapwing	L.	1	0.001
	13-02-2024 to 16-03-2024	WSS042	Snipe	SN	19	0.012
	13-02-2024 to 16-03-2024	WSS042	Teal	T.	5	0.003
	13-02-2024 to 16-03-2024	WSS049	Curlew	CU	15	0.009
	13-02-2024 to 16-03-2024	WSS049	Snipe	SN	2	0.001
	17-03-2024 to 13-04-2024	WSS042	Curlew	CU	91	0.056
	17-03-2024 to 13-04-2024	WSS042	Moorhen	MH	1	0.001
	17-03-2024 to 13-04-2024	WSS042	Oystercatcher	OC	1	0.001
	17-03-2024 to 13-04-2024	WSS042	Snipe	SN	15	0.009
	17-03-2024 to 13-04-2024	WSS050	Barnacle goose	BY	1	0.001
	17-03-2024 to 13-04-2024	WSS050	Curlew	CU	81	0.050
17-03-2024 to 13-04-2024	WSS050	Snipe	SN	64	0.040	

4.7. Hen harrier roost searches

4.7.1. Non-breeding season 2021-22

No hen harrier roosts were identified during the hen harrier roost surveys undertaken in winter 2021-22. No hen harriers were noted during any of the surveys covering the proposed development site or in the wider area.

4.7.2. Non-breeding season 2022-23

No hen harrier roost or individual birds were recorded during the targeted hen harrier roost searches, and/or during other surveys undertaken over winter 2022-23 within or adjacent to the 500 m turbine buffer area.

4.7.3. Non-breeding season 2023-24

No hen harrier roosts, or individual birds, were recorded during the targeted hen harrier roost searches, and/or during other surveys undertaken over winter 2023-24 within or adjacent to the 500 m turbine buffer area.

5. DISCUSSION

5.1. Waterbirds

5.1.1. Swans, geese and ducks

Two whooper swan observations were recorded generating a total of 1,080 flight seconds over the three winter surveys, with 100% of the flight time occurring within the CRZ. Flock sizes recorded were between three and five birds. Given only two flights were observed, there is no emerging pattern that is suggestive of birds regularly travelling over the site on migration or between roost sites and foraging areas.

Of geese and ducks recorded during VP surveys, a single Canada goose *Branta canadensis* was recorded flying through the 500 m turbine buffer, generating a total of 50 flight seconds over the three-year surveys and a single greylag goose flock (17 individuals) was noted flying within the 500 m turbine buffer. Three teal *Anas crecca* flights were recorded flying through the 500 m turbine buffer equating to a total of 127 flight seconds, with 69% of the flight time occurring within the CRZ. A total of 19 mallard *Anas platyrhynchos* flights were recorded within the 500 m turbine buffer, equating to 963 flight seconds, with 90% of the flight time occurring within the CRZ. Flights were generally of one to four individuals. A potential breeding territory was identified in a small waterbody in the west part of the 500 m turbine buffer during the 2021 breeding season.

In the wider area, the high activity of waterbirds relates to the presence of the Blacksod Bay/Broad Haven SPA, which comprises of coastal and estuarine habitats in the northern part of Blacksod Bay within the 6 km turbine buffer. Carrowmore Lake SPA also holds concentrations of waterbirds recorded during the wider area waterbird surveys and is in an inland waterbody northwest of the proposed site and within the 6 km turbine buffer.

5.1.2. Waders

Eight wader species were recorded during VP watches over the three-year survey period, with the aggregated flight times for only two wader species, including snipe and Wilson's phalarope, equating to more than 1,000 seconds within the CRZ. During VP surveys one observation of curlew (two individuals), golden plover (three individuals), greenshank *Tringa nebularia* (one individual), lapwing (three individuals), whimbrel *Numenius phaeopus* (seven individuals), and Wilson's phalarope (18 individuals) were made.

A total of 22 snipe observations were recorded generating a total of 2,158 flight seconds, with 99% of the flights occurring within the CRZ. Flock size ranged from one to 27 birds with an average flock size of 2 birds. Flight activity was recorded during the non-breeding seasons with higher activity noted over the autumn passage season 2023 (1,475 flight seconds recorded), which cumulatively accounted for 70% of the flight time recorded. Additionally, 20% of the flight time recorded was noted during the non-breeding seasons and only 10% of the flight time recorded was identified during the 2023 breeding season. It is important to mention that snipe were recorded making displaying flights (drumming) around VP4 indicating breeding in this area.

Breeding bird surveys confirmed the presence of breeding snipe within the 500 m turbine buffer during both the 2019 and 2020 breeding seasons. Snipe were recorded chipping and drumming from wet grassland habitats to the north-west and south-east of the 500 m turbine buffer during the 2021 breeding season. Snipe were also considered to hold breeding territories in bog habitat in the south-east of the 500 m turbine buffer during the 2022 and 2023 breeding seasons.

A total of one Wilson's phalarope observation was recorded generating a total of 1,080 flight seconds, with 100% of the flights occurring within the CRZ. The flock comprised a total of 18 individuals.

A total of four woodcock *Scolopax rusticola* observations were recorded during the 2021-22 non-breeding season in the north and east of the 500 m turbine buffer. Woodcock were not recorded during the breeding season in any survey year.

With the exception of snipe, no other wader species were identified as breeding within the 500 m turbine buffer during the three-year survey period.

5.1.3. Gulls

Five species of gull were recorded during VP watches, including black-headed gull, common gull, great black-backed gull, herring gull, and lesser black-backed gull. Four of these species, black-headed gull, great black-backed gull, herring gull and lesser black-backed gull, generated aggregate flight time of more than 1,000 seconds within the CRZ.

Lesser black-backed gull was the most frequently recorded gull species with 82 observations generating a total of 6,142 seconds, with 95% of the seconds occurring within the CRZ. Flock size ranged from one to three birds, with typically observed flights involving one bird. Flight activity was considerably higher during the breeding seasons compared to the non-breeding seasons. The high frequency of flights recorded in summer, mainly located in the west, centre and south-west of the 500 m turbine buffer, suggests that there is likely breeding in the wider area.

The second most recorded gull species was black-headed gull with a total of 70 flights recorded equating to 6,265 flight seconds, with 55% of the seconds occurring within the CRZ. Flock size ranged from one to three birds, with typically observed flights involving one bird. More than 98% of the flights were recorded during the three breeding seasons. Black-headed gull have previously been recorded breeding on Derreens Island in Carrowmore Lake (NPWS, 2015).

A total of 63 great black-backed gull observations were recorded during VP watches over the three-year study period, totalling 6,654 flight seconds, all occurring within the CRZ. These records were widespread within the 500 m turbine buffer and within the different breeding and non-breeding seasons.

A total of 63 herring gull observations were recorded generating a total of 2,628 flight seconds, with 99% of the flights occurring within the CRZ. Flock size ranged from one to five birds. Flight activity was recorded during the breeding seasons.

One single kittiwake *Rissa tridactyla* was recorded during the 2023 spring passage season, which is a very unusual record in the area, and it is presumed to be a disoriented bird.

Surveys indicate that gulls commute across the site, with a suggestion that black-headed gull and lesser black-backed gull breed in the wider area however, the presence of breeding colonies in the wider area was not confirmed.

5.1.4. Other waterbirds

A total of five cormorant *Phalacrocorax carbo* observations were recorded generating 510 flight seconds, with 100% of the flight seconds recorded within the CRZ. All records were of single birds during the non-breeding and the autumn passage seasons, with most flights associated with birds commuting along waterbodies within the 500 m turbine buffer and in the wider area. During wider area wintering waterbird surveys, cormorant observations were associated with the Blacksod Bay/Broad Haven SPA, within the 6 km turbine buffer.

Overall, a total of 32 grey heron observations were recorded equating to 1,603 flight seconds, with 63% of the seconds occurring within the CRZ. All the records were of single birds with the majority of flights associated with birds commuting along waterbodies within the 500 m turbine buffer and in the wider area.

5.2. Raptors

Seven species of raptor were recorded during the VP surveys within the 500 m turbine buffer including buzzard, hen harrier, hobby *Falco subbuteo*, kestrel, merlin, peregrine, and sparrowhawk. Three raptor species, buzzard, kestrel and sparrowhawk, displayed a total aggregate flight time of more than 1,000 seconds within the CRZ over the three-year survey period.

Kestrel was the most active raptor species within the 500 m turbine buffer with 176 flights recorded which generated 16,849 flight seconds recorded, 90% occurring within the CRZ. Almost 70% of the flights observed were recorded during the breeding seasons. Breeding was confirmed during all three breeding seasons in the existing site. Kestrel is a red-listed species due to declining population numbers, with the national population somewhere between 9,918 and 17,393 pairs (Lewis *et al.*, 2019a).

No other raptor species were identified as breeding within the 500 m or the 2 km turbine buffer during surveys.

A total of 75 sparrowhawk observations were recorded during VP watches conducted over the three-year study period, generating 6,133 flight seconds, with 88% occurring within the CRZ. This species tends to fly relatively low (below rotor-swept height), especially when hunting. However, display flights and when commuting longer distances result in flight time within the CRZ. It is acknowledged that the application of CRMs to smaller, evasive species like sparrowhawk may not provide an accurate estimate of collision risk, as these species can be difficult to detect over the full extent of the viewsheds for VPs, due to diminutive size, cryptic nature and/or flight behaviour. While fatalities have been reported from Irish wind farm sites (Cullen and Williams, 2010), sparrowhawk is green-listed species in Ireland of least conservation concern and has a national population of 8,746 – 14,252 pairs (Lewis *et al.*, 2019a).

A total of nine buzzard sightings were recorded during VP watches over the three-year study period. Buzzard observations generated 1,051 flight seconds, with 100% occurring within the CRZ. Typically, single buzzards were recorded foraging, displaying or commuting through the 500 m turbine buffer, with occasionally up to two birds observed simultaneously. Increasingly, as post-construction monitoring programmes improve, buzzards are a species emerging as susceptible to collision with turbines. The buzzard population in Ireland has steadily increased over the last 20 years and is still expanding into new areas, seemingly only limited by the availability of nesting habitat, typically in

trees (Lusby, 2011, Balmer *et al.*, 2013). Although no population estimate is available for buzzards in Ireland, as indicated by the BoCCI green-list status of the species.

Eight hen harrier observations were recorded equating to 935 flight seconds, with 28% of the seconds occurring within the CRZ. Four of these observations were recorded during the non-breeding seasons, two observations during the breeding seasons, a single observation during the autumn passage season and another one during the spring passage season. These results, along with results of other wider area surveys including hen harrier roost watches, suggest that flights are not associated with breeding or winter roosting sites within the 2 km buffer.

A total of eight peregrine observations were recorded generating 390 flight seconds, with all the flight time occurring within the CRZ. Half of these observations were recorded during the autumn passage season and the other half during the non-breeding seasons. Typically, single birds were recorded hunting or travelling through the 500 m buffer, although on two occasions during the 2022 autumn passage season a pair was seen flying to the west and south-west of the 500 m turbine buffer. Considering the infrequency of flights over three years of surveys, the proposed development site does not represent a particularly important site for peregrine.

Five merlin flights were observed during VP surveys, including three observations during the non-breeding seasons and two during the spring passage seasons. While observations were infrequent, merlin appear to be using the lands within the proposed development site to over-winter or for commuting through the spring season.

Three hobby flights were recorded during VP watches in the 2022 breeding season. All records were observed on the same day (19 July 2022), including a single individual flying low over peatland in the west of the 500 m turbine buffer.

5.3. Other species of conservation concern

Meadow pipit, a red-listed passerine of conservation concern, was recorded during the three-year survey period. Meadow pipits were the most abundant and widespread passerine recorded during all breeding seasons, and breed within suitable open bog and grassland habitats within the 500 m turbine buffer. Eight amber-listed passerines of conservation concern were recorded during the three-year survey period and included goldcrest *Regulus regulus*, house sparrow *Passer domesticus*, linnet *Linaria cannabina*, skylark *Alauda arvensis*, willow warbler *Phylloscopus trochilus*, starling, sand martin *Riparia riparia* and swallow *Hirundo rustica*. Goldcrest were recorded breeding in suitable forestry habitat within the 500 m turbine buffer and this result was consistent during all breeding seasons. Suitable breeding habitats for swallows were identified in the existing buildings in the central part of the proposed development site. Willow warblers were recorded breeding in suitable woodlands and scrublands within the 500 m turbine buffer.

Populations of red and amber-listed passerines recorded within the proposed development site are not at risk from collisions with turbines but are sensitive to vegetation removal and disturbance.

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Appendix I - Historical records

Table I.1: NBDC bird records within 10km of the proposed site from the period 2011-22

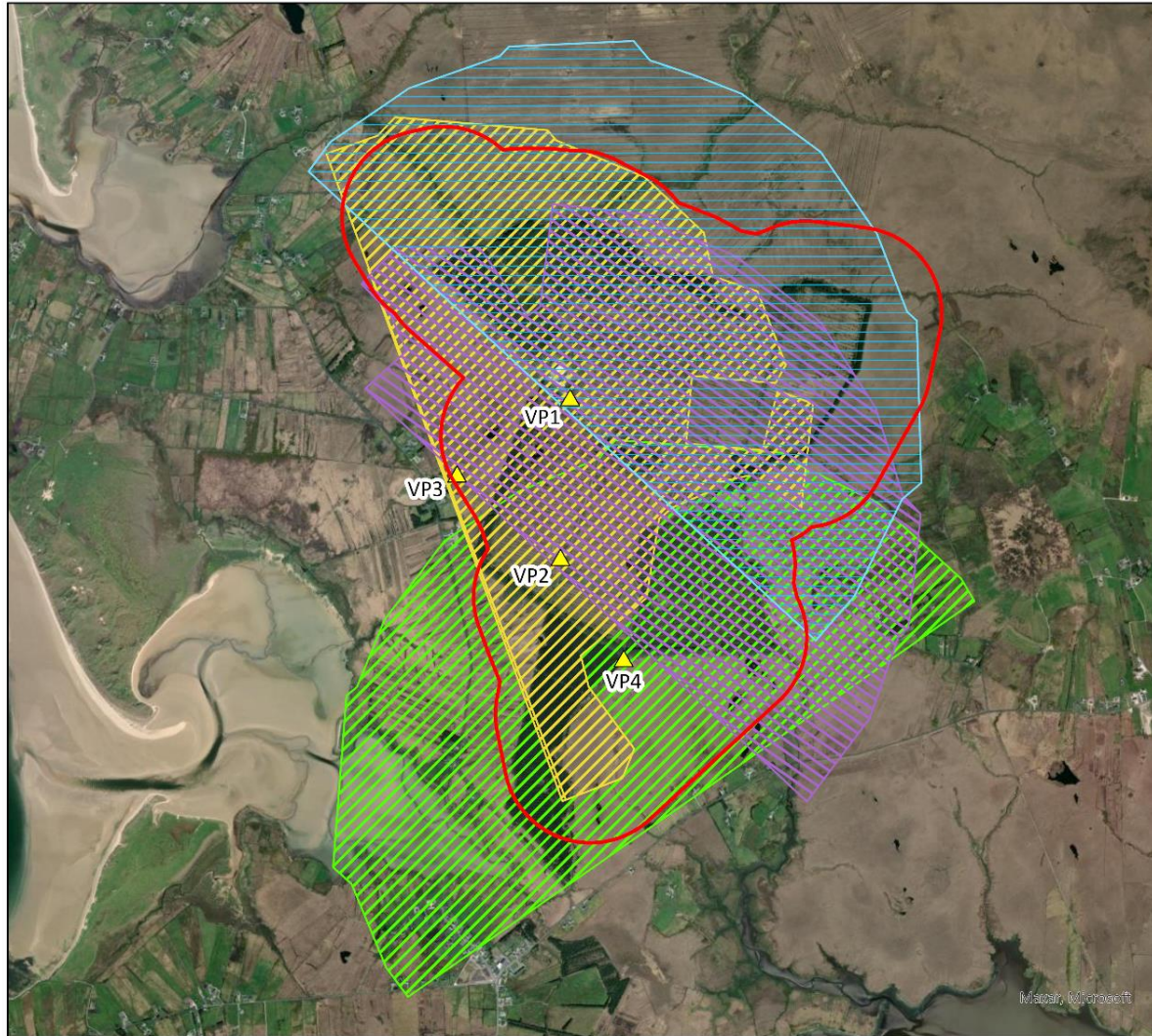
Common name	Scientific name	BoCCI 2020-2026	Count	Date
Red-listed species are species of highest conservation concern where the population is rapidly declining in abundance or range, has experienced a historic rapid decline (without recovery) or is globally threatened.				
Bar-tailed godwit	<i>Limosa lapponica</i>	Red ^{Win}	11	31/12/2011
Black-legged kittiwake	<i>Rissa tridactyla</i>	Red ^{Br}	4	15/05/2018
Common goldeneye	<i>Bucephala clangula</i>	Red ^{Win}	4	31/12/2011
Common kestrel	<i>Falco tinnunculus</i>	Red ^{Br}	21	04/08/2015
Common pochard	<i>Aythya ferina</i>	Red ^{Br. and Win}	4	31/12/2011
Common redshank	<i>Tringa totanus</i>	Red ^{Br. and Win}	22	31/12/2011
Common scoter	<i>Melanitta nigra</i>	Red ^{Br. and Win}	10	31/12/2011
Common snipe	<i>Gallinago gallinago</i>	Red ^{Br. and Win}	39	28/04/2018
Corn crake	<i>Crex crex</i>	Red ^{Br}	9	22/05/2018
Curlew sandpiper	<i>Calidris ferruginea</i>	Red ^{Passage}	1	24/02/2018
Dunlin	<i>Calidris alpina</i>	Red ^{Br. and Win}	14	31/12/2011
Eurasian curlew	<i>Numenius arquata</i>	Red ^{Br. and Win}	33	30/08/2020
Eurasian oystercatcher	<i>Haematopus ostralegus</i>	Red ^{Br. and Win}	29	10/07/2018
Eurasian woodcock	<i>Scolopax rusticola</i>	Red ^{Br}	10	31/12/2011
European golden plover	<i>Pluvialis apricaria</i>	Red ^{Br. and Win}	12	14/07/2021
European turtle dove	<i>Streptopelia turtur</i>	Red ^{Passage}	1	26/03/2018
Greater scaup	<i>Anas marila</i>	Red ^{Win}	4	31/12/2011
Grey plover	<i>Pluvialis squatarola</i>	Red ^{Win}	5	31/12/2011
Grey wagtail	<i>Motacilla cinerea</i>	Red ^{Br}	14	28/03/2019
Long-tailed duck	<i>Clangula hyemalis</i>	Red ^{Win}	5	31/12/2011
Meadow pipit	<i>Anthus pratensis</i>	Red ^{Br}	70	28/04/2018
Northern lapwing	<i>Vanellus vanellus</i>	Red ^{Br. and Win}	22	31/12/2011
Purple sandpiper	<i>Calidris maritima</i>	Red ^{Win}	3	31/12/2011
Red grouse	<i>Lagopus lagopus hibernicus</i>	Red ^{Br}	13	17/02/2020
Red knot	<i>Calidris canutus</i>	Red ^{Win}	5	31/12/2011
Redwing	<i>Turdus iliacus</i>	Red ^{Win}	13	31/12/2011
Slavonian grebe	<i>Podiceps auritus</i>	Red ^{Win}	6	31/12/2011
Twite	<i>Carduelis flavirostris</i>	Red ^{Br}	7	31/12/2011
Velvet scoter	<i>Melanitta fusca</i>	Red ^{Win}	1	31/12/2011
Amber-listed species are those with unfavourable European status, occur in internationally important numbers, are moderately declining in abundance or range, or if the population occurs in very small numbers.				
Arctic tern	<i>Sterna paradisaea</i>	Amber ^{Br}	3	31/12/2011
Barn swallow	<i>Hirundo rustica</i>	Amber ^{Br}	43	02/07/2018
Barnacle goose	<i>Branta leucopsis</i>	Amber ^{Win}	5	24/03/2018
Black guillemot	<i>Cephus grylle</i>	Amber ^{Br}	8	31/12/2011
Black-headed gull	<i>Chroicocephalus ridibundus</i>	Amber ^{Br. and Win}	31	05/08/2018
Black-throated diver	<i>Gavia arctica</i>	Amber ^{Win}	2	31/12/2011
Brent goose (light-bellied)	<i>Branta bernicla hrota</i>	Amber ^{Win}	10	31/12/2011
Common guillemot	<i>Uria aalge</i>	Amber ^{Br}	18	31/12/2011

Common name	Scientific name	BoCCI 2020-2026	Count	Date
Common kingfisher	<i>Alcedo atthis</i>	Amber ^{Br}	4	31/12/2011
Common linnet	<i>Carduelis cannabina</i>	Amber ^{Br}	31	31/12/2011
Common sandpiper	<i>Actitis hypoleucos</i>	Amber ^{Br}	14	31/12/2011
Common shelduck	<i>Tadorna tadorna</i>	Amber ^{Br. and Win}	12	07/04/2018
Common starling	<i>Sturnus vulgaris</i>	Amber ^{Br}	53	27/03/2019
Common tern	<i>Sterna hirundo</i>	Amber ^{Br}	5	10/06/2018
Eurasian teal	<i>Anas crecca</i>	Amber ^{Br. and Win}	19	31/12/2011
Eurasian tree sparrow	<i>Passer montanus</i>	Amber ^{Br}	2	15/03/2018
Eurasian wigeon	<i>Anas penelope</i>	Amber ^{Br. and Win}	11	31/12/2011
European greenfinch	<i>Carduelis chloris</i>	Amber ^{Br}	23	31/12/2011
European shag	<i>Phalacrocorax aristotelis</i>	Amber ^{Br}	10	16/05/2018
Gadwall	<i>Anas strepera</i>	Amber ^{Br. and Win}	2	31/12/2011
Goldcrest	<i>Regulus regulus</i>	Amber ^{Br}	23	29/11/2017
Goosander	<i>Mergus merganser</i>	Amber ^{Br}	2	31/12/2011
Great cormorant	<i>Phalacrocorax carbo</i>	Amber ^{Br. and Win}	31	20/02/2018
Great northern diver	<i>Gavia immer</i>	Amber ^{Win}	16	31/12/2011
Greylag goose	<i>Anser anser</i>	Amber ^{Win}	7	31/12/2011
Hen harrier	<i>Circus cyaneus</i>	Amber ^{Br}	4	31/12/2011
Herring gull	<i>Larus argentatus</i>	Amber ^{Br. and Win}	30	15/05/2018
House martin	<i>Delichon urbicum</i>	Amber ^{Br}	7	31/12/2011
House sparrow	<i>Passer domesticus</i>	Amber ^{Br}	45	27/03/2019
Lesser black-backed gull	<i>Larus fuscus</i>	Amber ^{Br. and Win}	15	12/03/2018
Mallard	<i>Anas platyrhynchos</i>	Amber ^{Br. and Win}	42	31/12/2011
Merlin	<i>Falco columbarius</i>	Amber ^{Br}	13	30/07/2017
Mew gull	<i>Larus canus</i>	Amber ^{Br. and Win}	31	31/12/2011
Mute swan	<i>Cygnus olor</i>	Amber ^{Br. and Win}	5	31/12/2011
Northern gannet	<i>Morus bassanus</i>	Amber ^{Br}	5	31/12/2011
Northern pintail	<i>Anas acuta</i>	Amber ^{Win}	3	31/12/2011
Northern wheatear	<i>Oenanthe oenanthe</i>	Amber ^{Br}	28	13/05/2021
Red-billed chough	<i>Pyrrhocorax pyrrhocorax</i>	Amber ^{Br}	4	18/03/2018
Red-breasted merganser	<i>Mergus serrator</i>	Amber ^{Br. and Win}	22	31/12/2011
Red-throated diver	<i>Gavia stellata</i>	Amber ^{Br. and Win}	6	31/12/2011
Ringed plover	<i>Charadrius hiaticula</i>	Amber ^{Br}	30	07/04/2018
Ruddy turnstone	<i>Arenaria interpres</i>	Amber ^{Win}	14	15/03/2018
Sand martin	<i>Riparia riparia</i>	Amber ^{Br}	10	31/12/2011
Sandwich tern	<i>Sterna sandvicensis</i>	Amber ^{Br}	8	31/12/2011
Sky lark	<i>Alauda arvensis</i>	Amber ^{Br}	52	02/07/2018
Spotted flycatcher	<i>Muscicapa striata</i>	Amber ^{Br}	3	21/05/2011
Tufted duck	<i>Aythya fuligula</i>	Amber ^{Br. and Win}	11	31/12/2011
Whooper swan	<i>Cygnus cygnus</i>	Amber ^{Br. and Win}	8	31/12/2011
Willow warbler	<i>Phylloscopus trochilus</i>	Amber ^{Br}	25	28/04/2018
Green-listed birds are not considered threatened.				
American golden plover	<i>Pluvialis dominica</i>	Green	7	30/09/2012

Common name	Scientific name	BoCCI 2020-2026	Count	Date
Black-billed magpie	<i>Pica pica</i>	Green	60	07/01/2018
Blackcap	<i>Sylvia atricapilla</i>	Green	2	31/12/2011
Blue tit	<i>Cyanistes caeruleus</i>	Green	38	29/03/2018
Brent goose	<i>Branta bernicla</i>	Green	13	31/12/2011
Carrion crow	<i>Corvus corone</i>	Green	5	27/03/2019
Chaffinch	<i>Fringilla coelebs</i>	Green	45	31/12/2011
Coal tit	<i>Periparus ater</i>	Green	27	26/03/2018
Common blackbird	<i>Turdus merula</i>	Green	68	27/03/2019
Common cuckoo	<i>Cuculus canorus</i>	Green	17	28/05/2018
Common grasshopper warbler	<i>Locustella naevia</i>	Green	14	28/04/2018
Common greenshank	<i>Tringa nebularia</i>	Green	12	18/03/2018
Common moorhen	<i>Gallinula chloropus</i>	Green	16	31/12/2011
Common pheasant	<i>Phasianus colchicus</i>	Green	3	31/12/2011
Common raven	<i>Corvus corax</i>	Green	17	27/05/2018
Common whitethroat	<i>Sylvia communis</i>	Green	4	31/12/2011
Common wood pigeon	<i>Columba palumbus</i>	Green	40	28/05/2018
Eurasian collared dove	<i>Streptopelia decaocto</i>	Green	11	31/12/2011
Eurasian jackdaw	<i>Corvus monedula</i>	Green	39	31/12/2011
Eurasian siskin	<i>Carduelis spinus</i>	Green	7	31/12/2011
Eurasian sparrowhawk	<i>Accipiter nisus</i>	Green	19	20/08/2018
European goldfinch	<i>Carduelis carduelis</i>	Green	18	31/12/2011
European robin	<i>Erithacus rubecula</i>	Green	64	27/03/2019
Fieldfare	<i>Turdus pilaris</i>	Green	10	27/03/2018
Great black-backed gull	<i>Larus marinus</i>	Green	16	31/12/2011
Great tit	<i>Parus major</i>	Green	16	31/12/2011
Greater white-fronted goose	<i>Anser albifrons</i>	Green	6	31/12/2011
Greenland white-fronted goose	<i>Anser albifrons flavirostris</i>	Green	4	31/12/2011
Green-winged teal	<i>Anas carolinensis</i>	Green	2	31/12/2011
Grey heron	<i>Ardea cinerea</i>	Green	23	22/05/2018
Hedge accentor	<i>Prunella modularis</i>	Green	41	31/12/2011
Hooded crow	<i>Corvus cornix</i>	Green	76	28/04/2018
Iceland gull	<i>Larus glaucooides</i>	Green	4	18/03/2018
Jack snipe	<i>Lymnocyptes minimus</i>	Green	2	31/12/2011
Lesser redpoll	<i>Carduelis flammea cabaret</i>	Green	23	28/04/2018
Little grebe	<i>Tachybaptus ruficollis</i>	Green	8	31/12/2011
Long-eared owl	<i>Asio otus</i>	Green	3	31/12/2011
Long-tailed tit	<i>Aegithalos caudatus</i>	Green	2	31/12/2011
Mistle thrush	<i>Turdus viscivorus</i>	Green	15	27/03/2019
Peregrine falcon	<i>Falco peregrinus</i>	Green	5	24/05/2018
Pied wagtail	<i>Motacilla alba yarrellii</i>	Green	2	05/01/2018
Pink-footed goose	<i>Anser brachyrhynchus</i>	Green	3	31/12/2011
Red-necked grebe	<i>Podiceps grisegena</i>	Green	3	31/12/2011
Reed bunting	<i>Emberiza schoeniclus</i>	Green	40	31/12/2011

Common name	Scientific name	BoCCI 2020-2026	Count	Date
Ring-necked duck	<i>Aythya collaris</i>	Green	3	31/12/2011
Rock pigeon	<i>Columba livia</i>	Green	3	31/12/2011
Rock pipit	<i>Anthus petrosus</i>	Green	17	31/12/2011
Rook	<i>Corvus frugilegus</i>	Green	16	31/12/2011
Sanderling	<i>Calidris alba</i>	Green	9	07/04/2018
Sedge warbler	<i>Acrocephalus schoenobaenus</i>	Green	24	31/12/2011
Snow bunting	<i>Plectrophenax nivalis</i>	Green	1	31/12/2011
Snow goose	<i>Anser caerulescens</i>	Green	4	31/12/2011
Song thrush	<i>Turdus philomelos</i>	Green	48	15/03/2018
Stonechat	<i>Saxicola torquata</i>	Green	50	31/12/2011
Water rail	<i>Rallus aquaticus</i>	Green	2	31/12/2011
White wagtail	<i>Motacilla alba</i>	Green	51	31/12/2011
White-rumped sandpiper	<i>Calidris fuscicollis</i>	Green	3	02/10/2012
White-throated dipper	<i>Cinclus cinclus</i>	Green	6	19/04/2016
Winter wren	<i>Troglodytes troglodytes</i>	Green	68	28/04/2018







Appendix II - VP viewshed analysis

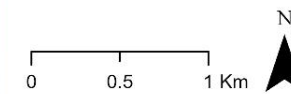


Muingmore Wind Farm

Viewshed analysis

Legend

-  500 m turbine buffer
-  VP locations
-  Viewshed VP1
-  Viewshed VP2
-  Viewshed VP3
-  Viewshed VP4



Date: 28/8/2024
Drawn by: JP
Checked by: MMM
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Appendix III - VP watches effort tables

Table III.1: VP watch survey hours completed at the 500 m turbine buffer during the 2021 breeding season

Breeding season 2021				
Date	VP1	VP2	VP3	VP4
27/04/2021	3	3	-	-
28/04/2021	3	-	3	-
10/05/2021	-	3	3	-
08/06/2021	3	-	-	3
09/06/2021	-	3	3	
10/06/2021	3		-	3
17/06/2021	2	2	-	
21/06/2021	2		2	2
28/06/2021	2	2	2	
01/07/2021	-	6	-	-
12/07/2021	3	-	-	3
13/07/2021	2		2	2
14/07/2021	-	2	2	2
15/07/2021	3	-	3	-
19/07/2021	-	-	3	3
21/07/2021	-	3	2	-
22/07/2021	-		2	3
04/08/2021	-	3	3	
10/08/2021	-		3	3
2/08/2021	3	3	-	-
18/08/2021	-	-	-	6
23/08/2021	6	-	-	-
24/08/2021	-	3	-	3
25/08/2021	3	-	3	-
26/08/2021	-	3	-	3
Total hours	38	36	36	36

Table III.2: VP watch survey hours completed at the 500 m turbine buffer during the 2021 autumn passage season

Autumn passage season 2021				
Date	VP1	VP2	VP3	VP4
07/09/2021	-	1.5	-	1.5
09/09/2021	1.5	-	1.5	-
27/09/2021	1.5	-	1.5	-
28/09/2021	-	1.5	-	1.5
04/10/2021	1.5	-	1.5	-
05/10/2021	-	1.5		1.5
Total hours	4.5	4.5	4.5	4.5

Table III.3: VP watch survey hours completed at the 500 m turbine buffer during the 2021-22 non-breeding season

Non-breeding season 2021-22				
Date	VP1	VP2	VP3	VP4
13/10/2021	3	3	-	-
14/10/2021	-	-	3	3
20/10/2021	3	3	-	-
25/10/2021	-	-	3	3
19/11/2021	3	3	-	-
22/11/2021	-	3	3	-
24/11/2021	3	-	-	3
25/11/2021	-	-	3	3
29/11/2021	-	-	3	3
09/12/2021	3	-	-	-
16/12/2021	3	-	3	-
17/12/2021	-	3	3	-
10/01/2022	-	3	-	3
12/01/2022	-	-	-	3
18/01/2022	3	3	-	-
19/01/2022	3	3	-	-
27/01/2022	3	3	-	-
31/01/2022	-	-	6	-
01/02/2022	-	-	-	3
09/02/2022	3	-	-	-
17/02/2022	3	-	3	-
18/02/2022	-	-	-	3
21/02/2022	-	3	3	
23/02/2022	-		-	3
28/02/2022	-	3	-	-
01/03/2022	-		-	3
04/03/2022	-	2	-	-
09/03/2022	-	-	3	3
10/03/2022	3	3	-	-
Total hours	36	38	36	36

Table III.4: VP watch survey hours completed at the 500 m turbine buffer during the 2022 breeding season

Breeding season 2022				
Date	VP1	VP2	VP3	VP4
14/04/2022	3	3	-	-
15/04/2022	-	-	3	3
21/04/2022	-	3		3
27/04/2022	3	-	3	-
28/04/2022	-	3	-	3
04/05/2022	3	-	3	-
05/05/2022	-	3	-	3
17/05/2022	-	3	6	-
02/06/2022	-	-	3	-

Breeding season 2022				
Date	VP1	VP2	VP3	VP4
18/05/2022	6	-	-	-
25/06/2022	6	-	-	-
06/07/2022	3	-	-	-
19/07/2022	3	-	3	-
03/08/2022	3	3	-	-
09/08/2022	6	-	-	-
16/05/2022	-	6	-	-
24/06/2022	-	6	-	-
18/08/2022	-	6	-	-
13/06/2022	-	-	6	-
08/08/2022	-	-	6	-
15/05/2022	-	-	-	6
26/06/2022	-	-	-	6
27/07/2022	-	-	-	6
11/08/2022	-	-	6	-
29/08/2022	-	-	-	6
Total hours	36	36	39	36

Table III.5: VP watch survey hours completed at the 500 m turbine buffer during the 2022 autumn passage season

Autumn passage season 2022				
Date	VP1	VP2	VP3	VP4
12/09/2022	5	3	-	-
13/09/2022		6	-	2
11/10/2022	1	3	-	3
12/10/2022	-	3	1	-
14/10/2022		3		-
19/10/2022	-	-	3	-
14/09/2022	-	-	8	3
15/09/2022	-	-	1	1
10/10/2022	2	-	2	-
13/10/2022	3	-	3	3
11/09/2022	4	-	-	3
16/10/2022	-	-	-	3
17/10/2022	3	-	-	-
Total hours	18	18	18	18

Table III.6: VP watch survey hours completed at the 500 m turbine buffer during the 2022-23 non-breeding season

Non-breeding season 2022-23				
Date	VP1	VP2	VP3	VP4
19/10/2022	3	3	-	-
08/11/2022	3	3	-	-
10/11/2022	2		3	2
11/11/2022	2.5	3	-	-

Non-breeding season 2022-23				
Date	VP1	VP2	VP3	VP4
13/11/2022	1	-	1.5	
14/11/2022	1.5	-	-	3
17/11/2022	2	-	3	2
07/12/2022	5	-	-	-
08/12/2022	1	-	6	-
21/01/2023	3	-	1	6
25/01/2023	3	3	-	-
08/02/2023	3	3	-	-
21/02/2023	6	-	-	-
09/11/2022	-	3	-	-
15/11/2022	-	3	1.5	-
12/12/2022	-	6	-	-
30/01/2023	-	3	-	-
22/02/2023	-	6		-
20/10/2022	-	-	1	3
21/10/2022	-	-	2	-
07/11/2022	-	-	3	3
20/01/2023	-	-	2	-
29/01/2023	-	-	3	-
18/02/2023	-	-	5	-
19/02/2023	-	-	4	5
12/11/2022	-	-	-	1.5
11/12/2022	-	-		4.5
15/12/2022	-	-		2
20/02/2023	-	-		4
Total hours	36	36	36	36

Table III.7: VP watch survey hours completed at the 500 m turbine buffer during the 2023 spring passage season

Spring passage season 2023				
Date	VP1	VP2	VP3	VP4
01/03/2023	-	-	3	-
02/03/2023	3	4.5	-	-
03/03/2023	-	-	2.5	3
05/03/2023	1.5	-	3.5	-
06/03/2023	1.5	-	-	-
08/03/2023	-	-	-	3
04/04/2023	-	-	9	-
05/04/2023	-	-	-	8
06/04/2023	6	-	-	-
07/04/2023	6	-	-	
09/04/2023	-	-	-	4
10/04/2023	-	7	-	-
11/04/2023	-	7	-	-

Total hours	18	18.5	18	18
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Table III.8: VP watch survey hours completed at the 500 m turbine buffer during the 2023 breeding season

Breeding season 2023				
Date	VP1	VP2	VP3	VP4
01/03/2023	3	-	-	3
04/03/2023	-	-	-	1.5
05/03/2023	-	2	-	-
06/03/2023	-	3	-	1.5
08/03/2023	-	3	-	-
09/03/2023	3	-	3	-
05/04/2023	-	-	3	-
04/05/2023	-	-	9	-
05/05/2023	-	-	-	9
06/05/2023	9	-	-	-
07/05/2023	-	6	-	-
08/05/2023	-	4	-	-
07/06/2023	-	-	9	-
08/06/2023	-	-	-	9
09/06/2023	9	-	-	-
10/06/2023	-	9	-	-
05/07/2023	3	3	-	-
06/07/2023	3	-	-	-
25/07/2023	-	2	3	3
26/07/2023	-	1	3	3
01/08/2023	3	-	6	-
02/08/2023	3	3	-	-
03/08/2023	-	3	-	3
09/08/2023	-	-	-	3
Total hours	36	39	36	36

Table III.9: VP watch survey hours completed at the 500 m turbine buffer during the 2023 autumn passage season

Autumn passage season 2023				
Date	VP1	VP2	VP3	VP4
02/09/2023	-	-	8	-
05/09/2023	-	-	-	6
06/09/2023	-	-	4	-
07/09/2023	9	-	-	-
12/09/2023	-	1	-	-
11/10/2023	-	-	6	-
13/10/2023	-	-	-	13.5
14/10/2023	9	-	-	1.25
17/10/2023	-	2.5	-	-
31/10/2023	-	9.5	-	-
03/11/2023	-	5	-	-

Total hours	18	18	18	20.8
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Table III.10: VP watch survey hours completed at the 500 m turbine buffer during the 2023-24 non-breeding season

Non-breeding season 2023-24				
Date	VP1	VP2	VP3	VP4
04/09/2023	2	-	-	-
05/09/2023	-	-	-	3
06/09/2023	-	-	-	3
08/09/2023	1	10	-	-
12/09/2023	-	1	-	-
12/10/2023	-	-	5	-
15/10/2023	2.75	-	-	-
01/11/2023	9.5	-	-	-
02/11/2023	1.25	-	10	-
04/11/2023	-	-	3	-
05/11/2023	-	7	1	-
06/11/2023	1	-	-	-
23/11/2023	-	-	-	6
30/11/2023	-	-	-	6
13/12/2023	3	-	3	-
14/12/2023	3	-	3	-
15/12/2023	-	6	-	-
20/12/2023	-	-	-	-
08/01/2024	3	-	3	-
09/01/2024	3	-	3	-
12/01/2024	-	6	-	-
25/01/2024	-	-	-	6
19/02/2024	3	-	6	-
20/02/2024	-	-	-	6
27/02/2024	1	6	-	-
05/03/2024	2	-	-	-
Total hours	35.5	36	37	36

Table III.11: VP watch survey hours completed at the 500 m turbine buffer during the 2024 spring passage season

Spring passage season 2024				
Date	VP1	VP2	VP3	VP4
19/03/2024	-	-	9	-
20/03/2024	9	-	-	-
21/03/2024	-	-	-	9
22/03/2024	-	9	-	-
16/04/2024	6	3	-	-
17/04/2024	3	-	-	-
18/04/2024	-	-	3	-
22/04/2024	3	-	-	-

23/04/2024	-	-	3	-
24/04/2024	-	-	-	6
25/04/2024	-	3	-	-
15/05/2024	-	-	3	-
16/05/2024	-	3	-	-
20/05/2024	-	-	-	3
Total hours	21	18	18	18

Appendix IV - Breeding bird survey effort tables

Table IV.1: Dates, duration, surveyor and weather conditions for walkover surveys during breeding seasons

Season	Visit	Date	Start time	Duration	Surveyor	Wind force ¹ above ²	Wind Dir	Cloud (oktas) ³	Temp. (°C)	Rain
Breeding 2021	1	12/05/2021	11:17	6.50	PD	3	SW	5	14	None
Breeding 2021	1	17/05/2021	08:17	8.00	PD	3	NE	6	13	Light showers
Breeding 2021	2	15/06/2021	11:59	5.25	PD	6	W	8	14	Heavy shower
Breeding 2022	1	24/06/2022	12:00	2.50	EH	3	SW	8	14	Heavy shower
Breeding 2022	1	25/06/2022	09:00	6.00	CD	2	SW	8	15	Heavy shower
Breeding 2022	1	26/06/2022	09:15	3.00	EH	3	SW	7	15	Occasional heavy shower
Breeding 2023	1	06/04/2023	14:30	3.00	SM	2	W	2	12	None
Breeding 2023	1	07/04/2023	13:45	5.00	SM	5	S	5	9	Light showers
Breeding 2023	1	11/04/2023	14:15	3.25	SM	3	SW	6	8	Moderate showers
Breeding 2023	2	06/05/2023	05:30	1.25	SM	2	ENE	0	16	None
Breeding 2023	2	07/05/2023	12:26	2.25	SM	1	E	8	11	None
Breeding 2023	2	07/05/2023	15:21	0.50	SM	3	SM	1	12	None
Breeding 2023	2	08/05/2023	18:00	1.75	SM	1	E	8	11	None
Breeding 2023	3	11/06/2023	14:30	2.50	SM	2	E	6	18	None
Breeding 2023	3	12/06/2023	15:20	4.00	SM	2	E	6	18	None
Breeding 2023	3	12/06/2023	19:15	1.75	SM	2	E	6	18	None
Breeding 2023	3	13/06/2023	14:30	1.75	SM	3	E	5	16	None
Breeding 2023	3	13/06/2023	17:00	1.50	SM	3	E	5	16	None
Breeding 2023	4	20/06/2023	18:00	1.50	SM	1	S	0	18	None

Table IV.2: Dates, duration, surveyor and weather conditions for dusk surveys during breeding seasons

Season	Visit	Date	Start time	Duration	Surveyor	Wind force ²	Wind Dir	Cloud (oktas) ³	Temp. (°C)	Rain
Breeding 2021	1	28/06/2021	21:42	2.00	PD	3	S	4	14	None
Breeding 2022	1	16/05/2022	19:30	3.00	CD	5	S	1	17	None
Breeding 2022	2	02/06/2022	23:32	1.50	DL	2	E	2	17	None
Breeding 2022	2	06/06/2022	23:31	1.50	DL	3	E	7	16	None
Breeding 2022	3	19/07/2022	23:30	1.50	DL	2	S	6	17	None

² Wind force is measured using the Beaufort Scale (1-12)

³ Cloud cover is measured using oktas (8/8)

Season	Visit	Date	Start time	Duration	Surveyor	Wind force ²	Wind Dir	Cloud (oktas) ³	Temp. (°C)	Rain
Breeding 2023	1	06/04/2023	18:15	1.00	SM	2	W	2	10	None
Breeding 2023	1	06/04/2023	20:20	0.50	SM	2	W	2	8	None
Breeding 2023	1	06/04/2023	20:55	1.00	SM	2	W	2	8	None
Breeding 2023	1	08/04/2023	18:17	1.00	SM	2	W	2	10	None
Breeding 2023	2	05/05/2023	21:15	1.00	SM	3	S	7	12	None
Breeding 2023	2	06/05/2023	21:15	1.00	SM	3	E	7	11	None
Breeding 2023	2	08/05/2023	21:15	1.00	SM	1	E	8	11	None
Breeding 2023	3	05/06/2023	21:50	2.00	SM	2	ENE	0	16	None
Breeding 2023	3	10/06/2023	21:20	1.50	SM	2	E	6	18	None
Breeding 2023	4	09/08/2023	21:00	2.00	DL	1	S	0	18	None

Appendix V - Breeding raptor survey effort table

Table V.1: Dates, duration, surveyor and weather conditions for breeding raptor surveys during breeding seasons

Season	Visit	Date	Start time	Duration	Surveyor	Wind Force ²	Wind Dir	Cloud (oktas) ³	Temp. (°C)	Rain
Breeding 2021	1	31/05/2021	12:55	4.00	PD	3	NE	8	16	None
Breeding 2021	2	01/06/2021	09:39	6.00	PD	2	SE	7	13	Showers
Breeding 2022	1	13/06/2022	11:45	2.50	DL	4	W-SW	5	14	None
Breeding 2023	1	28/03/2023	13:00	1.00	DL	4	S	8	10	Showers
Breeding 2023	2	09/04/2023	14:15	4.00	SM	4	S	8	10	Heavy shower
Breeding 2023	2	10/04/2023	12:10	1.00	SM	2	W	2	10	None
Breeding 2023	3	11/06/2023	17:30	2.00	SM	2	S	2	20	None
Breeding 2023	3	12/06/2023	12:25	3.50	SM	2	S	3	19	None
Breeding 2023	3	13/06/2023	13:15	1.00	SM	3	NE	2	18	None
Breeding 2023	3	14/06/2023	18:25	1.50	SM	3	NE	2	16	None
Breeding 2023	4	11/07/2023	14:45	3.00	DL	4	W	7	16	Showers
Breeding 2023	4	11/07/2023	18:00	3.00	DL	4	W	8	14	Showers

Appendix VI - Winter walkover survey effort table

Table VI.1: Dates, duration, surveyor and weather conditions for winter walkover surveys during non-breeding seasons

Season	Visit	Date	Start time	Duration	Surveyor	Wind Force ²	Wind Dir	Cloud (oktas) ³	Temp. (°C)	Rain
Non-breeding 2021-22	1	28/10/2021	07:15	6.00	DP	4	SE	8	12	None
Non-breeding 2021-22	1	31/10/2021	10:31	3.25	DP	4	SE/SW	8	10	Showers
Non-breeding 2021-22	2	11/01/2022	08:14	5.75	DP	4	SW	5	9	None
Non-breeding 2021-22	2	12/01/2022	11:15	3.00	DP	4	SW	6	8	None
Non-breeding 2021-22	3	23/02/2022	11:45	3.00	DP	6	SW	9	5	Showers
Non-breeding 2021-22	3	28/02/2022	11:55	3.00	DP	4	SW	4	10	Showers
Non-breeding 2022-23	1	11/10/2022	13:00	0.75	MH	4	S	8	14	None
Non-breeding 2022-23	1	12/10/2022	07:45	2.50	MH	2	W	6	13	None
Non-breeding 2022-23	1	14/10/2022	10:15	3.50	MH	3	SW	3	11	None
Non-breeding 2022-23	1	16/10/2022	07:35	5.00	MH	2	SE	7	10	None
Non-breeding 2022-23	2	08/11/2022	10:30	2.50	MH	3	SW	6	11	None
Non-breeding 2022-23	2	09/11/2022	12:50	2.00	MH	4	SW	8	12	Showers
Non-breeding 2022-23	2	11/11/2022	13:00	2.00	MH	3	SW	5	11	None
Non-breeding 2022-23	2	12/11/2022	10:30	2.00	MH	3	SW	7	12	None
Non-breeding 2022-23	2	14/11/2022	09:00	3.50	MH	3	SE	3	10	None
Non-breeding 2022-23	3	24/02/2023	12:15	6.00	SM	4	S	8	10	None
Non-breeding 2023-24	1	15/10/2023	11:00	3.25	SM	4	SE	3	12	None
Non-breeding 2023-24	1	16/10/2023	08:45	6.50	SM	4	E	4	14	None
Non-breeding 2023-24	2	07/11/2023	10:00	6.00	MH	6	S	5	10	Light showers
Non-breeding 2023-24	2	08/11/2023	10:15	4.00	MH	8	S	6	8	Moderate showers
Non-breeding 2023-24	3	11/01/2024	10:15	6.00	DL	2	E	3	6	None
Non-breeding 2023-24	3	18/01/2024	09:15	6.00	DL	3	NW	2	0	Light showers

Appendix VII - Wintering waterbird survey effort table

Table VII.1: Dates, duration, surveyor and weather conditions for wintering waterbird surveys during non-breeding seasons

Season	Visit	Date	Start time	Duration	Surveyor	Wind Force ²	Wind Dir	Cloud (oktas) ³	Temp. (°C)	Rain
Non-breeding 2021-22	1	27/10/2021	10:00	6.00	DP	5	S	8	14	None
Non-breeding 2021-22	1	31/10/2021	13:00	3.00	DP	7	NW	8	8	None
Non-breeding 2021-22	2	15/11/2021	10:30	4.50	DP	3	S	8	10	None
Non-breeding 2021-22	3	30/11/2021	08:30	5.00	DP	4	W/SW	8	10	Showers
Non-breeding 2021-22	4	09/12/2021	11:15	3.00	DP	5	W/SW	8	8	Showers
Non-breeding 2021-22	4	12/12/2021	09:00	5.00	DP	5	SE	8	9	Showers
Non-breeding 2021-22	5	17/01/2022	10:15	6.00	DP	1	E	1	4	None
Non-breeding 2021-22	6	31/01/2022	11:00	3.00	DP	5	SW	8	9	None
Non-breeding 2021-22	6	01/02/2022	11:30	3.00	DP	6	SW	8	10	Frequent showers
Non-breeding 2021-22	7	09/02/2022	12:00	3.00	DP	6	SW	7	6	Showers
Non-breeding 2021-22	7	15/02/2022	10:00	5.50	DP	5	SW	8	6	Showers
Non-breeding 2021-22	8	17/03/2022	08:10	6.00	DP	5	SW	6	12	Showers
Non-breeding 2022-23	1	15/10/2022	11:45	1.15	MH	5	SW	7	11	Frequent showers
Non-breeding 2022-23	2	12/11/2022	09:00	7.00	MH	3	SE	8	13	Light showers
Non-breeding 2022-23	2	17/11/2022	12:00	2.00	MH	3	SE	8	13	Light showers
Non-breeding 2022-23	3	06/12/2022	11:00	2.00	SM	3	NW	2	0	None
Non-breeding 2022-23	3	08/12/2022	10:30	5.00	SM	3	NW	2	0	None
Non-breeding 2022-23	3	09/12/2022	09:15	6.00	SM	3	NW	2	0	None
Non-breeding 2022-23	3	11/12/2022	08:10	4.00	SM	1	SE	3	2	Showers
Non-breeding 2022-23	4	21/01/2023	15:15	1.00	MH	2	SW	8	10	Light showers
Non-breeding 2022-23	4	22/01/2023	08:30	8.50	MH	2	SW	8	10	Light showers
Non-breeding 2022-23	4	25/01/2023	10:30	1.00	MH	2	SW	8	10	Light showers
Non-breeding 2022-23	5	20/02/2023	14:30	1.50	SM	3	SW	8	10	Light showers
Non-breeding 2022-23	5	23/02/2023	09:30	7.50	SM	3	NW	6	7	Light showers
Non-breeding 2022-23	6	04/03/2023	09:30	1.50	MH	1	NE	8	7	Light showers
Non-breeding 2022-23	6	06/03/2023	09:30	3.50	MH	2	NE	8	8	Light showers
Non-breeding 2023-24	1	15/10/2023	14:30	4.25	SM	4	E	4	12	None
Non-breeding 2023-24	1	16/10/2023	15:30	3.00	SM	4	E	4	14	None
Non-breeding 2023-24	2	03/11/2023	13:00	3.00	SM	6	NE	6	12	Showers
Non-breeding 2023-24	2	06/11/2023	11:30	2.00	SM	7	NW	6	12	Showers
Non-breeding 2023-24	3	31/12/2023	09:30	4.75	DL	6	NW	6	8	Showers
Non-breeding 2023-24	4	16/01/2024	10:30	5.00	DL	5	W	4	6	Showers
Non-breeding 2023-24	5	05/03/2024	12:30	5.00	DL	5	SW	3	10	None
Non-breeding 2023-24	6	22/03/2024	10:00	4.00	DL	4	W	3	10	None
Non-breeding 2023-24	6	25/03/2024	10:00	4.00	DL	4	W	6	8	None

APPENDIX VIII - HEN HARRIER ROOST SEARCHES EFFORT TABLE

Table VIII.1: Dates, duration, surveyor and weather conditions for hen harrier roost searches during non-breeding seasons

Season	Visit	Date	Start time	Duration	Surveyor	Wind force ²	Wind Dir	Temp	Rain
Non-breeding 2021-22	1	27/10/2021	17:15	1.50	DP	4-6	S	Mild	Dry
Non-breeding 2021-22	2	15/11/2021	15:10	2.00	DP	0-3	S	Cool	Dry
Non-breeding 2021-22	3	17/12/2021	15:00	2.00	DP	0-3	SW	Cool	Dry
Non-breeding 2021-22	4	27/01/2022	16:10	2.00	DP	4-6	NW	Mild	Dry
Non-breeding 2022-23	1	12/10/2022	17:47	1.50	MH	0-3	W	Mild	Dry
Non-breeding 2022-23	2	14/10/2022	17:48	1.50	MH	4-6	SSW	Mild	Intermittent or Drizzle
Non-breeding 2022-23	3	19/10/2022	17:40	1.50	MH	4-6	E	Mild	Dry
Non-breeding 2022-23	4	09/11/2022	15:50	1.50	MH	4-6	SW	Mild	Intermittent or Drizzle
Non-breeding 2022-23	5	13/11/2022	16:00	1.50	MH	0-3	SSW	Mild	Dry
Non-breeding 2022-23	6	14/11/2022	15:45	1.50	MH	4-6	S	Cool	Intermittent or Drizzle
Non-breeding 2022-23	7	21/01/2023	15:52	1.50	MH	4-6	SSW	Mild	Intermittent or Drizzle
Non-breeding 2022-23	8	29/01/2023	16:05	1.50	MH	4-6	WSW	Mild	Intermittent or Drizzle
Non-breeding 2022-23	9	30/01/2023	16:15	1.50	MH	4-6	SW	Cool	Intermittent or Drizzle
Non-breeding 2022-23	10	23/02/2023	17:14	1.00	SLM	3	NW	Cool	Light Showers
Non-breeding 2022-23	11	02/03/2023	17:23	1.50	MH	0-3	NE	Cool	Dry
Non-breeding 2022-23	12	05/03/2023	17:25	1.50	MH	1-3	NW	Cool	Showers
Non-breeding 2023-24	1	08/01/2024	15:00	1.50	DL	4-6	SE	Cool	Dry
Non-breeding 2023-24	2	10/01/2024	15:50	1.50	DL	0-3	E	Cool	Dry
Non-breeding 2023-24	3	16/01/2024	16:05	1.50	DL	0-3	N	Cool	Dry
Non-breeding 2023-24	4	27/02/2024	17:30	1.50	DL	0-3	E	Cool	Dry

Appendix IX - VP data including flight line tables and maps for each target species

Table IX.1: VP watch data for common gull

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total (secs)	Sex	Age	Behaviour
1	4	22/07/2021	12:58	Common gull	2	10	B	580			Landed in field
2	4	10/11/2022	11:18	Common gull	2	10	B	5			Landed in field
3	4	17/11/2022	09:59	Common gull	1	25	B	5			
4	2	05/07/2023	15:14	Common gull	1	70	B	45			Flying
5	2	05/07/2023	17:30	Common gull	1	80	B	64			
6	3	09/01/2024	12:35	Common gull	1	15	B	10			

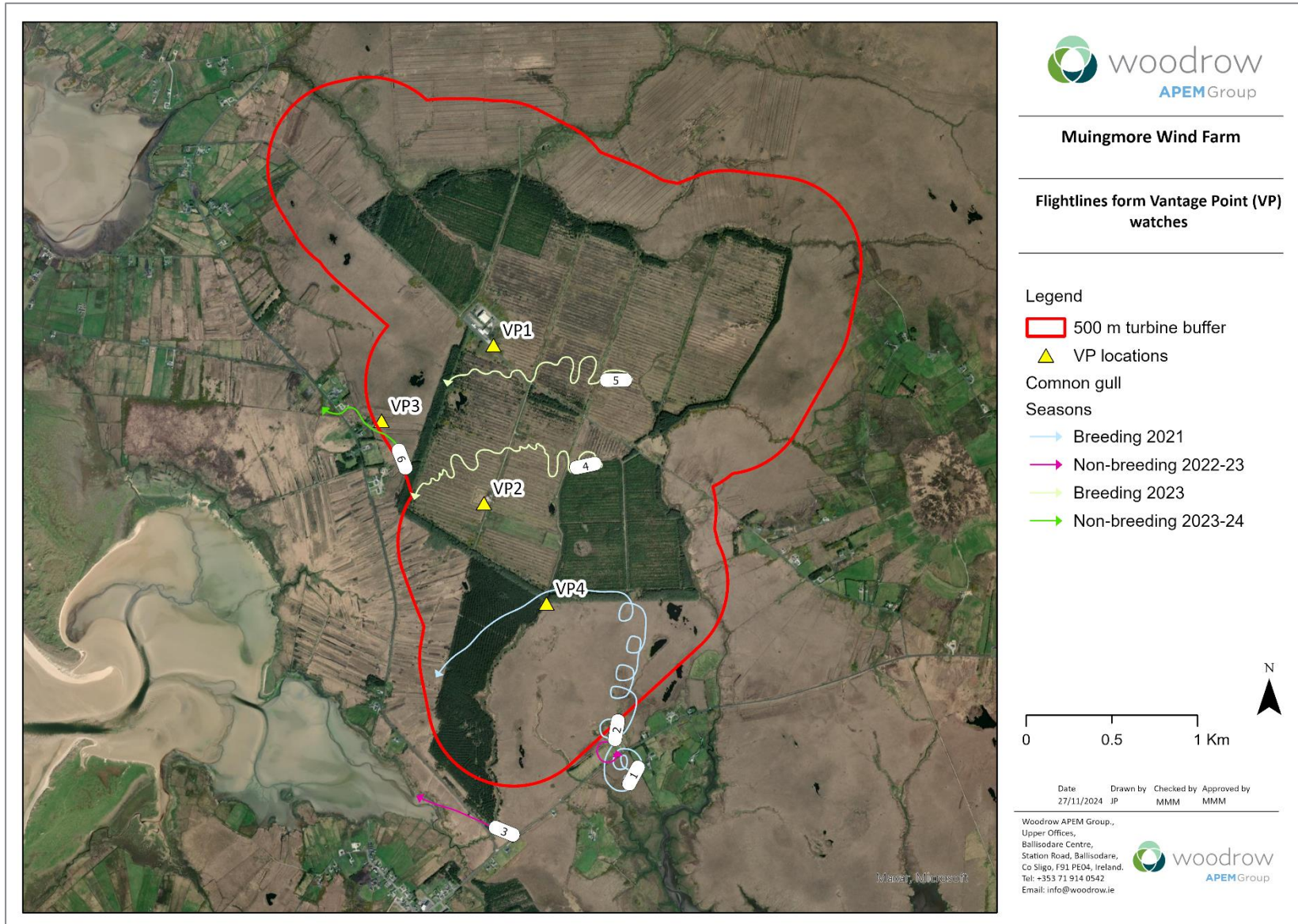


Figure IX.1: Common gull flightlines from VP watches

Table IX.2: VP watch data for black-headed gull

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total (secs)	Sex	Age	Behaviour
1	1	10/06/2021	11:50	Black-headed gull	1	5	A	56			
2	1	10/06/2021	13:05	Black-headed gull	1	30	B	56			
3	1	17/06/2021	12:33	Black-headed gull	1	30	B	21			Flying
4	1	17/06/2021	12:34	Black-headed gull	1	5	A	45			Took off flying then landed again
5	2	09/06/2021	14:50	Black-headed gull	1	20	B	63			
6	2	28/06/2021	16:35	Black-headed gull	2	30	B	190			
7	2	28/06/2021	16:56	Black-headed gull	1	20	B	109			
8	2	01/07/2021	14:11	Black-headed gull	1	30	B	39			
9	2	14/07/2021	10:44	Black-headed gull	1	30	B	87			
10	2	14/07/2021	12:15	Black-headed gull	1	30	B	121			Circled near small lake
11	3	09/06/2021	10:56	Black-headed gull	1	5	A	56			Headed towards the coast
12	3	09/06/2021	11:08	Black-headed gull	1	30	B	70			
13	3	09/06/2021	11:19	Black-headed gull	1	5	A	27			
14	3	09/06/2021	11:21	Black-headed gull	1	5	A	40			Flying above treeline
15	3	09/06/2021	11:30	Black-headed gull	1	5	A	9			Staying around a small lake
16	3	09/06/2021	11:53	Black-headed gull	1	15	B	37			
17	3	09/06/2021	12:47	Black-headed gull	2	25	B	80			Landed back in a small lake
18	3	09/06/2021	13:07	Black-headed gull	1	10	B	15			Came from a small lake
19	3	21/06/2021	11:02	Black-headed gull	1	30	B	81			
20	3	21/06/2021	11:04	Black-headed gull	1	30	B	5			Flew toward old factory
21	3	21/06/2021	11:12	Black-headed gull	1	20	B	70			
22	3	21/06/2021	11:20	Black-headed gull	1	20	B	33			
23	3	21/06/2021	11:22	Black-headed gull	1	20	B	32			
24	3	21/06/2021	11:45	Black-headed gull	1	10	B	10			
25	3	21/06/2021	11:51	Black-headed gull	1	10	B	90			
26	3	21/06/2021	12:05	Black-headed gull	1	10	B	31			
27	3	28/06/2021	14:18	Black-headed gull	1	30	B	53			

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total (secs)	Sex	Age	Behaviour
28	3	28/06/2021	14:54	Black-headed gull	1	30	B	115			
29	3	13/07/2021	09:41	Black-headed gull	1	20	B	24			Flying low over heather
30	4	08/06/2021	11:15	Black-headed gull	2	10	B	116			Heard calling and then flying
31	4	08/06/2021	11:16	Black-headed gull	1	10	B	32			
32	4	08/06/2021	11:48	Black-headed gull	1	30	B	44			
33	4	08/06/2021	12:35	Black-headed gull	1	10	B	11			
34	4	08/06/2021	13:26	Black-headed gull	1	10	B	42			
35	4	08/06/2021	13:35	Black-headed gull	1	30	B	34			
36	4	10/06/2021	14:03	Black-headed gull	1	10	B	15			
37	4	10/06/2021	14:12	Black-headed gull	1	10	B	46			
38	4	10/06/2021	14:59	Black-headed gull	1	50	B	48			Disappeared out of sight
39	4	10/06/2021	15:50	Black-headed gull	1	5	A	4			
40	4	10/06/2021	15:52	Black-headed gull	1	30	B	51			
41	4	10/06/2021	15:59	Black-headed gull	1	25	B	15			
42	4	10/06/2021	16:26	Black-headed gull	1	5	A	13			
43	4	21/06/2021	15:58	Black-headed gull	1	15	B	100			
44	4	21/06/2021	16:09	Black-headed gull	1	30	B	100			
45	4	21/06/2021	16:51	Black-headed gull	1	5	A	45			
46	4	21/06/2021	16:58	Black-headed gull	1	30	B	16			
47	4	14/07/2021	13:50	Black-headed gull	1	5	A	37			
48	1	06/07/2022	10:46	Black-headed gull	1	40	B	90			
49	1	06/07/2022	12:29	Black-headed gull	3	25	B	90			Disappeared behind tree line
50	2	16/05/2022	12:53	Black-headed gull	1	25	B	70			
51	3	17/05/2022	15:52	Black-headed gull	2	10	B	5			
52	4	26/06/2022	11:49	Black-headed gull	1	30	B	5			
53	4	26/06/2022	13:52	Black-headed gull	2	10	B	260			
54	4	11/10/2022	11:56	Black-headed gull	1	25	B	15			

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total (secs)	Sex	Age	Behaviour
55	4	16/10/2022	11:19	Black-headed gull	2	20	B	60			Dropped out of view
56	4	10/11/2022	11:29	Black-headed gull	1	12	B	25			
57	2	10/06/2023	11:24	Black-headed gull	1	20	B	40			
58	2	10/06/2023	17:25	Black-headed gull	1	12	B	70			
59	2	05/07/2023	15:42	Black-headed gull	1	80	B	51			
60	3	04/05/2023	13:10	Black-headed gull	1	30	B	90			
61	3	04/05/2023	17:45	Black-headed gull	1	15	B	110			Dropped behind pine belt
62	3	07/06/2023	16:21	Black-headed gull	1	20	B	65			
63	3	07/06/2023	17:36	Black-headed gull	1	20	B	25			
64	3	07/06/2023	18:21	Black-headed gull	1	25	B	45			
65	4	08/06/2023	12:59	Black-headed gull	1	10	B	35			
66	4	08/06/2023	17:49	Black-headed gull	1	10	B	45			
67	4	08/06/2023	18:51	Black-headed gull	2	3	A	2,520			Feeding over small pools NE
68	4	08/06/2023	18:58	Black-headed gull	1	35	B	70			Flew directly E
69	2	03/11/2023	11:07	Black-headed gull	1	15	B	20			
70	4	20/5/2024	17:02	Black-headed gull	1	20	B	124		Ad	Flying

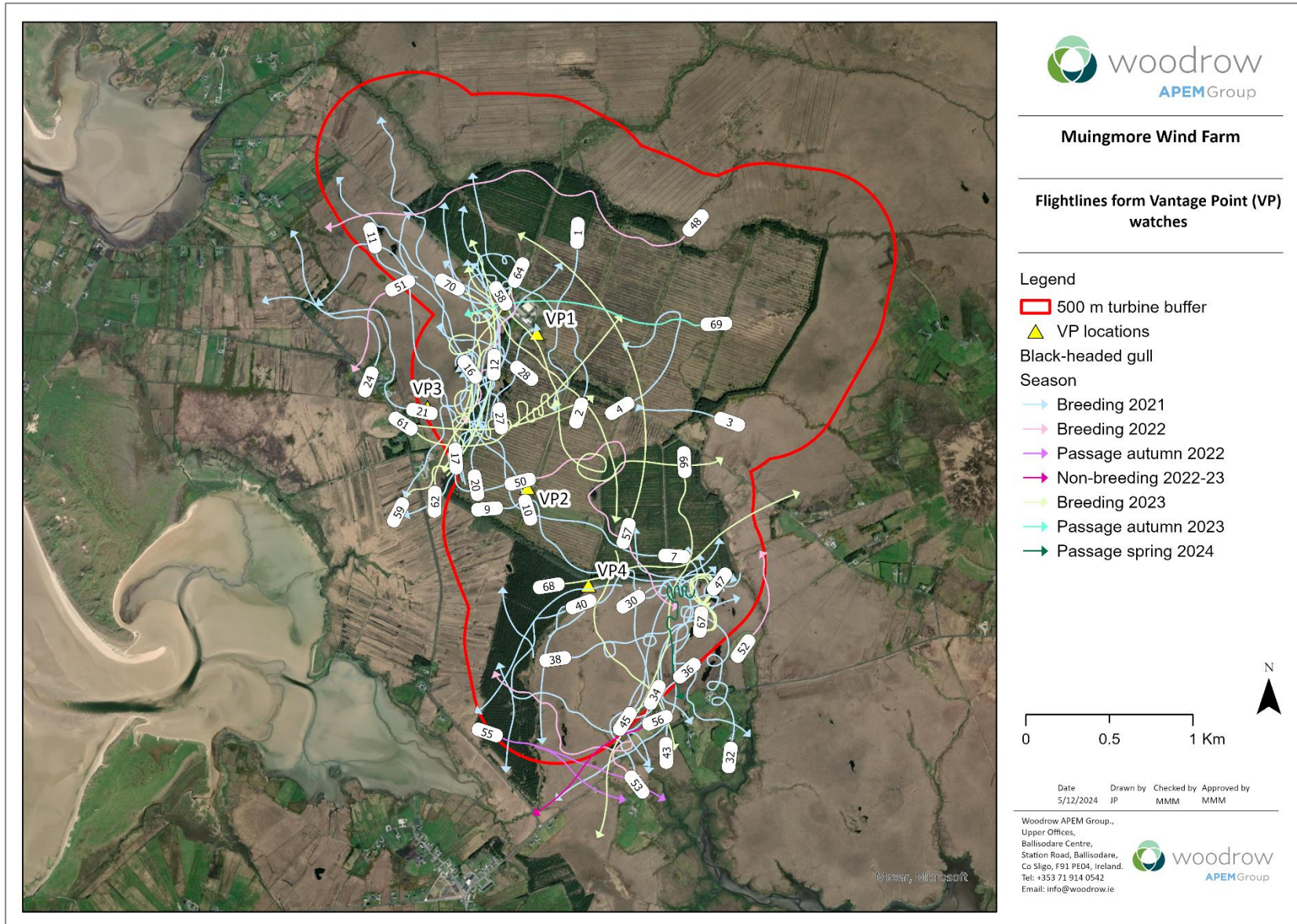


Figure IX.2: Black-headed gull flightlines from VP watches

Table IX.3: VP watch data for great black-backed gull

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total	Sex	Age	Behaviour
1	1	27/4/2021	15:58	Great black-backed gull	1	25	B	41			Flying
2	1	28/4/2021	16:13	Great black-backed gull	1	20	B	5			Flying
3	1	12/7/2021	15:04	Great black-backed gull	1	40	B	230			Circling
4	1	12/8/2021	10:53	Great black-backed gull	1	10	B	132			Flying
5	2	27/4/2021	12:49	Great black-backed gull	1	40	B	41			Flying
6	2	14/7/2021	11:07	Great black-backed gull	1	30	B	69			Flying
7	3	28/4/2021	11:50	Great black-backed gull	1	50	B	80			Flying
8	4	12/7/2021	11:34	Great black-backed gull	1	30	B	8			Circling
9	4	12/7/2021	11:40	Great black-backed gull	1	50	B	32			Circling
10	4	12/7/2021	12:10	Great black-backed gull	1	40	B	67			Flying
11	4	18/8/2021	16:23	Great black-backed gull	1	35	B	65			Flying
12	1	19/11/2021	8:44	Great black-backed gull	1	25	B	174		A	Commuting
13	1	19/1/2022	12:07	Great black-backed gull	1	35	B	92		J	Commuting
14	1	19/1/2022	12:49	Great black-backed gull	1	50	B	72		A	Commuting
15	3	17/2/2022	10:41	Great black-backed gull	2	40	B	20		A	Commuting
16	4	14/10/2021	9:59	Great black-backed gull	1	35	B	22			Commuting
17	4	24/11/2021	11:58	Great black-backed gull	1	20	B	5		A	Commuting
18	4	29/11/2021	12:08	Great black-backed gull	1	50	B	17		A	Commuting
19	4	12/1/2022	9:32	Great black-backed gull	1	40	B	40		A	Commuting
20	4	12/1/2022	11:12	Great black-backed gull	1	35	B	36		A	Commuting
21	4	23/2/2022	9:08	Great black-backed gull	1	25	B	17		A	Commuting
22	2	16/5/2022	11:09	Great black-backed gull	1	30	B	120		A	Commuting
23	2	18/8/2022	12:19	Great black-backed gull	1	25	B	97		A	Commuting
24	3	2/6/2022	18:20	Great black-backed gull	1	20	B	5		A	Commuting
25	3	13/6/2022	14:03	Great black-backed gull	1	20	B	35		A	Flying
26	3	8/8/2022	15:56	Great black-backed gull	1	10	B	30		A	Flying
27	4	21/4/2022	17:00	Great black-backed gull	2	50	B	4		A	Commuting

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total	Sex	Age	Behaviour
28	4	26/6/2022	14:30	Great black-backed gull	1	10	B	10		A	Flying
29	4	27/7/2022	16:15	Great black-backed gull	1	15	B	28		A	Commuting
30	4	27/7/2022	17:58	Great black-backed gull	1	10	B	4		A	Flying
31	4	29/8/2022	17:02	Great black-backed gull	1	23	B	40		A	Commuting
32	1	8/2/2023	13:46	Great black-backed gull	1	25	B	40		Ad	Flying
33	2	8/2/2023	10:35	Great black-backed gull	3	25	B	1440		Ad	Hunting
34	2	8/2/2023	10:52	Great black-backed gull	2	35	B	360		Ad	Gliding
35	2	8/2/2023	11:41	Great black-backed gull	1	20	B	0		Ad	Commuting
36	2	8/2/2023	12:29	Great black-backed gull	1	30	B	45		Ad	Gliding
37	2	8/2/2023	12:18	Great black-backed gull	2	35	B	0		Ad	Flying
38	3	19/2/2023	12:01	Great black-backed gull	1	25	B	35		Ad	Present
39	4	19/2/2023	15:11	Great black-backed gull	1	30	B	65		Ad	Present
40	2	12/10/2022	12:24	Great black-backed gull	1	60	B	270		J	Commuting
41	1	6/4/2023	11:04	Great black-backed gull	1	30	B	4		Ad	Present
42	1	7/4/2023	13:43	Great black-backed gull	1	12	B	105		Ad	Present
43	2	10/4/2023	13:31	Great black-backed gull	2	30	B	6		Ad	Present
44	2	10/4/2023	13:52	Great black-backed gull	1	20	B	4		Ad	Present
45	2	10/4/2023	14:26	Great black-backed gull	1	30	B	180		Ad	Present
46	2	10/4/2023	14:26	Great black-backed gull	1	25	B	20		Ad	Present
47	2	10/4/2023	18:03	Great black-backed gull	1	10	B	25		Ad	Present
48	3	4/4/2023	12:28	Great black-backed gull	1	12	B	15		Ad	Flying
49	4	5/4/2023	14:45	Great black-backed gull	4	25	B	1,000		Ad	Present
50	4	5/4/2023	18:04	Great black-backed gull	1	30	B	125		Ad	Flying
51	1	6/5/2023	15:18	Great black-backed gull	1	15	B	180		Ad	Present
52	2	5/3/2023	11:51	Great black-backed gull	1	80	B	195			Flying
53	2	7/5/2023	10:16	Great black-backed gull	1	15	B	45		Ad	Present
54	2	7/5/2023	12:15	Great black-backed gull	2	15	B	220		Ads	Present
55	3	4/5/2023	16:46	Great black-backed gull	2	80	B	240		Ads	Present

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total	Sex	Age	Behaviour
56	4	1/3/2023	9:11	Great black-backed gull	1	60	B	5		Ad	Flying
57	4	6/3/2023	17:57	Great black-backed gull	1	50	B	105			Flying
58	4	5/5/2023	15:59	Great black-backed gull	1	20	B	30		Ad	Present
59	4	9/8/2023	18:12	Great black-backed gull	1	60	B	10		Ad	Commuting
60	4	9/8/2023	18:48	Great black-backed gull	1	60	B	0		Ad	Commuting
61	1	1/11/2023	7:34	Great black-backed gull	1	25	B	25		Ad	Present
62	1	5/3/2024	11:33	Great black-backed gull	2	10	B	120		Ad	Feeding
63	1	5/3/2024	11:46	Great black-backed gull	2	10	B	130		Ad	Fly-land
64	4	21/3/2024	12:47	Great black-backed gull	1	2	A	4		Ad	Present
65	4	21/3/2024	15:03	Great black-backed gull	1	3	A	5		Ad	Present

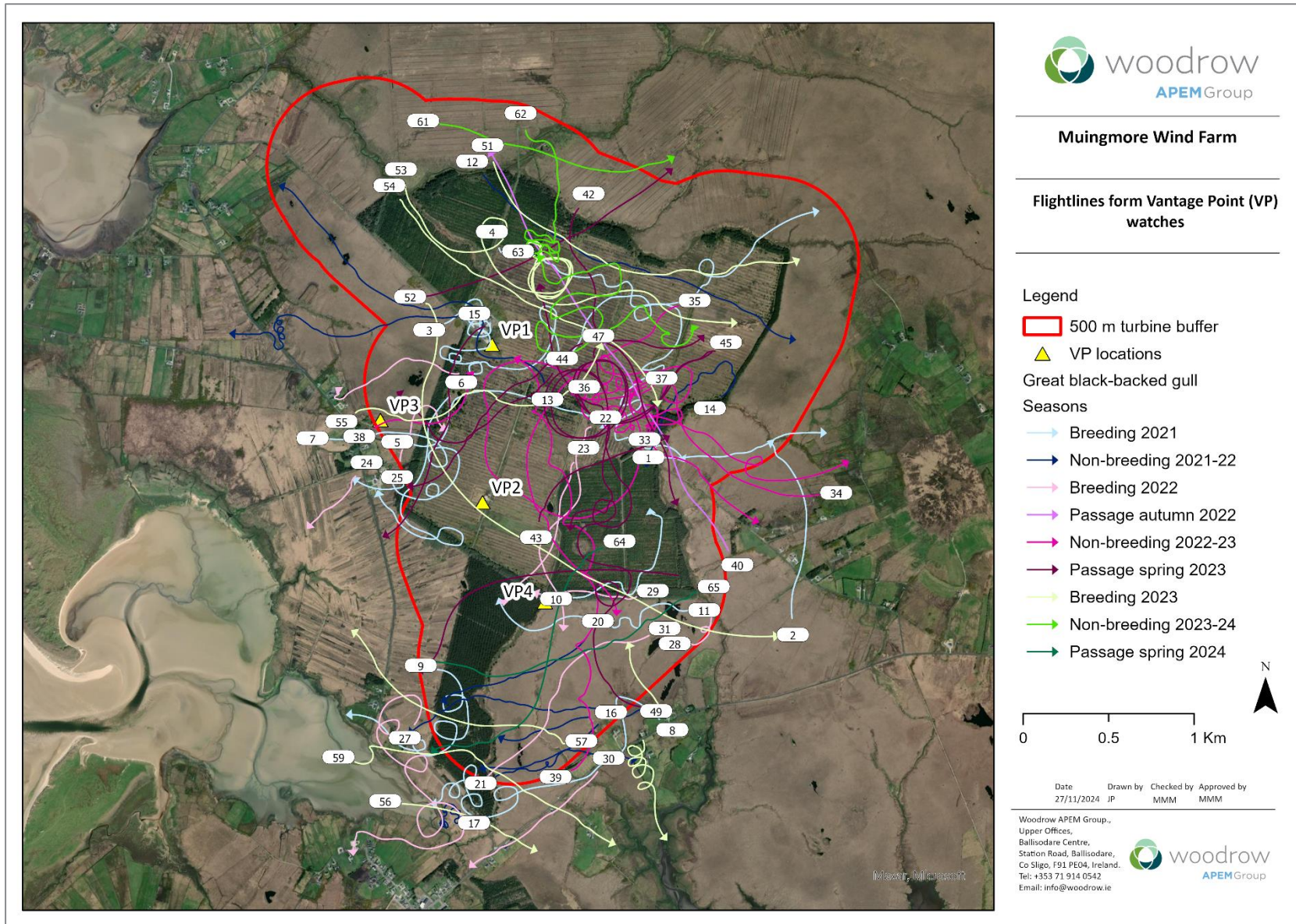


Figure IX.3: Great black-backed gull flightlines from VP watches

Table IX.4: VP watch data for lesser black-backed gull

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total	Sex	Age	Behaviour
1	1	27/4/2021	15:48	Lesser black-backed gull	2	70	B	30			Soaring
2	1	27/4/2021	16:08	Lesser black-backed gull	1	20	B	28			Flying
3	1	27/4/2021	16:53	Lesser black-backed gull	1	40	B	10			Flying
4	1	27/4/2021	17:05	Lesser black-backed gull	1	40	B	119			Flying
5	1	27/4/2021	17:19	Lesser black-backed gull	1	50	B	65			Soaring
6	1	28/4/2021	14:50	Lesser black-backed gull	1	60	B	62			Flying
7	1	28/4/2021	15:01	Lesser black-backed gull	1	60	B	20			Flying
8	1	28/4/2021	16:15	Lesser black-backed gull	1	50	B	30			Flying
9	1	28/4/2021	16:52	Lesser black-backed gull	1	40	B	63			Flying
10	1	8/6/2021	15:25	Lesser black-backed gull	1	20	B	81			Circling
11	1	8/6/2021	16:33	Lesser black-backed gull	1	20	B	38			Flying
12	1	10/6/2021	12:27	Lesser black-backed gull	2	80	B	98			Circling
13	1	10/6/2021	12:40	Lesser black-backed gull	1	70	B	37			Circling
14	1	17/6/2021	12:23	Lesser black-backed gull	1	10	B	109			Flying
15	1	17/6/2021	13:06	Lesser black-backed gull	1	30	B	85			Flying
16	1	12/7/2021	15:05	Lesser black-backed gull	1	30	B	133			Circling
17	1	12/8/2021	10:37	Lesser black-backed gull	1	25	B	57			Flying
18	1	12/8/2021	12:17	Lesser black-backed gull	1	5	A	29			Flying
19	2	10/5/2021	12:00	Lesser black-backed gull	3	40	B	126			Flying
20	2	9/6/2021	16:24	Lesser black-backed gull	1	30	B	24			Flying
21	2	9/6/2021	16:52	Lesser black-backed gull	1	10	B	96			Flying
22	2	9/6/2021	16:58	Lesser black-backed gull	3	30	B	285		Ad, Juv	Flying
23	2	17/6/2021	15:16	Lesser black-backed gull	1	30	B	87			Circling
24	2	1/7/2021	11:49	Lesser black-backed gull	1	40	B	63			Flying
25	2	14/7/2021	10:48	Lesser black-backed gull	1	5	A	78			Flying
26	3	28/4/2021	10:18	Lesser black-backed gull	1	25	B	140			Flying
27	3	10/5/2021	14:37	Lesser black-backed gull	1	25	B	66			Flying

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total	Sex	Age	Behaviour
28	3	10/5/2021	16:32	Lesser black-backed gull	2	30	B	6			Flying
29	3	21/6/2021	11:18	Lesser black-backed gull	1	5	A	28			Flying
30	3	14/7/2021	16:24	Lesser black-backed gull	1	30	B	14			Flying
31	3	15/7/2021	10:05	Lesser black-backed gull	1	40	B	55			Flying
32	3	15/7/2021	10:09	Lesser black-backed gull	1	20	B	5			Flying
33	3	15/7/2021	10:10	Lesser black-backed gull	1	20	B	5			Flying
34	3	15/7/2021	10:32	Lesser black-backed gull	1	20	B	5			Flying
35	3	15/7/2021	11:00	Lesser black-backed gull	1	30	B	196			Flying
36	3	19/7/2021	17:31	Lesser black-backed gull	1	35	B	45			Flying
37	3	21/7/2021	13:02	Lesser black-backed gull	1	20	B	2			Flying
38	3	10/8/2021	10:53	Lesser black-backed gull	1	15	B	5			Flying
39	3	10/8/2021	11:05	Lesser black-backed gull	1	5	A	19			Flying
40	3	10/8/2021	11:07	Lesser black-backed gull	1	5	A	17			Circling
41	4	8/6/2021	11:03	Lesser black-backed gull	1	50	B	35			Flying
42	4	8/6/2021	11:43	Lesser black-backed gull	1	40	B	31			Flying
43	4	8/6/2021	12:23	Lesser black-backed gull	1	50	B	70			Flying
44	4	8/6/2021	13:16	Lesser black-backed gull	1	30	B	41			Flying
45	4	10/6/2021	16:20	Lesser black-backed gull	1	40	B	33			circling
46	4	21/6/2021	17:08	Lesser black-backed gull	1	10	B	5			Flying
47	4	14/7/2021	13:56	Lesser black-backed gull	1	20	B	52			Flying
48	4	19/7/2021	14:42	Lesser black-backed gull	1	15	B	21			Flying
49	4	19/7/2021	15:41	Lesser black-backed gull	1	70	B	110			Circling
50	4	19/7/2021	15:46	Lesser black-backed gull	1	20	B	32			Flying
51	4	22/7/2021	12:23	Lesser black-backed gull	1	30	B	34			Flying
52	4	10/8/2021	14:07	Lesser black-backed gull	1	40	B	87			Flying
53	4	10/8/2021	14:07	Lesser black-backed gull	1	40	B	40			Flying
54	1	25/6/2022	11:50	Lesser black-backed gull	1	15	B	60		Ad	Flying
55	1	25/6/2022	11:55	Lesser black-backed gull	1	40	B	37		Ad	Flying

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total	Sex	Age	Behaviour
56	1	25/6/2022	14:15	Lesser black-backed gull	1	30	B	30		Ad	Flying
57	2	24/6/2022	15:10	Lesser black-backed gull	1	15	B	70		Ad	Commuting
58	3	27/4/2022	16:20	Lesser black-backed gull	2	100	B	5		Ad	Commuting
59	3	13/6/2022	13:03	Lesser black-backed gull	1	18	B	50		Ad	Gliding
60	3	13/6/2022	15:52	Lesser black-backed gull	1	20	B	20			Flying
61	3	13/6/2022	17:14	Lesser black-backed gull	1	20	B	15			Gliding
62	4	26/6/2022	13:47	Lesser black-backed gull	1	5	A	45		Ad	Flying
63	4	26/6/2022	15:21	Lesser black-backed gull	2	15	B	240		Ad	Commuting
64	1	25/1/2023	14:18	Lesser black-backed gull	2	40	B	250		Ad	Commuting
65	2	11/4/2023	18:49	Lesser black-backed gull	3	2	A	90		Ad	Present
66	4	9/4/2023	12:32	Lesser black-backed gull	3	30	B	75		Ad	Flying
67	1	9/6/2023	16:09	Lesser black-backed gull	2	40	B	8		Ad	Present
68	2	7/5/2023	13:01	Lesser black-backed gull	2	18	B	1,000		Ad	Present
69	2	7/5/2023	13:12	Lesser black-backed gull	1	25	B	90		Ad	Present
70	2	10/6/2023	17:01	Lesser black-backed gull	1	45	B	50		Ad	Present
71	3	4/5/2023	17:56	Lesser black-backed gull	1	10	B	30		Ad	Present
72	3	4/5/2023	17:58	Lesser black-backed gull	1	25	B	125		Ad	Present
73	3	7/6/2023	11:38	Lesser black-backed gull	1	10	B	10		Ad	Present
74	3	7/6/2023	11:46	Lesser black-backed gull	1	25	B	45		Ad	Present
75	3	7/6/2023	16:05	Lesser black-backed gull	2	30	B	80		Ad	Present
76	4	8/6/2023	17:02	Lesser black-backed gull	2	15	B	170		Ad	Present
77	1	7/9/2023	17:09	Lesser black-backed gull	1	20	B	45		Ad	Present
78	1	14/10/2023	12:21	Lesser black-backed gull	1	25	B	65		Ad	Flying
79	2	31/10/2023	16:01	Lesser black-backed gull	1	15	B	50		Ad	Present
80	4	5/9/2023	15:31	Lesser black-backed gull	1	15	B	190		Ad	Present
81	4	6/9/2023	13:22	Lesser black-backed gull	1	23	B	30		Ad	Present
82	1	16/4/2024	8:49	Lesser black-backed gull	2	30	B	74		Ad	Flying
83	1	16/4/2024	12:41	Lesser black-backed gull	1	30	B	136		Ad	Flying

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total	Sex	Age	Behaviour
84	1	16/4/2024	13:25	Lesser black-backed gull	1	80	B	379		Ad	Flying
85	1	22/4/2024	14:50	Lesser black-backed gull	2	30	B	186		Ad	Flying
86	2	16/4/2024	16:04	Lesser black-backed gull	2	20	B	442		Ad	Flying
87	2	17/4/2024	9:41	Lesser black-backed gull	2	40	B	188		Ad	Flying
88	2	17/4/2024	11:30	Lesser black-backed gull	1	30	B	54		Ad	Flying
89	3	18/4/2024	10:30	Lesser black-backed gull	5	30	B	980		Ad	Flying
90	1	22/4/2024	14:50	Lesser black-backed gull	2	30	B	186		Ad	Flying
91	3	23/4/2024	16:57	Lesser black-backed gull	1	40	B	79		Ad	Flying
92	2	25/4/2024	9:33	Lesser black-backed gull	3	50	B	243		Ad	Flying

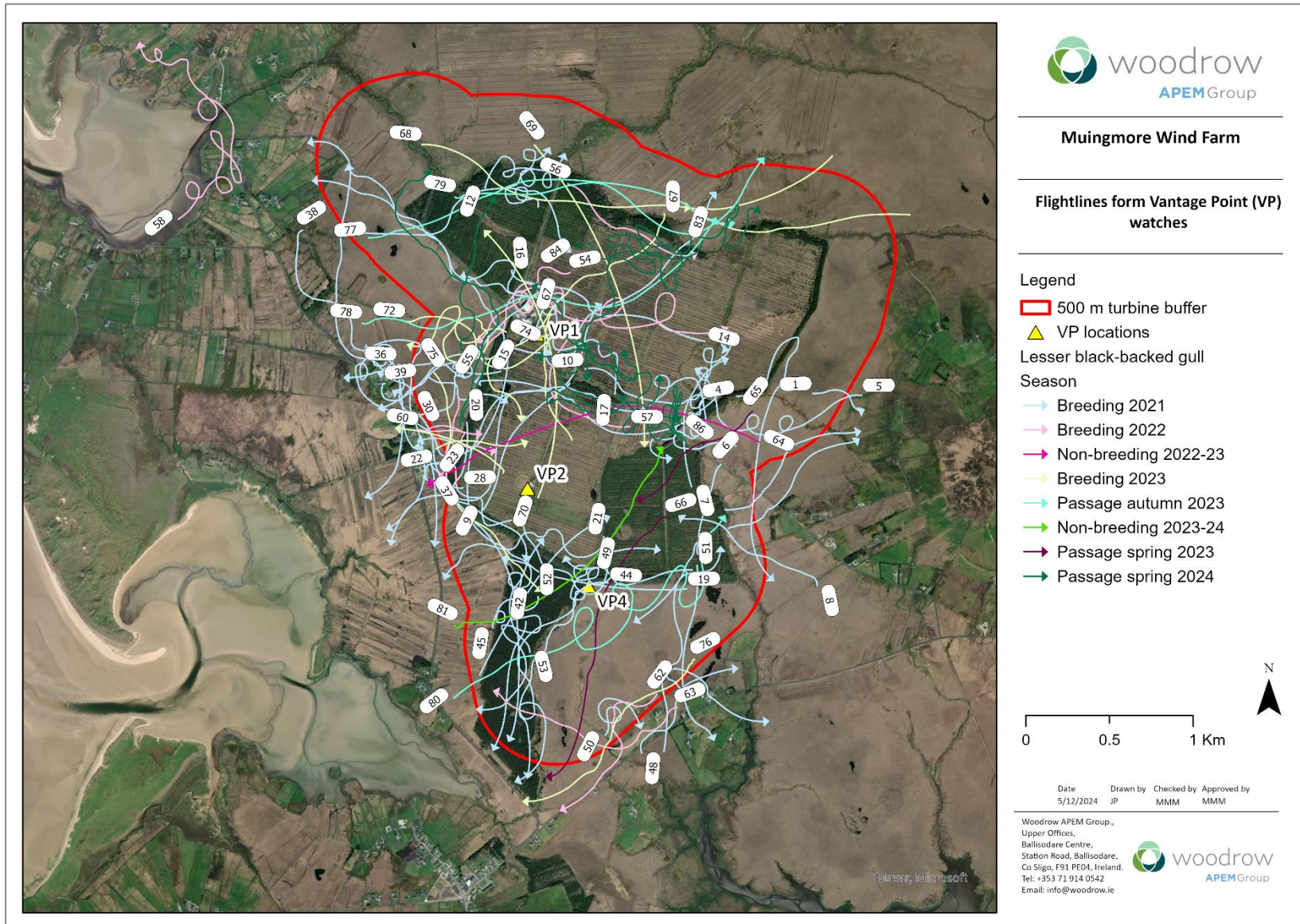


Figure IX.4: Lesser black-backed gull flightlines from VP watches

Table IX.5: VP watch data for herring gull

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total	Sex	Age	Behaviour
1	1	8/6/2021	16:32	Herring gull	1	30	B	9			Flying
2	2	9/6/2021	14:50	Herring gull	1	20	B	22			Flying
3	2	9/6/2021	15:15	Herring gull	1	25	B	56			Flying
4	2	1/7/2021	14:11	Herring gull	1	40	B	45			Circling
5	2	14/7/2021	10:49	Herring gull	1	30	B	49			Flying
6	2	14/7/2021	11:34	Herring gull	1	30	B	61			Flying
7	3	10/8/2021	11:18	Herring gull	1	10	B	6			Flying
8	4	8/6/2021	12:56	Herring gull	1	20	B	90			Flying
9	4	8/6/2021	13:02	Herring gull	1	30	B	21			Flying
10	4	10/6/2021	15:52	Herring gull	1	10	B	5			Flying
11	4	10/6/2021	16:16	Herring gull	1	25	B	12			Flying
12	4	10/6/2021	16:24	Herring gull	1	5	A	6			Flying
13	4	21/6/2021	15:55	Herring gull	1	5	A	6			Circling
14	4	21/6/2021	16:55	Herring gull	2	10	B	108			Flying
15	4	21/6/2021	16:58	Herring gull	2	10	B	98			Circling
16	4	21/6/2021	17:08	Herring gull	1	10	B	5			Flying
17	1	6/7/2022	10:19	Herring gull	1	50	B	135		A	Commuting
18	1	19/7/2022	14:13	Herring gull	1	40	B	80		A	Commuting
19	2	14/4/2022	17:42	Herring gull	1	50	B	36		J	Commuting
20	2	28/4/2022	15:46	Herring gull	1	100	B	5		J	Commuting
21	2	16/5/2022	12:20	Herring gull	1	40	B	100		J	Commuting
22	3	27/4/2022	14:45	Herring gull	1	15	B	10		A	Hunting
23	3	17/5/2022	14:46	Herring gull	1	5	A	5		A	Commuting
24	3	13/6/2022	12:10	Herring gull	1	10	B	10		A	Gliding
25	3	13/6/2022	14:26	Herring gull	2	20	B	110		A	Flying
26	3	13/6/2022	15:36	Herring gull	2	20	B	150			Flying
27	3	13/6/2022	17:09	Herring gull	1	7	A	18			Fly-land

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total	Sex	Age	Behaviour
28	3	19/7/2022	10:20	Herring gull	1	20	B	10		A	Commuting
29	3	19/7/2022	10:53	Herring gull	1	10	B	60		A	Commuting
30	3	8/8/2022	15:26	Herring gull	1	10	B	5		A	Fly-land
31	3	8/8/2022	15:26	Herring gull	1	0	-	-		A	Perched
32	3	8/8/2022	15:28	Herring gull	1	10	B	5		A	Fly-land
33	3	8/8/2022	15:28	Herring gull	1	0	-	-		A	Perched
34	3	8/8/2022	15:45	Herring gull	1	0	-	-		A	Perched
35	3	8/8/2022	16:01	Herring gull	1	10	B	10		A	Flying
36	3	8/8/2022	16:36	Herring gull	1	20	B	5		A	Flying
37	4	26/6/2022	12:19	Herring gull	1	35	B	60		A	Commuting
38	4	26/6/2022	12:47	Herring gull	1	5	A	2		A	Flying
39	4	27/7/2022	13:01	Herring gull	1	15	B	5		A	Commuting
40	4	27/7/2022	14:34	Herring gull	1	10	B	5		A	Flying
41	4	27/7/2022	15:00	Herring gull	1	10	B	2		A	Flying
42	4	27/7/2022	16:57	Herring gull	1	10	B	25		A	Flying
43	4	27/7/2022	16:58	Herring gull	1	10	B	5		A	Flying
44	4	27/7/2022	17:30	Herring gull	1	10	B	5		A	Flying
45	4	27/7/2022	18:50	Herring gull	1	50	B	40		A	Flying
46	3	19/10/2022	10:19	Herring gull	1	15	B	55		J	Commuting
47	4	13/10/2022	12:39	Herring gull	1	20	B	80		J	Commuting
48	4	8/3/2023	15:47	Herring gull	1	30	B	35			Flying
49	4	5/4/2023	14:46	Herring gull	1	40	B	60		Ad	Flying
50	3	25/7/2023	13:45	Herring gull	3	90	B	105			Flying
51	3	25/7/2023	13:49	Herring gull	1	90	B	17			Flying
52	3	25/7/2023	14:23	Herring gull	2	100	B	120			Flying
53	3	26/7/2023	14:21	Herring gull	5	80	B	115		Ad	Flying
54	3	1/8/2023	15:25	Herring gull	1	25	B	10		Ad	Commuting
55	4	8/6/2023	10:16	Herring gull	1	15	B	70		Ad	Present

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total	Sex	Age	Behaviour
56	4	8/6/2023	14:40	Herring gull	2	40	B	100		Ad	Present
57	4	25/7/2023	10:32	Herring gull	1	80	B	10		Ad	Flying
58	4	25/7/2023	10:52	Herring gull	2	50	B	50		Ad	Flying
59	4	25/7/2023	11:33	Herring gull	4	100	B	92		Ad	Flying
60	4	25/7/2023	11:54	Herring gull	5	90	B	185		Ad	Flying
61	4	26/7/2023	11:15	Herring gull	1	80	B	17			Flushed
62	2	3/11/2023	10:21	Herring gull	1	30	B	20		Ad	Flying
63	2	3/11/2023	10:22	Herring gull	1	25	B	75		Ad	Flying
64	2	22/3/2024	10:21	Herring gull	1	20	B	45		Ad	Present

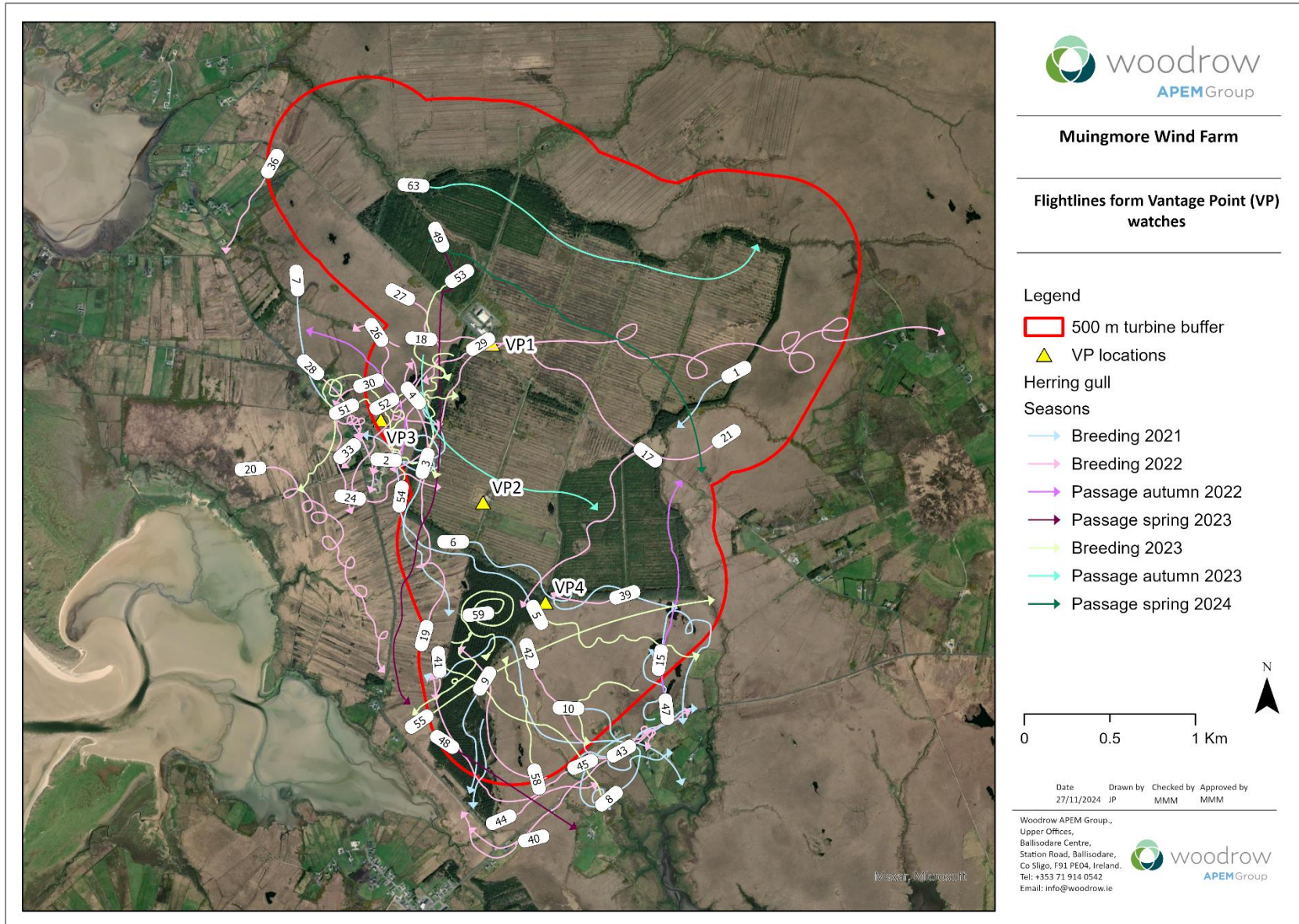


Figure IX.5: Herring gull flightlines from VP watches

Table IX.6: VP watch data for common tern

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total (secs)	Sex	Age	Behaviour
1	3	13/06/2022	15:38	Common tern	1	25	B	30			Flying
2	3	13/06/2022	17:37	Common tern	1	11	B	24			Flying

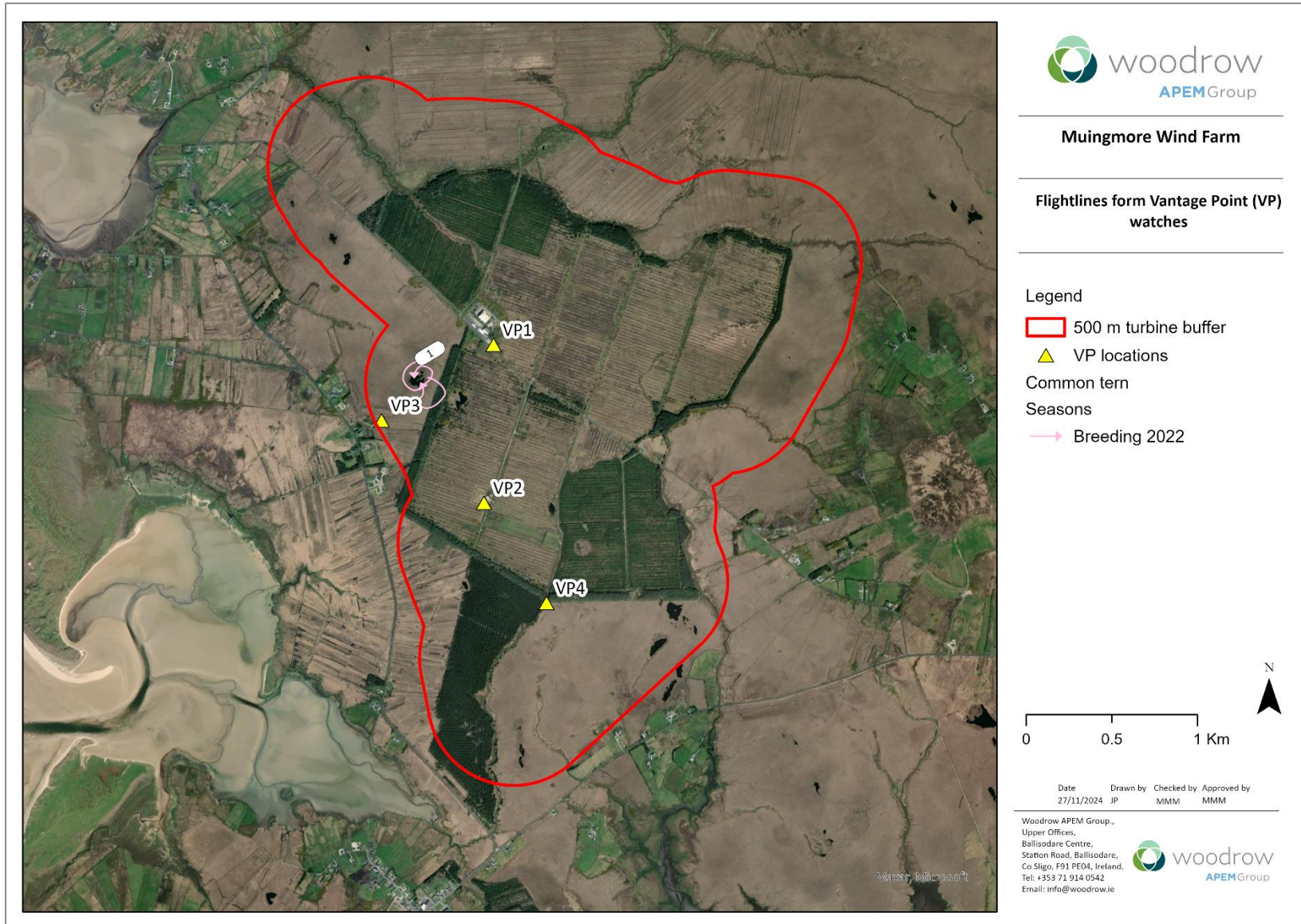


Figure IX.6: Common tern flightlines from VP watches

Table IX.7: VP watch data for cormorant

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total (secs)	Sex	Age	Behaviour
1	1	13/10/2022	10:20	Cormorant	1	35	B	160			Flying
2	2	25/01/2023	09:37	Cormorant	1	40	B	165			Flying
3	4	13/10/2022	13:13	Cormorant	1	50	B	45			Commuting
4	4	16/10/2022	08:22	Cormorant	1	40	B	25			Flying
5	3	05/03/2023	08:23	Cormorant	1	45	B	115			

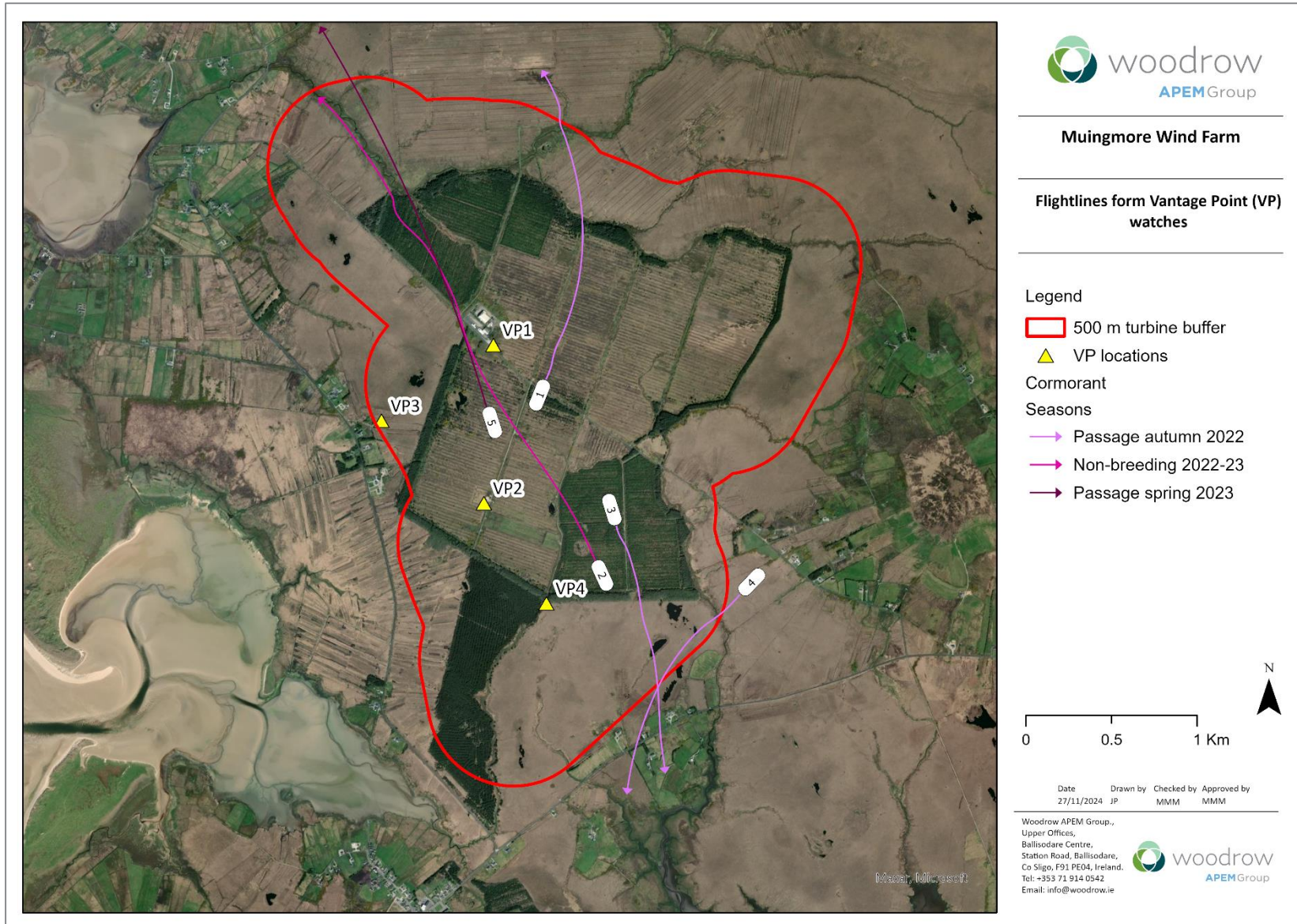


Figure IX.7: Cormorant flightlines from VP watches

Table IX.8: VP watch data for grey heron

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total (secs)	Sex	Age	Behaviour
1	1	21/06/2021	13:17	Grey heron	1	10	B	25			Feeding
2	1	21/06/2021	13:31	Grey heron	1	5	A	80			
3	1	28/06/2021	19:26	Grey heron	1	0	A	8			Flying
4	2	21/07/2021	10:39	Grey heron	1	15	B	60			Landed at small pond
5	2	21/07/2021	10:58	Grey heron	1	15	B	58			
6	4	10/06/2021	15:33	Grey heron	1	20	B	5			
7	4	18/08/2021	14:55	Grey heron	1	5	A	31			
8	2	21/02/2022	11:52	Grey heron	1	20	B	34			Commuting
9	2	21/02/2022	12:41	Grey heron	1	5	A	47			
10	2	21/02/2022	12:41	Grey heron	1	20	B	28			Flying
11	2	21/02/2022	13:15	Grey heron	3	15	B	108			Flying
12	3	14/10/2021	13:34	Grey heron	1	25	B	52			Commuting
13	3	25/11/2021	10:33	Grey heron	1	20	B	22			Commuting
14	1	14/04/2022	12:20	Grey heron	1	250	C	180			
15	1	03/08/2022	12:32	Grey heron	1	30	B	120			
16	2	18/08/2022	13:01	Grey heron	1	2	A	3			
17	2	18/08/2022	13:25	Grey heron	1	5	A	5			
18	3	19/07/2022	10:30	Grey heron	1	30	B	5			
19	4	05/05/2022	16:35	Grey heron	1	30	B	60			
20	4	27/07/2022	18:09	Grey heron	1	5	A	2			
21	1	11/11/2022	13:31	Grey heron	1	20	B	40			
22	2	22/02/2023	13:39	Grey heron	1	5	A	120			
23	2	13/09/2022	14:03	Grey heron	1	120	C	120			
24	2	02/03/2023	15:02	Grey heron	1	25	B	115			
25	3	05/03/2023	07:45	Grey heron	1	8	A	20			
26	3	05/03/2023	07:45	Grey heron	1	15	B	75			
27	3	05/03/2023	08:35	Grey heron	1	3	A	45			

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total (secs)	Sex	Age	Behaviour
28	3	05/03/2023	08:35	Grey heron	1	2	A	60			Commuting
29	4	08/03/2023	14:55	Grey heron	1	30	B	25			
30	4	06/03/2023	18:43	Grey heron	1	25	B	45			
31	4	03/08/2023	14:10	Grey heron	1	20	B	5			
32	2	03/11/2023	08:03	Grey heron	1	20	B	15			Commuting
33	1	16/4/2024	07:32	Grey heron	1	15	B	78		Ad	Flying
34	1	22/4/2024	16:09	Grey heron	1	30	B	67		Ad	Flying
35	4	24/4/2024	16:18	Grey heron	1	30	B	32		Ad	Flying
36	4	20/5/2024	15:58	Grey heron	1	30	B	46		Ad	Flying

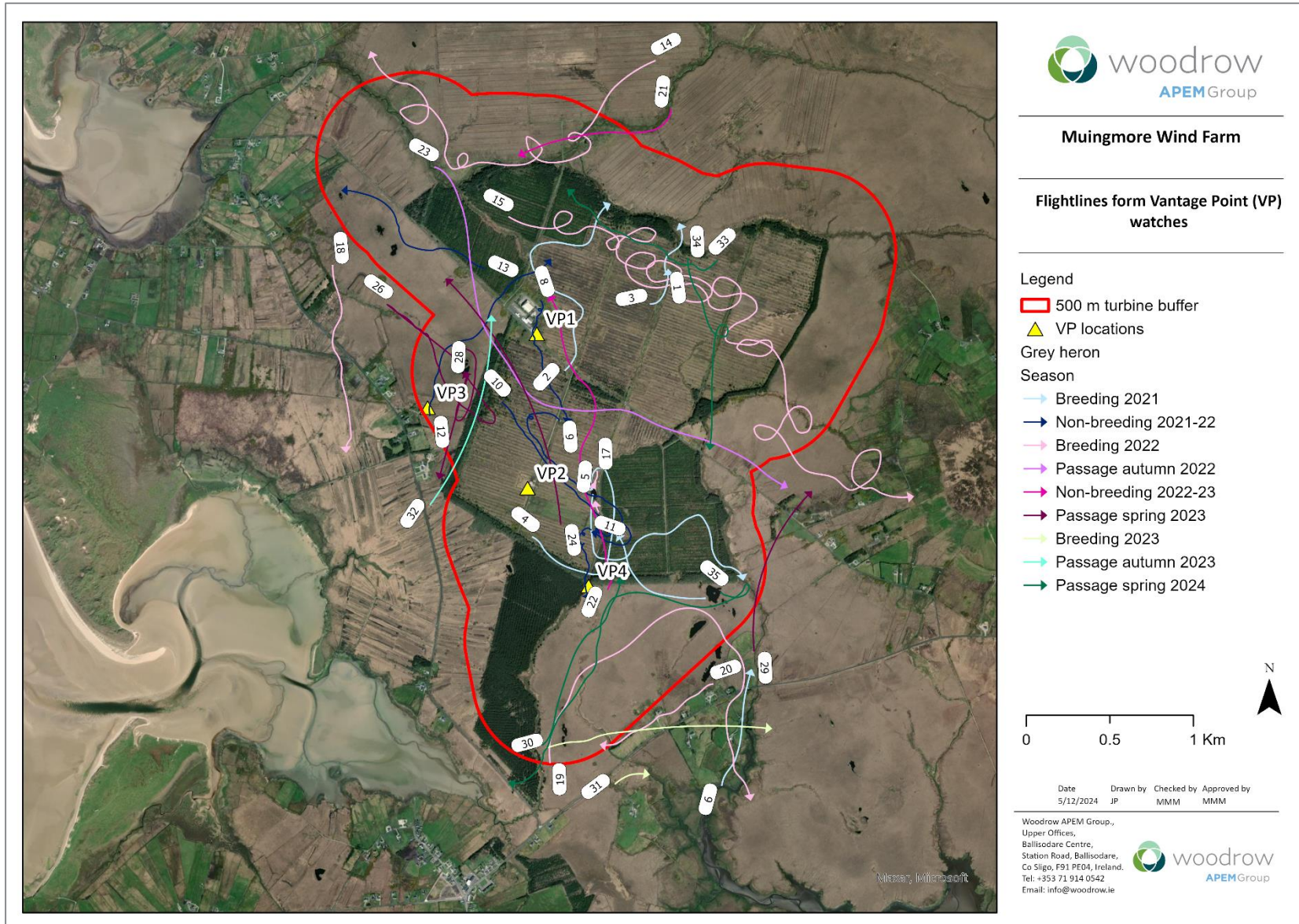


Figure IX.8: Grey heron flightlines from VP watches

Table IX.9: VP watch data for snipe

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total (secs)	Sex	Age	Behaviour
1	1	13/10/2021	10:04	Snipe	1	5	A	5			Commuting
2	2	13/10/2021	11:27	Snipe	1	10	B	5			Commuting
3	2	28/02/2022	08:25	Snipe	1	15	B	12			
4	2	28/02/2022	09:38	Snipe	1	15	B	16			Flying
5	3	14/10/2021	11:45	Snipe	1	10	B	12			
6	1	13/10/2022	08:55	Snipe	5	45	B	425			
7	2	11/11/2022	17:11	Snipe	2	45	B	90			
8	2	30/01/2023	13:05	Snipe	1	60	B	125			
9	3	10/10/2022	14:45	Snipe	27	25	B	540			
10	3	19/10/2022	09:54	Snipe	11	20	B	440			
11	4	20/10/2022	18:58	Snipe	2	40	B	110			
12	4	19/02/2023	16:54	Snipe	1	80	B	40			Flushed by kestrel
13	2	11/10/2022	09:23	Snipe	1	30	B	70			Landed
14	2	10/06/2023	17:28	Snipe	1	35	B	30			Displaying
15	3	25/07/2023	13:17	Snipe	2	60	B	16			
16	4	05/05/2023	11:27	Snipe	1	40	B	20			Drumming
17	4	05/05/2023	13:50	Snipe	2	50	B	90			Drumming
18	4	25/07/2023	11:00	Snipe	1	30	B	12			
19	4	26/07/2023	10:28	Snipe	1	70	B	23			
20	4	26/07/2023	11:10	Snipe	1	40	B	9			
21	1	14/10/2023	17:37	Snipe	2	60	B	60			
22	2	03/11/2023	09:15	Snipe	1	10	B	8			Flying

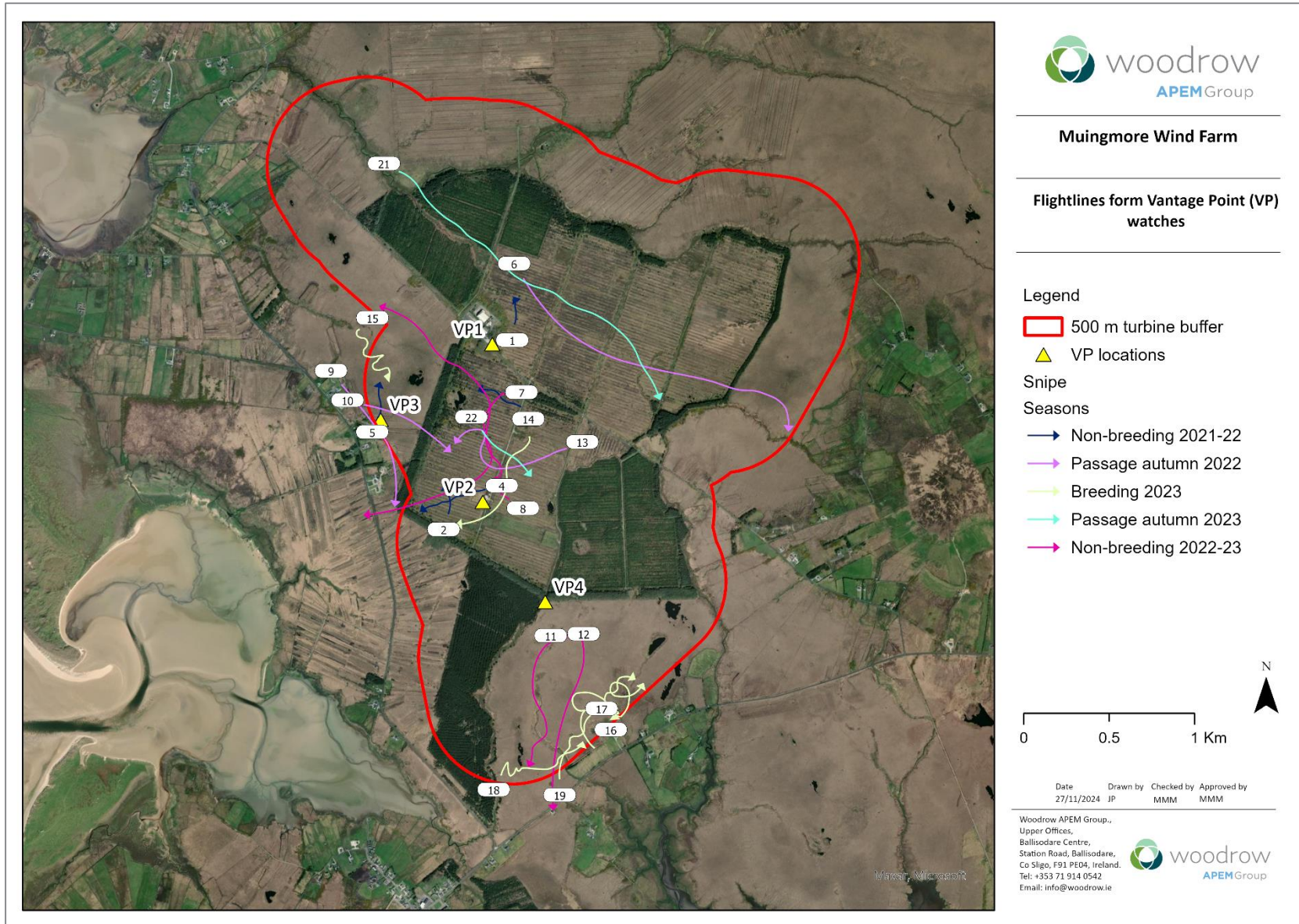


Figure IX.9: Snipe flightlines from VP watches

Table IX.10: VP watch data for other waders

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total (secs)	Sex	Age	Behaviour
1	1	24/11/2021	09:23	Lapwing	3	100	B	222			Commuting
2	1	19/01/2022	12:12	Woodcock	1	40	B	17			Flying
3	1	19/01/2022	12:12	Woodcock	1	30	B	4			
4	3	16/12/2021	13:41	Woodcock	1	1	A	9			Commuting
5	4	12/01/2022	08:15	Woodcock	1	1	A	5			
6	2	19/10/2022	15:58	Wilson's phalarope	18	80	B	1,080			
7	4	16/10/2022	10:19	Curlew	2	40	B	5			Dropped out of view
8	4	17/11/2022	08:14	Greenshank	1	50	B	20			Dropped out of view
9	4	25/07/2023	11:40	Golden plover	3	40	B	36			
10	2	07/05/2023	17:12	Whimbrel	7	150	C	945			

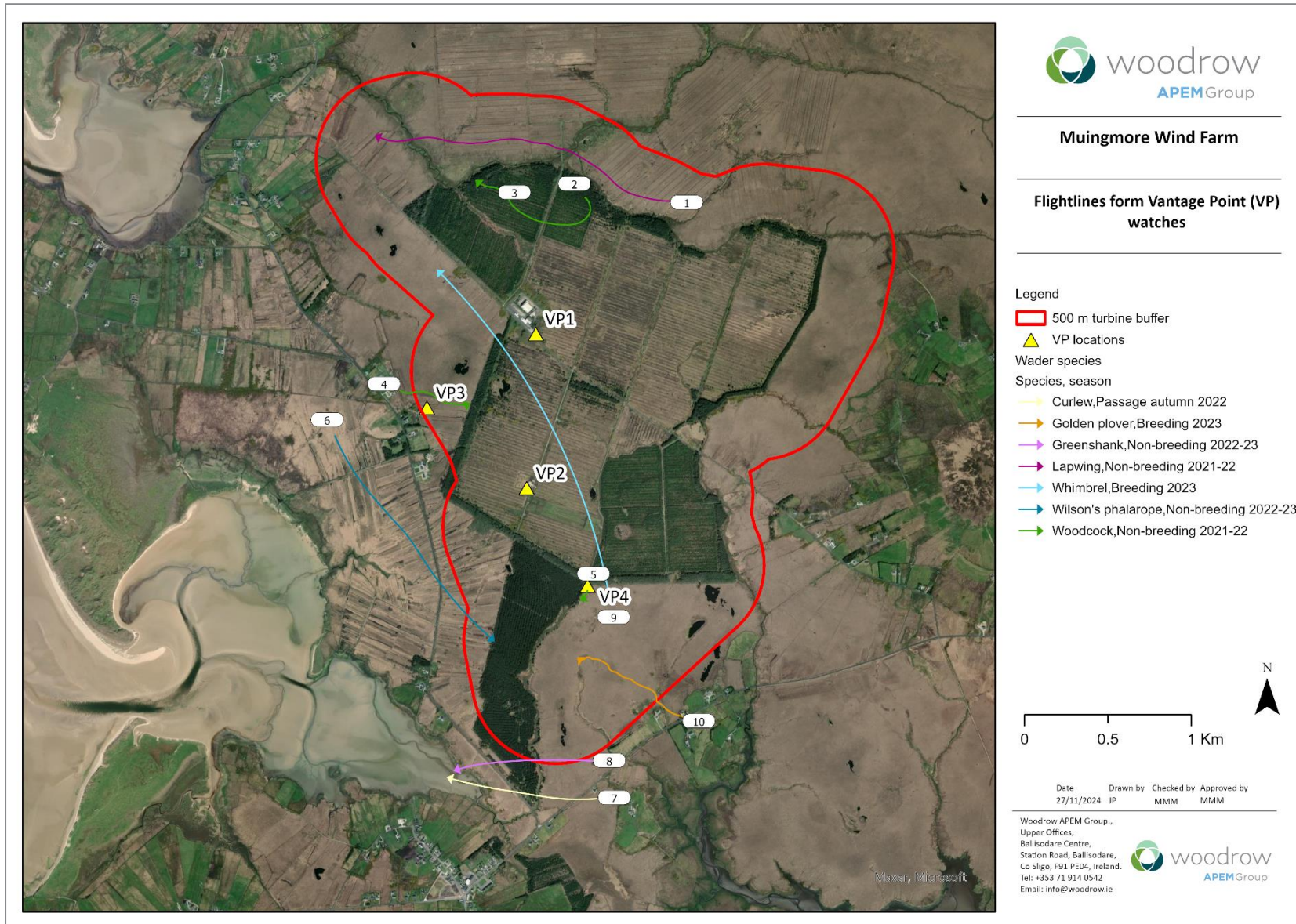


Figure IX.10: Waders flightlines from VP watches

Table IX.11: VP watch data for mallard

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total	Sex	Age	Behaviour
1	3	28/4/2021	11:17	Mallard	1	30	B	24	M		Flying
2	3	10/5/2021	15:12	Mallard	1	5	A	28	M		Flying
3	3	10/5/2021	16:33	Mallard	1	15	B	22	M		Flying
4	3	25/8/2021	14:58	Mallard	1	5	A	16	F		Flying
5	1	3/8/2022	11:46	Mallard	1	15	B	45		Ad	Commuting
6	3	27/4/2022	16:43	Mallard	2	15	B	50	M	Ad	Commuting
7	3	27/4/2022	17:05	Mallard	1	10	B	38	M	Ad	Commuting
8	3	17/5/2022	11:21	Mallard	1	15	B	5			Commuting
9	4	21/4/2022	17:25	Mallard	1	15	B	65	M	Ad	Commuting
10	4	5/5/2022	16:53	Mallard	1	10	B	40	F	Ad	Commuting
11	4	15/5/2022	20:32	Mallard	1	15	B	20	M	Ad	Commuting
12	4	15/5/2022	20:49	Mallard	1	45	B	20	M	Ad	Commuting
13	3	19/2/2023	12:32	Mallard	3	7	A	45	2M 1F		Displaying
14	4	12/11/2022	7:33	Mallard	4	25	B	40			Commuting
15	3	4/4/2023	18:10	Mallard	1	5	A	10	M	Ad	Present
16	4	5/4/2023	18:22	Mallard	4	35	B	400		Ad	Present
17	3	1/8/2023	13:05	Mallard	2	20	B	30			Commuting
18	3	1/8/2023	14:30	Mallard	1	15	B	10	F	Ad	Commuting
19	4	25/1/2024	10:39	Mallard	2	15	B	60			Flushed
20	2	17/4/2024	7:18	Mallard	4	10	B	40	M+F	Ad	Flying
21	2	17/4/2024	7:39	Mallard	4	25	B	112	M+F	Ad	Flying
22	3	18/4/2024	7:35	Mallard	2	5	A	8	M	Ad	Hunting
23	4	24/4/2024	12:08	Mallard	1	20	B	9	M	Ad	Flying
24	3	15/5/2024	19:38	Mallard	1	40	B	29	M	Ad	Flying
25	2	16/5/2024	19:43	Mallard	2	30	B	16	M	Ad	Flying

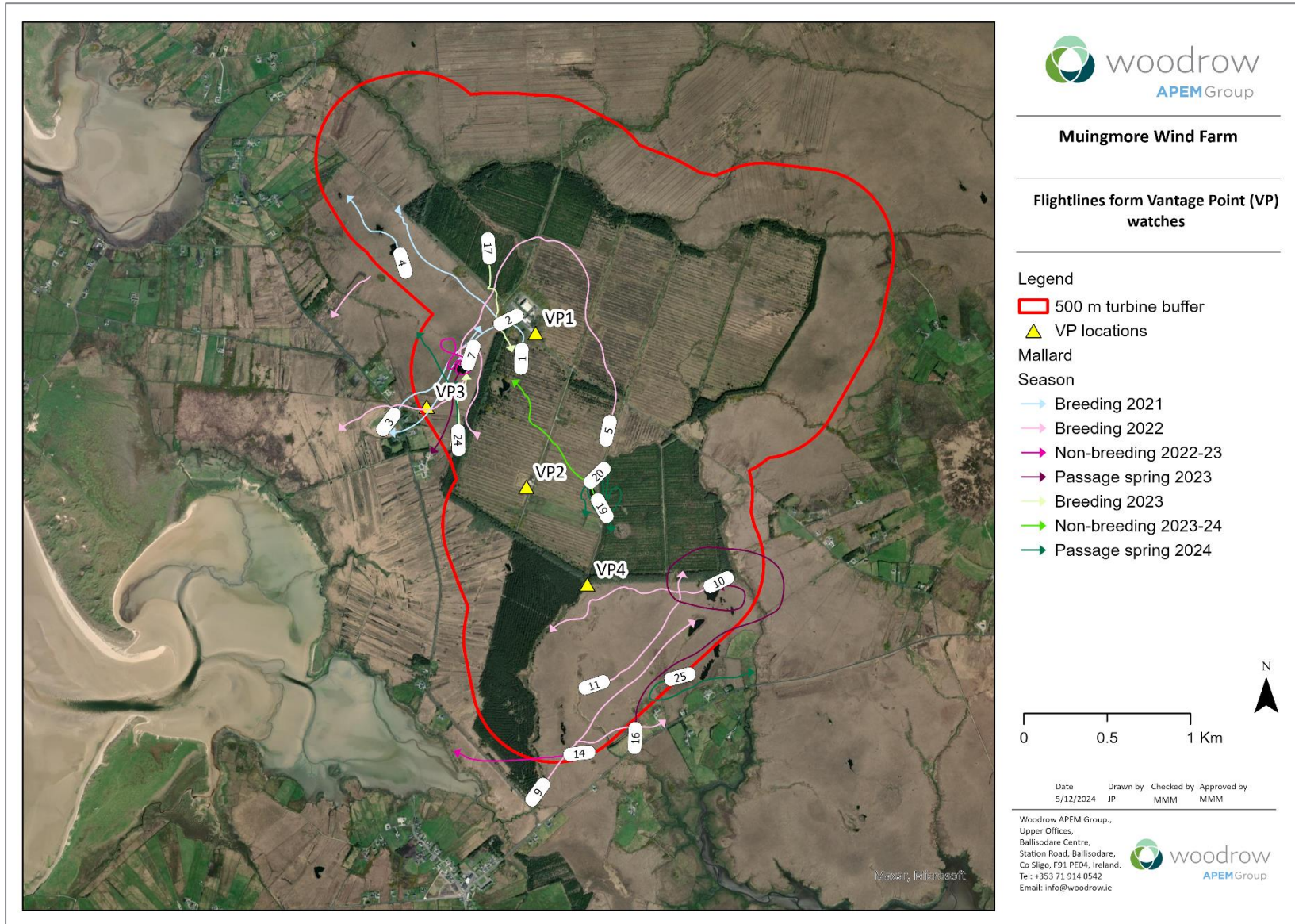


Figure IX.11: Mallard flightlines from VP watches

Table IX.12: VP watch data for teal

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total (secs)	Sex	Age	Behaviour
1	2	1/7/2021	13:24	Teal	1	10	B	12			Nesting
2	4	26/7/2023	11:30	Teal	5	80	B	75			
3	3	3/3/2023	17:19	Teal	2	2	A	40			Landed on pond

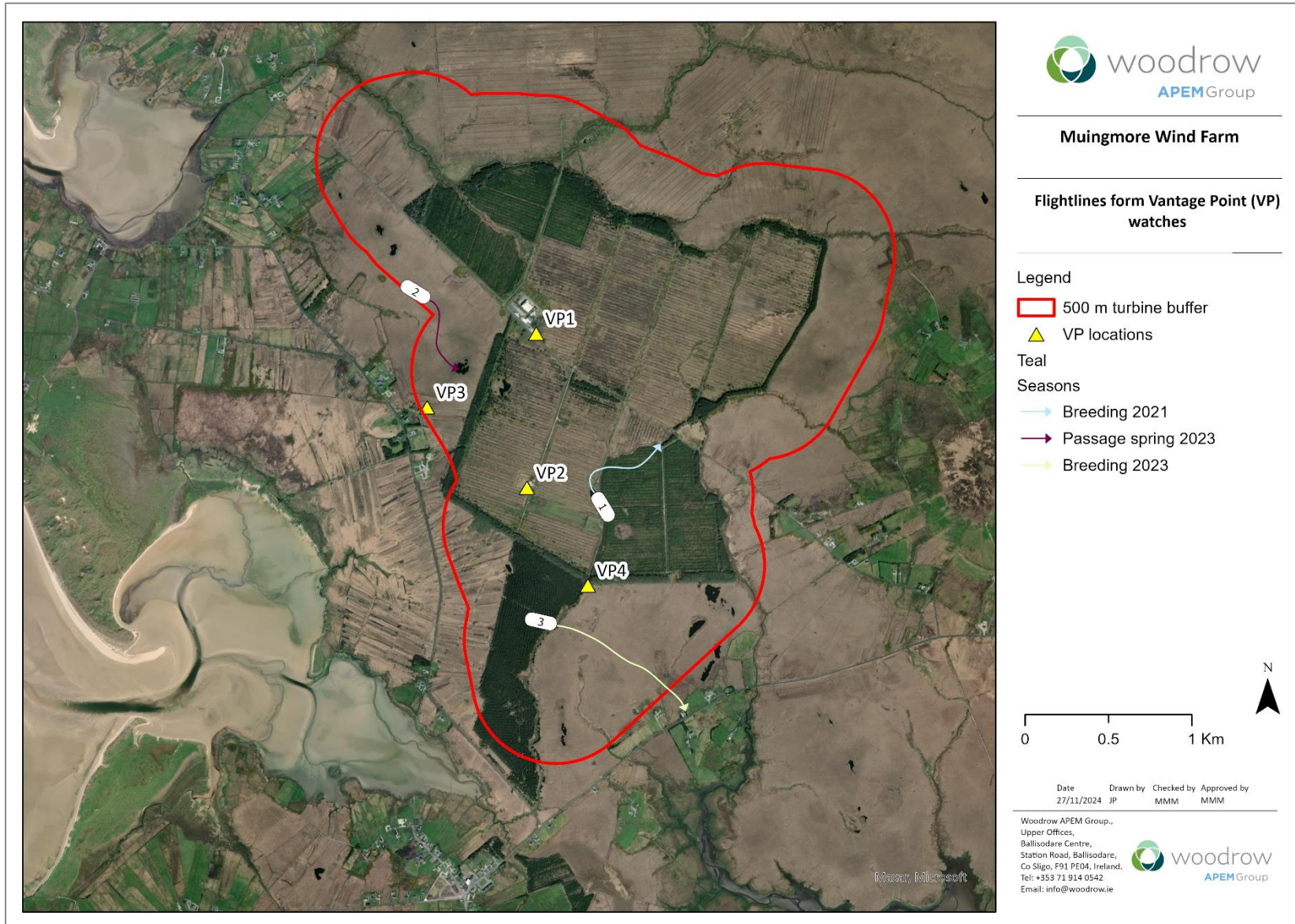


Figure IX.12: Teal flightlines from VP watches

Table IX.13: VP watch data for greylag goose, Canada goose and whooper swan

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total (secs)	Sex	Age	Behaviour
1	3	03/03/2023	17:40	Greylag goose	17	80	B	4,335			
2	3	07/06/2023	17:13	Canada goose	1	25	B	50			
3	3	17/12/2021	09:32	Whooper swan	3	25	B	120			Commuting
4	1	25/01/2023	11:39	Whooper swan	5	30	B	875		Ad, Juv	

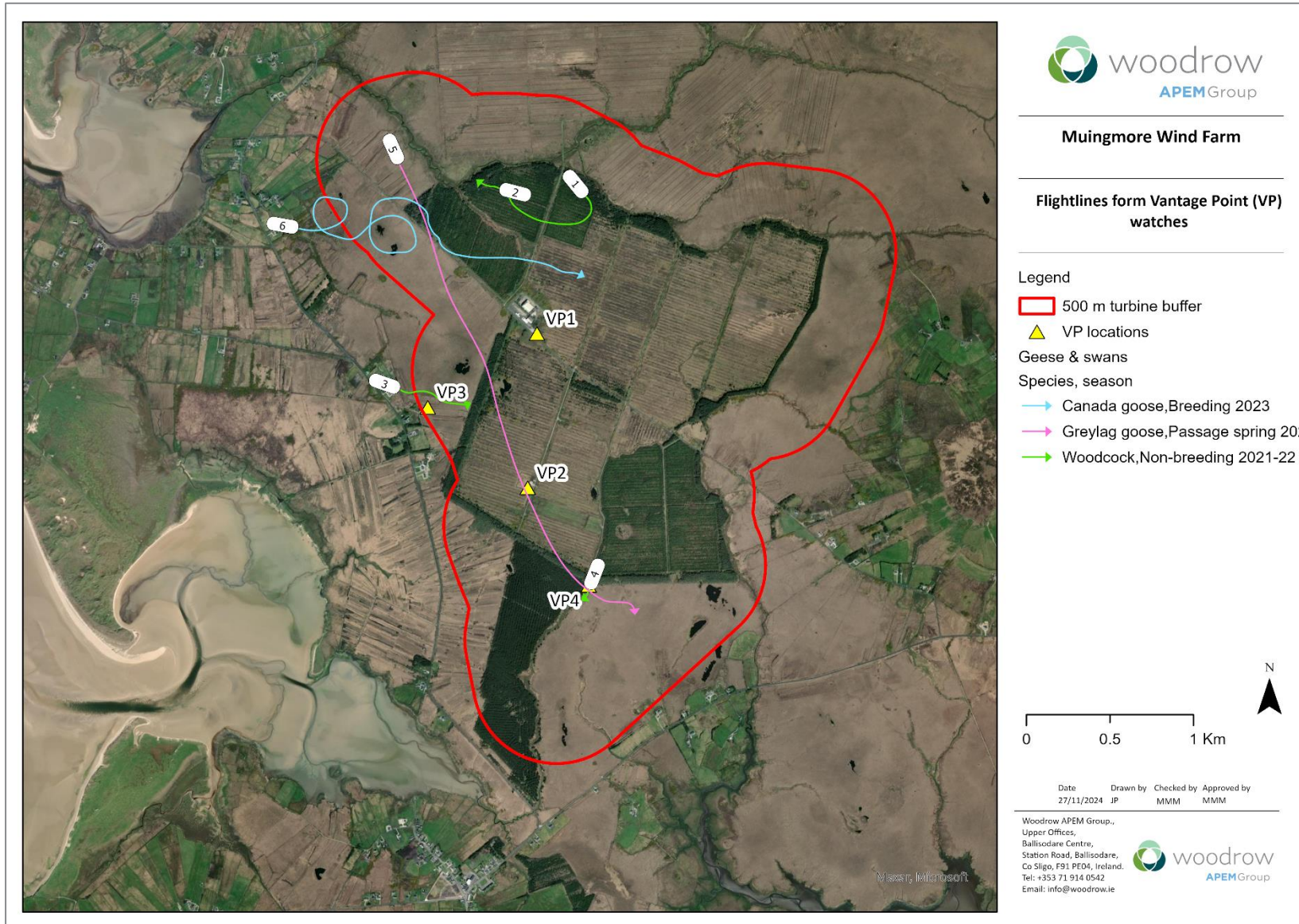


Figure IX.13: Greylag goose, Canada goose and whooper swan flightlines from VP watches

Table IX.14: VP watch data for kittiwake

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total (secs)	Sex	Age	Behaviour
1	2	10/04/2023	17:48	Kittiwake	1	15	B	40			Presume storm blown bird in, reorienting. Unusual record

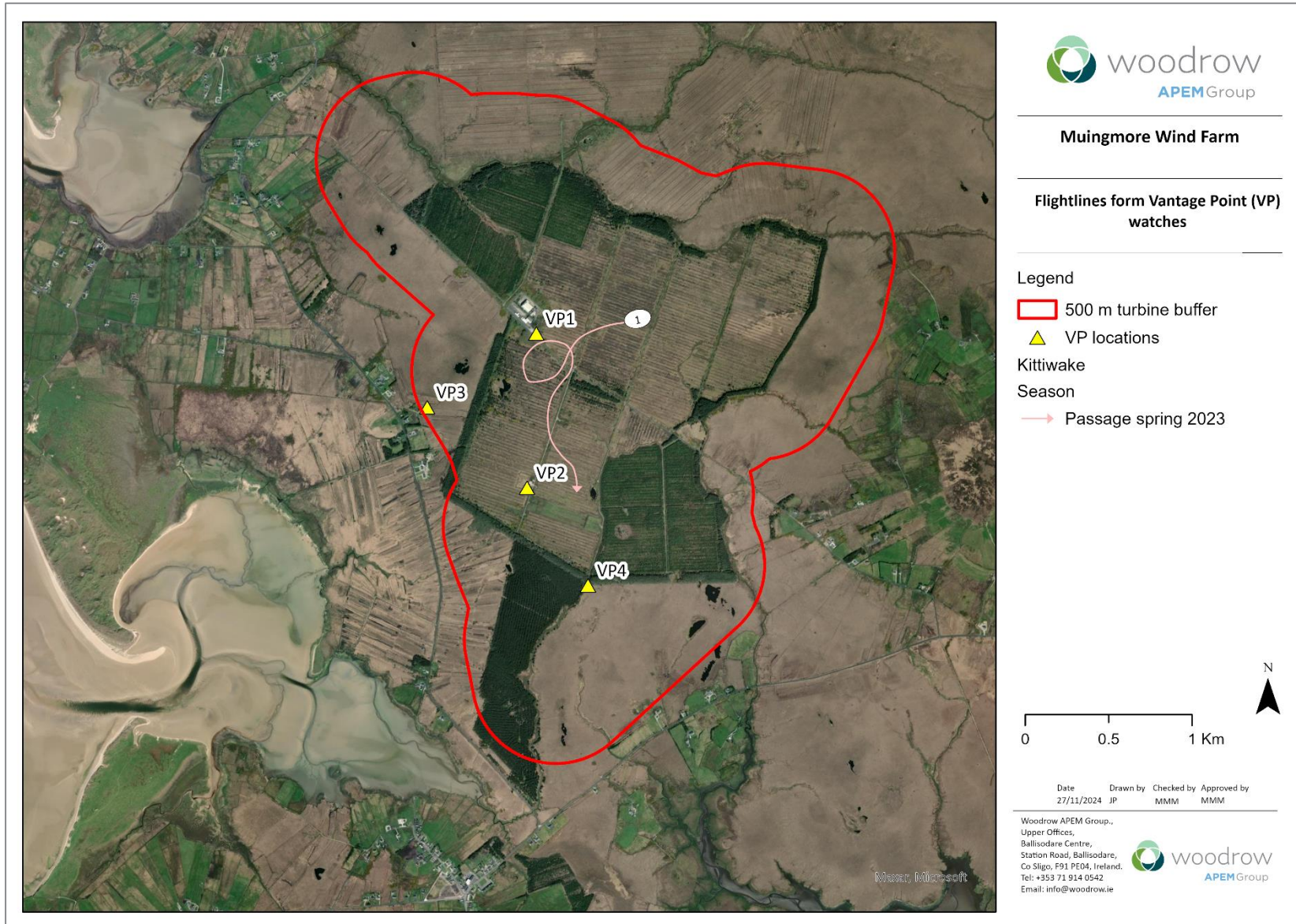


Figure IX.14: Kittiwake flightlines from VP watches

Table IX.15: VP watch data for buzzard

Flight ID	VP no.	Date	Time	Species	No. birds	Height (m)	Height band	Flight total (secs)	Sex	Age	Behaviour
1	1	28/04/2021	15:48	Buzzard	1	100	B	53			
2	1	14/04/2022	12:10	Buzzard	1	-	-	-			Perched
3	1	09/08/2022	16:48	Buzzard	2	55	B	440			Pair circling up high
4	2	21/04/2022	11:50	Buzzard	1	35	B	68			
5	2	21/04/2022	12:50	Buzzard	1	40	B	120			Hunting
6	2	21/04/2022	12:52	Buzzard	1	150	C	310			
7	4	29/08/2022	11:41	Buzzard	2	50	B	5			
8	1	08/02/2023	16:05	Buzzard	1	15	B	20			Landed on bog
9	2	08/02/2023	12:21	Buzzard	1	25	B	40			